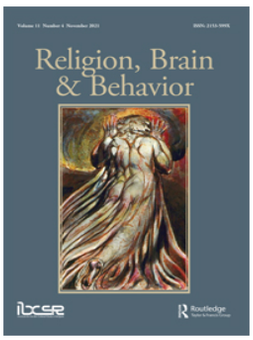

Routledge
Taylor & Francis Group

Religion, Brain & Behavior

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rrbb20

Cognitive bugs, alternative models, and new data

Joseph Henrich

To cite this article: Joseph Henrich (2022): Cognitive bugs, alternative models, and new data, Religion, Brain & Behavior, DOI: 10.1080/2153599X.2021.1991462

To link to this article: https://doi.org/10.1080/2153599X.2021.1991462

Published online: 28 Jan 2022.

RELIGION, BRAIN & BEHAVIOR
https://doi.org/10.1080/2153599X.2021.1991458

Routledge
Taylor & Francis Group

BOOK SYMPOSIUM: *THE WEIRDEST PEOPLE IN THE WORLD* BY JOSEPH HENRICH

COMMENTARIES

WEIRD Indeed, but there is more to the story: anthropological reflections on Henrich's "The Weirdest people in the world"

Agustín Fuentes

Princeton University, Princeton, NJ, USA

In this massive tome Joseph Henrich's goal is to explain how understanding patterns that shape global psychological variation can assist in understanding why contemporary WEIRD populations are so peculiar relative to other populations. In doing so he seeks to offer insight into how these WEIRD peculiarities facilitated WEIRD nations becoming "particularly prosperous."

Henrich's conclusion is that a specific suite of social, historical, perceptual/ideological and institutional processes and patterns came together in Western/Northern Europe to create a distinctive cultural context with substantive, and evolutionally relevant, structuring impacts on the populations residing there. He asserts that it was the sequential processes of social, economic, and institutional changes related to widespread adoption of, and control by, the Christian church that shaped Western/Northern Europe populations' worldviews, beliefs, and psychologies post ~1200 and created those groups of humans he calls WEIRD. The flowchart in figure 14.1 on page 472 of the book does a nice job of laying out his argument for the trajectory of these psychological and structural patterns.

Henrich's overall theme is robust and the core theoretical and structural layout admirable. Few scholars have the capacity, community, and collaborative energy to carry something like this to fruition. One has to acknowledge Henrich's book as a substantial amount of effort, insight, investigation, and analyses. Regardless of my critiques below, this is first and foremost a major contribution and sure to stimulate discussion, debate, and further research.

To set the stage Henrich argues, and offers examples in support of, the assertion that the human mind is the product of coevolutionary forces. Psychologies vary across the globe due to the interfaces between the products of human evolutionary histories and distinctive historical and structural mixes of institutions, technologies, languages, and belief systems across the planet. This is reasonable well-trodden ground and resonates with anthropological, social psychological and evolutionary assessments and proposals across much of the last century (e.g., Geertz, 1973; Han, 2017; Kroeber & Kluckhohn, 1952; Laland, 2017; Lende & Downey, 2012; Read, 2011; Tomasello, 2014, and of course Henrich's previous work (Henrich, 2016). One can quibble as to whether or not Henrich includes enough variables and interaction/systemic dynamics in the overall model, and whether there is sufficient ethnographic depth in his examples, but his general conclusion is cogent.

The major focus of the book concerns proposing and assessing assertions, drawing on the work of Jack Goody (Goody, 1983) and others, that certain threads of medieval Christianity gave rise to a collection of social norms and practices (in parts of Europe) that Henrich refers to as the Marriage and Family Program (MFP). Henrich argues the MFP redesigned kinship structures and the meaning of kinship, restructuring marriage and residence patterns, breaking down intensive kinship and community networks, increasing relational and residential mobility and reliance on the Church as central unifying factor replacing previous broadscale kinship networks. Such changes opened the

CONTACT Agustín Fuentes afuentes2@princeton.edu

door to impersonal markets and urbanization and the creation of institutions that promoted and solidified such processes. This is a reasonable description of some key demographic, political, and economic elements shared historically by WEIRD groups. However, Henrich's engagement with the actual social lives and perceived (believed) experiences of the peoples existing in the historical moments he describes are less in depth; people appear primarily as demographic descriptions, political, and economic timelines and historical accounts of political processes, declarations and church records. There is much to discuss in the details of this key aspect of Henrich's argument, but I leave that to the historians, socio-cultural anthropologists, theologians, religious studies scholars, and archeologists who I am sure will weigh in on the topic.

After establishing the MFP and its structures, Henrich invokes the psychological and structural changes it produces to explain the industrial revolution, European global expansion, and contemporary WEIRD nations' political and economic systems, which he sees as the logical outcome of what makes WEIRD weird. Specifically, Henrich focusses on increased impersonal prosociality and increased individualism and self-focus/personal motivation and a cascade of psychological characteristics leading to the emergence of Protestantism, individual-centered law, contemporary market economies, etc. Specifically, he asserts that WEIRD peoples are more self-focused, have more self-control and patience, value hard work more, value trust and fairness more, are more analytical, and believe in free will more than other groups of people in the world.

While Henrich offers convincing scenarios by which these psychological states might have emerged, there is much room for debate about how one assesses "values," "trust," "fairness," and "analytical thinking" in truly cross-cultural and cross-historical comparisons. The definitions and frame Henrich uses to discuss and assess these psychological characteristics, and make the comparisons, are rooted in a particular WEIRD intellectual tradition and have a history. I am concerned that this particular mode of framing/naming these traits in the context of a specific comparative assertion, WEIRD vs. the rest of the world, obliquely (and unintentionally) mirrors "scientific" racist and colonialist arguments of the last three centuries: Europeans/Whites are more rational, hardworking, honest, and intelligent, in short more "evolved" than other humans (Darwin, 1871; Galton, 1883; Hernstein & Murray, 1994, and many others, see Saini, 2019). This is clearly not Henrich's intent, but, as I note below, there are specific histories and systems that are relevant to such scientific inquiry (Marks, 2017; Saini, 2019; Sussman, 2016).

As the core of this essay, I offer two specific critiques. One minor, one major. The minor is a general critique regarding basal assumptions about human evolution and the major is a suite of historical/societal omissions that highlight the troublesome aspect of Henrich's account of why WEIRD people, or rather *White* people (e.g., Clancy & Davis, 2019), have become particularly prosperous.

First, and briefly, the selective engagement with contemporary human evolutionary histories, processes and patterns creates a problem for the suite of assumptions undergirding the basal narrative about why humans do what they do. Henrich and colleagues have published on cooperation extensively, including substantive reviews recently (e.g., Henrich & Muthukrishna, 2021). Their position is that that cooperation "cannot be fully explained by the canonical approaches found in evolutionary biology, psychology, or economics" (24.1) and they are right. Henrich and colleagues do a good job of engaging psychological and economic literatures to justify their assertion. However, they are surprisingly light on anthropological, paleoanthropological, and archeological Pleistocene human evolutionary research and analyses, and contemporary evolutionary theory (e.g., Laland et al., 2015). Henrich and colleagues continue to rely primarily on a model that prioritizes inter-individual and inter-group conflict, and most recently the self-domestication model version of it (Wrangham, 2019), as the core driver for Pleistocene hominin social evolution. This approach assumes a relatively recent emergence of intensive and complex cooperation as a central process in the human niche and relies primarily on a standard adaptationist approach for Pleistocene pre-domestication *Homo* populations (e.g., 99% of human history). Such a perspective structures how one sees and explains contemporary cooperation/conflict and what one assumes about the basic adaptive patterns for individuals in the ancestral human niche. Current work in human

evolution effectively argues against a basal inter-individual/inter-group competition/cooperation frame for Pleistocene *Homo*. Substantial data and analyses demonstrate complex interwoven processes of mutuality, collaboration, cooperation, and competition deep in the Pleistocene (Antón & Josh Snodgrass, 2012; Burkart et al., 2009; Fuentes, 2015, 2017a; Hrdy, 2009; Kissel & Kim, 2019; Spikins, 2015; Sterelny, 2012) which sets a very different stage for the emergence of contemporary societies, and human behavior, than classic adaptationist paradigms (and I think much of Henrich's work actually resonates with this contemporary perspective). Just as an example, on pp. 327–328 (and in chapters 2–4) there is representation of Pleistocene *Homo* as rife with intergroup conflict. Henrich frames *Homo* populations and the evolution of cooperation as emerging from " … competition among bands, clans, and tribes drove the cultural spread of cooperative norms that permitted groups to survive both violent conflicts with other groups and natural disasters." The reality of Pleistocene human lives is more complex and less clear, as is evidenced by state-of-the-art overviews in the paleoanthropological and archeological record (e.g., Antón & Kuzawa, 2017; Brooks et al., 2018; Fry, 2013; Kim & Kissel, 2018; Potts et al., 2018) wherein cooperation and collaboration are not initially, or only, an emergent response to inter- or intra-group conflict (contra Wrangham, 2019).

The constraints of staying with a narrow explanatory human evolution frame are seen in the engagement with the processes and patterns of domestication and the origins of large-scale societies, critical theoretical underpinning of Henrich's argument for the structural peculiarities of WEIRD. When Henrich does engage issues related to domestication and Holocene human societies years he often falls into the "the Diamond effect" (Antrosio, 2014) overlooking critical contemporary work on the subject (e.g., Bird et al., 2019; Smith, 2011; Zeder, 2009, 2017, 2018). Despite Henrich's declaring that Jared Diamond's approach is insufficient to explain Industrial revolution and Enlightenment (but that his does) he relies on "Diamond's elegant argument" (p.475) citing seven Diamond publications and almost no other, more current scholars who counter Diamond's assertions, aside from classic gene-culture co-evolution work. This same practice is seen in his allegiance to the "Big Gods" theorizing, understandable given his early role in the model but problematic because of growing debates and complexity in the explanatory sequencing and power of the approach (in which Henrich is deeply engaged e.g., Beheim et al., 2019; Whitehouse et al., 2019).

Overall Henrich assumes that the traditional adaptationist narrative of Pleistocene human evolution is the only or best supported model as a baseline for the human niche, and it is not (Antón & Josh Snodgrass, 2012; Antón & Kuzawa, 2017; Fuentes, 2017b). If such a framing is incorrect some of the assumptions that Henrich builds as basal to his model, and central to interpretation of economic game outcomes and related assessments of basal human adaptive processes, are on tenuous ground. I offer that it is possible that Henrich's assumptions about how human evolution works might well be influenced by the very WEIRD contexts he writes about and critiques. Being a WEIRD human evolutionary scientist, even if one recognizes that, can influence one to produce a WEIRD human evolution narrative that is often deficient in key elements/perspectives (Athreya & Ackermann, 2018; Fuentes, 2019; Kissel, 2019; Smith & Bolnick, 2019). As noted earlier, an example of such bias is the illusion that "domestication" of plants and animals has discrete origins associated with specific geographic and cultural "civilizations" and what that implies for cultural evolutionary processes and trajectories (e.g., the Diamond effect). Abundant evidence challenges and complicates such an assumption (Callaway, 2014; Hunt & Rabat, 2014; Larson & Fuller, 2014; Smith, 1997, 2011; see Fuentes, 2017a ch. 6 for a review). Regardless of whether or not one agrees with my critique here, there is a serious debate in the contemporary human evolutionary literature about the validity of the "classic" stances Henrich ascribes to and in such a massive undertaking as this book it is worth thinking through more carefully and engaging a broader range of the contemporary literature.

My second critique is more serious: the omission of critically important, and relevant, historical and contemporary WEIRD-related processes, patterns and events, particularly the Transatlantic slave trade and the settler colonial history of the USA and the subsequent economic/political systems associated with them. Henrich nods to these issues very few times. In the 583 pages of text, appendix and notes the word "Colonialism" appears twice, "Slavery" three times, "Genocide"

three times, "Racism" once and "Race" not at all. None of these words/contexts/events are developed and get only a sentence or two with their mention.

Henrich acknowledges that European expansion does have serious negative associations but that "Nevertheless, whether one prefers to focus on the economic and technological triumphs or the conquests and atrocities the question remains the same: How and why did this innovation-driven economic and military expansion explode out of Europe after 1500?" (pp. 431–433). This statement is paired with a page of two graphs supposedly highlighting WEIRD "prosperity," one demonstrating GDP per capita and the other average life expectancy in seven western European countries and the USA from 1800 to 2018 (p. 432). I suggest that the inherently positive phrasing "innovation-driven economic and military expansion" and the glass half-full/glass half-empty option to "focus on the economic and technological triumphs or the conquests and atrocities" creates an obfuscating context that enables an analysis wherein totality of the last 500 years is reframed as "progress" with some negative side effects. This is not an accurate representation for such an analysis as this book seeks to carry out. The graphs, like the phrase, act to conceal a more accurate and in-depth engagement with the actual lived social, political, and economic processes associated with the WEIRD world over the last 500 years, especially the last 300.

For example, one cannot simply report national average GDP and life expectancy for the USA from 1800 to 2018 in this manner and expect it to reflect a valid (and evolutionarily relevant) assessment of humans' lives in that nation: in 1850 the income and life expectancy of a White land-owning man and an African-descendant enslaved man were not comparable as co-contributors to this index, they were not living structurally comparable lives to be collapsed into a common measure by any stretch of the imagination. The economic benefit of the labor of the enslaved man was assigned to the White land-owning man in the analysis, negating its value as a true indicator of individual or national economic realities. And the enslaved man was not even "counted" as a full human being. Despite a few structural differences this incongruity is true for a White and a Black man in 1950 USA as well. To use GDP in this manner obscures the actual, and culturally/evolutionarily relevant, processes for the living humans in this WEIRD nation. The lack of engagement with key aspects of the last ~300–500 years of Western European "structuring of structures" (to paraphrase Bourdieu (1977)) in regard to global and regional economic and political realities and to have a subtitle that reads "How the west became psychologically peculiar and particularly prosperous" is problematic. To not spend much time/space/theory on Empire building, Colonialism (especially Settler Colonialism), the construction of racializing processes, the Christian theology and practices associated with slavery and genocide, is detrimental to the core goal of this book: explaining WEIRD.

When the full range of data and processes are left out of a narrative like this the story becomes less about the processes and patterns associated with the WEIRD world, and more specifically about a history of, and from the perspective of, a select group of "White" peoples. I think Clancy and Davis (2019, p. 169) stated it best when they pointed out that "whiteness [is] the factor that most strongly unites WEIRD research and researchers yet typically goes unacknowledged." In the current analyses there is a marked absence of non-White members of the WEIRD world, and the WEIRD nations' engagement with the non-WEIRD nations and peoples, both of which are quite significant in understanding the economic, political, technological, and social processes that Henrich heralds as leading to the prosperity of the WEIRD world. This is evident in many places in the final section of the text where a bias towards what can be thought of as positive outcomes of WEIRD psychology is increasingly noticeable and the recognition of inconsistencies swept aside. For example, in the chapter on "Law, Science, and Religion" Henrich uses the USA Declaration of Independence as an example of the WEIRD innovative focus on rights for individuals. But this is ironic (at least) as the declaration was not at all originally intended for human rights, but rather only for certain kind of White male rights, an issue directly related to particulars both about WEIRD psychology and about slavery and settler colonialism in the USA. This is a very interesting conundrum that deserves as much attention as is offered in the variety of complex analyses of earlier European WEIRD society in the preceding portions of the book. Henrich is aware of the incongruency in his example but limits his concern to an end note (p. 569): "Of course, the founding fathers struggled with some glaring inconsistencies,

including their own participation in the institution of slavery. But, this contradiction bothered them and many other analytical thinkers, which is crucial. They knew it would eventually have to be resolved, either by ending slavery or by concluding that slaves were a different kind of creation and thus not subject to the self-evident assertion about unalienable rights. Less analytical thinkers are just not so bothered by category distinctions." This is a particular, and debatable, "explaining away" of a serious confounding feature of the WEIRD psychology/historical reality.

Thinking specifically about the key WEIRD psychological characteristics in regard to the details of global expansion, colonialism, and slavery, all central to the development of the "particular prosperity," can only add to the impact and quality of Henrich's analyses. Near the end there is one paragraph on page 486, where colonialism, slavery, empire, and racism are all mentioned. But they noted as a "mismatch," a lag in cultural evolutionary adaptation, between the realities of the WEIRD psychology and "new institutions or practices." Henrich suggests that the processes of globalization caused a disjuncture between intent and outcome. However, one wonders if in following the thread of analyses that Henrich introduces in the first sections of the book whether one could argue for a reading of the WEIRD psychology characteristic cluster in quite the opposite direction than (I assume) Henrich intends: could the WEIRD psychology and history he lays out actually predicate the subsequent processes and outcomes of colonialism, slavery, and racialized political and economic systems? It is certainly worth further consideration.

In the terminal portions of the book the framing of "progress" and "democracy" for the success and prosperity of the WEIRD creates an incomplete analysis. Henrich acknowledges the "bad stuff" emerging in concert with the WEIRD world but does not include it as a salient and structuring aspect in the investigation. Such an omission does not follow the mode of argumentation and assessment by example from earlier in the book and is not developed in the same way as the argument about the "structuring structures" of western European Christianity and the emergence of Protestantism. This leads to the problematic "view from nowhere" approach to thinking with and about human evolution and thus human societies, cultures, and "human nature"(Clancy & Davis, 2019; Kissel, 2019; Smith & Bolnick, 2019). The processes/events associated with empire building, colonialism (especially Settler Colonialism), the construction of racializing processes, slavery, and genocide are related to the core issues of WEIRD psychology Henrich spends so much time developing and are more than central (partly causal) for much in the economic and political "prosperity" that Henrich refers to in the subtitle and in the text. See for example Baptist (2014) and Graeber (2011) for linkages between slavery, colonialism and the WEIRD prosperity/economic systems, and Keel (2018) for the specifics of Christianity's core role in racialization and racism by WEIRD societies and scientists. These processes should be a central feature in the WEIRD historical and analytical narrative.

There is a missed opportunity at the end of the text to focus in more detail on the weirdest of the WEIRD nations, the USA. Such a case study enables one to delve into the patterns of outcomes of the WEIRD trajectory from the MFP, through the industrial revolution, colonialism, genocide, and slavery, and into the creation of a contemporary WEIRD extreme. But to do so one would have to specifically engage themes of the creation of Whiteness and the enfranchisement and dis-enfranchisement of non-White peoples in the WEIRD landscapes. This necessitates thinking with frames of "double consciousness" (W.E.B. DuBois, 1897, 1940), and the well documented relations between slavery, twentieth century racist legal and economic processes, the histories of genocide/removal of indigenous peoples, and the use and abuse of non-White peoples in creating the economic and political systems that Henrich heralds as "particularly prosperous." I suggest that an expanded engagement, that includes the range of relevant elements and the actual processes involved, alters some of the foundational narrative about WEIRD peoples and complexifies the conclusions. Without such efforts the analyses remain incomplete. In the end, I think Henrich has always been right; being WEIRD creates powerful blinders.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Agustín Fuentes http://orcid.org/0000-0003-0955-8214

References

Antón, S. C., & Josh Snodgrass, J. (2012). Origins and evolution of genus *homo*. *Current Anthropology*, *53*(S6), S479–S496. https://doi.org/10.1086/667692

Antón, S. C., & Kuzawa, C. W. (2017). Early homo, plasticity and the extended evolutionary synthesis. *Interface Focus*, *7*(5), 20170004. https://doi.org/10.1098/rsfs.2017.0004

Antrosio, J. (2014). Public Anthropology: Margaret Mead, Jared Diamond, and Onward. *Living Anthropologically*. https://www.livinganthropologically.com/jared-diamond-future-public-anthropology/. First posted 21 July 2014. Revised 15 April 2018.

Athreya, S., & Ackermann, R. R. (2018). Colonialism and narratives of human origins in Asia and Africa. In M. Porr, & J. Matthews (Eds.), *Interrogating human origins: Decolonisation and the deep past. Vol. 136* (pp. 23–42). Routledge.

Baptist, E. E. (2014). *The half Has Never been told: Slavery and the making of American capitalism*. Basic Books.

Beheim, B., Atkinson, Q., Bulbulia, J., Gervais, W., Gray, R., Henrich, J., Lang, M., Monroe, M., Muthukrishna, M., Norenzayan, A., Purzycki, B., Shariff, A., Slingerland, E., Spicer, R., & Willard, A. (2019). Corrected analyses show that moralizing gods precede complex societies but serious data concerns remain. 10.31234/osf.io/jwa2n.

Bird, D. W., Bird, R. B., Codding, B. F., & Zeanah, D. W. (2019). Variability in the organization and size of hunter-gatherer groups: Foragers do not live in small-scale societies. *Journal of Human Evolution*, *131*, 96–108. https://doi.org/10.1016/j.jhevol.2019.03.005

Bourdieu, P. (1977). *Outline of a theory of practice. Richard nice, trans*. Cambridge University Press.

Brooks, Alison S., Yellen, John E., Potts, R., Behrensmeyer, Anna K., Deino, Alan L., Leslie, David E., Ambrose, Stanley H., Ferguson, Jeffrey R., d'Errico, F., Zipkin Andrew M., Whittaker, S., Post, J., Veatch, Elizabeth G., Foecke, K., & Clark, Jennifer B. (2018). Long-distance stone transport and pigment use in the earliest Middle Stone Age Science. 10.1126/science.aao2646.

Burkart, J. M., Hrdy, S. B., & van Schaik, C. (2009). Cooperative breeding and human cognitive evolution. *Evolutionary Anthropology*, *18*(5), 175–186. https://doi.org/10.1002/evan.20222

Callaway, E. (2014). The birth of rice. *Nature*, *514*(7524), S58–S59. https://doi.org/10.1038/514S58a

Clancy, K. B. H., & Davis, J. L. (2019). Soylent Is people, and WEIRD is white: Biological anthropology, whiteness, and the limits of the WEIRD. *Annual Review of Anthropology*, *48*(1), 169–186. https://doi.org/10.1146/annurev-anthro-102218-011133

Darwin, C. (1871). *The descent of man and selection in relation to Sex*. John Murray Co.

Du Bois, W. E. B. (1897). The Strivings of the Negro People, *The Atlantic Monthly*, August: 194–197. [Du Bois 1897 available online].

Du Bois W. E. B. (1940). *Dusk of Dawn: An essay toward an autobiography of a race concept*. Harcourt, Brace, & Co. the Schocken Books edition, New York, 1968.

Fry, D. P. (2013). *War, peace, and human nature*. Oxford University Press.

Fuentes, A. (2015). Integrative anthropology and the human niche: Toward a contemporary approach to human evolution. *American Anthropologist*, *117*(2), 302–315. https://doi.org/10.1111/aman.12248

Fuentes, A. (2017a). *The creative spark: How imagination made humans exceptional Dutton*. Penguin.

Fuentes, A. (2017b). Human niche, human behaviour, human nature. *Interface Focus*, *7*(5), 20160136. https://doi.org/10.1098/rsfs.2016.0136

Fuentes, A. (2019). Identities, experiences, and beliefs: On challenging normativities in biological anthropology. *American Anthropologist*, *121*(2), 467–479. https://doi.org/10.1111/aman.13227

Galton, F. (1883). *Inquiries into the human faculty & its development*. JM Dent and Company.

Geertz, C. (1973). *Thick description: Towards an interpretive theory of culture*. Basic Book.

Goody, J. R. (1983). *The development of the family and marriage in Europe*. Cambridge University Press.

Graeber, D. (2011). *Debt: The first 5000 year*. Melville House.

Han, S. (2017). *The sociocultural brain*. Oxford University Press.

Henrich, J. (2016). *The secret of our success*. Princeton University Press.

Henrich, J., & Muthukrishna, M. (2021). The origins and psychology of human cooperation. *Annual Review of Psychology*, *72*(1), 207–240. https://doi.org/10.1146/annurev-psych-081920-042106

Hernstein, R., & Murray, C. (1994). *The bell curve: Intelligence and class structure in American life*. Free Press.

Hrdy, S. (2009). *Mothers and others: The evolutionary origins of mutual understanding*. Belknap.

Hunt, C. O., & Rabat, R. J. (2014). Holocene landscape intervention and plant food production strategies in island and mainland Southeast Asia. *Journal of Archaeological Science*, *51*, 22–33. https://doi.org/10.1016/j.jas.2013.12.011

Keel, T. D. (2018). *Divine variations: How Christian thought became racial science*. Stanford University Press.

Kim, N. C., & Kissel, M. (2018). *Emergent warfare in our evolutionary past*. Routledge.
Kissel, M. (2019). How popular science (Mis)characterizes human evolution. In K. Willermet, & S. H. Lee (Eds.), *Evaluating evidence in biological anthropology: The strange and the familiar* (pp. 55–70). Cambridge University Press.
Kissel, M., & Kim, N. C. (2019). The emergence of human warfare: Current perspectives. *American Journal of Physical Anthropology*, *168*(S67), 141–163. https://doi.org/10.1002/ajpa.23751
Kroeber, A. L., & Kluckhohn, C. (1952). *Culture: A critical review of concepts and definitions*. Vintage.
Laland, K. N., Uller, T., Feldman, M. W., Sterelny, K., Müller, G. B., Moczek, A., Jablonka, E., & Odling-Smee, J. (2015). The extended evolutionary synthesis : Its structure, assumptions and predictions. *Proc. R. Soc. B Biol. Sci*, *282*, 1–13. http://dx.doi.org/10.1098/rspb.2015.1019
Laland, K. N. (2017). *Darwin's unfinished symphony: How culture made the human mind*. Princeton University Press.
Larson, G., & Fuller, D. (2014). The evolution of animal domestication. *Annual Review of Ecology, Evolution, and Systematics*, *45*(1), 115–136. https://doi.org/10.1146/annurev-ecolsys-110512-135813
Lende, D. H., & Downey, G. (2012). *The encultured brain: An introduction to neuroanthropology*. MIT Press.
Marks, J. (2017). *Is Science racist?* Polity Press.
Potts, R., Behrensmeyer, A. K., Faith, J. T., Tryon, C. A., Brooks, A. S., Yellen, J. E., Deino, A. L., Kinyanjui, R., Clark, J. B., Haradon, C. M., Levin, N. E., Meijer, H. J. M., Veatch, E. G., Owen, R. B., & Renaut, R. W. (2018). Environmental dynamics during the onset of the Middle Stone Age in Eastern Africa. *Science*, *360*(6384), 86–90. https://doi.org/10.1126/science.aao2200
Read, D. (2011). *How culture makes us human: Primate social evolution and the formation of human societies*. Left Coast.
Saini, A. (2019). *Superior: The return of race science*. Beacon Press.
Smith, B. (1997).)The initial domestication of Cucurbita pepo in the Americas 10,000 years ago. *Science*, *276*(5314), 932–934. https://doi.org/10.1126/science.276.5314.932
Smith, B. (2011). General patterns of niche construction and the management of 'wild' plant and animal resources by small-scale pre-industrial societies. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *366* (1566), 836–848. https://doi.org/10.1098/rstb.2010.0253
Smith, R. W. A., & Bolnick, D. A. (2019). Situating science: Doing biological anthropology as a view from somewhere. In: Vital topics forum – How academic diversity is transforming scientific knowledge in biological anthropology. *American Anthropologist*, *121*(2), 465–467. https://doi.org/10.1111/aman.13213
Spikins, P. (2015). *How compassion made us human: The evolutionary origins of tenderness, trust and morality*. Pen & Sword Books Ltd.
Sterelny, K. (2012). *The evolved apprentice: How evolution made humans unique*. MIT Press.
Sussman, R. W. (2016). *The myth of race: The troubling persistence of an unscientific idea*. Harvard University Press.
Tomasello, M. (2014). *A natural history of human thinking*. Harvard University Press.
Whitehouse, H., François, P., Savage, P. E., Currie, T. E., Feeney, K. C., Cioni, E., Purcell, R., Ross, R. M., Larson, J., Baines, J., ter Haar, B., Covey, A., & Turchin, P. (2019). Complex societies precede moralizing gods throughout world history. *Nature*, *568*(7751), 226–229. https://doi.org/10.1038/s41586-019-1043-4
Wrangham, R. W. (2019). *The goodness paradox*. Pantheon.
Zeder, M. A. (2009). The neolithic macro-(R)evolution: Macroevolutionary theory and the study of culture change. *J Archaeol Res*, *17*(1), 1–63. DOI 10.1007/s10814-008-9025-3
Zeder, M. A. (2018). Why evolutionary biology needs anthropology: Evaluating core assumptions of the extended evolutionary synthesis. *Evolutionary Anthropology: Issues, News, and Reviews*, *27*(6), 267–284. https://doi.org/10.1002/evan.21747
Zeder, M. A. (2017). Domestication as a model system for the extended evolutionary synthesis. *Interface Focus*, *7*(5), 20160133. https://doi.org/10.1098/rsfs.2016.0133

Religion: the WEIRDest concept in the world?

Aaron D. Lightner[a], Zachary H. Garfield[a,b], and Edward H. Hagen [a]

[a]Department of Anthropology, Washington State University, Vancouver, WA, USA; [b]Institute for Advanced Study in Toulouse, Toulouse, France

1. Introduction

After a long hiatus, grand theory in anthropology is back. From the second half of the nineteenth century through first half of the twentieth century, anthropologists aimed to develop overarching

CONTACT Edward H. Hagen edhagen@wsu.edu

theories of human cultural variation, from the early evolutionism of Tylor and Morgan to the functionalism of Malinowski to the cultural ecology of Steward. One by one, however, these theories failed. Fleeing the conceptual wreckage, many anthropologists disavowed grand theory, turning inward to produce highly particular accounts of specific populations, or to pillory anthropology itself. Predictably, anthropology's scientific influence waned (Spiro, 1992).

Anthropology's subject matter, though, was too scientifically important to ignore. As the twentieth century drew to a close, Jared Diamond, an outsider, put forward a materialist grand theory in *Guns, Germs, and Steel* that rooted economic disparities between the West and the "Other" in the luck of the ecological draw: domesticable species in a longitudinally extensive temperate continent, Eurasia, gave its inhabitants a leg up over those in Africa, Australia, and the Americas in developing large, innovative nation-states (Diamond, 1997).

If *Guns, Germs, and Steel* revived materialist grand theory, then anthropologist Joseph Henrich's *The WEIRDest People in the World* is its ideational counterpart. Henrich credits *Guns, Germs, and Steel* for his initial interest in cross-cultural differences in prosperity, and in his comprehensive and thought-provoking book, he presents a variety of cultural evolutionary theories to explain how Western societies became psychologically peculiar and affluent. His book is ultimately an account of the cultural evolutionary success of one unusual family of religious movements and institutions —the Catholic Church and the Protestant Reformation—whose suites of beliefs and practices shaped Western minds over the course of several centuries.

We have been conducting extensive investigations of the ethnographic literature on the roles and functions of leaders and knowledge specialists across cultures, many of whom are part of religious institutions—the universalizing "launchpads" that, according to Henrich, have taken over the world in some form or another (p. 151). Our results speak to an ongoing discussion about the evolutionary origins of religion. Some of our results support Henrich, for whom religious institutions have been a powerful evolutionary force from the "fog of prehistory" onward (p. 127), playing a causal role in shaping behavior and psychology, and having downstream effects on socioeconomic and ecological practices. Religion, according to this view, culturally evolved to promote collective action and other group-level advantages.

Other results of ours, though, support the Boyer (2020) "wild religions" view that in many cultures there are no religious institutions in the sense that Henrich describes. Instead, there are a variety of ideas that Westerners tend to label "religious" that are better understood as cognitively attractive explanations employed by specialists to help others (Bloch, 2008; Boyer, 2016; Sperber, 2018). "Religious" ideas, in other words, are those that resemble Western religious ideas to Western observers, whereas these same ideas, as understood by members of societies in which they originated, are simply part and parcel of larger explanatory frameworks for understanding the world. The challenge, which we take up later, is to understand why the human brain, relentlessly optimized by natural selection to further survival and reproduction, would entertain such false explanations.

We expand on these perspectives in the following ways. In Section 2, we critically discuss Henrich's account of religions. In Section 3, we propose our own view, which is complementary to Henrich's account in some cases, and to the alternative "wild religions" perspective in others: in some cases, religious leaders and knowledge specialists serve as prestigious teachers, mentors, and exemplars of cooperative norms, as Henrich describes. In many other cases, though, leaders and knowledge specialists deploy "supernatural" ideas to provide pragmatic services to their communities (Garfield et al., 2019; Hagen & Garfield, 2019). The key distinction, we argue, is that Henrich's model applies mostly to common, everyday problems, such as subsistence and collective actions, whereas the "wild religions" model applies mostly to rare and uncertain phenomena (Lightner et al., 2021a). We conclude in Section 4 by considering why Western ethnographers might tend to interpret these practical services as religious institutions, arguing that theories of "religions" might ironically reflect the WEIRD mindset Henrich describes in his book.

2. Religious institutions: their ingredients and cultural functions

One of anthropology's rejected grand theories is that societies are like organisms: religions, marriage systems, and other social institutions exist because they serve the survival and reproduction of the society (Kroeber, 1917). Henrich and other cultural evolutionists are reviving this theory using analogies from evolutionary biology: groups, like organisms, compete with other groups for resources, with different group-specific ideas playing the role of genetic variants. *Intergroup competition*, one of three main ingredients that Henrich uses to explain Western prosperity, is the trial and error stage of cultural evolution that tinkers with a proliferation of different beliefs and practices. For Henrich, moralizing gods that punished rule-breakers were a key innovation in this cultural evolutionary process that enabled Western societies to cooperate at large scales and, therefore, outcompete other societies (p. 127):

> If you are WEIRD, you may think that religion always involves morally concerned gods who exhort people to behave properly, …[but] the character of gods, afterlives, rituals, and universal morality common to today's world religions is unusual, the product of long-running cultural evolutionary processes.

This cultural evolutionary account depends on two other ingredients, two properties of human cognition that evolved by genetic natural selection. *Faith instincts* are our evolved tendencies to rely heavily on social learning over individual learning or other sources of information. Social learning requires trust in the testimony of others, especially trust in common beliefs or beliefs espoused by highly regarded individuals, which evolutionary anthropologists will recognize as the conformist and prestige learning biases long emphasized by one camp of cultural evolutionary theorists (e.g., Henrich & Boyd, 1998; Henrich & Gil-White, 2001; Richerson & Boyd, 2008). Genetically evolved social learning biases, according to Henrich, open the door to religious beliefs because they can override our direct experiences and personal incentives (Henrich & McElreath, 2007). If prestigious leaders credibly signal their beliefs about the supernatural, even in the absence of personal experience, their authority can override intuitions that conflict with the content of their testimony (Henrich, 2009), as can their plausible-seeming magical practices that are subjectively appealing (Singh, 2018). Indeed, people often outsource so much of their knowledge that they do not know how much they do not know (Rozenblit & Keil, 2002).

We found some support for this view in our cross-cultural study of experts and knowledge specialists: many specialists were prestigious teachers, especially in task domains involving motor skills applied to everyday problems, such as toolmaking and food preparation (Lightner et al., 2021b). See 'Prestigious teachers' in Figure 1. Similarly, in one of the few studies to investigate prestige-biased social learning in a relatively egalitarian society, Garfield and Hagen (2020) found that among Chabu forager-horticulturalists, biased-social learning was at least moderately associated with being an elected community leader and strongly associated with being widely respected in the community.

Our faith, though, is not blind. Learners are epistemically vigilant (Mercier & Sperber, 2017): when the consequences of a persuasive argument are personally relevant to recipients, they critically evaluate the argument based on its content (Axsom et al., 1987; Petty et al., 1981). When the stakes are especially high, or where conflicts of interests exist, people remain largely skeptical about advice from even prestigious and well-respected members of their communities, and are wary of trusting advice that might not stand to benefit them personally (Lightner & Hagen, 2021a; Morin, 2016).

Learners' epistemic vigilance likely complements the social cues that Henrich and others have emphasized, such as prestige, but it also suggests that human "faith instincts" do not deviate far from personal incentives (Hagen & Hammerstein, 2006). In smaller-scale societies and informal group contexts, which lack strong institutionalized leadership, individuals are continually updating their cognitive models of candidate leaders, sharing information on their capacities and past performance, and evaluating efficacy of their social influence (Garfield et al., 2021). Reputations and social status may often be necessary but insufficient qualities of leadership; equally important are

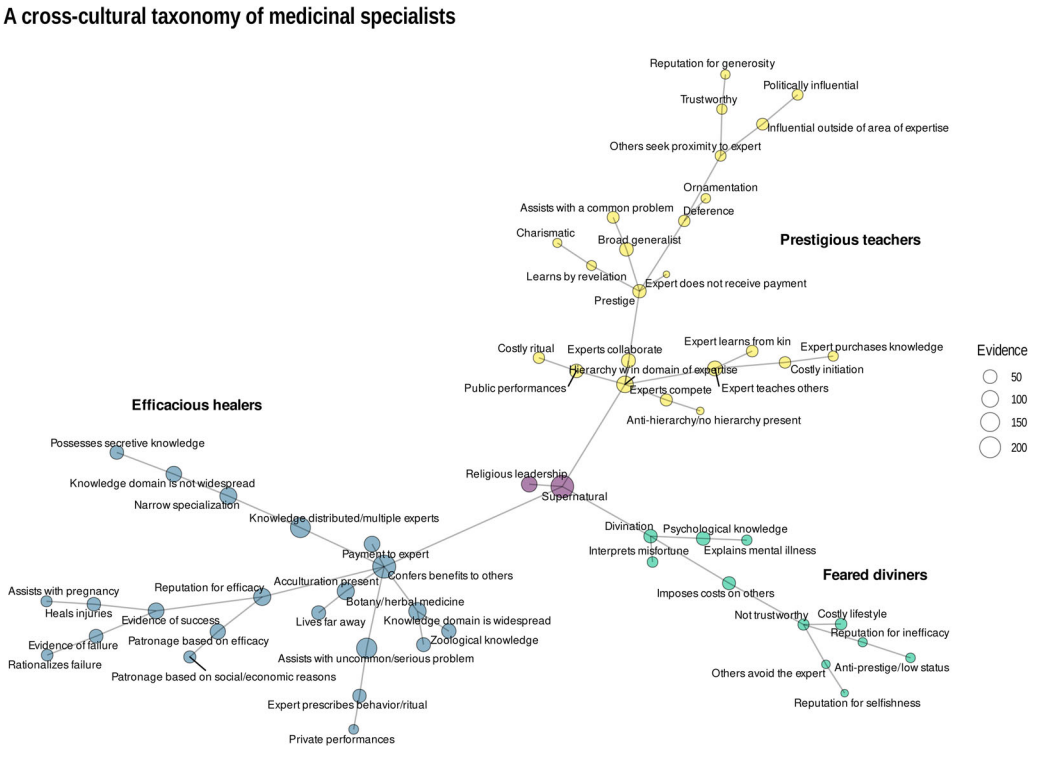

Figure 1. A data-driven taxonomy of ethnomedical specialists in 47 cultures derived from ethnographic text records in the Human Relations Area Files. This minimum spanning tree estimates the similarities of binary presence/absence data for each of the coded variables (vertices) in the cross-cultural dataset. Vertex sizes correspond to levels of text record evidence for each variable. Edge lengths represent binary distances between variables. Colors refer to our interpretations of each branch in the taxonomy of ethnomedical specialists. Adapted from Lightner et al. (2021a).

capacities—including supernatural, social, cognitive, and physical—to reliably produce individual and group benefits, and appropriately impose costs (Garfield et al., 2020). The ethnographic record does, however, provide ample evidence of reputations promoting conformity and group unity, in support of Henrich and cultural group selection arguments (e.g., Richerson et al., 2016; Smith, 2020). Drawing on ethnographic data from 153 mostly nonindustrial societies, Garfield et al. (2021) suggest reputations for cultural group unity will be a *context-independent* human universal, likely to be found in all human societies, whereas reputations associated with social status and dominance, although fairly common across societies, are more likely to be *context-dependent* features of human reputations.

Cognitive bugs are the second ingredient needed to explain how moralizing gods enforce large-scale collective actions. Few evolutionary theorists of religion doubt that supernatural beliefs are somehow rooted in adaptive cognitive mechanisms whose evolved functions were not "religious." Henrich favors the view that "supernatural" beliefs reflect an overuse of our otherwise practical abilities to mentalize (i.e., infer the mental states of others), creating an opportunity for cultural evolution to populate our worldviews with minds that do not exist. This is a compelling perspective, especially because assuming agency when stimuli are ambiguous can be an evolutionary "best bet" for minimizing costly decision-making errors (Guthrie, 1995).

We offer two caveats to these apparent cognitive bugs, however. First, mental representations of the supernatural might actually reflect abstract metaphors rather than sincere assumptions about reality. Lightner et al. (2021a) found that a traditional Maasai diviner characterized the mental properties of God (*Engai*) as more akin to the totality of knowledge rather than as an agent with

its own active mental life, and many other cultures similarly describe their "supernatural agents" in indistinct and ethereal terms (Bird-David, 1999; Evans-Pritchard, 1956; Fuller, 2004). The extent to which these descriptions are metaphorical is a problem of interpretation that cannot be underestimated, particularly when ethnographers are interpreting their observations from a Western perspective (Sperber, 1985). We take this point up in more detail below.

A second caveat is that, to whatever extent we can (or cannot) characterize "supernatural" explanations as metaphorical abstractions, anthropomorphism can be a genuinely useful starting point for modeling rare and opaque phenomena, especially in domains where information is scarce and ambiguous (Lightner et al., 2021a). Misapplying the intentional stance might, in a literal sense, represent a distorted understanding of reality, but it can also be a useful falsehood for approximating the most relevant dynamics of a complex phenomenon (Keil, 2006; Lightner & Hagen, 2021b).

To use some familiar examples, in modern biology, genes can be "selfish" agents with "goals" (Dawkins, 1976), societies can be likened to organisms (Richerson & Boyd, 1999), and cultural evolution can "seek out" cognitive glitches to "nurture" group-level harmony (p. 151). These are each a conventional shorthand that we recognize to be false, but they are useful for making predictions that would be difficult otherwise (Gardner, 2019; Hammerstein & Hagen, 2006). Non-WEIRD explanations might similarly invoke useful anthropomorphic concepts to describe non-biotic physical processes: During a flash flood, observers might predict the water's movement across the landscape in terms of the water's goals, preferences, and spiteful disposition—a pragmatic and intuitive approach to making fitness-relevant predictions, no water spirits or similar ideas necessary.

By abstracting away many noisy details in our initial observations and creating cartoonishly simple models of reality—a skill our theories of mind are well-equipped to do—we improve a bias-variance tradeoff by approximating an underspecified model of complex and uncertain processes that are relevant to fitness (Gigerenzer & Brighton, 2009; Lightner & Hagen, 2021b). This type of usefully false explanatory model can be conditioned on future data and, therefore, gains its utility *because* of its falsity (Wimsatt, 1987). Cross-culturally, starting from such a pragmatic and generalized explanation would equip future cultural learners with increasingly useful conventions for understanding their world. To paraphrase C. S. Peirce, this is about the best we can do in the face of complex real-world scenarios, most of which are opaque to the senses.

It is not obvious that supernatural beliefs are truly a glitch in our cognitive systems, as Henrich describes them, rather than useful abstractions about highly uncertain and complex observations. As a cognitive model, how should "the possible existence of supernatural beings, hidden powers, and parallel worlds" (p. 128) be differentiated from Westerners' models of consciousness, personality types, or probability theory and its use of counterfactual worlds? Empirically, Westerners and non-Westerners do frequently combine supernatural and natural concepts in their explanations of life, death, misfortune, meteorology, and disease (Legare et al., 2012; Lightner et al., 2021a; Tucker et al., 2015). For explaining illnesses in particular, the abundance of disease-causing spirits and magical contagion in the ethnographic literature can be matched by similar Western folk intuitions about germs and disease transmission, respectively (Gottlieb, 2004; Keil et al., 1999).

Among individuals, not all of these explanations are guaranteed to be equal, and some might even be unhelpful and misleading. This points to the importance of specialists who *do* provide falsehoods that are more useful than most—a dynamic we refer to as a *market for specialists* (Lightner et al., 2021b).

3. Toward reconciling institutional vs. wild religions

Leaders and knowledge specialists[1] are central to both Henrich's institutional view of religion, as well as to the wild religions model which sees religious ideas as elements of broader explanatory systems for practical tasks (Bloch, 2008; Boyer, 2020; Sperber, 2018). For Henrich, prestigious teachers feed our faith instincts. For the wild religion scholars, knowledge specialists provide solutions

to everyday problems to their clients. Our work has revealed an important distinction in the problem domains tackled by knowledge specialists that points toward a synthesis of these ideas.

Our analyses of the ethnographic record of knowledge specialists found one important cluster of cases, which we term "prestigious teachers" that largely corresponds to Henrich's model. Broadly, and across different types of expertise, prestigious teachers tend to be skilled in common everyday tasks that involve observable motor activity, such as technology and food preparation (Lightner et al., 2021b). In smaller scale societies in particular, these skills are probably most commonly learned during adolescence and via oblique modes or from specialists other than parents (Garfield et al., 2016).

There is another large cluster of ethnographic cases, however, which we term "efficacious healers" that better supports the wild religions view. These specialists often employ supernatural theories of disease and are in leadership roles and, therefore, might be mistaken for religious leaders. However, they provide solutions to uncommon, serious, and uncertain problems. Their relationships with their clients are frequently transactional, and depend on how effective the specialists are at providing beneficial services. Often, and contrary to Henrich's model, their knowledge is proprietary—the specialists provides services, such as treatments for illnesses, to clients in return for payments, but keep the underlying knowledge systems to themselves. Winkelman (1986) similarly found that religious specialists, such as shamans, belonged to a broader "healer complex," i.e., medicinal specialists who administer herbal medicines to their clients.

We hypothesize that prestigious teachers are associated with common and observable tasks, such as tool-making and subsistence, because most adults need and use these skills, sometimes on a daily basis. The skills are widespread in the population and usually motor-based, so it is straightforward to acquire them by observation. Efficacious healers, in contrast, help with rare and unobservable problems, such as treating uncommon illnesses, because although most individuals might never need to solve this specific type of problem, someone in the population will. This creates a market for specialists who offer their services, based on valuable know-how that is difficult to copy, in exchange for various types of transactional payments (Lightner et al., 2021b).

While our findings clearly support some aspects of Henrich's model of religions and their underlying ingredients, they are problematic in cases where pragmatic specialist—client relationships are mistaken for religious communities. In some cases, to solve common collective action problems, political leaders such as priests might deploy the supernatural sticks and carrots Henrich describes. Across a diverse ethnographic sample of 59 cultures, leaders were found to have both supernatural qualities and perform ritual functions in over 60% of societies. Shaman leaders used their knowledge to impose costs on others (Garfield et al., 2020). While religious intuitions may drive much of social change, it is likely individual leaders and other influential individuals are at the helm.

In other cases, however, non-WEIRD "coreligionists" might in fact be clients who share patronage with the same pragmatic specialists who provide solutions to less common problems, such as illnesses, rather than as members of a community with a stable doctrine (Boyer, 2020). Where this applies, it would be difficult to see how their "religious" beliefs—beliefs about the useful techniques of their specialist—are sufficiently uniform, widespread, or potent in motivating behavior for mobilizing collective action.

4. Religions: how WEIRD are they?

Henrich's view of religions as distinct, formal social institutions represents only some of the evidence on "religions" across cultures. Knowledge specialists who help clients are widespread in the ethnographic record. Their practical services can be misconstrued as religious rituals, and their abstract explanations as doctrinal beliefs in the supernatural. But why should specialists and their explanatory systems for solving practical problems be so reliably misconstrued as religious institutions in the first place?

The answer to this question, we suggest, is indirectly supplied by Henrich's book: Theories about what religions are and why they are useful are rooted in WEIRD assumptions about the religion concept. Evolutionary theories of religion, which we addressed in Section 2, focus on individuals' beliefs and intentions, their commitments to the ingroup, and—perhaps most importantly—the assumption that people deeply care about what their gods care about. These theoretical emphases bear a striking resemblance to WEIRD religions because they "place individuals' personal commitments and their relationship with the divine at the core of spiritual life" (p. 415). Could the very *concept* of religion be WEIRD?

Christianity was and remains a major influence on the West. It is plausible, however, that this deep religious influence might not reflect a universal institution of religion. Rather, WEIRD observers might misinterpret non-WEIRD practices as evidence of religious institutions where no such thing exists (Bloch, 2008; Boyer, 2016; Sperber, 1985). Our results do not lead us to take such an extreme view, but they do give us pause about the assumption that religious institutions and their culturally evolved functions can always be assumed using the ingredients Henrich provides, or that they are a universal launchpad for human societies. In many cases, they might actually reflect useful services from leaders and knowledgeable specialists (Hagen & Garfield, 2019; Lightner et al., 2021a).

Grand theories are always wrong, but in a good way: like the explanations that knowledge specialists have offered for millennia, they engage physical, design, and intentional stances (Dennett, 1987) to varying degrees, retaining some particular details of the phenomenon of interest, but to approach the truth, ruthlessly ignoring or abstracting away the rest. Henrich's WEIRD concept has drawn the attention of science to humanity as a complex whole, and by so doing is helping restore the relevance of cultural anthropology. And Henrich is surely correct that the WEIRDness of Christianity is the right place to look to understand the weirdness of the West.

Note

1. "Knowledge specialists" refer to experts who possess high levels of conceptual knowledge in folk scientific domains, such as ethnobotany, ethnozoology, and ethnometeorology. See Lightner et al. (2021b) for details about our operationalization.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

Aaron D. Lightner and Edward H. Hagen acknowledge financial support from the Issachar Fund and the Templeton Religion Trust. Zachary H. Garfield acknowledges IAST funding from the French National Research Agency (ANR) under the Investments for the Future (Investissements d'Avenir) program, grant ANR-17-EURE-0010. Partial funding by National Science Foundation Division of Behavioral and Cognitive Sciences awards #1628509 and #1823324.

ORCID

Edward H. Hagen http://orcid.org/0000-0002-5758-9093

References

Axsom, D., Yates, S., & Chaiken, S. (1987). Audience response as a heuristic cue in persuasion. *Journal of Personality and Social Psychology*, *53*(1), 30. https://doi.org/10.1037/0022-3514.53.1.30

Bird-David, N. (1999). "Animism" revisited: personhood, environment, and relational epistemology. *Current Anthropology*, *40*(1), S67–S91. https://doi.org/10.1086/200061

Bloch, M. (2008). Why religion is nothing special but is central. *Philosophical Transactions of The Royal Society B: Biological Sciences*, *363*(1499), 2055–2061. https://doi.org/10.1098/rstb.2008.0007
Boyer, P. (2016). Explaining religious concepts: Lévi-strauss the brilliant and problematic ancestor. In *Mental culture* (pp. 174–185). Routledge.
Boyer, P. (2020). Informal religious activity outside hegemonic religions: Wild traditions and their relevance to evolutionary models. *Religion, Brain & Behavior*, *10*(4), 459–472. https://doi.org/10.1080/2153599X.2019.1678518
Dawkins, R. (1976). *The selfish gene*. Oxford Univ. Press. OCLC: 477132640.
Dennett, D. C. (1987). *The intentional stance*. MIT press.
Diamond, J. (1997). *Guns, germs, and steel*. W. W. Norton.
Evans-Pritchard, E. E. (1956). *Nuer religion*. Oxford Univ. Press.
Fuller, C. J. (2004). *The camphor flame: Popular hinduism and society in India*. Princeton University Press.
Gardner, A. (2019). The agent concept is a scientific tool. *Metascience*, *28*(3), 359–363. https://doi.org/10.1007/s11016-019-00451-9
Garfield, Z. H., Garfield, M. J., & Hewlett, B. S. (2016). A cross-cultural analysis of hunter-gatherer social learning. In B. S. Hewlett, & T. Hideaki (Eds.), *Social learning and innovation in contemporary hunter-gatherers*, Replacement of Neanderthals by Modern Humans Series (pp. 19–34). Springer.
Garfield, Z. H., & Hagen, E. H. (2020). Investigating evolutionary models of leadership among recently settled Ethiopian hunter-gatherers. *The Leadership Quarterly*, *31*(2), 101290. https://doi.org/10.1016/j.leaqua.2019.03.005
Garfield, Z. H., Hubbard, R. L., & Hagen, E. H. (2019). Evolutionary models of leadership: Tests and synthesis. *Human Nature*, *30*(1), 23–58. https://doi.org/10.1007/s12110-019-09338-4
Garfield, Z. H., Schacht, R., Post, E. R., Ingram, D., & Macfarlan, S. J. (2021). *zhgarfield/content-and-structure-of-reputation- domains: Preprint manuscript of the publication "The content and structure of reputation domains across human societies: A view from the evolutionary social sciences"*.
Garfield, Z. H., Syme, K. L., & Hagen, E. H. (2020). Universal and variable leadership dimensions across human societies. *Evolution and Human Behavior*, *41*(5), 397–414. https://doi.org/10.1016/j.evolhumbehav.2020.07.012
Gigerenzer, G., & Brighton, H. (2009). Homo heuristicus: Why biased minds make better inferences. *Topics in Cognitive Science*, *1*(1), 107–143. https://doi.org/10.1111/tops.2009.1.issue-1
Gottlieb, A (2004). *The afterlife is where we come from: The culture of infancy in West Africa* (1st ed.). University of Chicago Press.
Guthrie, S. (1995). *Faces in the clouds: A new theory of religion*. Oxford University Press on Demand.
Hagen, E. H., & Garfield, Z. (2019). *Leadership and prestige, mothering, sexual selection, and encephalization: The computational services model*.
Hagen, E. H., & Hammerstein, P. (2006). Game theory and human evolution: A critique of some recent interpretations of experimental games. *Theoretical Population Biology*, *69*(3), 339–348. https://doi.org/10.1016/j.tpb.2005.09.005
Hammerstein, P., & Hagen, E. H. (2006). Broken cogs or strategic agents? *Science*, *312*(5773), 530. https://doi.org/10.1126/science.1125754
Henrich, J. (2009). The evolution of costly displays, cooperation and religion: Credibility enhancing displays and their implications for cultural evolution. *Evolution and Human Behavior*, *30*(4), 244–260. https://doi.org/10.1016/j.evolhumbehav.2009.03.005
Henrich, J., & Boyd, R. (1998). The evolution of conformist transmission and the emergence of between-Group differences. *Evolution and Human Behavior*, *19*(4), 215–241. https://doi.org/10.1016/S1090-5138(98)00018-X
Henrich, J., & Gil-White, F. J. (2001). The evolution of prestige: Freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. *Evolution and Human Behavior*, *22*(3), 165–196. https://doi.org/10.1016/S1090-5138(00)00071-4
Henrich, J., & McElreath, R. (2007). Dual-inheritance theory: The evolution of human cultural capacities and cultural evolution. In L. Barrett, & R. Dunbar (Eds.), *Oxford handbook of evolutionary psychology*. Oxford University Press.
Keil, F. C. (2006). Explanation and understanding. *Annual Review of Psychology*, *57*, 227–254. https://doi.org/10.1146/annurev.psych.57.102904.190100
Keil, F. C., Levin, D. T., Richman, B. A., & Gutheil, G. (1999). Mechanism and explanation in the development of biological thought: The case of disease. In *Folkbiology* (pp. 285–319). The MIT Press.
Kroeber, A. L. (1917). The superorganic. *American Anthropologist*, *19*(2), 163–213. https://doi.org/10.1525/aa.1917.19.2.02a00010
Legare, C. H., Evans, E. M., Rosengren, K. S., & Harris, P. L. (2012). The coexistence of natural and supernatural explanations across cultures and development. *Child Development*, *83*(3), 779–793. https://doi.org/10.1111/cdev.2012.83.issue-3
Lightner, A., & Hagen, E. (2021a). Acculturation and market integration are associated with greater trust among Tanzanian Maasai pastoralists. *Evolutionary Human Sciences*, *3*, E15. https://doi.org/10.1017/ehs.2021.10
Lightner, A. D., & Hagen, E. H. (2021b). *Supernatural beliefs as adaptive explanations about the abstract and the otherwise mysterious* [Unpublished manuscript].

Lightner, A. D., Heckelsmiller, C., & Hagen, E. H. (2021a). Ethnomedical specialists and their supernatural theories of disease. *Review of Philosophy and Psychology*.
Lightner, A., Heckelsmiller, C., & Hagen, E. (2021b). Ethnoscientific expertise and knowledge specialisation in 55 traditional cultures. *Evolutionary Human Sciences*, *3*, E37. https://doi.org/10.1017/ehs.2021.31
Mercier, H., & Sperber, D. (2017). *The enigma of reason*. Harvard University Press.
Morin, O. (2016). *How traditions live and die*. Oxford University Press.
Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality and Social Psychology*, *41*(5), 847. https://doi.org/10.1037/0022-3514.41.5.847
Richerson, P., Baldini, R., Bell, A. V., Demps, K., Frost, K., Hillis, V., Mathew, S., Newton, E. K., Naar, N., & Newson, L. (2016). Cultural group selection plays an essential role in explaining human cooperation: A sketch of the evidence. *Behavioral and Brain Sciences*, *39*, E30. https://doi.org/10.1017/S0140525X1400106X
Richerson, P. J., & Boyd, R. (1999). Complex societies: The evolutionary origins of a crude superorganism. *Human Nature*, *10*(3), 253–289. https://doi.org/10.1007/s12110-999-1004-y
Richerson, P. J., & Boyd, R. (2008). *Not by genes alone: How culture transformed human evolution*. University of Chicago press.
Rozenblit, L., & Keil, F. (2002). The misunderstood limits of folk science: An illusion of explanatory depth. *Cognitive Science*, *26*(5), 521–562. https://doi.org/10.1207/s15516709cog2605_1
Singh, M. (2018). The cultural evolution of shamanism. *Behavioral and Brain Sciences*, *41*, E66. https://doi.org/10.1017/S0140525X17001893
Smith, D. (2020). Cultural group selection and human cooperation: A conceptual and empirical review. *Evolutionary Human Sciences*, *2*, E2. https://doi.org/10.1017/ehs.2020.2
Sperber, D. (1985). *On anthropological knowledge*. Cambridge University Press.
Sperber, D. (2018). Cutting culture at the joints?. *Religion, Brain & Behavior*, *8*(4), 447–449. https://doi.org/10.1080/2153599X.2017.1323783
Spiro, M. (1992). Cultural relativism and the future of anthropology. In G. E. Marcus (Ed.), *Rereading cultural anthropology* (pp. 124–151). Duke University Press.
Tucker, B., Tsiazonera, , Tombo, J., Hajasoa, P., & Nagnisaha, C. (2015). Ecological and cosmological coexistence thinking in a hypervariable environment: Causal models of economic success and failure among farmers, foragers, and fishermen of southwestern Madagascar. *Frontiers in Psychology*, *6*, 1533. https://doi.org/10.3389/fpsyg.2015.01533
Wimsatt, W. C. (1987). False models as means to truer theories. In M. H. Nitecki, & A. Hoffman (Eds), *Neutral models in biology* (pp. 23–55). Oxford University Press.
Winkelman, M. J. (1986). Magico-religious practitioner types and socioeconomic conditions. *Behavior Science Research*, *20*(1–4), 17–46.

Diverse evolutionary strategies for explaining features of religions

Robert N. McCauley

Center for Mind, Brain, and Culture, Emory University, Atlanta, GA, USA

My goal is to distill some of the central theses of Joseph Henrich's overall project and to situate them to aid scholars unfamiliar with his work to grasp how those theses connect with various long-standing interests in religious studies and the cognitive science of religion.

I speak of Henrich's "overall project," for as he notes in its "Preface," *The WEIRDest People in the World* (*WIERDEST People,* hereafter) is the *second* of two closely connected, ambitious, and thought-provoking books. The first is his 2016 work, *The Secret of Our Success: How Culture is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter*. In these two books, Henrich defends, among other things, two claims that deserve attention in this forum.

First, Henrich holds that our *capacity for cultural learning* is the secret of our success. Our abilities to learn from those around us and to transmit that learning to others both *horizontally* through

CONTACT Robert N. McCauley philrnm@emory.edu

our social networks and *vertically* through the generations jointly constitute what sets our species apart.

It is uncontroversial that our prehistoric cousins (both *Australopithecus* and *Homo*) produced culture and learned socially, but over the past two decades scholars have been making the same claims in behalf of chimpanzees (McGrew, 2004; Tomasello, 1999; Tomasello & Carpenter, 2005). Social learning "refers to any time an individual's learning is influenced by others, and it includes many different kinds of psychological processes" (Henrich, 2016, p. 12). Learning socially and producing culture, however, are not enough to explain our accomplishments, as the million-plus years of technological stasis in the archaeological record among those prehistoric cousins and chimpanzee groups' cultural stasis and limitations both suggest.

Henrich holds that our success depended on natural selection for cognitive mechanisms that led to a rarefied type of social learning, which he calls "*cultural learning* … in which individuals seek to acquire information from others" (2016, p. 13). Among other things, this capacity facilitates the rise of *teaching*, when *model-individuals* actively and purposefully transmit information to learners. In those circumstances *natural selection* would promote cognitive mechanisms that enable us to get *adaptive* information from others more efficiently than by way of more costly alternatives, such as everybody figuring everything out on their own. Although we are not the only social learners or producers of culture, we are cognitively equipped as unprecedently effective cultural learners, teachers, and inventors. Crucially, the more adaptive cultural items that there are to learn, the more advantageous cultural learning capacities are. The tipping point comes as soon as there is more cultural knowledge to learn and master than any one individual, no matter how gifted, can invent.

Cultural learning mechanisms (framed in terms of what has come to be called *context biases*) confer an advantage in ever-more-complex cultural settings by influencing how individuals ascertain *who, what,* and *when to imitate*. Context biases are either model-based or frequency-based, i.e., they focus either on model-individuals to be emulated (imitate prestigious people!) or on the relative frequency of practices (when in doubt, do what everyone else is doing!).

The ascendancy of these cultural learning processes and the evolution of such cognitive biases lead both to more and to more sophisticated cultural products, including—in addition to tools—behaviors, techniques, rituals, and knowledge. Each new achievement that can be sustained and transmitted constitutes a new platform from which to undertake further innovation. This is what Michael Tomasello (1999) calls the "ratchet effect," resulting in a gradually *improving* fit between the cultural repertoire and the environment—at least when environments are not rapidly changing. This auto-catalytic process of cultural evolution, in effect, constitutes a new selection force impinging on genes, individuals, and groups that supports *cumulative* cultural evolution.

The principal selective influence on genes has been for psychological dispositions to obtain command of fitness-enhancing items, including ideas and practices, available in others' minds. Humans have come to rely on cultural learning and teaching to access substantial segments of their behavioral repertoire. Vastly more than any other species, humans possess cultural inheritances as well as their genetic inheritances, which interact and, thereby, continually alter the transmission frequencies of both alleles and cultural items. The resulting cultural selection pressures, *qua cultural,* merit specialized conceptual and theoretical treatment as a distinct species of natural selection (in its most generic sense). They merit that treatment on multiple grounds, not the least of which is the speed at which cultural evolution can occur.

The second important claim that Henrich affirms is that the *larger the population* of engaged minds and the *greater the interconnectedness* between those minds, the faster the rate of cumulative cultural evolution is—with the immediate inference that the more valuable cultural learning is. The bigger the market for ideas and the more teachers and experts to learn from, the more discriminating learners can be about *what* and *from whom* they learn. It is, therefore, not mere coincidence that civilizations are anchored in cities, which serve as crucibles of cultural innovation. It also follows that a major issue across the history of our species is how to get larger and larger groups of people not only to get along, not only to cooperate, but even to cooperate *with strangers*.

Cultural solutions to the problems associated with the *scaling-up* of human groups have been a major focus of the literature on cumulative cultural evolution. In *WEIRDest People,* Henrich proposes an elaborate hypothesis about the collection of cultural innovations responsible for the most striking developments on this front over the past 500 years. The account that he defends includes at least two positions that hold particular interest for scholars in religious studies.

First, Henrich maintains that religions have sometimes played a central causal role in the processes of cultural evolution. The core argument of *WEIRDest People* is his hypothesis about western Christianity's pivotal contributions to the evolution of WEIRD culture and psychology. The acronym, WEIRD, stands for Western, Educated, Industrialized, Rich, Democratic societies and dates to an earlier paper (Henrich et al., 2010). There Henrich and his colleagues argue that WEIRD people, i.e., people from such societies, are psychologically peculiar on dozens of fronts compared to people from the rest of the world. Key elements of WEIRD psychology include such features as a focus on the individual over the group, the cultivation of impersonal prosociality, and the development of a host of cognitive and, even, perceptual biases (McCauley & Henrich, 2006). The principal aims of *WEIRDEST People* is to explain why WEIRD people are so atypical psychologically and how that has contributed to the comparative success of WEIRD cultures over the last five centuries.

Henrich argues that, historically, Roman Catholicism and what he calls "the Church's Marriage and Family Program—the MFP" (2020, p. 165) have jointly constituted the major force driving the emergence of WEIRD psychology and cultures. The Roman Catholic MFP dismantled kin-intensive social arrangements and institutions by prohibiting marriage to blood relatives (as far as sixth cousins), by forbidding polygamy, by restricting adoption, by requiring explicit consent from both partners in marriage rituals (a beginning at undermining arranged marriages), by encouraging dowries to help launch independent households and individual ownership of land, and by treating affinal kin as blood relatives and creating spiritual kinship, especially godparents, with all corresponding taboos applicable to blood relatives in both cases.

It thereby created an opening for new *voluntary* social relations and organizations, beginning with monasteries and, later, with charter cities, universities, guilds, and later still, with impersonal markets and representative governments, all of which foster a new set of WEIRD psychological predilections. Henrich argues that Protestantism (which he dubs "the WEIRDest Religion") with its focus on individuals' intentions and beliefs, on nonrelational morality, on individuals' vocational callings, on hard work, on reading and relying on the scriptures (without a priestly hierarchy), etc., has "sacralized" WEIRD psychology and cultural arrangements (2020, p. 416).

Second, it is Henrich's broader claim that religions (and culture, more broadly) can influence psychology, that I want to *situate* in the space that remains. Let me begin by clarifying three things that are *not* true about this general claim.

First, this is not simply an intuition. Henrich argues at length for this claim, assembling diverse empirical and experimental evidence in support of his hypotheses and of this one especially. One of Henrich's most impressive accomplishments throughout *WEIRDest People* is to repeatedly devise plausible means for the measurement of what would, otherwise, be but mere impressionistic takes on socio-cultural variables. Examples include everything from his Kinship Intensity Index of societies, to dosage estimates of the Roman Catholic MFP in the history of a society, to dating the appearance of clock towers in European cities as a measure of the values associated with organized commercial markets.

Second and third, Henrich's claim is neither grandiose nor exclusivist. He is arguing neither that culture *determines* psychology nor that it influences *everything* about psychology. He states that "[m]y effort here is not so much to reject existing explanations but … It's no longer tenable to continue pretending that all populations are psychologically indistinguishable or that cultural evolution doesn't systematically modify how people think, feel, and believe" (2020, p. 435). Like cognitive scientists of religion, Henrich does not aim to put other inquiries out of business. He wants, instead, to enrich our understanding of human psychologies and cultures and to provide an empirically supported and detailed account of some pivotal roles religions sometimes play.

Henrich's point is that cultural materials and arrangements often shape human biology and psychology *in part*. The book's analysis of WEIRD people is his parade case, but *WEIRDest People* is filled with illustrations. For example, Henrich begins the book by discussing how acquiring literacy influences both the anatomical development of brains and some associated cognitive functions and later discusses how monogamy generally reduces the testosterone levels of married males and, comparatively speaking, renders them both more cooperative and pro-social. These are ways culture influences human biology and psychology by *non-genetic* means. Cultural evolution in these cases has biological effects, though not genetic effects.

Cultural evolutionary thinkers are more famous, though, for their argument that culture also influences human biology and psychology *genetically*, i.e., their arguments for *gene-culture coevolution*. Before exploring that claim, one point of clarification about cultural selection may be helpful. Just like natural selection, cultural selection is not some single mechanism or process—no matter how fancy or complex. Furthermore, although the rhetoric can make the reader feel this way at times, the mechanism of cultural evolution is *not* some magic wand that Henrich waves to dispose of explanatory problems. The mechanism or process of cultural evolution to which he appeals is an *abstraction* over a multitude of natural and cultural arrangements that function as selection forces, whether on genes, individuals, or groups. Again, just like talk about the mechanism or process of *natural selection*, cultural selection ranges over countless different circumstances that typically involve causal relationships that are multifarious and complex. Cultural selection may concern the influences—across the wide array of natural environments that our species has come to occupy—of cultural representations (such as rituals), tools (such as bows and arrows), practices (such as the processing of otherwise toxic foods), and norms (such as the Church's prohibitions on cousin marriage) on the success of genes, individuals, or groups.

Each case requires careful attention to cultural and historical details bearing on the causally relevant mechanisms and processes. Larger patterns sometimes emerge and, thus, hypotheses apply more generally. For example, Henrich argues that segmentary lineages and age-sets are a pair of cultural gimmicks (which extend kinship) that arise repeatedly among humans in the Neolithic, since they serve as a fairly effective means for scaling-up to larger groups—from Jared Diamond's (1998) bands to tribes.

Although evolutionary theories of religion abound, the near-pervasive assumption is that evolutionary forces have produced various adaptive cognitive and behavioral dispositions in humans that have a role in religiosity. Whether such adaptive dispositions of mind pertain to religious matters directly or they are in place on the basis of completely different considerations and only pertain to religion incidentally, they have, in both cases, rendered humans susceptible to religious representations, to finding those representations appealing, and to developing commitments to some of them—usually, as opposed to others (Gervais & Henrich, 2010).

Versions of evolutionary theorizing about religions can be distinguished in terms of the *selective mechanisms* involved and the *levels (or units) of selection* on which those mechanisms operate (see Figure 1). The term "natural selection" is *ambiguous*, especially when discussing cultural evolution. To the extent that culture is part of nature, *all* selection is *natural* selection. Darwin himself, though, recognized distinctive forms of selection that might be separated out for special treatment, anticipating the differentiation of sexual selection (cells #2, #5, and #8 in Figure 1) and, arguably, cultural selection as well (cells #3, #6, and #9) in his discussion of technical innovation in *The Descent of Man* (1877/2004). So, it is in this more restrictive sense, pertaining to cells #1, #4, and #7, that I employ the term "natural selection" here.

Recent theories about features of religions range over these three mechanisms of selection operating (at least potentially) at three different levels having to do with genes, individuals (phenotypes), and groups. Existing theories about various features of religions occupy at least eight of the cells (however controversial the notion of natural selection operating at the level of groups, i.e., theories in cell #7 (e.g., Wilson, 2002), remains), and nothing in principle precludes proposals in the

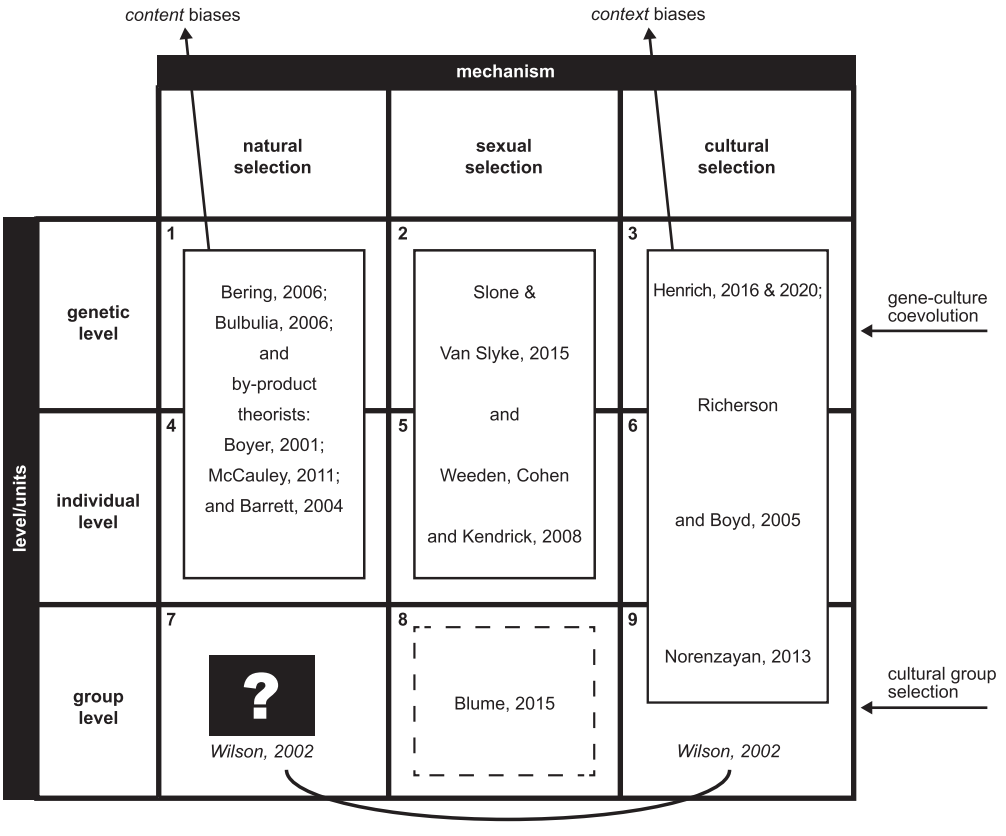

Figure 1. The range of possible evolutionary approaches to religion.

remaining cell, viz., #8. (See Blume, 2015 for a suggestion on this front.) I will concentrate in what follows on natural and cultural mechanisms of selection, since these are the ones that Henrich discusses.

Various theorists have asserted that religiosity influences gene distributions and individuals' welfare, contending that religiosity is a naturally selected adaptation. Generally, these theories (e.g., Bering, 2006) look to religions' abilities to produce individuals who are well-suited for cooperation, highlighting the many benefits for such individuals that attach thereto. They also point to a growing body of evidence that religious involvement enhances participants' physical, mental, and social health (e.g., Bulbulia, 2006).

By-product theorists (Barrett, 2004; Boyer, 2001; McCauley, 2011) also look to natural selection; however, they are not committed to the view that religiosity is an adaptation. Instead, they hold that religious representations take the forms that they do and that we find those forms alluring because they are by-products of maturationally natural cognitive dispositions concerning *content* biases in the mind that have arisen by means of natural selection to address diverse problems that have proven critical to human survival. By-product theorists stress that *from an evolutionary standpoint* such underlying cognitive dispositions have *nothing* to do either with religion or with one another.

Henrich's work focuses on *cultural* selection that encompasses the genetic, individual, and group levels. In particular, *WEIRDest People* discusses at length both *cultural group selection* (cell #9) and the intergroup competition that drives it. The easiest illustration here is total war, but Henrich takes up multiple alternative forms, including differential rates of migration, of reproduction, of group

survival without conflict, and of prestige-biased imitation of groups (think cargo cults). Henrich maintains that one of the keys to the success of WEIRD societies is their *domestication* of intergroup competition through non-violent competition between voluntary associations such as political parties, businesses, corporations, and more.

Henrich also lays out a compelling case for *gene-culture coevolution* (cell #3), which envisions on-going interactions between genes and culture, as two separate and interacting mechanisms of *inheritance*. The genetic influences on culture that the cultural selectionists accentuate have to do principally with the emergence of this evolutionary synergy in the first place. As I noted earlier, because of natural selection in our species' prehistoric past, we, unlike other primates, acquired cognitive capacities that enabled our ancestors *not* just to *produce* culture, but to learn it, to teach it, and to build on it. We are cognitively equipped as unprecedentedly effective cultural learners, teachers, and innovators.

The showcase illustration for a cultural development serving as a selection force on genes, is the evolution of lactase persistence, which permits approximately a third of contemporary humans to continue *in adulthood* to extract nutrients from the milk that became available from domesticated animals over the last 12,000 years. As Henrich notes, further cultural evolution—specifically, the discoveries of technologies such as cheese and yogurt-making, which deliver the nutrients of milk with only miniscule amounts of lactose—can *obviate* the selection pressure for genes supporting lactase persistence.

This cognitive machinery for learning culture is responsible for the *context* biases that, Henrich submits, play a critical role in establishing humans' religious *commitments*. It is context biases concerning prestige, conformity, credibility enhancing displays, and more that lead most people to subscribe only to some subset of the available religious representations in a competitive religious market.

Recall Henrich's comment that his aim is *not* to reject existing explanations, but to fill-out, enhance, and enrich the explanatory picture of our species' history. Setting aside for the moment the controversial status of natural selection at the level of groups (cell #7), it is perfectly possible for evolutionary proposals in all nine cells of Figure 1 not only to be *consistent* with one another but, in fact, *to all be true* (though, to be clear, *that* is not the same as saying either that they are always consistent or that they are all true). Each could explain different features of religions or each could explain a portion of the variance regarding some feature or other of religions. Henrich, for example, accepts the by-product theory's account of the *forms* of religious representations in terms of content biases and supplements it with a cultural selectionist account of followers' *commitments* to those representations in terms of context biases. No one has woven these various evolutionary approaches into any tighter or more extensive or more detailed or better defended explanatory fabric than Henrich does in *The Secret of Our Success* and *The WEIRDest People in the World*.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

Barrett, J. L. (2004). *Why would anyone believe in god?* Alta Mira Press.

Bering, J. M. (2006). The folk psychology of souls. *Behavioral and Brain Sciences*, *29*(5), 453–462 (with commentaries and replies). https://doi.org/10.1017/S0140525X06009101

Blume, M. (2015). How is't with thy religion, pray? Selection of religiosity among individuals and groups. In D. J. Slone & J. A. Van Slyke (Eds.), *The attraction of religion: A new evolutionary psychology of religion* (pp. 63–71). Bloomsbury Academic.

Boyer, P. (2001). *Religion explained: The evolutionary origins of religious thought*. Basic Books.
Bulbulia, J. (2006). Nature's medicine: Religiosity as an adaptation for health and cooperation. In P. McNamara (Ed.), *Where man and god meet: The new sciences of religion and brain* (pp. 87–121). Greenwood Publishers.
Darwin, C. (1877/2004). *The descent of man*, second edition, with an introduction by Adrian Desmond and James Moore. Penguin.
Diamond, J. (1998). *Guns, germs, and steel: The fates of human societies*. Norton.
Gervais, W. M., & Henrich, J. (2010). The Zeus problem: Why representational content biases cannot explain faith in gods. *Journal of Cognition and Culture*, *10*(3-4), 383–389. https://doi.org/10.1163/156853710X531249
Henrich, J. (2016). *The secret of our success: How culture is driving our evolution, domesticating our species, and making us smarter*. Princeton University Press.
Henrich, J. (2020). *The WEIRDest people in the world: How the west became psychologically peculiar and particularly prosperous*. Farrar, Straus, and Giroux.
Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, *33* (2-3), 61–83 (with commentaries and replies). https://doi.org/10.1017/S0140525X0999152X
McCauley, R. N. (2011). *Why religion Is natural and science is not*. Oxford University Press.
McCauley, R. N., & Henrich, J. (2006). Susceptibility to the Müller-Lyer illusion, theory-neutral observation, and the diachronic penetrability of the visual input system. *Philosophical Psychology*, *19*(1), 79–101. https://doi.org/10.1080/09515080500462347
McGrew, W. (2004). *The cultured chimpanzee: Reflections on cultural primatology*. Cambridge University Press.
Norenzayan, A. (2013). *Big gods: How religion transformed cooperation and conflict*. Princeton University Press.
Richerson, P. J., & Boyd, R. (2005). *Not by genes alone: How culture transformed human evolution*. University of Chicago Press.
Slone, D. J., & Van Slyke, J. A. (Eds.). (2015). *The attraction of religion: A new evolutionary psychology of religion*. Bloomsbury.
Tomasello, M. (1999). *The cultural origins of human cognition*. Harvard University Press.
Tomasello, M., & Carpenter, M. (2005). *The emergence of social cognition in three young chimpanzees*. Blackwell Publishers.
Weeden, J., Cohen, A. B., & Kenrick, D. T. (2008). Religious attendance as reproductive support. *Evolution and Human Behavior*, *29*(5), 327–334. https://doi.org/10.1016/j.evolhumbehav.2008.03.004
Wilson, D. S. (2002). *Darwin's cathedral: Evolution, religion, and the nature of society*. University of Chicago Press.

Henrich's Weberian project

Ann Taves

Religious Studies, University of California, Santa Barbara, California, USA

I first learned of Henrich's book when he lectured at UCSB in December 2019 (available at https://youtu.be/yWu35XfL2Jo). It struck me at the time that there were definite parallels between his project and that of Max Weber, whose work I regularly included in my graduate course in classical sociological and anthropological approaches to the study of religion along with Marx, Durkheim, Geertz, and others (Pals, 2015). In studying these classical theorists, I found it helpful to think in terms of intellectual lineages that had common questions and broadly similar approaches. I would place Weber in a lineage that was responding to Marx and Engels, who were in turn responding not only to Hegel and Feuerbach but also to Darwin (Engels, 1876; Foster, 2000). In contrast to others who are designated as "theorists of religion," the theorists in this lineage did not focus on religion per se but on large scale processes of development and change. As a result, they didn't actually offer theories of religion, but they all located religion within these large-scale processes and, in doing so, they had to conceptualize it in one way or another. In what follows, I want to consider

CONTACT Ann Taves anntaves@ucsb.edu

Henrich book in relation to this lineage, most specifically in relation to Weber, but keeping this larger lineage in mind.

Before proceeding, I should offer a pedagogical caveat. None of the classics in this lineage are easy to teach. Each author has a sprawling corpus and Henrich fits the lineage in this respect as well. Before he could write *The WEIRDEST People in the World,* which is almost 700 pages, he found he had to lay the foundation by writing *The Secret of Our Success,* which explains the critical role that culture plays in human evolution and in differentiating humans from other species. There he defines culture as "the large body of practices, techniques, heuristics, tools, motivations, values and beliefs that we all acquire from other people" (Henrich, 2016, p. 3). The interaction between culture and genes, he argues "drove our species down a novel evolutionary pathway not observed elsewhere in nature" (ibid.). This is the platform on which his new book rests and the reason I think it's important to place his work in a lineage that begins with Darwin. But since this new book follows most closely in the footsteps of Weber, I want to offer a Cliff Notes version of Henrich that we can compare with a similarly skeletal view of Weber.

This reading will come as no surprise to Henrich, who acknowledges in a footnote that the book can be read as "updating Weber in light of our modern understanding of cultural and genetic evolution as well as newly available historical, psychological, and economic data" (Henrich, 2020, p. 581n7). Like Weber, he says, his "account shares a central role for religion and the nature of European cities, as well as a recognition that culture and institutions can shape basic aspects of people's psychology" (ibid.). Building on this, I want to compare their research questions and methods, the role of religion and the medieval European city, and the core dynamic at the heart of their theory of large-scale change.

Let me begin with their research questions, both of which are prompted by the observation that the modern West has diverged from the rest of the world in a significant way (see Table 1 for a summary). Weber as a historical sociologist with an interest in economics asks why "a very different form of capitalism" emerged in the modern West, one that involved "the rational capitalistic organization of (formally) free labor" (Weber, 1976, p. 21). Henrich, as an anthropologist who branched out into both psychology and economics, starts with two observations (Henrich 2020, pp. xi-xii): (1) the Industrial Revolution occurred only in Europe and nowhere else and (2) Western, educated, industrialized, rich, and democratic populations were psychologically WEIRD compared to the rest of the world. Religion has a significant place in both of their answers. Weber argued that the Protestant way of organizing life played a significant part in calling forth the spirit of capitalism (Weber, 2009, p. 8). Henrich argues that changes in marriage policy instituted by the medieval

Table 1. A Comparison of the Research Questions, Thesis, Method, and Tools of Weber and Henrich.

	Weber	Henrich
Research Questions	Why did modern capitalism emerge only in the modern West?	Why did WEIRD minds (and the Industrial Revolution) emerge in the modern West?
Thesis	The Protestant way of organizing life played a significant part in calling forth the spirit of capitalism.	Changes in marriage policy instituted by the medieval Catholic Church produced a proto- WEIRD psychology that laid the foundation for the rise of the modern capitalist market economy
Method	Kalberg: "The uniqueness of the West and rise of modern capitalism can be explained adequately, he [Weber] holds, only through rigorous cross-civilizational comparisons that seek, first to isolate the West's specific features and, second, to facilitate causal explanations of this particularity" (xiv).	Henrich: "To explain psychological variation broadly, we need to examine how history has unfolded in different ways in different places and consider the coevolution of people's minds with different institutions, technologies, and languages" (473).
Tools	Ideal types and "imaginary experiments."	Field experiments and historical quasi- experiments.

Catholic Church produced a proto-WEIRD psychology that laid the foundation for the rise of the modern capitalist market economy.

Both use a broadly similar comparative methodology to support their initial observations regarding the distinctiveness of the modern West and their explanations for it. As Kalberg indicates (Weber, 2009, p. xiv), Weber held that "the uniqueness of the West and rise of modern capitalism can be explained adequately … only through rigorous cross-civilizational comparisons that seek, first to isolate the West's specific features and, second, to facilitate causal explanations of this particularity." In a similar vein, Henrich indicates (p. 473): "To explain psychological variation broadly, we need to examine how history has unfolded in different ways in different places and consider the coevolution of people's minds with different institutions, technologies, and languages."

When it comes to research tools, there are similarities as well. Weber explains that his ideal types were an attempt to capture a "subjective meaning complex of action" that sociologists could use to conduct "imaginary experiments" or in more contemporary terms, quasi-experiments (Weber, 1978, p. 12). Henrich dramatically updates Weber through cross-cultural field experiments and by setting up numerous quasi-experiments using newly available historical, psychological, and economic data.

If we look at the content of their explanation of the divergence of the modern West, we find similarities as well (see Table 2). Both argue that medieval industrial cities had features that distinguished them from cities elsewhere and created the space that allowed divergences to emerge. Both highlight the weakening of traditional clan ties and the emergence of new forms of association as central to this process. Both argue that religion play a crucial role in this process. As Weber, states, "in dissolving clan ties, [Christianity] importantly shaped the medieval city" and enabled the emergence of "a new kind of labor structure … based on the social power of the guilds and the guild organization of production" (Weber, 2009, pp. 370, 375).

Henrich digs much more deeply into how this came about, arguing that the medieval Catholic Church's marriage and family program, which—most notably—forbade marriage between extended family members, undermined the kin-based family structure and led to the emergence of proto-WEIRD families that were free to associate with others based on their personal attributes and mutual interests. "[F]rom the ruins of the traditional social structures, people began to form new voluntary associations [such as guilds and universities] based on shared interests or beliefs rather than on kinship or tribal affiliations" (Henrich, 2020, p. 159). This resulted in increased urbanization, greater occupational choice, and the emergence of impersonal markets.

Table 2. Similarities and differences in the arguments of Weber and Henrich.

	Weber	Henrich
Argument	• Medieval industrial cities had features that distinguished them from cities elsewhere and created the space that allowed these divergences. • Both highlight the weakening of traditional clan ties and the emergence of new forms of association as central to this process. • Both argue that religion play a crucial role in this process.	
Differences	Christianity dissolved clan ties, but Weber doesn't explain how it did this.	Changes in the Church's marriage rules undermined the kin-based family structure and led to the emergence of proto-WEIRD families that were free to associate with others based on their personal attributes and mutual interests.
Core dynamics	Ideas and interests of social groups interact.	Minds and social institutions co-evolve.
Differentiated Religions	Systems of life regulation (FMW, 267).	Institutions that embody culturally transmitted social norms.

They differ in subtle, but important ways, regarding the core dynamics at work. Weber's thesis stressed the role of ideas, beliefs, and values in affecting the course of history when they are embraced by "powerful social carriers [that] coalesce behind them and support them" (Kalberg, Introduction in Weber 2009, p. xii). Henrich stresses the co-evolution of minds and institutions, highlighting the role of kin-based institutions. Thus, he argues that changes in the family led to changes in people's "motivations, mental abilities, and decision-making biases" (p. 16).

Both conceive of religion in broadly cultural terms, such that, in homogeneous societies, I suspect they would both view religion as an integral, largely undifferentiated aspect of the overall way of life. Weber characterizes differentiated religions—"world religions"—as "systems of life regulation [that] … gather multitudes of confessors around them" (Gerth and Mills, 1958, p. 267). In contrast to Marx, who characterizes religion as ideology, Weber argues that these "systems of life regulation" can affect people's behavior. In his words: "Not ideas, but material and ideal interests, directly govern men's conduct. Yet very frequently the 'world images' that have been created by 'ideas' have, like switchmen, determined the along which action has been pushed by the dynamic of interest" (ibid., p. 280). Henrich conceives differentiated religions as institutions that embody "culturally transmitted social norms." In contrast to Weber, who focuses on economic ethics, Henrich focuses on kin-based institutions, which he places at the center of pre-modern states. The Catholic Church, conceived as a sort of "super-tribe" (p. 151), had a lasting effect of the mind of the West, he argues, because it instituted a new set of kinship rules.

In laying out this comparison, my goal was to situate Henrich's book in a Weberian lineage. Doing so, highlights the ambitious, comparative scope of Henrich's work, its significance, and the need for critique by experts from many different fields. Like Weber's work, Henrich's thesis deserves rigorous and extended critique. But regardless of the fate of his thesis, his method deserves study as an updating of Weber's comparative sociology, grounded in a firmer, more sophisticated understanding of the co-evolution of culture and cognition.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

Engels, F. (1876). *The part played by labour in the transition from ape to man*. https://www.marxists.org/archive/marx/works/1876/part-played-labour/index.htm

Foster, J. B. (2000). *Marx's ecology: Materialism and nature*. Monthly Review Press.

Gerth, H., & Wright Mills, C. (eds.). (1958). *From max weber: Essays in sociology*. Oxford University Press.

Henrich, J. P. (2016). *The secret of our success: How culture Is driving human evolution, domesticating our species, and making us smarter*. Princeton University Press.

Henrich, J. P. (2020). *The WEIRDest people in the world: How the wWest became psychologically peculiar and particularly prosperous*. Farrar, Straus and Giroux.

Pals, D. L. (2015). *Nine theories of religion* (3rd ed.). Oxford University Press.

Weber, M. (1976). *The Protestant Ethic and the spirit of capitalism*. Charles Scribner's Sons.

Weber, M. (1978). G. Roth, & C. Wittich (Eds.), *Economy and society: An outline of interpretive sociology*. University of California Press.

Weber, M. (2009). *The Protestant Ethic and the spirit of capitalism: With other writings on the rise of the west* (4th ed). Edited and Introduced by Stephen Kalberg. Oxford University Press.

WEIRD people and the Western Church: who made whom?

Sam Passmore [a] and Joseph Watts [b,c,d]

[a]Faculty of Environment and Information Studies, Keio University SFC (Shonan Fujisawa Campus), Fujisawa, Japan; [b]Religion Programme, School of Social Sciences, University of Otago, Dunedin, New Zealand; [c]Center for Research on Evolution, Belief and Behaviour, University of Otago, Dunedin, New Zealand; [d]Department for Linguistic and Cultural Evolution, Max Planck Institute for the Science of Human History, Jena, Germany

Henrich's *The WEIRDest People in the World* (*WPW*) explains how the West came to be psychologically and culturally WEIRD (Western, Educated, Industrialized, Rich, Democratic), and the economic and social effects this has had on the last two thousand years of human history. One of the many strengths of *WEIRDest People in the World* is that it synthesizes evidence from psychology, economics, anthropology, and history into an integrated, compelling, and coherent theoretical framework. In this book, kinship is positioned at the forefront of narratives about the evolution of human societies—something that has long been recognized within anthropology but often missing from grand history narratives (Diamond, 1999; Harari, 2014). This work is highly readable while still making clear, empirically testable causal hypotheses. A central hypothesis of *WPW* is that the Western Christian Church's Marriage and Family Program (MFP) caused changes in European kinship systems. Here we evaluate the evidence presented in support of this hypothesis by reviewing the available information on pre-MFP kinship systems in Europe and reanalyzing cross-national associations between MFP and kinship structures using phylogenetic comparative methods. We raise alternative hypotheses about the relationships between the Western Christian Church and kinship structures and suggest that further research is needed to arbitrate these hypotheses.

Does MFP cause changes in kinship intensity?

According to Henrich, the MFP began in the fourth century, when the Western Christian Church (henceforth, the Church) institutionalized a host of policies that functioned to break down the kin-based institutions of European society. These policies came in the form of a continuous history of decrees, condemnations, letters, and laws beginning in 305CE, which increased in frequency in the seventh and eighth centuries (documented in Appendix A of *WPW*). The Church's policies involved the recombination and adjustment of beliefs and practices from existing religious and social systems—specifically involving social norms for kinship. The Church's institutionalized breakdown of kin-based society consequently changed the psychology of individuals and the social structure of society from a kin-oriented system to a system that allowed and necessitated individualized psychology and the cooperation of unrelated individuals. The importance of kin-based institutions within a society is summarized as *kinship intensity*. The concept of kinship intensity used in *WPW* relates to the existing literature on intensive and extensive kinship systems (Bailey et al., 2014; Bugos, 1985; Shenk et al., 2016), as well as how kin-dense social networks are within a society (Colleran, 2020). The *kinship intensity index (KII)* quantifies the relative strength of kin-based institutions in a society, as defined within Schulz et al. (2019), and is used throughout Part 2 of *WPW*. A shift to an impersonal psychology allowed a prosocial model of voluntary cooperation to develop and in turn granted the opportunity for impersonal markets (demarcated from markets driven by personal relationships) to flourish. The rise of impersonal markets ultimately led to the commercial and urban revolutions that built and shaped modern European society.

According to Henrich, the change in kinship intensity within Europe was caused by the Church's MFP. Contemporary evidence suggests that the breakdown of kin-based institutions often stems

CONTACT Sam Passmore passmore@sfc.keio.ac.jp

from an increase in market integration (Colleran, 2020; Shenk et al., 2016). With increased market integration comes an increased need for mobility (moving for work), and the ability to provide resources for yourself and immediate family (through wage labor and markets). The ability for people to provide for themselves means a reliance on kin is no longer necessary, and is sometimes a hindrance, resulting in a breakdown of kinship ties. Henrich states that the breakdown of kinship systems in European history was different from elsewhere, with the breakdown in European kin-based institutions occurring *before* the rise of impersonal markets, and importantly MFP was the reason for their breakdown.

There are two main sources of evidence used to support the claim that the Church's MFP caused changes in kin-based institutions. The first is historical examples of institutional policies, letters, and edicts from Christian leaders and throughout Europe between the fourth and twentieth century, indicative of top-down change in kin-based institutions. The second is the cross-national relationship between kinship intensity and psychological diversity found in a recent article by Henrich and colleagues (Schulz et al., 2019).

Evaluating evidence from historical case studies

The WEIRDest People in the World draws on an extensive number of letters, policies and edicts concerning family structures. Examples include the 305CE decree from the Synod of Elvira banning the marriage of a widower to his wife's sister (sororate marriage), Pope Gregory I's 600CE letter prohibiting first cousin marriage, and the 874CE ban on third-cousin marriage in Douci, which made children of an incestuous marriage ineligible for succession. Within *WPW*, these examples are interpreted as evidence that top-down changes in law and church policy shifted the kinship and marriage practices of Europe at the time.

An assumption made in *WPW* is that Church policies, letters, and edicts represent the beginnings of changing kinship structure in Europe, and that this change occurred through the Church imposing top-down rules on populations. An alternative hypothesis is that Church policies are symptomatic of broader social changes occurring within populations (alternative model 1, Figure 1). For example, the attitudes of Church leaders may simply have reflected the changing times, and the availability of written records may reflect who was literate within early European societies. Another alternative hypothesis is that Church's MFP and kinship practices co-evolved with one another (alternative model 2, Figure 1). For example, the Church's policies could have reinforced and formalized processes of change in kinship that had already been set in motion. These alternative hypotheses differ from the causal claims set out in *WPW* in that they suggest the Church's position on kinship structures were, at least in part, influenced by broader patterns of change occurring within Europe at the time. By suggesting the Church was influenced by broader social change, these models allow for the possibility of kinship changes to arise and spread throughout populations, rather than being imposed top-down by leaders. These alternative hypotheses also reflect different perspectives on the relationship between religion and society, as well as the ways in which cultural systems change (Smaldino, 2014).

To evaluate the hypotheses in Figure 1, it would ideally be possible to examine the kinship structures of European societies before and after implementation of the Church's MFP. Unfortunately, there is a paucity of information on the kinship and marriage practices of many European populations in the early stages of the Church. Within the Roman empire, written historical records are limited to the lives of the rich and powerful, and usually only the men of this subset—representing a tiny proportion of the population (Knapp, 2011). The information left by this population was often done intentionally and tells us little about the behaviors of the general population. However, there is sometimes scope to analyze incidental evidence. For example, the available written historical records suggest that at least parallel-cousin marriage (marrying children of your parent's same-sex sibling) was rare prior to 300CE in Roman aristocracy (Shaw & Saller, 1984). We note that the ethnographic record indicates that parallel cousin marriage is uncommon outside Arabic societies

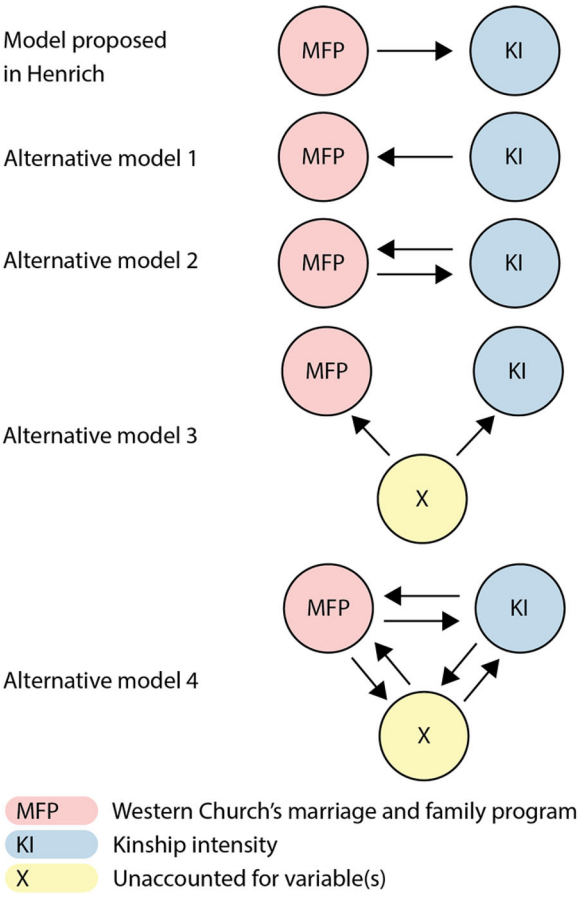

Figure 1. Causal relationships between MFP and kinship intensity (KI). The first model shows the causal relationship proposed in Henrich (2020), according to which the Church's MFP caused changes in kinship intensity. Alternative model 1 shows the kinship intensity of societies influencing the Church's MFP. Alternative model 2 shows an interaction between MFP and kinship intensity. Alternative model 3 shows a third variable (or variables) producing changes in kinship intensity. Alternative model 4 shows all three variables interacting with one another.

(Murphy & Kasdan, 1959), and has a low global frequency (4.5% of the Ethnographic Atlas; Kirby et al. 2016), meaning that the scarcity of parallel cousin marriage in early Europe is not particularly informative. Information on other forms of cousin marriage during the early stages of the Church's MFP in Europe is scarce—indicated by Henrich's use of twentieth century cousin marriage rates (p. 238). Inferences from cultural phylogenetic reconstructions and genetic histories indicate that monogamy is likely to have been common from at least the Neolithic (Fortunato, 2011; Rasteiro & Chikhi, 2013; Scheidel, 2009). The reconstructed evidence of monogamy suggests that some changes in kinship intensity associated with the Church's MFP had already occurred earlier in European history. These reconstructions of monogamy provide information on only one aspect of kinship and marriage systems. In general, there is insufficient evidence to build a rich picture of pre-MFP kinship practices in European society, but the scarce evidence available suggests that at least some of the core features of MFP may already have been present within European society before the Church implemented its MFP.

While we may never have a clear picture of the relationship between the Church and kinship in early Europe, it is possible to examine the interaction between kinship structure and the Church in more recent times and across other nations to infer relationship in the past—which is a second line of evidence drawn upon in *WPW*.

Evaluating evidence from a cross-national study

A cross-national study of kinship intensity and exposure to the Church provides a second core line of evidence that the Church drove changes in kinship intensity (Schulz et al., 2019). Across a sample of 146 nations, this study found that the greater the number of years of exposure to the Church, the lower the country's level of kinship intensity today. We raise two issues with this analysis: how the variable "Western Church exposure" is defined, and a need to control for cultural interdependencies. We only focus on the global, cross-national analyses from Schulz et al. (2019) but the concerns raised here potentially also apply to all parts of the study where the Western Church exposure variable is used and cross-national analyses are performed.

The variable "Western Church Exposure" used by Schulz et al. (2019) is defined as the number of years that a nation has had both a Christian leader, and importantly, that the leader had implemented the Church's MFP policies (Schulz et al., 2018). By conditioning the Church exposure measurement to nations where MFP laws were implemented, this variable overlooks those nations where the Church was present but institutionalized change in kinship practices did not occur. The structure of conditioning means that both these variables are measures of kinship within a society: one is, in part, a measure of kinship laws ("Western Church Exposure"), and the other is a measure of kinship practices ("kinship intensity index"). An alternative explanation for the relationship between kinship intensity and presence of MFP is that nations with looser kinship systems are more likely to have leaders that are willing to implement the Church's MFP. An explanation where MFP nations are more likely to have leaders who implement the program aligns with alternative model 1 and alternative model 2 (Figure 1), suggesting that the level of kinship intensity influences the Church's policies, rather than just involving the Church imposing a top-down process of cultural change.

The second issue concerns the interdependence of data points when modeling cross-cultural (or cross-national) data. In Schulz et al. (2019), it is shown that each additional 100 years under the Church are affiliated with a 0.24 standard deviation change in the kinship intensity index. However, two nations that are close to each other (either through time by sharing recent common ancestor or by being geographically adjacent), are more likely to be similar than two nations that are less close to one another, also known as autocorrelation (Bromham et al., 2018; Roberts & Winters, 2013). Within macro-cultural evolution studies, historical relationships are commonly controlled for using linguistic phylogenies (Evans et al., 2021), which have been shown to be particularly important in the analysis of kinship systems (Guglielmino et al., 1995; Jordan & Dunn, 2010; Passmore & Jordan, 2020).

We reanalyzed the relationship between exposure to the Church and kinship using the Bayesian phylogenetic repeated measures mixed model (Bürkner, 2018). In these analyses, we used a language tree as a proxy for the historical relationships between the global sample of societies (Jäger, 2018). This tree was generated through the automated similarity judgment program of 40 concepts across 7000 languages. The automatically generated language tree only coarsely represents the relationships between societies but is sufficient for providing a first-pass assessment of the effect of autocorrelation in this dataset. Nations were assigned languages based on the most widely spoken language within each country. After making connections between nations, languages, and phylogeny, we have a subset of 148 nations, from a complete dataset of 160 nations.

Since we are implementing the models in a Bayesian framework, we first replicate the relationship between Church exposure and kinship intensity from Schulz et al. (2019), then secondly, include phylogenetic covariances into the model. Using our approach, we can replicate the results from the model predicting KII with exposure to the Western and Eastern Church (table S4.8, Panel 1; column 1 in Schulz et al., 2019): an additional 100 years of Western Church exposure reduces the KII by 0.23 standard deviations (95% CI: – 0.27, −0.18). Additionally, we find exposure to the Eastern Church reduced KII by 0.19 standard deviations, a result negligibly different from the original (95% CI: −0.30, −0.08). However, when controlling for phylogenetic relationships, an additional 100 years of exposure to the Western Church only reduces KII by 0.06 standard deviations—less than half the original effect (95% CI: −0.10, −0.01; Figure 2). Additionally, within the

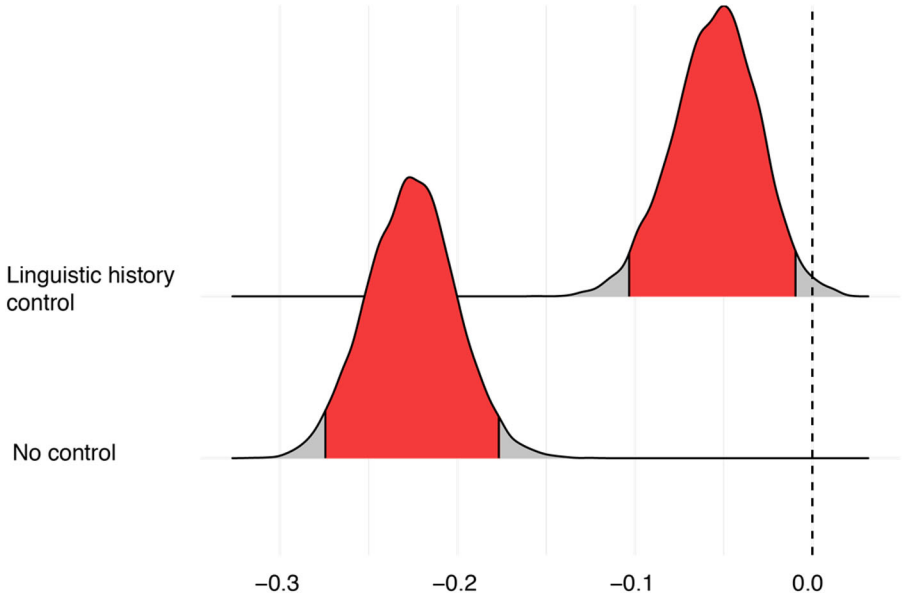

Figure 2. Posterior distribution of beta coefficient for Western Church exposure across models with and without a linguistic history control. Red sections represent 95% confidence intervals.

phylogenetically controlled model, we estimate the size of phylogenetic signal in the residuals to be 0.91, highlighting the importance of controlling for autocorrelational processes when modeling cross-cultural data. Supplementary information on the models run here is available at https://osf.io/rzk34/. Further models with alternative measures of cultural ancestry and additional control variables are warranted.

The results of the phylogenetically controlled analysis are consistent with the hypothesis that exposure to the Western Church is negatively related to kinship intensity, presented in *WPW*. However, the magnitude of the relationship between Church exposure and kinship intensity is considerably reduced, which decreases confidence in the practical significance of this relationship. The result of our phylogenetic model suggests that the spread of MFP legislation and changes in kinship practices within populations are both highly related to the linguistic communities that they are part of.

This suggests that language, kinship systems, and religion are part of a core package of cultural traits that are stably inherited over long periods of time, as is illustrated in alternative model 3 and alternative model 4 of Figure 1. Both alternative model 3 and alternative model 4 differ from the hypothesis presented in *The WEIRDest People in the World* by emphasizing the importance of an external variable that influences both kinship intensity and MFP. Alternative model 3 represents a simple causal fork in which both kinship intensity and the Church's MFP are products of a third factor (Pearl & Mackenzie, 2018). Alternative model 4 hypothesizes that the relationship proposed by Henrich exists within a complex web of religion, kinship, language, and other cultural components that are absent from the theoretical model proposed in *WPW*. While complex, we believe that alternative model 4 is likely to be closer to the true historical relationship between these variables than the unidirectional model proposed in *WPW*. Systematic cross-cultural research is needed to identify the relative importance of the causal relationship defined in these models.

Conclusion

The WEIRDest People in the World sets out hypotheses that will inspire future research, highlights the importance of cultural evolutionary frameworks, and sets a new standard for inter-disciplinary

theoretical syntheses. In this review, we have highlighted that the evidence presented for the causal relationship between the Church's MFP and changes in kinship intensity is also compatible with alternative causal models (Figure 1). These alternative models differ from *WPW* in the nature of the relationship between religion and society, processes of cultural change, and the factors shaping kinship systems.

We have presented a number of reasons to think that the relationship between the Church's MFP and kinship practices is more complicated than the unidirectional hypothesis outlined in *WPW*. Despite little available information on the kinship systems of societies within Europe before the Church's MFP, at least some core features of the Church's MFP are likely to have been common in Rome prior to the Western Church (Fortunato, 2011; Rasteiro & Chikhi, 2013; Scheidel, 2009). This suggests that MFP was informed by, and potentially reinforced, changing kinship systems, rather than acting as the primary driver of kinship change. Additionally, our reanalysis of the cross-national data by Schulz et al. (2019) suggests that the relationship between church exposure and kinship intensity can be largely (but not entirely) explained by the common cultural ancestry of nations. Further research is needed to systematically test the causal claims set out by Henrich and evaluate alternative causal hypotheses.

Acknowledgements

We would like to thank Dr. Caitlin Greenwood for her advice on Roman history and literature, as well as Associate Professor John Shaver for feedback and comments.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Marsden Fund, Royal Society Te Apārangi: [Grant Number 19-VUW-188] and by the Japan Society for the Promotion of Science [Grant Number 19KK0065].

ORCID

Sam Passmore http://orcid.org/0000-0002-5302-356X
Joseph Watts http://orcid.org/0000-0002-7737-273X

References

Bailey, D. H., Hill, K. R., & Walker, R. S. (2014). Fitness consequences of spousal relatedness in 46 small-scale societies. *Biology Letters*, *10*(5), 20140160. https://doi.org/10.1098/rsbl.2014.0160

Bromham, L., Hua, X., Cardillo, M., Schneemann, H., & Greenhill, S. J. (2018). Parasites and politics: Why cross-cultural studies must control for relatedness, proximity and covariation. *Royal Society Open Science*, *5*(8), 181100. https://doi.org/10.1098/rsos.181100

Bugos, P. E. (1985). *An evolutionary ecological analysis of the social organization of the Ayoreo of the Northern Gran Chaco*. Northwestern University.

Bürkner, P.-C. (2018). Advanced Bayesian multilevel modeling with the R package brms. *The R Journal*, *10*(1), 395–411. https://doi.org/10.32614/RJ-2018-017

Colleran, H. (2020). Market integration reduces kin density in women's ego-networks in rural Poland. *Nature Communications*, *11*(1), 266. https://doi.org/10.1038/s41467-019-14158-2

Diamond, J. M. (1999). *Guns, germs, and steel*. W. W. Norton.

Evans, C. L., Greenhill, S. J., Watts, J., List, J. M., Botero, C. A., Gray, R. D., & Kirby, K. R. (2021). The uses and abuses of tree thinking in cultural evolution. *Philosophical Transactions of the Royal Society B*, *376*(1828), 20200056. https://doi.org/10.1098/rstb.2020.0056

Fortunato, L. (2011). Reconstructing the history of marriage strategies in Indo-European—speaking societies: Monogamy and polygyny. *Human Biology*, *83*(1), 87–105. https://doi.org/10.3378/027.083.0106

Guglielmino, C. R., Viganotti, C., Hewlett, B., & Cavalli-Sforza, L. L. (1995). Cultural variation in Africa: Role of mechanisms of transmission and adaptation. *Proceedings of the National Academy of Sciences*, *92*(16), 7585–7589. https://doi.org/10.1073/pnas.92.16.7585
Harari, Y. N. (2014). *Sapiens: A brief history of humankind*. Random House.
Henrich, J. (2020). *The Weirdest People in the world*. Farrar, Straus and Giroux.
Jäger, G. (2018). Global-scale phylogenetic linguistic inference from lexical resources. *Scientific Data*, *5*(1), 180189. https://doi.org/10.1038/sdata.2018.189
Jordan, F. M., & Dunn, M. (2010). Kin term diversity is the result of multilevel, historical processes. *Behavioral and Brain Sciences*, *33*(5), 388–388. https://doi.org/10.1017/S0140525X10001962
Kirby, K. R., Gray, R. D., Greenhill, S. J., Jordan, F. M., Gomes-Ng, S., Bibiko, H.-J., … Gavin, M. C. (2016). D-PLACE: A global database of cultural, linguistic and environmental diversity. *PLOS ONE*, *11*(7), e0158391. https://doi.org/10.1371/journal.pone.0158391
Knapp, R. (2011). *Invisible romans*. Harvard University Press.
Murphy, R. F., & Kasdan, L. (1959). The structure of parallel cousin marriage. *American Anthropologist*, *61*(1), 17–29. https://doi.org/10.1525/aa.1959.61.1.02a00040
Passmore, S., & Jordan, F. M. (2020). No universals in the cultural evolution of kinship terminology. *Evolutionary Human Sciences*, *2*, E42. https://doi.org/10.1017/ehs.2020.41
Pearl, J., & Mackenzie, D. (2018). *The book of why: The new science of cause and effect*. Basic Books.
Rasteiro, R., & Chikhi, L. (2013). Female and male perspectives on the neolithic transition in Europe: Clues from ancient and modern genetic data. *PLOS ONE*, *8*(4), e60944. https://doi.org/10.1371/journal.pone.0060944
Roberts, S., & Winters, J. (2013). Linguistic diversity and traffic accidents: Lessons from statistical studies of cultural traits. *PLOS ONE*, *8*(8), e70902. https://doi.org/10.1371/journal.pone.0070902
Scheidel, W. (2009). A peculiar institution? Greco–Roman monogamy in global context. *The History of the Family*, *14*(3), 280–291. https://doi.org/10.1016/j.hisfam.2009.06.001
Schulz, J., Bahrami-Rad, D., Beauchamp, J., & Henrich, J. (2018). *The origins of WEIRD psychology* (SSRN Scholarly Paper No. ID 3201031). Rochester, NY: Social Science Research Network. Retrieved from Social Science Research Network website: https://papers.ssrn.com/abstract=3201031
Schulz, J. F., Bahrami-Rad, D., Beauchamp, J. P., & Henrich, J. (2019). The church, intensive kinship, and global psychological variation. *Science*, *366*(6466), eaau5141. https://doi.org/10.1126/science.aau5141
Shaw, B. D., & Saller, R. P. (1984). Close-Kin marriage in Roman society? *Man*, *19*(3), 432. https://doi.org/10.2307/2802181
Shenk, M. K., Towner, M. C., Voss, E. A., & Alam, N. (2016). Consanguineous marriage, kinship ecology, and market transition. *Current Anthropology*, *57*(S13), S167–S180. https://doi.org/10.1086/685712
Smaldino, P. E. (2014). The cultural evolution of emergent group-level traits. *Behavioral and Brain Sciences*, *37*(3), 243–254. https://doi.org/10.1017/S0140525X13001544

It's WEIRD how much Joseph Henrich needs computational simulation

Wesley J. Wildman[a,b,c]

[a]School of Theology, Boston University, Boston, USA; [b]Faculty of Computing and Data Sciences, Boston University, Boston, USA; [c]Center for Mind and Culture, Boston, USA

Introduction

In 2009, the journal *Evolution and Human Behavior* published Joseph Henrich's "The evolution of costly displays, cooperation and religion: credibility enhancing displays and their implications for cultural evolution" (Henrich, 2009). The paper demonstrates that high-cost lifestyles can be sustainable (i.e., a high-cost equilibrium exists in the energy landscape) for an entire society under specifiable conditions, even though low-cost lifestyles are the more common equilibrium. Inspired by the evolutionary model in that paper, I replicated that model to make sure there were no errors. Henrich's math was perfect.

CONTACT Wesley J. Wildman wwildman@bu.edu, wwildman@ibcsr.org https://wesleywildman.com

Despite the model's mathematical exactitude, I was disappointed by its inability to make sense of modern, differentiated societies. At the time, I was studying high-cost religious extremist groups and wanted to know whether and why high-cost subgroups can thrive within a larger society including many readily accessible subgroups that operate with far lower costs. Henrich demonstrated the possibility of a high-cost equilibrium for an entire society. But why would people choose a costly lifestyle in a differentiated society where alternative low-cost lifestyles abound? And why would such high-cost groups persist stably when surrounded by less painful and costly alternatives?

To investigate these questions, Rich Sosis and I created an agent-based computer simulation (Wildman & Sosis, 2011), which is a useful way to look for behavioral equilibria for subgroups within a larger population, as well as for the population as a whole. Rich was my subject-matter expert in the process, helping me articulate an artificial society and agents with the characteristics needed to express Henrich's evolutionary model in as much detail as possible. We verified that the simulation met our specs, and validated it using Rich's expertise. We finally reached the point that we could run the simulation—always a moment of great drama—and then we dove into analyzing the simulated data.

Sure enough, certain high-cost subgroups would emerge and stabilize within the artificial society while others would emerge and later collapse. Naturally, we pushed to identify the secret of high-cost group stability. We called the secret sauce "group power": 95% of long-lasting high-cost groups had high group power, which means high group cost, high leader charisma, and high behavior-belief consistency. Lower the group cost, weaken leader charisma, or make key people in the group fail to practice what they preach, and the group doesn't survive; the secret sauce is just not there.

This is an example of what computational simulation can add to a very good idea. This high-tech tool can articulate a theoretical hypothesis in a far more precise and rigorous way than is possible using other tools, and thereby generate novel insights that extend the original idea. It is the key to generative social science (see Epstein, 2006). Neither of the papers discussed above deals explicitly with real-world data, though they are informed by extensive information about human group life. By simulating Henrich's signaling theory, executing the model over time, the simulation invites a stronger evidential foundation when the turn to real-world data is made. It's the difference between point-based, often time-independent data tie-downs for a complex, dynamic theoretical edifice, on the one hand, and a simulation's demand for denser, time-dependent data tie-downs, on the other.

The central thrust of my response to Henrich's *The Weirdest People in the World* (WPW; 2020) is that there is significant uncertainty about the accuracy of the book's complex, multidisciplinary hypothesis. Its complexity suggests the possibility of causal pathways other than those Henrich focuses on, and it is difficult to decide whether the pathways he emphasizes or the pathways he neglects are more important causal contributors to the emergence of WEIRD people and cultures. My central constructive suggestion is that, as with Henrich's signaling theory, questions about the model's accuracy could be both clarified and partially resolved by means of computational simulation. In what follows, I will lay out my reasons for saying this.

Grappling with large-scale hypotheses

WPW presents an elaborate hypothesis about a complex, dynamic system of minds and cultures. This is the most multidisciplinary of the large-scale hypotheses aiming to explain western cultures and minds, which makes the book an impressive achievement even if you disagree with some of the details. In fact, for me, WPW beautifully expresses what multidisciplinary inquiry can achieve in modern research universities. By itself, this both invites and obliges us to evaluate WPW's hypothesis as energetically as we possibly can.

Henrich espouses a bi-directionally non-reductive account of the mind-culture nexus: minds influence cultures, cultures influence minds, and neither direction of influence can be theoretically or explanatorily reduced to the other. This implies that we should expect all kinds of feedback mechanisms, reinforcing or dampening processes of emergence, and multiple layers of causality.

WPW's basic story at the cultural level, for which historical and economic data is particularly useful, is about the influence of key ideas prevalent within the western Christian church. That worldview and the associated cultural practices around family and cooperation demolished European kin groups and tribes and the cultural patterns that depended on them. This spawned voluntary associations such as guilds, monasteries, charter towns, and universities, which depended on cooperative networks and shared commitments rather than kin ties. The resulting competition among these voluntary associations produced occupational choice and made urban centers far more attractive, which in turn spawned impersonal markets open to everyone. The spectacular socio-economic outcome, enhanced by Protestant Christianity, was representative government, financial markets, innovation in production and distribution, and unprecedented economic growth.

All these elements combined to encourage WEIRD (western, educated, industrialized, rich, and democratic) psychology in western people, and that psychology reinforced commitment to guild expertise rather than kin ties, and to representative government, innovation in production, and impersonal markets—a reinforcing feedback loop on a civilizational scale. The transformation of psychology is possible because our brains are highly responsive to cultural conditioning and learning. That neural plasticity in turn helps to explain how novel socioeconomic and cultural arrangements arise and stabilize without becoming so rigid that they can't be transformed under the right conditions.

To support this account of the WEIRD west, Henrich must navigate evidence on both the historical and psychological levels, and this is far and away the richest aspect of the book. There is a veritable flood of evidence, tying the massive hypothesis down to measurable elements of western minds and cultures both now and as far back into the past as research creativity permits. The labor involved in integrating a host of academic disciplines and datapoints, keeping everything in proper perspective, is prodigious.

Yet there are reasons to hesitate to embrace the entire story. To begin with, causal connections that WPW does not discuss could be at least as important as those that are discussed. For example, the Catholic Church's dissolution of kin-based ties might have directly influenced the creation of representative governments, rather than only indirectly impacting their formation through voluntary associations and impersonal markets. The causal architecture, already complex in Henrich's telling of it, might be far more complex, and the cascade of evidence offered in WPW doesn't settle such questions. There are also causal factors that don't get a lot of coverage. For example, the rocket-like, exponential rise of energy capture is taken by many theorists to be the central reason for changes in civilizational form of all kinds since the Neolithic invention of agriculture and domesticated animals. Ian Morris's (2010) attempt to demonstrate a high correlation between energy capture and social development strikes me as largely successful and certainly raises a question about how important the WPW narrative is relative to alternative causal stories. In fact, alternative explanations are plentiful (e.g., Cosandey, 2008; Diamond, 1997; Needham, 1969; Turchin, 2007; Weber, 1934 among dozens of others in multiple European languages), raising questions for WPW about comparison and compatibility.

An important caveat on such concerns is that theorists are not always talking about precisely the same thing when they are "explaining" modern western cultures. For example, Morris isn't trying to explain WEIRD psychology and Henrich isn't trying to explain transportation and communication technologies. Yet the question about what might be missing in Henrich's account remains an important one and it is difficult to answer. To his credit, Henrich sometimes engages alternative explanations and tries to demonstrate compatibility, as he does with Jared Diamond's *Guns,*

Germs, and Steel, arguing that the account in WPW picks up after Diamond's narrative ends. This isn't a fully satisfactory response because there is more overlap in time period and less overlap in system dynamics than Henrich allows; nevertheless, his willingness to engage alternative large-scale hypotheses is commendable.

These remarks highlight the challenges faced by all large-scale hypotheses. How are we supposed to integrate all relevant theories, with the right weightings, in the right causal loops, reinforcing and dampening the right emergent features? How are we supposed to protect against adducing evidence to support the proffered hypothesis but not considering how that same evidence might be parsed by alternative hypotheses? How do we discover when an important factor is missing and what should we do with such a discovery? Nobody familiar with ongoing efforts to explain the distinctiveness of western cultures should be unimpressed by Henrich's achievement in WPW. However, precisely because of that familiarity, many might hesitate to fully embrace the book's hypothesis, wondering how all the theoretical elements, disciplinary perspectives, and data nuggets fit together.

In relation to this particular concern, there is a lot to be said for computational simulation, and from two directions.

On the one side, computational simulation forces the precise specification of causal relationships. The mathematical demands of expressing a conceptual model in a computational system surface every hidden assumption and every lingering ambiguity. This is incredibly helpful for explaining what a hypothesis really means with far more precision than is possible in the normal narrative and empirical modes of theory presentation.

On the other side, computational simulation extends the cognitive powers of theorists. The hypothesis in WPW is extremely complex with a lot of moving parts and it is cognitively challenging for any person, no matter how smart or erudite, to hold together all elements with the right interconnections and weightings. In a miracle of extended cognition, computational simulation helps us integrate and balance everything we know, holding all of it in place so we can investigate in detail little corners of the hypothesis without losing cognitive control over the whole.

WPW gives its readers a wealth of reasons to think that one particular tangle of causes within the mind-culture nexus is the leading explanation for the emergence and stabilization of western cultures and associated WEIRD minds. But it doesn't press its case well enough in relation to alternative explanations, which would involve helping the reader assess how important the WPW hypothesis is relative to other causal factors such as energy capture, war-making capacity, transportation and communication technologies.

However, place competing theories into a single, coherent conceptual model, implement the conceptual model in a simulation, validate the simulation against the data used to render the individual theories plausible in the first place, and you have a platform for analyzing the strength of causal connections. Using techniques such as sensitivity analysis, it is possible to determine which causal factors explain most variance in outcome variables, such as degree of WEIRDness in a population of agents. Does WPW's hypothesis about the emergence and stabilization of western WEIRDness explain a whopping 95% of the puzzle or a slender 5%? This is the same idea behind regression analyses in far simpler datasets: figure out what accounts for variations in outcome variables.

The fact that simulations can supply tentative answers to such questions means that this computational technique can shift the burden of proof in a complex argument. And that's an advance over interminable debates among competing hypotheses of large-scale civilizational change.

The mystery of tangled beginnings

Let's suppose for the sake of argument that the WPW hypothesis or an extension of it has all key causal factors identified and properly positioned in relation to one another, with the major causal loops articulated, in a strongly validated conceptual or even computational model. There is still the question about how change gets started, how novel norms emerge and stabilize. Is the WPW

hypothesis correct that one Christian vision of family life and social relationships was the key change-maker? Could something else have been more important? If we had competing hypotheses, how could we ever decide between them when we scarcely understand how novel civilizational niches arise within the mind-culture nexus in the first place?

Computational simulation can help here, too, but it is important to note limitations on what simulation can achieve in penetrating the mystery of tangled beginnings. Complex adaptive social systems famously display sensitive dependence on initial conditions in some regimes of behavior, making the emergence of novelty extremely difficult to predict. A classic example is Stephen Greenblatt's account of the emergence of western modernity in *The Swerve: How the World became Modern* (2011). Could renowned book-hunter Poggio Bracciolini's fifteenth-century discovery of Lucretius's poem *De rerum natura* really have triggered the Renaissance and ushered in modernity? Greenblatt makes a case that many experts treat as exciting speculation rather than sound reasoning based on solid evidence. But Greenblatt could conceivably be correct about his speculative explanation for the supposedly sudden onset of the Renaissance, even though it seems clear that neither he nor anyone else could ever prove it.

That is the mystery of tangled beginnings in a nutshell. If a complex adaptive social system finds itself in a transition regime, there may well be sensitive dependence on initial conditions such that tiny, untraceable events could ramify into vast system-level changes with stabilization around new rules. Even though computational models can be made to display precisely this type of sensitive dependence, modeling real-world sensitive dependence using sensitive dependence in a virtual system is an exercise in futility. For example, statistical models of gas laws are extremely powerful and computational models can be used to produce those statistical regularities just as mathematical analysis did when they were first discovered. But because of sensitive dependence, neither the mathematics of statistical mechanics nor the mathematics of computer simulation can predict individual particle trajectories for long; the predictions quickly lose accuracy, even when their starting locations and trajectories are known with high precision. Move from the closed system of a gas in a sealed container used to articulate the gas laws into an open system with energy fluxing across permeable boundaries and intricate internal dynamics, and computational models struggle with prediction even more. Thus, computational simulation is most useful when complex adaptive social systems are in *non-chaotic* regimes of dynamical behavior—regimes where sensitive dependence is limited and small perturbations do not significantly impact model dynamics. But then how can novelty arise within a computational rendering of a complex adaptive social system? How can a computational simulation help us penetrate the mystery of tangled beginnings at issue in WPW?

In computational models of complex adaptive social systems of minds and cultures, explaining transition dynamics from one social equilibrium to another must combine:

- slow changes in beliefs, worldviews, imaginaries;
- thresholds for dramatic social transformation; and
- stabilization of newly emergent norms.

WPW's hypothesis about the WEIRD west involves a way of thinking slowly permeating European societies over 1,500 years before triggering civilizational transformation of staggering proportions, with the mind-culture nexus in the west ultimately stabilizing around quite different norms than in the past. This is a useful exhibition of bootstrapping in the mind-culture nexus (Figure 1 captures the dynamics).

To see this kind of emergence in action somewhere other than in WPW, consider a computer simulation of the axial-age transformation a few centuries either side of 500 BCE (Shults & Wildman, 2018), where the parallels to the hypothesis of WPW are quite close. This model, called MAXIM, synthesizes three main theories of the Axial-age transition normally considered competitors: (1) the pathway related to arrangements of political power and conflict; (2) the pathway

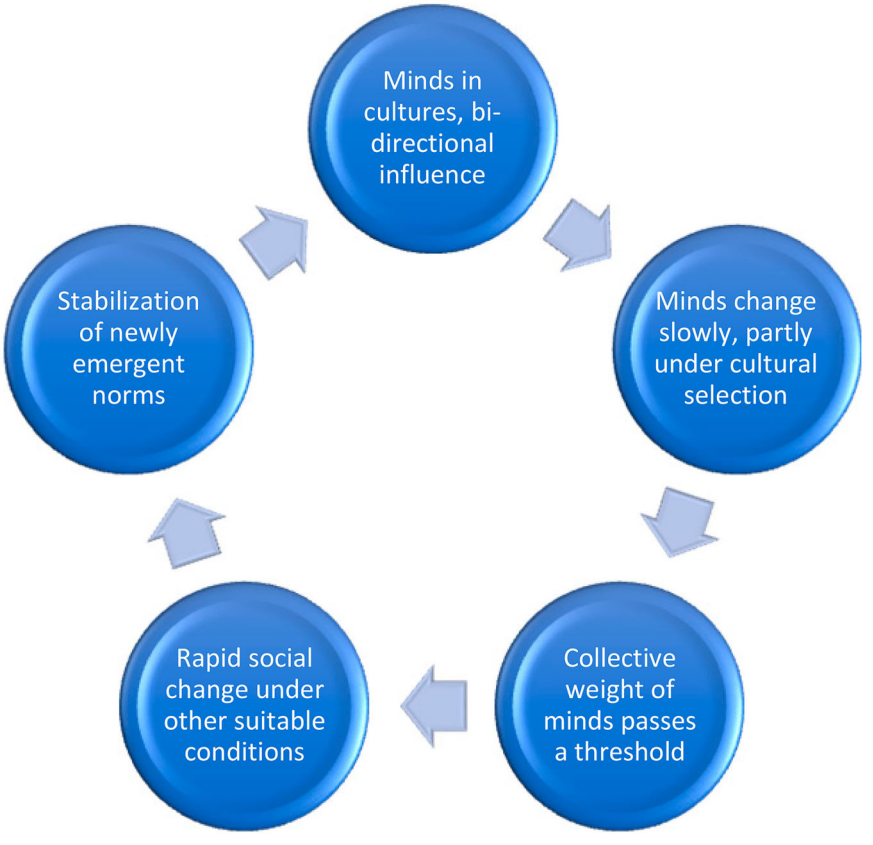

Figure 1. WPW's cycle of transformation in the mind-culture nexus involves slow change, fast change, and critical thresholds.

related to energy, technology, and social organization; and (3) the pathway related to human minds, beliefs, and consensus-based cooperation. This synthesis demonstrates that these three pathways can be treated as largely complementary rather than strictly competitive hypotheses, takes advantage of evidence used to support each pathway independently, and suggests that any one of the three is probably only incorrect when its proponents claim it offers a comprehensive explanation. The Axial age emerges in MAXIM in the manner of Figure 1: the same way that WEIRDness emerges in the WPW hypothesis. This strongly suggests that computational simulation can help penetrate the mystery of tangled beginnings and thereby lend support to a hypothesis as complex as WPW's.

MAXIM expresses the slow spread of an Axial way of thinking (an imaginary or a worldview) through a population until a threshold is reached at around 15% of the population after about 800 years (Figure 2). At that point, institutional form undergoes a dramatic transformation over a period of a mere two generations, creating new social structures commensurate with the Axial imaginary. Once the social institutions stabilize in their new Axial form, there is a rapid spread of Axial ideas through the remainder of the population until virtually everyone shares the novel worldview and Axiality becomes the new normal. The threshold for the change in civilizational structures is not hard-baked into the simulation code; it emerges from the model dynamics. That is generative social science in action.

This way of depicting phase transitions in simulations is important for models trying to express dynamism within the mind-culture nexus. It implements the dynamics of Figure 1, which express what Henrich hypothesizes in WPW. Thus, I would expect a computer simulation to be an

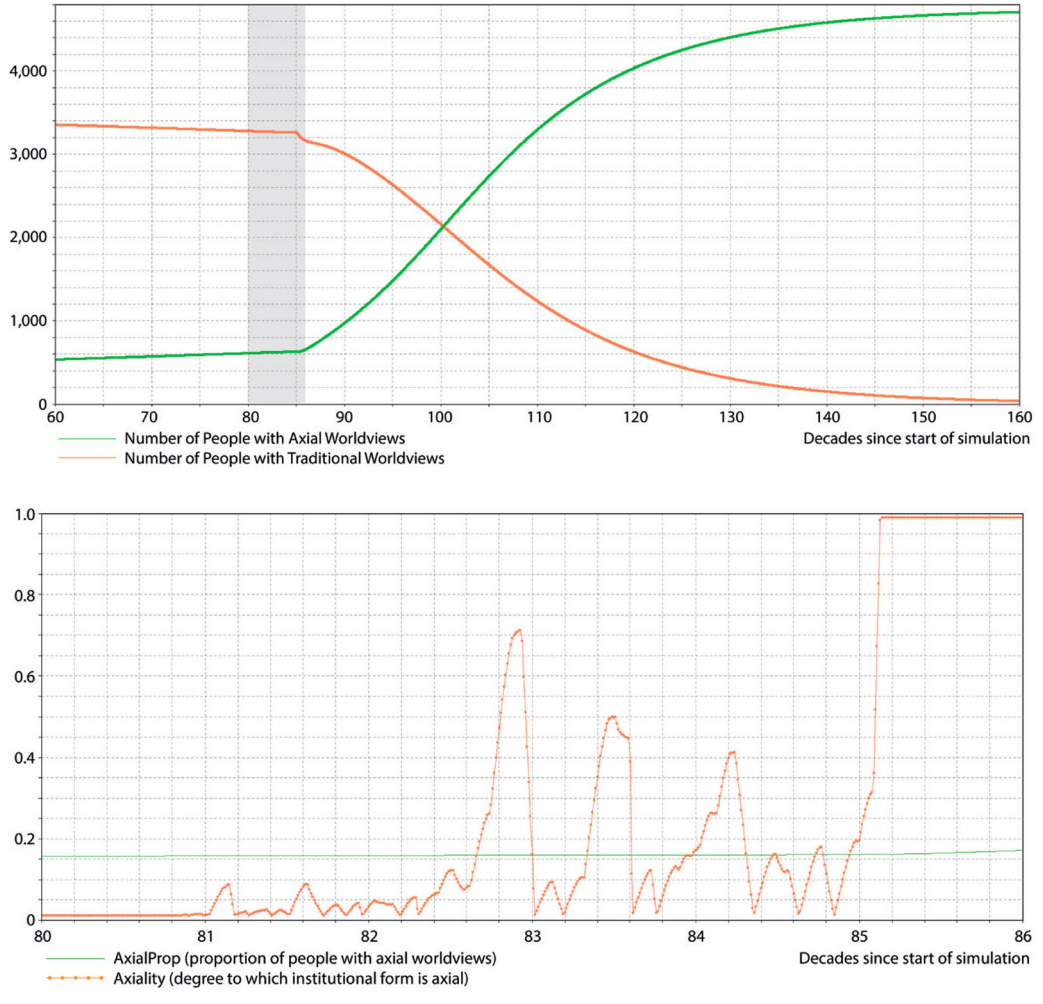

Figure 2. The Axial Age (several centuries either side of 2500 BCE) offers an example of interaction between individual beliefs and socio-political structures in a phase transition. The upper diagram shows the distribution in a population of pre-Axial and post-Axial worldviews as it changes over 1,000 years. Zooming in on the sixty years of the gray bar, the lower diagram shows threshold behavior whereby pre-Axial institutional forms destabilize and then restabilize around Axial institutional forms in a relatively short period of time.

extremely helpful adjunct to the argument of WPW, helping to articulate, support, and refine its central hypothesis.

Conclusion

Henrich's astonishing achievement raises a lot of new questions—about the quality of competitor explanations relative to WPW, about the reasons for emphasizing some causal processes rather than others in the complex system of causes WPW advances, and about the shrouded beginnings of the transitions that culminate in WEIRD people and cultures. We do not need to settle for guesses in the face of such crucial questions. Computational simulation is a method that allows us to dig much deeper into the intricate causal architecture of WPW's hypothetical model, and its complementary or competitive alternatives, and produce answers supported by solid reasons. As with Henrich's signaling theory, his hypothesis in WPW is peculiarly well-suited to implementation in a computer

simulation. If that project were undertaken, we'd understand the model a lot better and we'd know more about the extent to which we should believe it.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

Cosandey, D. (2008). *Le Secret de l'Occident: Vers une Théorie Générale du Progrès Scientifique. Corrected Edition*. Editions Flammarion.
Diamond, J. (1997). *Guns, germs, and steel: The fates of human societies*. W. W. Norton.
Epstein, J. M. (2006). *Generative social science: Studies in agent-based computational modeling. Princeton Studies in complexity*. Princeton University Press.
Greenblatt, S. (2011). *The swerve: How the world became modern*. W. W. Norton & Company.
Henrich, J. (2009). The evolution of costly displays, cooperation and religion: Credibility enhancing displays and their implications for cultural evolution. *Evolution and Human Behavior*, *30*(4), 244–260. https://doi.org/10.1016/j.evolhumbehav.2009.03.005
Henrich, J. (2020). *The weirdest people in the world: How the west became psychologically peculiar and particularly prosperous*. Farrar, Straus & Giroux.
Morris, I. (2010). *Why the west rules—For now: The patterns of history, and what they reveal about the future*. Farrar, Straus & Giroux.
Needham, J. (1969). *The grand titration: Science and society in east and west*. George Allen & Unwin.
Shults, F. L., & Wildman, W. J. (2018). Multiple Axialities: A computational model of the Axial Age. *Journal of Cognition and Culture*, *18*(5), 537–564. https://doi.org/10.1163/15685373-12340043
Turchin, P. (2007). *War and peace and war: Life cycles of imperial nations* (Annotated edition). Penguin.
Weber, Max. (1934/1904-1905). *Die protestantische Ethik und der Geist des Kapitalismus*. Mohr.
Wildman, W. J., & Sosis, R. (2011). Stability of groups with costly beliefs and practices. *Journal of Artificial Societies and Social Simulation*, *14*(3). https://doi.org/10.18564/jasss.1781

The success story of the west, perceptual art, and the challenges of the Global East

Fenggang Yang

Purdue University, West Lafayette, IN, USA

Since Max Weber published *The Protestant Ethic and the Spirit of Capitalism* in the first decade of the twentieth century, a number of theories have been constructed to explain the success of the West in various social institutions, such as the economy, politics, science, or the modernization of society overall. But none of them seems to be more ambitious than *The WEIRDest People in the World: How the West Became Psychologically Peculiar and Particularly Prosperous* by Joseph Henrich (2020), who positions his book to offer the most comprehensive scientific discoveries of the deeper reasons, or "the dark matter," that undergird the social institutions of the modern West. It is a brilliant masterpiece. However, after reading the book, I can't help thinking about the particular vantage point required to get such a spectacular view, much like appreciating an awe-inspiring masterpiece of perceptual art (see, e.g., https://www.perceptualart.com/). Some methodological issues also beg further explanation, articulation, and research.

This is a massive and indeed overwhelming book with a total of 680 pages. The 14 chapters in four parts summarize dozens, if not hundreds, of empirical studies in various disciplines. Each of them, especially the psychological tests, economic games, anthropological fieldwork, and social

CONTACT Fenggang Yang fyang@purdue.edu

surveys, is presented in a way that is fascinating and often entertaining. The reader has to mobilize all his or her knowledge and imagination in order to fully understand and critically inspect the research design and execution, the findings, and the interpretations. As a matter of fact, I had to read the volume two or three times from cover to cover, including the many long endnotes, and look through some of the cited publications in the long bibliography, before I felt comfortable enough to formulate my opinions and make comments.

The central argument, as far as my understanding goes, is this: By the mechanisms of natural selection and cultural evolution, humans usually survive and thrive by relying on the family and clan in their biogeographical environments and in competition with other people. Against this common and powerful tendency, however, the kinship norms and institutions were broken down in the West. This breakdown is a result of what the author called the Marriage and Family Program (MFP) of the Western Church, which is not only the Catholic Church but also Protestant churches. The MFP prohibited polygynous marriage, marriage to blood relatives, affinal kin, and non-Christians, and encouraged or required newly married couples to set up independent households. These prohibitions and prescriptions fractured and weakened kinship networks, reduced family size, and limited fertility and inheritance, so that people had to rely on the Church as safety net. The Church imposed and vigorously enforced the MFP from the fourth to the thirteenth century, which was probably due to various idiosyncratic reasons but certainly including its competition against other religions—Roman religions, Zoroastrianism, Judaism, and Islam.

Unintentionally, the breakdown of the kinship system resulted in a set of psychological patterns. Western people became more individualistic, self-obsessed, control-oriented, nonconformist, guilt-ridden, and analytical in perceptual and cognitive abilities. These are not common psychologies of all peoples, rather, they are peculiar to people of the West. These psychological patterns led to norms of impersonal prosociality, including trust in non-kin-related strangers, fairness, honesty, cooperation, impartial principles, and intentionality in moral judgment. Further, these social norms led to the development of certain social institutions, including voluntary associations of guilds, cities, and universities, impersonal markets, and participatory governance. These social institutions gradually emerged in Medieval Europe, evolved into the modern West, and eventually expanded to the whole world.

It appears that this work was not inspired by the classic Weberian thesis. In fact, Henrich did not engage Max Weber until around page 420, where he began with pointing out some problems in Weber's formulation of his arguments. For example, the kind of Protestant work ethic may also be found among the Jews, the Chinese, and many other peoples. Also, there were Catholic monastic orders and religious movements before and alongside the Reformation that had similar characteristics. Nonetheless, Protestantism did cause the rapid rise of literacy in the populace. In fact, as presented in the very first chapter, reading and writing abilities have actually changed both brain structure and psychological functions of literate people. Eventually, Protestantism and the evolved Catholicism led to the spread of the printing press, mass education, proliferation of literary and scientific associations, and the Industrial Revolution.

Having amassed so many separate empirical studies across multiple disciplines and assembling them in such a logical and systematic fashion, Henrich has constructed a masterpiece of scholarship that is many times stronger than Weber's set of multiple volumes. He argues that the success of the West is not merely in its economy, but in its many social institutions; these successes are attributed not merely to the Protestant ethic, but to the peculiar psychology that resulted from the MFP of the Western Church that was launched back in the fourth century.

However, I wonder how much this theoretical construction is dependent upon the particular vantage point of the author, or the reader's specific perspective, just like appreciating a masterpiece of perceptual art. Without this perspective, the artwork would look like unrelated pieces chaotically gathered together. In other words, is it necessary for the reader to be part of the WEIRD—Western, Educated, Industrialized, Rich, and Democratic—in order to understand and appreciate this masterpiece? Moreover, are the numerous pieces actually linked together, or do they merely appear so when you turn to the exact angle to see the spectacle?

To be fair, the book repeatedly emphasizes that it is not about the West vs. the Rest, nor about genetics, but cultural evolution and psychology that have led to current norms and modern institutions. The centrality of culture in human nature reflects the capacities of learning—who to learn from, what to learn, and when to use cultural learning more than one's own experience, especially in religion and ritual. "We are not observing fixed or essential differences among peoples but watching an ongoing cultural revolutionary process—influenced by multiple factors—playing out across geography and over centuries" (p. 194). Nonetheless, "culture rewires our brains and alters our biology—it renovates the firmware" (p. 65), not simply upgrading the software, analogically speaking. It is evident that

> even when institutional practices have been abandoned, the values, motivations, and socialization practices that were wrapped around these traditional institutions can stick around for generations, sustained by cultural transmission. This creates a pathway through which even extinct historical institutions influence contemporary minds. (p. 195)

China is a good example, Henrich suggests, of adopting the Western institutions while the traditional psychology persists. "In this situation, cultural transmission can perpetuate a clannish psychology for generations, even after clan organizations have vanished" (p. 195). Indeed, Henrich rightly points out,

> Unlike people in the MFP-dosed regions of medieval Europe, rural Chinese in the late twentieth century didn't spontaneously create myriad voluntary associations of like-minded strangers. Instead, people reaffirmed links to their ancestral homes, strengthened their clan affiliations, and spontaneously reformed exclusive groups built on the virtues of kin-based loyalty (nepotism). This occurred even though the Chinese government had tried to disband the clans, in part by burning their genealogies, in the 1950s. (p. 357)

Thus framed, it may be inferred that non-Western peoples may have to live in the reality of wrestling and struggling for a very long time to come before they can bring their psychology, norms, and institutions, or even the rewired brains, into alignment. And even that may not be possible without also adopting the religion of the West, because

> of all the agricultural, ecological, climatic, geographic, and historical factors that we explored in trying to understand the global variation in kinship intensity, the biggest factor—though not the only—was historical exposure to the Church. … Each century of Western Church exposure cuts the rate of cousin marriage by nearly 60 percent. (p. 226)

Are we on a slippery slope here? It is not necessarily so. But, if aligned changes can only happen over multiple centuries and through generations of a people, what might hold some readers from free falling into some version of cultural essentialism or some kind of eugenic racializing?

However, the Global East, comprised of China, Korea, Japan, and the East Asian diasporas around the world, seems to present some challenges, or at least some inconveniences, to this theoretical construct. First, the Global East has indeed adopted most of the practices of the MFP with or without the Western religion, as described in the book. However, instead of taking centuries, the rapid economic rises of Japan, the "four little tigers" (South Korea, Taiwan, Hong Kong, and Singapore), and China, have happened almost simultaneously with the MFP adoption, rather than following the seemingly logical order of the MFP, change of psychology, change of social norms, and formation of modern social institutions that took centuries. Therefore, is the seemingly logical order actually illusional, or is it open to rearrangement during the diffusion process of modern institutions?

Second, Henrich rightly points out,

> while many ancient and medieval societies beyond Europe had thriving markets and extensive long-distance trade, they were generally built on webs of interpersonal relationships and kin-based institutions, not on impersonal norms of exchange with broadly applicable principles of fairness and impersonal trust. Hui and Assure merchants represent impressive and sophisticated elaborations of our species' usual approach to trade. (p. 307)

However, this has happened not only in the ancient past. The kin-based expansive networks have played critically important roles in the economic success of the Chinese diasporas in southeast Asia under Western colonialism and as an "ungrounded empire" in the Pacific Rim in the West-

dominant modern world. In fact, some Chinese families that I have interviewed have intentionally placed family members in different countries across the Pacific as a survival strategy in the face of wars, political turmoil, racist violence, or financial storms that sometimes happen in different countries at different times. Similarly, the Jewish diasporas have maintained expansive kin networks around the global for survival. These cases beg for research and interpretation in this new theoretical construct, especially for the underlying factors of migration, transnationalism, and globalization that have been enabled by new technologies. I wonder whether the thick kinship relations only stifle a society of immobile people, whereas migration would thin out or loosen up the relations without giving up certain benefits for maintaining business trust and serving as safety net.

Third, some of the so-called WEIRD psychological patterns have existed in the Global East before or without the adoption of Western or modern institutions. For example, Figure 1.4 shows a map of global distribution of patience across 76 countries. The varied shades of gray indicate that China, Japan and Korea are very similar to Western Europe, North America, and Australia, but I failed to see much discussion of the Global East in this regard. Also, the industrious work ethic of East Asians is noted more than once in the book, but not well integrated into the theoretical explanations. I speculate that, once the kinship networks thin out, as it has happened in the Global East societies in the twentieth century and in some of the diasporic communities where migrant people have settled in culturally diverse cosmopolises, these psychological characters may serve the individuals and communities well in their adoption of and integration into modern institutions.

The book includes many maps and charts making cross-cultural comparisons. Most are informative and make good sense. However, some of the charts seem to be based on studies that were less robust. Chapter 6 presents many scatterplots along with the correlating straight lines. Henrich acknowledges that "such simple correlations in cross-country data should be regarded with skepticism" (p. 204), but says that the problems have been taken care of through a number of statistical controls. Still, in multiple places I am not fully persuaded. It is obvious that the sloped line of correlation can be pulled up or down by some dots (data points) at either the lower or upper ends on the left or right, especially by some outlier dots. In some of the charts (e.g., Figure 6.4a, Figure 6.6a, and Figure 6.9a), the dots do not show perceivable linear relationships. Instead, I wonder whether it makes better sense to treat them as clusters. Figure 7.2 presents findings using the European Social Survey about the relationships between the prevalence of first cousin marriages in regions of Spain, Italy, France, and Turkey and four dimensions of psychology: individualism-independence, conformity-obedience, impersonal trust, and impersonal fairness. Apparently, adding Turkey to the charts dramatically strengthens the correlations, but is this inclusion fully justifiable? If Turkey is dropped, the slope line of Figure 7.2a would be tempered and that of Figure 7.2c would become flat—no significant correlation.

Finally, the book makes analytical thinking as a major characteristic of the WEIRD psychology. However, shouldn't it be complemented by the synthetic abilities, so that the big picture would not be lost? Perhaps most of the "WEIRDest people" are indeed analytical without being synthetical. But the exceptional few who have both abilities in the WEIRD world would be able to assemble analytical pieces together and present the big picture in a spectacular fashion, as this book does, even though much remains to be further researched, refined, and reinforced. Regardless, this masterpiece of scholarship deserves to be read widely by many people in diverse cultures, especially graduate students in their training to become social scientists of the modern world.

Disclosure statement

No potential conflict of interest was reported by the author.

ORCID

Fenggang Yang http://orcid.org/0000-0002-4723-9735

RESPONSE

Cognitive bugs, alternative models, and new data

Joseph Henrich

Department of Human Evolutionary Biology, Harvard University, Cambridge, MA, USA

With great humility, I offer my heartfelt thanks to both the commentators, for their careful readings, instructive syntheses and insightful critiques, and to the *RBB* editors (particularly Rich Sosis), for nurturing of this process and recruiting such an excellent selection of commentators. This is precisely the kind of rich intellectual and scientific exchange I hoped for in putting together, *The WEIRDest People in the World*.

Below, I'll primarily use the available space to address the most pungent criticisms and concerns among the commentaries rather than to comment on the fascinating elaborations, meditations and comparisons offered by scholars like Bob McCauley, Fenggang Yang, and Ann Taves, who do me a great service by seating my efforts within the contexts of broader scholarly enterprises. Simply being compared to Max Weber by someone as insightful and thoughtful as Ann Taves is about as good as it gets.

"Religions," epistemic vigilance and "cognitive bugs"

Lightner et al. frame four critiques or concerns that I'll address here. Importantly, while three of these seem to have been offered as contrasts with my views or approaches, I actually agree with their points and have written on these myself. First, the trio make the standard anthropological points that the application of the word "religion" by non-experts is often based on similarities with Christianity and that many "wild religions," which lack organizational forms, represent widespread cultural phenomena. The packages of ritual and supernatural beliefs possessed by various populations have been more likely to get called "religion" by scholars when they appear more similar to Christianity. At the same time, religious packages labeled as shamanism, ancestor worship, witchcraft, and divination are strikingly common across diverse populations.

These are both good points. My coauthors and I have highlighted the problem of using a historically and cross-culturally peculiar religions like Christianity as the prototypical case and developed a cultural evolutionary theory meant to explain both why Christianity is so odd within the universe of religions and why it is so different from "wild religions" (Norenzayan et al., 2016a). Of course, my students and I have conducted ethno-experimental fieldwork (Henrich et al., 2004) to study ancestor worship and compare it to both Christianity and Hinduism (McNamara et al., 2019; McNamara & Henrich, 2018; Willard & McNamara, 2019). My students and I have also published on "wild religious" topics, including shamanism (Singh & Henrich, 2020), divination (Hong & Henrich, 2021), and rain-making (Hong et al., forthcoming). This work combines ethnographic fieldwork with historical analyses of Chinese written corpora going back over a millennium. In my view, some of best work on shamanism and witchcraft is being done by my former graduate student, Manvir Singh (2018, 2021). As the commentators hopefully realize, the material on religion in Chapter 4 of *WEIRD* is meant to provide a theory for how and why the elements at the core of "wild religions" can evolve culturally into more familiar religions like Islam and Christianity (Atran & Henrich, 2010; Norenzayan et al., 2016b). Given all my prior efforts on this front, I was glad to see Lightner et al. highlighting these parts of the puzzle.

CONTACT Joseph Henrich joseph.henrich@gmail.com

Second, Lightner et al. emphasize that copying is not blind and point to work on epistemic vigilance by Sperber and his collaborators. Of course, the entire notion of adaptive cultural learning mechanisms, developed first by Boyd and Richerson (1985), had already moved starkly away from notions of "purely blind copying" (Cavalli-Sforza & Feldman, 1981). For example, Boyd and Richerson's concept of "direct bias" explicitly included the evaluation of costs and benefits as well as psychological effects—we now call these content-based mechanism or content biases (Henrich & McElreath, 2003). In my work, I've repeatedly emphasized how adaptive learning relies on ensembles of both context and content-based learning abilities to adaptively acquire behavior, beliefs, motivations and much more (Gervais et al., 2011; Henrich & Henrich, 2010). Furthermore, I wrote the first paper on epistemic vigilance (Henrich, 2009), though I didn't use the terminology coined by Sperber et al. (2010) a year later. Specifically, I described an adaptive psychological mechanism based on using *Credibility Enhancing Displays* or CREDs to avoid being manipulated by those who could gain an advantage by passing on false beliefs or practices that they themselves don't hold—in other words, epistemic vigilance. This paper also provided the first formal model of epistemic vigilance, which has been explored in greater depth theoretically (Wildman & Sosis, 2011) and generated a battery of both laboratory and field studies (Kraft-Todd et al., 2018; Lanman, 2012; Lanman & Buhrmester, 2017; Willard et al., 2016; Willard & Cingl, 2017). I'd be interested to hear why Lightner et al. don't count my paper within the epistemic vigilance literature. I also caution them against affirming or essentializing academic tribal distinctions where none really exist—unfortunately, some scholars have worked hard to create camps (the "California School") where sharp distinctions cannot really be drawn (Heyes, 2018).

Next, Lightner et al. expressed two main concerns with my discussion of "cognitive bugs," which I suggested in Chapter 4 could help explain why we might be capable of holding certain supernatural beliefs. Curiously, while Lightner seems to want to credit me with this idea, I'm actually drawing on work by Boyer (2001) and Atran (2002) and representing a view common among the cognitive science of religion crowd. So, just to clarify, this is not a disagreement with me per se, but with a large group of experts on the evolution of religion, including those who coined the term "wild religions."

Lightner et al. suggests that what I'm calling "cognitive bugs" might actually be "cognitive features" that provide fast and frugal heuristics that allow for adaptive behavior. Unfortunately, the authors' proposal is not clear on the processes that would have given rise to these adaptive functions—e.g., cultural vs. genetic evolution. If the authors think cultural evolution might shape supernatural beliefs to make them adaptive, then they've just redescribed an argument I've been making for two decades. In *The Secret of Our Success*, for example, I discuss how divination protocols might provide a simple way to optimally randomize one's strategy in hunting, yielding what game theorists call a mixed strategy. Similarly, in *WEIRD*, I discuss how if people believe that the gods desire communal rituals, then they are more likely to conduct these rituals, resulting in greater solidarity for their communities. However, if Lightner et al. are suggesting that these fast and frugal heuristics are somehow the direct products of genetic evolution, they will face some serious empirical challenges given the diversity of ways in which supernatural beliefs provide adaptive functions. For example, in traditional Sardinia, beliefs in ghosts led people to shut their windows at night and take other precautions that would have protected them against endemic malaria (Brown, 1998). Spirit beliefs here provide a heuristic that allows this population to reduce the devastating impact of malaria-carrying mosquitoes. As a genetic adaptation, this would have to be an amazing jukebox-type cognitive module (Tooby & Cosmides, 1992). It would have helped if the authors had provided at least one illustrative ethnographic case example.

Finally, the authors offered a suggestion common to *WEIRD* academics: maybe people don't actually believe these supernatural agents are agents per se, but instead represent something more abstract. The evidence supporting this seems to be a discussion with one Maasai diviner. In contrast, a great deal of ethnographic and historical research indicate that this Maasai's comments don't apply very broadly. For example, drawing on rich ethnography and systematic

interviews with many shamans, Singh et al.'s detailed studies of the Crocodile Spirit in Mentawai Indonesia clearly indicate a strong belief in an agent: people pay costs for shamans to root out this spirit. Shamans look for the crocodile spirit in people's houses, which is often in the ceiling, and carry it to the river (Singh et al., 2021). People can draw sketches of the spirit if you ask them. Similarly, led by Ben Purzycki, systematic cross-cultural studies using detailed interviews on what gods like and dislike as well as more in-depth studies of Buddhists also indicate a belief in agents and human-like minds (Purzycki, 2011, 2013; Purzycki et al., 2012, 2018; Purzycki & Holland, 2019)—not vague abstractions. Finally, our historical work on rain-making and divination in China support the view that people see supernatural agents as agents that can be bargained with, bribed and threatened (Hong & Henrich, 2021; Hong et al., forthcoming).

In closing this section, I want to emphasize the role of theory in my research enterprise because Lightner et. al. seemed worried about the semantics of the word "religion." Usually, I hear this kind of concern coming from humanities scholars and see it as a pre-theoretical intuition. As I've emphasized many times, all of my work on "religion" could be done without the word "religion" and nothing hinges on the meaning of this English word. My colleagues and I have developed theories about the origins and cultural evolution of various supernatural beliefs, rituals, and devotions. All of these theories involve the interaction of some innate psychological machinery, which often includes our evolved capacities for social learning, with cultural evolutionary processes as they are shaped by ecology, economics, and interactions among social groups (among other factors). None of our evolved capacities are "for" (as targets of natural selection) "religion" in general or supernatural agents, afterlife beliefs or rituals. The role of the word "religion" in all this is just to help readers orient themselves regarding the general topic, and I take advantage of the typical English semantic intuitions. Beyond this, we are testing hypotheses that don't reference "religion" per se.

Alternative models?

Passmore and Watts question whether an alternative model or causal network might better fit the evidence I provide. This is an important question that I've focused on, both while writing the book and in my ongoing research. Unfortunately, as Figure 1 illustrates, the authors have mistaken my interest in establishing one particular set of links for the entire causal network that I lay out over the course of the book. In *WEIRD*, I repeatedly emphasize that the process is coevolutionary, and discuss how once markets, voluntary associations and impersonal institutions emerge, this would have put a further pressure on our cultural psychology and favored even less intensive forms of kinship. I also emphasize how, in the modern world, much of the ongoing transformations in kinship are driven by market integration, urbanization and other economic forces. But, as I emphasize in Chapter 1, I'm aiming to illuminate the origins of this autocatalytic feedback process and consider how and why Europe started down this pathway while other more market-integrated and urbanized parts of the world did not. This means that, contrary to Passmore and Watts' suggestion, explanations that focus primarily on "market integration," "urbanization" or "wealth" can't get off the ground because Europe was a relative backwater when this process began; yet, at least some European regions experienced substantial reductions in kinship intensity long before Europe surpassed China and the Islamic world in wealth and urbanization.

We can reframe Passmore and Watts' question to focus on the evidence revealing a link between the Church and kinship intensity. Unfortunately, the authors open by misleading the reader on the evidence I presented in *WEIRD*. They claim that my evidence consists of only two main types: (1) the Church's changing policies regarding marriage and the family and (2) cross-national regressions that establish a correlation between Church exposure and kinship intensity. This not only misses five other sources of evidence, but crucially ignores what is by far the best evidence. Let's itemize the data they ignore:

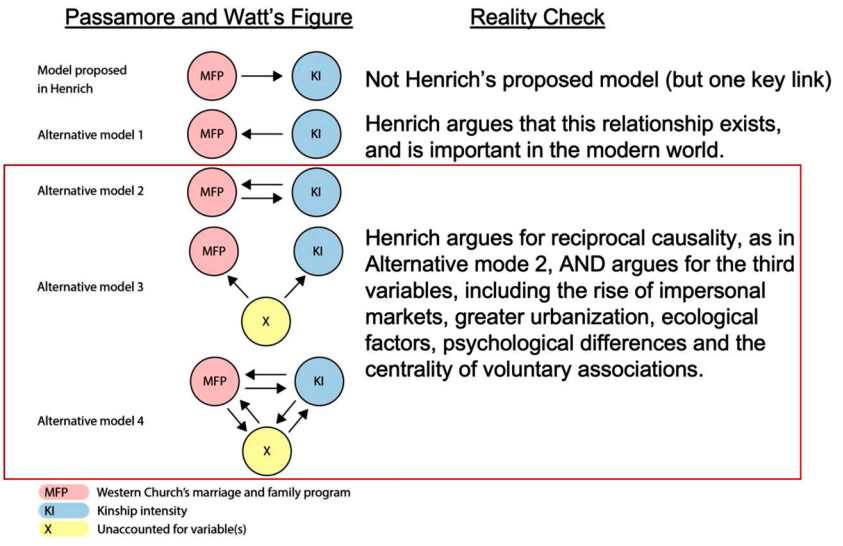

Figure 1. Addressing the model alternative presented by Passmore and Watts.

1. *Changing kinship terminology* (Chapter 5): Pre-Christian European languages possessed complex kinship terminologies that variously differentiated sides of the family, types of uncles (e.g., mother's brother separate from father's brother), and types of cousins (parallel or cross). Over time, many European languages all shifted to the terminological system used in English today, a system also common in hunter-gatherer societies. Globally, Schulz's analyses reveal that for every century under the Church the likelihood of a population speaking a language that differentiate cousins (parallel vs. cross) declines by 7–9 percentile points. Furthermore, I make two other points that underline the role of the Church. First, in English, affines went from having their own independent labels—as in most agricultural societies with intensive kinship—to combining nuclear family terms with the affix "-in-law." So, your "sister-in-law" is your sister *in Canon law*—effectively invoking the Church's incest taboos. Coincidence? Second, all German dialects changed their kinship terminologies to also to use the nuclear family term plus an affinal affix except one dialect. Can you guess which German dialect retains the pre-Christian forms? It's Yiddish, the dialect spoken by German Jews. The footprints of the Church are all over this. If this were some general process, as Passmore and Watts suggest, why didn't the kinship terms used by German Jews change as well? If this was part of a more general process, why adopt an expression that invokes Canon Law every time we mention an affine?
2. *European Analyses* (Chapter 7): Focusing only on Europe, I report analyses that linked four aspects of psychology among Europeans directly to both kinship intensity (measured using cousin marriage) and centuries of Church exposure. To accomplish the latter, we constructed a database of the diffusion of bishoprics across Europe. This permitted us to calculate the length of each region's exposure to the Church—based on proximity to an existing bishopric over time. We then compared only regions in the same modern country, and held constant a large battery of controls including individual income, education, religions and regional measures such as the presence of Roman roads and many ecological and agricultural factors. The work also shows that when you only compare regions within Italy, Spain, France, and Turkey, the duration of Church exposure strongly predicts cousin marriage rates in the twentieth century. These analyses directly confirm our hypotheses and are perhaps the best test.
3. *Second Generation Analysis* (Chapter 7): Focusing only on second generation immigrants in Europe, our analyses link individual-level psychological measures back to the kinship intensity

of their parents' ethnolinguistic home or to country-level measures of kinship intensity and Church Exposure. We compare only second-generation immigrants living in the same European country, and in some analyses the same subnational region, and hold constant a battery of controls that include income, education and religion. In some analyses, we compare only individuals whose parents came from the same country but different ethnolinguistic groups. Now, this doesn't directly link the Church to kinship, but it's a powerful demonstration of patterns consistent with the broader theory and thus provide indirect support for the Church-Kinship linkage. Which of the alternatives proposed by Passmore and Watts would be consistent with this pattern of findings?

4. *Italian Analysis* (Chapter 7) Focusing on Italy, I explain how the broad patterns showing high cousin marriage rates in southern Italy and Sicily are consistent with historical patterns. Northern Italy was under the Carolingian Empire and thus got the full force of the Church's Marriage and Family Program. Meanwhile, southern Italy and Sicily had very different historical experiences.
5. *African evidence (Chapter 8)*: drawing on data from Africa, Fenske (2015) shows how proximity to historical Christian missions is associated with lower rates of polygyny today and persuasively argues that the channel is not through formal education.

The authors also ignore the evidence from Mormon polygyny in the United States (Chapter 8). The authors suggest some force besides religion was driving the change, and the Church was merely swept along. Does this apply to the populations who suddenly started practicing polygynous marriage in nineteenth century America or those populations in Utah who practice polygynous marriage today? In this case, the historical record is clear that the Mormon Prophet Joseph Smith introduced polygynous ("celestial") marriage, modeled on the Old Testament Patriarchs, after purportedly receiving a communique from God. Polygyny began to spread while the Mormon faithful lived in Nauvoo, Illinois, but expanded after Brigham Young led them into Utah (Smith was murdered in Nauvoo). Not all nineteenth century Mormons were polygamists, but all polygamists were Mormons, at least among the settler communities. Today in Utah, and surrounding regions, polygamists are all fundamentalist Mormons who explicitly engage in the practice on religious grounds. So, something totally different might have been afoot in Medieval Europe, but this case demonstrates that religion can transform marriage and family practices among culturally European populations.

Since *WEIRD* went to press, more evidence has emerged. Working in the Democratic Republic of Congo, Bergeron (2019) has linked the proximity of historical Christian missions to measures of both kinship intensity and psychological outcomes. By comparing members of the same ethnic groups all living in the same city (but who are linked back to their natal villages, which give the distance to the nearest abandon missions), Bergeron makes a persuasive case that exposure to the Church via mission stations both reduced people's kinship intensity and altered their moral psychology. Bergeron also makes a persuasive case against both reverse causality and third-variable explanations. Which of Passmore and Watts alternative models can explain this?

It's odd that Passmore and Watts decided to focus on our cross-national analyses given that I explicitly cautioned the reader against reading too much into these analyses. At the end of Chapter 6, I wrote,

> The problem is that, while comparing countries is a convenient way to illuminate the broad patterns of global variation, it's not a great way to unearth 'what causes what' because too many factors remain hidden below. In the next chapter, we'll dig deeper to uncover this pathway more clearly.

Passmore and Watts ignore the next chapter entirely.

So, Passmore and Watts targeted the weakest line of evidence available, which both Schulz et al. (2019) and I clearly acknowledge. Nevertheless, let's see how they did with their cross-national critique. First, contrary to the authors' implication, we made extensive efforts to address the problem of non-independence using standard techniques from economics. First, we used continental fixed

effects in some models, so we only compared countries in the same continent. Second, we analyzed only countries with little exposure to the Church, meaning that the variation in kinship intensity was due to factors besides the Church. Finally, and most relevant to the authors' own reanalysis, we conducted robustness checks for the non-independence of datapoints in which we adjusted our standard errors (Conley, 1999) using both the spatial distance between countries and a cross-national distance measure that is correlated highly with cultural dissimilarity (Table S4.6 in Schulz et al., 2019).

Nevertheless, Passmore and Watts do highlight an important issue that my colleagues and I do worry about; but, in my judgment, there's no clear or widely agreed upon approach to tackling this challenge. Unlike some in the cultural evolutionary community, economists typically address this through clustering at various levels or by using Conley standard errors. These approaches are far from fool proof, but among the universe of potential approaches, Passmore and Watt's effort doesn't stand out as a good choice. If the underlying cultural evolutionary process is driven by cultural group selection, creating strongly biased horizontal transmission, it's far from clear that phylogenetic regressions using language to mark shared history are appropriate. Within Europe, the expanding Roman Empire and later the Church spread Latin, leading to French, Spanish, and Italian, among other languages. Meanwhile, English replaced Welsh, Celtic and Gaelic, but striking non-linguistic cultural differences persisted. Instead of using linguistic distances, one of our robustness checks used a measure correlated with omnibus measures of overall cultural similarity created using the World Values Survey (Muthukrishna et al., 2020). Second, it's not clear that phylogenetic regression is the right tool if some linguistic or cultural group is expanding and budding at the expense of others because of a particular trait or set of traits that can be acquired both vertically and horizontally. Controlling for phylogeny absorbs the fact that populations with the trait under study—the Church in this case—tended to spawn more new data points than those without. The Roman Church arrived in Kent, England, and the regional population would eventually conquer Wales, Scotland and Ireland—eliminating their languages and transferring the "Church trait." Given our historical knowledge of the underlying process, it's clear that phylogenetic regression should reduce the measured effect size because their controls actually absorb part of the causal pathway. This conceptual argument is consistent with the reduced (but still non-zero) effect found by the authors in their analyses.

Passmore and Watt also object to my account by referencing some historical data. Unfortunately, I suspect they simply grabbed anything that appeared to support their skepticism without taking a close look at the source. For example, they reference a paper by Shaw and Saller (1984) that I cited in *WEIRD* and have studied. Using funerary inscriptions, the paper provides data on the frequency of husbands and wives with the same last names. Using such data, under some assumptions, one can infer rates of cousin marriage. But, one problem with this data is that in some regions, many people adopted the last name of their new Emperors or the generals who conquered them. Shaw and Saller simply show the raw data and assert that cousin marriage rates were low.

I took a more quantitative approach. First, I started with their raw data but then assume that 90% of the same-name matches were not cousin marriages if Shaw and Saller noted that common last names in that subpopulation were likely not due to common descent ("Julius"), reducing their raw numbers. Of course, if the raw data were available (we are working on that), I could use the actual frequencies of names to make more accurate estimates. But, by any measure, 90% is conservative. When Shaw and Saller stated that few widely shared names existed, I assumed only 10% of matches were not cousin marriages. This is also probably conservative. Then, I multiplied by four, since spousal name matches only occur in one of the four types of cousin marriages. For example, my father's brother's daughters share my last name, but my father's sister's children do not. Of course, this approach assumes that all matches are equally likely, which is also conservative since, as the authors note, cross-cousin marriages are much more common cross-culturally than parallel cousin marriages (except in the Islamic world). Table 1 shows the results.

Table 1 shows that Shaw and Saller's funerary data actually suggest quite high rates of cousin marriage. To illustrate this, Figure 2 replots Figure 7.2 from WEIRD, where the horizontal axes plot the percentage of cousin marriage in the twentieth century on a log scale. Clearly, these rates are high in a historical perspective, and most are higher than anything seen in Spain, Italy, and France in the twentieth century. Several Roman populations are even high compared to modern Turkey. Thanks to Passmore and Watts for highlighting this important paper.

Similarly, Passmore and Watts claim that "monogamy is likely to have been common from at least the Neolithic, referencing Scheidel (2009) and Fortunato (2011). Scheidel, however, essentially says the opposite, arguing that monogamous marriage was a "peculiar" institution that set the ancient Greeks apart. He then reviews the historical evidence showing how common polygyny was around the world. Meanwhile, Fortunato's (2009) claim that Proto-Indo-Europeans were monogamous has been dramatically undermined along with her approach. Fortunato took data from the *Ethnographic Atlas* on whether various Indo-European societies (assessed circa 1900) had normative monogamy or permitted polygyny. Then, using the Indo-European language tree, she probabilistically reconstructed the ancestral states of monogamy/polygyny by assuming primary vertical transmission plus mutation. The core problem with her approach is that the method doesn't do well if there is substantial *biased* horizontal transmission—the kind produced by cultural group selection. Illustrating this, we know from historical evidence that some of her input data points —the tips of her tree—were changed in historical time from polygyny to monogamy by powerful horizontal transmission. For example, Fortunato input the Irish as being monogamous but historical evidence indicates the Irish were polygynous until after the Norman conquest, when the Church's Marriage and Family program was imposed. To highlight the deep problems with this approach, Fortier-Dubois (2016) entered data on religion for the same populations used by Fortunato and applied her methods. Christianity is reconstructed to have ancestral societies thousands of years before Jesus and, the method would have us believe, the proto-Indo-European ancestor was likely Hindu (but, Hinduism develops much later). Of course, both Hinduism and Christianity spread strongly horizontally, violating the assumptions imported from genetics and imposed on cultural evolution. Similarly, Fortier-Dubois also illustrate the problems of this method by analyzing the cultural trait "has slavery" using Fortunato's approach. This analysis suggests that the ancient Romans and Greeks did not have slavery, which is worrisome since an overwhelming body of historical research indicates otherwise. Overall, I know of no research that benchmarked this methodological approach by applying it to cases in which the historical patterns were known or to simulated data where strongly biased horizontal transmission was considered. Fortunato simply assumed this would work.

In general, Passmore and Watts efforts to locate empirical evidence to assess the pre-Christian kinship structure of Europe seem to have missed relevant evidence. First, consistent with my reanalysis of the Shaw and Saller evidence, Thonemann (2017) demonstrates the high prevalence of cousin marriage in Anatolia under the Roman Empire using historical sources. Second, archaeological research using techniques from ancient DNA confirm that many pre-Christian agricultural populations in Europe had key aspects of intensive kinship, including patrilocality, patrilineal descent, female exogamy and polygyny (Knipper et al., 2017; Mittnik et al., 2019; Racimo et al., n.d.;

Table 1. Estimate of cousin marriage rates based on raw data from Shaw and Saller.

	Populations	Cousin Marriage Rate
1	Northern Italy	28.8
2	Southern France	19.2
3	Noricum (Austria)	72
4	Spain	25
5	North Africa	
5a	Military Officers	21.6
5b	Foot soldiers	2.8
5c	Civilians	10.9

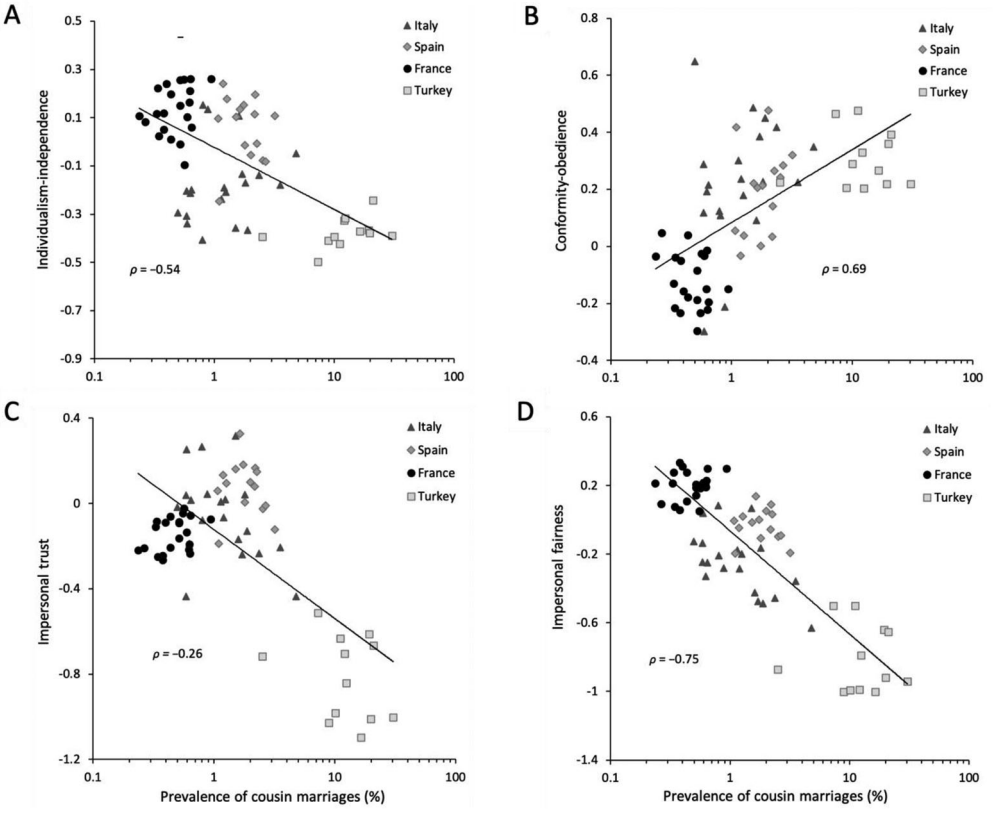

Figure 2. The relationships between the prevalence of first cousin marriages in regions of Spain, Italy, France, and Turkey and four dimensions of psychology: (A) Individualism-Independence, (B) Conformity-Obedience, (C) Impersonal Trust and (D) Impersonal Fairness. Replotted from Henrich (2020).

Schroeder et al., 2019). Broader analyses of ancient DNA, looking at variation in Y vs. X chromosomes, suggest that polygynous clans expanded dramatically after the origins of agriculture (Zeng et al., 2018). Finally, detailed analyses of archaeological, historical and genetic evidence reveal the intensity of kinship and role of polygyny in the Viking communities in Scandinavia (Karras, 1990; Margaryan, n.d.; Raffield et al., 2017a, 2017b). All of this evidence, which arrived after *WEIRD* was finalized, suggests that the pre-Christian societies of Europe, while showing substantial variation, possessed forms of intense kinship that bear little resemblance to the small, monogamous nuclear families—termed the European Marriage Pattern by historic demographers—that had emerged by the late Middle Ages in Europe.

Evolutionary foundations

When I first developed the book proposal for *WEIRD*, Part I was supposed to be devoted to developing an evolutionary framework for exploring and understanding human behavior, psychology and culture. After two years of work, it became clear that Part I had to be set free to become its own monograph, *The Secret of Our Success* (2015), hereafter *The Secret*. This book laid the foundation for *WEIRD* and allowed me to provide a summary of the key points in Chapter 2, where I explicitly point the reader to *The Secret*. I was delighted to see that both Bob McCauley and Anne Taves understood that *The Secret* and *WEIRD* are best considered together, and form a continuous line of argument.

Given the extensive account provided in *The Secret*, I was rather puzzled by Fuentes's many assertions about my evolutionary approach. His claims are not only off target, but they run directly counter to the main thrusts of the *Secret* (and my entire career). To start, Fuentes states that my "selective engagement with contemporary human evolutionary histories, processes, and patterns creates a problem for the suite of assumptions undergirding the basal narrative about why humans do what they do" and depicts my approach as a "standard adaptationist" approach. Unfortunately, Fuentes offers few specifics, and those he does suggest a lack of familiarity with my work. *The Secret* is a book length treatment of the most formally developed and researched aspects of the *extended evolutionary synthesis* as applied to human evolution. My main argument is that cultural evolution has been the key driver of our species genetic evolution for at least a million years. Woven into this argument is the notion that the secret of our species success lies not in improvisational intelligence, fitness optimizing cognitive abilities, or specialized evolved modules (Pinker, 2010; Winterhalder & Smith, 2000), but hinges on how our species' social and cultural nature creates a collective brain that powers up innovation and cumulative cultural evolution. None of this even remotely resembles the "standard adaptationist" approach which doesn't consider culture-driven evolution or the niche construction processes it can create (Barrett et al., 2007). Puzzlingly, several of the authors cited affirmatively by Fuentes, most notably Sarah Hrdy and Carel van Schaik, are much closer to "standard adaptationists" than I am—and I think they would enthusiastically agree.

In critiquing my approach, Fuentes suggests that my efforts are "surprisingly light … on contemporary evolutionary theory" and he references "(e.g., Laland et al., 2015)." However, Laland's (2017) own effort to apply the extended evolutionary synthesis draws heavily on my work and dovetails beautifully with *The Secret*. In reviewing Laland's book in *Science* (2017) I struggled to find something to disagree with. I wish Fuentes had provided one example of how my efforts are at odds with those of Professor Laland in his magisterial work on human niche construction.

Apparently, I'm also "surprisingly light … on anthropological, paleoanthropological, and archeological Pleistocene human evolutionary research and analyses." Well, *The Secret* has 17 chapters, two of which are devoted entirely to paleoanthropological and archeological evidence on human evolution. Table 15.1, which spreads across two pages, cites and discusses the implications of 17 paleoanthropological finds ranging from 3.4 million years ago to 750,000 years ago. Figure 15.1 shows a hand axe made of bone dating to 1.4 million years ago. Paleoanthropological and/or primatological evidence appears in Chapters 1, 2, 5, 7, 10, 12, 13 and 14. Figure 2.1 shows a giant carnivorous reptile from Pleistocene Australia, Figures 2.2 and 2.3 show chimpanzees or data from non-human apes. Anthropological ethnography, including my own fieldwork, appears in chapters 3, 4, 5, 7, 8, 9, 10, 11, 12, 13 and 14. Figures 3.1 shows an Inuit fishing spear, Figure 5.2 Aboriginal water containers, Figure 7.1 anthropological data; Figure 7.2 Inuit house construction; Figure 9.1 hunter-gather band composition, Figure 11.4 an ethnographic image, Figure 12.2 tool data gleaned from ethnographies; Figure 13.1 sign language gestures from aboriginal Americans in the Plains and 14.1 Mayan writing using faces.

"Light," really? Actually, there's more research from anthropology in *The Secret* than any other single discipline, though I did also draw on psychology, economics, neuroscience, and evolutionary biology.

Fuentes further critiques my efforts:

> Current work in human evolution effectively argues against a basal inter-individual/intergroup competition/cooperation framework for Pleistocene *Homo*. Substantial data and analyses demonstrate complex interwoven processes of mutuality, collaboration, cooperation and competition deep in the Pleistocene (Anton and Snodgrass, 2012, Burkhart et al., 2009; Fuentes, 2015, 2017a; Kissel & Kim, 2018; Hrdy, 2009; Spikins, 2015; Sterelny, 2021).

The reader might be wondering what a, "basal inter-individual/intergroup competition/cooperation framework" is and how it differs from one that involves "complex interwoven

processes of mutuality, collaboration, cooperation and competition." In the second quotation, which is apparently the view supported by "substantial data and evidence," Fuentes's four item list repeats "cooperation" and "competition" and adds "mutuality" and "collaboration." Of course, in *The Secret*, I draw explicitly on formal (mathematical) evolutionary models of "mutuality" (Boyd & Richerson, 2002) and "collaboration" (Henrich & Boyd, 2008) as well as "coordination" (McElreath et al., 2003) and "collective action" (Henrich et al., 2015) to discuss the emergence of mutually-beneficial norms, a division of labor, the coevolution of ethnic groups and markers, and the emergence of prestige-based leadership, respectively. Admittedly, these mathematical approaches are in lieu of the usual handwavy verbal theorizing that characterize much work in anthropology. Only some of these models invoke multi-level selection.

So, really the only difference between our approach is the prominence of the word "complex"? But, in my view, scientists all know the world is complex. My endeavor has been, and remains, to unravel the otherwise beguiling complexity of the world into well-defined causal threads that can then be gradually woven into an increasingly rich tapestry of how both evolutionary and historical processes unfold. I'm less clear on what Fuentes is up to—at times he seems to intentionally inject a vague fuzziness into his work and his critiques. It's often not clear what the processes are that he has in mind—and it's not clear how to prove him wrong. Maybe he likes to create an air of mystery or to appeal to his postmodernist colleagues.

But, what about all the references that Fuentes cited, "(Anton and Snodgrass, 2012 … .)," which supposedly contain all that knockdown data and analyses on the "basal" human condition that I've apparently ignored? Prior to seeing Fuentes' commentary, I had read almost all of those references, and have now reviewed the few I missed. I can't figure out what data or analyses Fuentes has in mind. Few of these refences have anything I'd call "analyses," though some are excellent reviews. Many of the insights discussed in those papers appear in my book and are folded into my account, though admittedly not always in the same way the original authors would have wanted. For example, Fuentes references Burkhart et. al. and Hrdy. Both authors argue for the importance of alloparents and others in raising offspring. In *The Secret*, I discuss the importance of this, under the label "The Sociality-Care Pathway" (p. 303) and fold it into a larger causal framework that includes pair-bonding, knowledge sharing, labor coordination, group size and several other factors. Figure 16.1 lays out the causal interconnections. The Secret builds on ideas also found in Sterelny as well as Anton and Snodgrass; of course, Sterelny (2012) relies heavily on my earlier work (Henrich & Gil-White, 2001).

Although Fuentes is generally vague about the "data and analyses" that apparently undermine my view, there are indeed two places where he is more specific. In the first, he seems to want to critique my approach to self-domestication. Unfortunately, he gets the basics incorrect by suggesting that (1) I follow Wrangham's account of self-domestication, (2) my account requires high rates of violence and (3) I argue that this domestication process occurred recently. Instead, the process I describe in *The Secret* (2016) diverges from that proposed by Wrangham (2019) and my account doesn't require any violence—though violence may play a role. I argue that norm violators have been sanctioned in myriad ways that lower their fitness—e.g., norm violators aren't preferred marriage partners and are targets of theft and other forms of exploitation (Bhui et al., 2019). Further, my account proposes that these processes begin with the origins of *Homo* (Chapters 15–16), which is to my knowledge the earliest anyone has suggested. Note, Richard Wrangham and I were co-teaching a course called *Human Nature* back then, so I'm pretty clear on the differences in our accounts (his account is much more a "standard adaptationist" approach than mine).

Second, Fuentes seems to take issue with the role of intergroup violence in the paleolithic, citing Kissel and Kim. There is indeed an ongoing debate here, with some anthropologists still pushing the pseudo-Rousseauan view that human communities before the origins of agriculture didn't engage in intergroup violence. In writing chapter 10 of *The Secret*, I had reviewed that literature and found the pseudo-Rousseauan arguments and evidence to be unpersuasive. In *WEIRD*, Chapter 2 deals

with this by opening with an account of the life of William Buckley, who lived with Australian foragers for over three decades. My confidence in these inferences has only strengthened with the growing evidence from ancient DNA on human expansions (Reich, 2018), reanalyses of paleolithic violence (Crevecoeur et al., 2021) and reassessments of the ethnohistorical record (Hames, 2019). But, regardless, taking a view on this debate hardly seems grounds for Fuentes to declare my work to be "deficient in key elements/perspectives." Again, Fuentes presents no alternative accounts, but merely suggests there's a better one out there, somewhere, and then references things that also don't provide an alternative account. Declaring "It's complicated" is not an alternative account.

Doing the job: on methods and data

Both Wildman and Fuentes offer critiques of my methodological approaches. Wildman suggests the use of computational simulations to more effectively specify the theory, and explore all the moving parts. Broadly, I agree with him and certainly have argued for the importance of formal theoretical methods in the evolutionary social and psychological sciences (Muthukrishna & Henrich, 2019). For formal theory-building, I tend to prefer more analytical (and less computational) approaches (Bhui et al., 2019; Henrich et al., 2015; Henrich & Boyd, 2001), but I've used computational approaches from my first year of graduate school (Henrich & Boyd, 1998) and from time to time since then (Boyd et al., 2011; Muthukrishna et al., 2018). However, while I agree with Wildman that this would be instructive, I felt and still feel that focusing on the empirical case was the best approach to kicking off this enterprise. In my experience, offering a strong empirical case is more likely to entice other researchers to explore one's ideas than making a purely theoretical contribution.

In contrast to Wildman, Fuentes worries that I've not captured enough of the texture of people's lives, that I'm not much of a cultural anthropologist and ethnographer:

> Henrich's engagement with the actual social lives and perceived (believed) experiences of the peoples existing in the historical moments he describes are less in depth; people appear primarily as demographic descriptions, political, and economic timelines and historical accounts of political processes, declarations and church records.

This is discouraging because I thought I'd done well on this front. In *WEIRD*, Chapter 1 discusses my own ethnographic experience working among Mapuche farmers in rural Chile and relates how interviews of each person informed my interpretation of the experiments I was conducting. Chapter 2 opens with an ethnographic account of Australian aboriginal life, discussing ritual, death, warfare, fishing, kidnapping, and marriage, among other things. I drew on several ethnographic accounts, but particularly on the life of William Buckley who lived as a member of these communities for decades. Later in Chapter 2, you'll encounter quotations and ethnographic descriptions from multiple researchers on the psychological impacts of communal rituals among the Ju/'hoansi. Chapter 3 opens with a detailed ethnographic account of life among the Ilahita Arapesh from the anthropologist Donald Tuzin. Figure 3.1 is a sketch of one of the Arapesh's communal rituals that I commissioned based on Tuzin's photographs and ethnographic descriptions. Two pages later I provide an ethnographic description of the Matsigenka, based on my own fieldwork and that of several other anthropologists, including psychological anthropologists who explicitly discuss the Matsigenka's experience of guilt and distrust (they are quoted). I also draw on missionary accounts and include quotations from the Matsigenka themselves. A few pages later, I begin another ethnographic description from New Guinea. In Chapter 6, I discuss the Pashtun's segmentary lineages and quote the Pakistani politician Wali Khan. In Chapter 8, I quote at length first-hand ethnographic descriptions of both sixteenth century Aztecs and twentieth century Mormons in the Americas. Chapter 9 draws heavily on my own ethnography, including my experiences working in rural Chile that led me to more intuitively understand "economic embeddedness" in decision-making. Chapter 10's epigraph comes from the famed ethnographer of the Mundurucu, Robert

F. Murphy and then I immediately provide an account of the horrors of Sierra Leone's civil war. Chapter 11, in discussing time psychology, quotes the sociologist Pierre Bourdieu's ethnography on the Kabyle in Algeria and then quotes Ben Franklin to get a sense of eighteenth century Philadelphia. The chapter also covers extensive ethnographic and experimental work among the Tsimane in Bolivia and the Hadza in Tanzania. To provide a sense of the experience of democracy in Afghanistan, I quote the Afghan-born author Tamin Ansary's description of his interview with villagers after their country's first election, in the wake of the U.S.'s defeat of the Taliban. Later in the book, I quote the Muslim scholars Said ibn Ahmad and Ibn Khaldûn along with David Hume and Adam Smith. Overall, my goal was to integrate the rich texture of daily life, including people's qualitative thoughts and feelings, with both quantitative observations and experimental data. Thus, it would have been helpful if Fuentes would have been more specific about how all this was inadequate; perhaps he could have suggested an author who I could use as a role model in this regard.

The problem of postmodernist ideology

Fuentes "major" concern with my book parallels criticisms I've received from several humanities scholars, so I'm going to use this opportunity to speak more broadly. Although the precise criticisms are always vague, they seem to revolve around three main concerns:

(1) These scholars feel that acknowledging the existence of psychological diversity, which may contribute to economic outcomes, flirts with racism. Of course, my argument in *WEIRD* directly undercuts and opposes those made by white supremists and other political ideologues (see Chapter 14). Below, I argue that by incessantly firing off knee-jerk charges of "racism" at anyone who seriously endeavors to explain either psychological diversity or global inequality, such scholars unwittingly help the racist ideologues by suppressing real scientific inquiry.
(2) These scholars feel that any work of this kind must focus on topics like "colonialism," "racism," and "genocide." Illustrating this, Fuentes counts appearances of these buzz words in my book and finds I only use them 9 times—which is apparently insufficient (What is the ideal number of times?). In my view, the impacts of the European expansion, including colonialism, conquest, genocide, slavery, and the rise of scientific racism, are phenomena to be explained, not first causes in themselves. Well back into history and around the globe, expansionist societies have engaged in conquest, settlement, genocide, slavery, and the oppression of groups based on ethnic differences—consider the Inca, Aztecs, Persians, Romans, classical Greeks, ancient Chinese, and medieval societies of the Islamic World. Focusing narrowly on such phenomena as causal in explaining recent global inequality and modern institutions is like insisting that a car's camshaft explains it's propulsion. Historically-uninformed and anthropologically naïve, this rigid focus prevents us from getting at the real underlying causes and a deeper explanation—e.g., a theory of combustion.
(3) Finally, some scholars have deputized themselves as blood hounds who dash about seeking any whiff of pro-Western sentiment or anything that smacks of Euro-centrism. Again, to the contrary, my account undermines Euro-centric triumphalism, and any pro-Western sentiments they think they sniff merely reflect their own ethnocentric biases regarding different aspects of psychology or institutions—e.g., conformity and nepotism are demonstrations of intelligence and moral character in some societies (Clegg et al., 2017).

The first thing the reader must know is that these critiques are all pulled directly from the standard-issue, postmodernist quiver and can be fired at anyone who deviates from certain rhetorical orthodoxies. I'm deeply familiar with the postmodernist quiver—I have three degrees in cultural anthropology (including a PhD) and was granted academic tenure in this field in 2006. I've seen folks in the humanities knock these arrows upon only hearing the title of my book and particularly

the word, "prosperity." These attacks may be launched at anyone who suggests that diversity matters in ways that are important, who doesn't talk about these issues in particular (politically-charged) ways, or who thinks that colonialism, racism, and genocide are only part of a larger story.[1]

Again, not only are Fuentes and other such critics wrong regarding *WEIRD*, they've got it backwards. To begin, the large body of evidence I present dissolves any notion that the psychological characteristics I highlight—e.g., individualism, analytic thinking, and impersonal trust—are (1) ancient, (2) genetic, (3) associated with "whiteness" or even (4) fundamental to Europe in any geographical sense. In detailed analyses, we compare Europeans within the same countries and predict aspects of their psychology based on the expansion of the Roman Catholic Church or using data on cousin marriages. Our theory explains not only variation across countries but variation among regions within European countries. So, there's no "Europe" per se in the psychological data. Then, focusing only on Italians, we link cousin marriage to voluntary blood donations and trust in strangers—and discuss how the differences across Italy reflect the quite different histories of different parts of the pennisula. This powerfully demonstrates that national identities are recent and don't capture psychological or behavioral differences that are "essential" or historically deep. Thus, our approach and analyses provide a cultural evolutionary and historical explanation for why Eastern Europe—where folks are notably melanin-deprived—are different from places like England and northern France. Overall, *WEIRD* dismantles notions of European essentialism and "whiteness" and argues that many interesting psychological differences have only emerged in the last millennium. I close the book by directly confronting arguments that such differences are genetic and make the case that they are not.

I hammer this home by applying my theoretical approach to explaining variation within both China and India. Again, these analyses dissolve simplistic notions of "Chinese," "Indian," or "Asian" psychology by both showing lots of variation within these countries and then by showing how to explain it with a cultural evolutionary theory anchored in history. In both places, the data also reveal dimensions along which with some Asian populations are rather similar to some European populations—again effectively dissolving any role for racial differences, "whiteness" or essentialism.

Furthermore, the data I discuss on both U.S. immigration and within country variation within Europe undermines Fuentes' notions of the "whiteness" in *WEIRD*: lots of melanin-rich Americans and Europeans with heritages from around the world are psychologically indistinguishable from their melanin-deprived neighbors. Notably, second generation immigrants can still be distinguished psychologically, but these echoes of their parent's ancestral homes are soon lost. *WEIRD* is not about "whiteness"—this is a cultural evolutionary argument. Fuentes and his post-modernist brethren feel that "race" must be injected in every discussion even if it's not about race. I suspect that one of the orthodoxies I violated is a rule something like, "you must make race the central issue in every discussion of inequality." This observation is underscored by the fact that Fuentes took the time to do an accounting of my word usage and then specifically highlights that I never used the word "race" in its noun form (apparently, adjectival variants don't count?).

In my penultimate chapter, to explain the rise in innovation that has occurred over the last few centuries, I emphasize the role of immigration, residential mobility, social tolerance, trust in strangers and individualism. As evidence, I point to the powerful ways that immigration has driven American ingenuity, citing some excellent studies from economics using the Patent database. I've expanded on these themes elsewhere (see https://thisviewoflife.com/why-immigration-drives-innovation/).

If you are a White Nationalist or European Triumphalist, *WEIRD* delivers bad news. White Nationalists and other racial ideologues are now in the game of twisting results skimmed from genetics to support their ideological ambitions. Confronting such pseudo-science, I've delivered a richly detailed and highly quantitative argument that explains the striking economic and political differences around the world without reference to "whiteness," "Europeaness," or "race". Even worse for the White Nationalists, the whole matter appears to have risen by accident—the Church adopted a bunch of peculiar prohibitions on marriage and the family. Global inequality is not due to

something inherent in Europeans or "white" people—which are shown using data to not even be coherent groups. It was a fluke: some odd supernatural beliefs about family structure had big downstream consequences. So much for triumphalism.

Yet, I'm criticized by Fuentes and others as if I argued the opposite.

The fact that post-modernist scholars attack anyone who violates their rhetorical orthodoxies in this arena, even when these arguments provide a powerful opposition to ideologically-motivated, racist narratives of global inequality, has created a scientific void. Serious researchers flee from these topics because they don't want to risk getting called a "racist" or "supportive of racist ideologies" when they may be doing precisely the opposite. Into this scientific void, there has been a flood of pseudo-science that begins with the assumption that race is real and important; with no serious competitors on the real science side, racist ideologies are substituted for real science in rightwing discourse. Consequently, when curious but naïve people start looking for explanations to help them understand the apparent inequality all around them, they find mostly either (1) incoherent postmodernism, with vague but passionate references to a role for colonialism, slavery, and genocide (but no real historical processes and little that looks like evidence), or (2) modern race ideology, arguing for continental genetic differences.

The upshot is that the hair-trigger willingness of some scholars to launch accusations of racism against any scientist who seriously engages in trying to explain differences in economic outcomes among populations inadvertently helps racist ideologies to survive and thrive—by driving out the competition. Of course, the best antidote for ideologically-driven pseudoscience is more real science; but, the post-modernists have made this a dangerous place for those of us who just want to follow the facts. Hopefully, these postmodernists will take a broader view and stop inadvertently aiding the white nationalists. If they really want to fight pernicious ideologies, they should be more tolerant of serious efforts to understand the world even if these efforts defy their rhetorical orthodoxies.

Note

1. Scholars in the humanities, including in anthropology, typically don't today identify themselves as "postmodernists" in the same way that scientists don't identify themselves as "Baconians." But, the intellectual history of the orthodoxies discussed here trace back to the epidemic of post-modernist thinking that infected the humanities in the 1980s (Pluckrose & Lindsay, 2020). Large sways of the academy are still recovering.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

Antón, S. C., & Josh Snodgrass, J. (2012). Origins and evolution of genus homo: New perspectives. *Current Anthropology*, *53*(S6), S479–S496. https://doi.org/10.1086/667692

Atran, S. (2002). *In gods we trust: The evolutionary landscape of religion*. Oxford University Press.

Atran, S., & Henrich, J. (2010). The evolution of religion: How cognitive by-products, adaptive learning heuristics, ritual displays, and group competition generate deep commitments to prosocial religions. *Biological Theory*, *5*(1), 18–30. https://doi.org/10.1162/BIOT_a_00018

Barrett, H. C., Cosmides, L., & Tooby, J. (2007). The hominid entry into the cognitive niche. In S. Gangestad & J. Simpson (Eds.), *Evolution of the mind, fundamental questions and controversies* (pp. 241–248). Guilford Press.

Bergeron, A. (2019). *Religion and the scope of morality: Evidence from exposure to missions in the D.R. Congo*. Work. Pap. https://www.dropbox.com/s/7q1c9imfi7bk6wv/Mission_paper_20201116.pdf?dl=0

Bhui, R., Chudek, M., & Henrich, J. (2019). How exploitation launched human cooperation. *Behavioral Ecology and Sociobiology*, *73*(6), https://doi.org/10.1007/s00265-019-2667-y

Boyd, R., & Richerson, P. (2002). Group beneficial norms can spread rapidly in a structured population. *Journal of Theoretical Biology*, *215*(3), 287–296. https://doi.org/10.1006/jtbi.2001.2515

Boyd, R., & Richerson, P. J. (1985). *Culture and the evolutionary process*. University of Chicago Press.

Boyd, R., Richerson, P. J., & Henrich, J. (2011). Rapid cultural adaptation can facilitate the evolution of large-scale cooperation. *Behavioral Ecology and Sociobiology*, *65*(3), 431–444. https://doi.org/10.1007/s00265-010-1100-3
Boyer, P. (2001). *Religion explained: The evolutionary origins of religious thought*. Basic Books.
Brown, P. J. (1998). Cultural adaptations to endemic malaria in sardinia. In P. J. Brown (Ed.), *Understanding and applying medical anthropology*. Mayfield Publishing Company.
Burkart, J. M., Hrdy, S. B., & Van Schaik, C. P. (2009). Cooperative breeding and human cognitive evolution. *Evolutionary Anthropology: Issues, News, and Reviews*, *18*(5), 175–186. https://doi.org/10.1002/evan.20222
Cavalli-Sforza, L. L., & Feldman, M. W. (1981). *Cultural transmission and evolution: A quantitative approach* (Issue 16). Princeton University Press.
Clegg, J. M., Wen, N. J., & Legare, C. H. (2017). Is non-conformity WEIRD? Cultural variation in adults' beliefs about children's competency and conformity. *Journal of Experimental Psychology: General*, *146*(3), 428–441. https://doi.org/10.1037/xge0000275
Conley, T. G. (1999). GMM estimation with cross sectional dependence. *Journal of Econometrics*, *92*(1), 1–45. https://doi.org/10.1016/S0304-4076(98)00084-0
Crevecoeur, I., Dias-Meirinho, M.-H., Zazzo, A., Antoine, D., & Bon, F. (2021). New insights on interpersonal violence in the late Pleistocene based on the Nile valley cemetery of Jebel Sahaba. *Scientific Reports*, *11*(1), 9991. https://doi.org/10.1038/s41598-021-89386-y
Fenske, J. (2015). African polygamy: Past and present. *Journal of Development Economics*, *117*, 58–73. https://doi.org/10.1016/j.jdeveco.2015.06.005
Fortier-Dubois, E. (2016). *Problems of Bayesian trait reconstruction on linguistic phylogeneis in evolutionary anthropology* [Masters, Harvard University]. https://henrich.fas.harvard.edu/files/henrich/files/fortier-dubois_-_2016_-_problems_of_baysian_trait_reconstruction_on_linguistic_phylogenies_in_evolutionary_anthropology.pdf
Fortunato, L. (2011). Reconstructing the history of marriage and residence strategies in indo-european—speaking societies. *Human Biology*, *83*(1), 129–135. https://doi.org/10.3378/027.083.0108
Fuentes, A. (2015). Integrative anthropology and the human niche: Toward a contemporary approach to human evolution. *American Anthropologist*, *117*(2), 302–315.
Gervais, W., Willard, A., Norenzayan, A., & Henrich, J. (2011). The cultural tranmission of faith: Why innate intuitions are necessary, but insufficient to explain religious belief. *Religion*, *41*(3), 389–410. https://doi.org/10.1080/0048721X.2011.604510
Hames, R. (2019). Pacifying hunter-gatherers. *Human Nature*, https://doi.org/10.1007/s12110-019-09340-w
Henrich, J. (2009). The evolution of costly displays, cooperation and religion: Credibility enhancing displays and their implications for cultural evolution. *Evolution and Human Behavior*, *30*(4), 244–260. https://doi.org/10.1016/j.evolhumbehav.2009.03.005
Henrich, J. (2016). *The secret of our success: How culture is driving human evolution, domesticating our species, and making us smarter*. Princeton University Press.
Henrich, J. (2020). *WEIRD: How westerners became psychologically peculiar and particularly prosperous*. Farrar, Straus and Giroux.
Henrich, J., & Boyd, R. (1998). The evolution of conformist transmission and the emergence of between-group differences. *Evolution and Human Behavior*, *19*(4), 215–241. https://doi.org/10.1016/S1090-5138(98)00018-X
Henrich, J., & Boyd, R. (2001). Why people punish defectors: Weak conformist transmission can stabilize costly enforcement of norms in cooperative dilemmas. *Journal of Theoretical Biology*, *208*(1), 79–89. https://doi.org/10.1006/jtbi.2000.2202
Henrich, J., & Boyd, R. (2008). Division of labor, economic specialization, and the evolution of social stratification. *Current Anthropology*, *49*(4), 715–724. https://doi.org/10.1086/587889
Henrich, J., Boyd, R., Bowles, S., Camerer, C. F., Fehr, E., & Gintis, H. (2004). Foundations of human sociality: Economic experiments and ethnographic evidence from fifteen small-scale societies. In *Foundations of human sociality: Economic experiments and ethnographic evidence from fifteen small-scale societies*. Oxford University Press. https://doi.org/10.1093/0199262055.001.0001
Henrich, J., Chudek, M., & Boyd, R. (2015). The big man mechanism: How prestige fosters cooperation and creates prosocial leaders. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *370*(1683), 20150013. https://doi.org/10.1098/rstb.2015.0013
Henrich, J., & Gil-White, F. J. (2001). The evolution of prestige: Freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. *Evolution and Human Behavior*, *22*(3), 165–196. https://doi.org/10.1016/S1090-5138(00)00071-4
Henrich, J., & Henrich, N. (2010). The evolution of cultural adaptations: Fijian food taboos protect against dangerous marine toxins. *Proceedings of the Royal Society B: Biological Sciences*, *277*(1701), 3715–3724. https://doi.org/10.1098/rspb.2010.1191
Henrich, J., & McElreath, R. (2003). The evolution of cultural evolution. *Evolutionary Anthropology: Issues, News, and Reviews*, *12*(3), 123–135. https://doi.org/10.1002/evan.10110
Heyes, C. (2018). *Cognitive gadgets*. Harvard University Press.

Hong, Z., & Henrich, J. (2021). The cultural evolution of epistemic practices: The case of divination. *Human Nature*. https://doi.org/10.1007/s12110-021-09408-6

Hong, Z., Slingerland, E., & Henrich, J. (forthcoming). Magic and empiricism in early Chinese rainmaking. *Current Anthropology*.

Karras, R. M. (1990). Concubinage and slavery in the viking age. *Scandinavian Studies*, *62*(2), 141–162. https://doi.org/10.2307/40919117

Kissel, M., & Kim, N. C. (2018). The emergence of human warfare: Current perspectives. *The American Journal of Physical Anthropology*, *168*, 141–163.

Knipper, C., Mittnik, A., Massy, K., Kociumaka, C., Kucukkalipci, I., Maus, M., Wittenborn, F., Metz, S. E., Staskiewicz, A., Krause, J., & Stockhammer, P. W. (2017). Female exogamy and gene pool diversification at the transition from the final Neolithic to the early Bronze Age in central Europe. *Proceedings of the National Academy of Sciences*, *114*(38), 10083–10088. https://doi.org/10.1073/pnas.1706355114

Kraft-Todd, G. T., Bollinger, B., Gillingham, K., Lamp, S., & Rand, D. G. (2018). Credibility-enhancing displays promote the provision of non-normative public goods. *Nature*, *563*(7730), 245–248. https://doi.org/10.1038/s41586-018-0647-4

Laland, K. N. (2017). *Darwin's unfinished symphony: How culture made the human mind*. Princeton University Press. https://doi.org/10.1515/9781400884872

Laland, K. N., Uller, T., Feldman, M. W., Sterelny, K., Müller, G. B., Moczek, A., Jablonka, E., & Odling-Smee, J. (2015). The extended evolutionary synthesis: Its structure, assumptions and predictions. *Proceedings of the Royal Society B: Biological Sciences*, *282*(1813), 20151019. https://doi.org/10.1098/rspb.2015.1019

Lanman, J. A. (2012). The importance of religious displays for belief acquisition and secularization. *Journal of Contemporary Religion*, *27*(1), 49–65. https://doi.org/10.1080/13537903.2012.642726

Lanman, J. A., & Buhrmester, M. D. (2017). Religious actions speak louder than words: Exposure to credibility-enhancing displays predicts theism. *Religion, Brain & Behavior*, *7*(1), 3–16. https://doi.org/10.1080/2153599X.2015.1117011

Margaryan, A. (n.d.). *Population genomics of the Viking world*. 36.

McElreath, R., Boyd, R., & Richerson, P. J. (2003). Shared norms and the evolution of ethnic markers. *Current Anthropology*, *44*(1), 122–130. https://doi.org/10.1086/345689

McNamara, R. A., & Henrich, J. (2018). Jesus vs. The ancestors: How specific religious beliefs shape prosociality on Yasawa Island, Fiji. *Religion, Brain & Behavior*, *8*(2), 185–204. https://doi.org/10.1080/2153599X.2016.1267030

McNamara, R. A., Willard, A. K., Norenzayan, A., & Henrich, J. (2019). Weighing outcome vs. Intent across societies: How cultural models of mind shape moral reasoning. *Cognition*, *182*(September 2018), 95–108. https://doi.org/10.1016/j.cognition.2018.09.008

Mittnik, A., Massy, K., Knipper, C., Wittenborn, F., Friedrich, R., Pfrengle, S., Burri, M., Carlichi-Witjes, N., Deeg, H., Furtwängler, A., Harbeck, M., von Heyking, K., Kociumaka, C., Kucukkalipci, I., Lindauer, S., Metz, S., Staskiewicz, A., Thiel, A., Wahl, J., … Krause, J. (2019). Kinship-based social inequality in Bronze Age Europe. *Science*, *366*(6466), 731–734. https://doi.org/10.1126/science.aax6219

Muthukrishna, M., Bell, A. V., Henrich, J., Curtin, C. M., Gedranovich, A., McInerney, J., & Thue, B. (2020). Beyond western, educated, industrial, rich, and democratic (WEIRD) psychology: Measuring and mapping scales of cultural and psychological distance. *Psychological Science*, *31*(6), 678–701. https://doi.org/10.1177/0956797620916782

Muthukrishna, M., Doebeli, M., Chudek, M., Henrich, J., & Tarnita, C. E. (2018). The cultural Brain hypothesis: How culture drives brain expansion, sociality, and life history. *PLoS Computational Biology*, *14*(11), e1006504. https://doi.org/10.1371/journal.pcbi.1006504

Muthukrishna, M., & Henrich, J. (2019). A problem in theory. *Nature Human Behaviour*, https://doi.org/10.1038/s41562-018-0522-1

Norenzayan, A., Shariff, A. F., Gervais, W. M., Willard, A. K., McNamara, R. A., Slingerland, E., & Henrich, J. (2016a). "*Parochial prosocial religions: Historical and contemporary evidence for a cultural evolutionary process": Authors' Response*.

Norenzayan, A., Shariff, A. F., Gervais, W. M., Willard, A. K., McNamara, R. A., Slingerland, E., & Henrich, J. (2016b). The cultural evolution of prosocial religions. *Behavioral and Brain Sciences*, *39*, 1–86. https://doi.org/10.1017/S0140525X14001356

Pinker, S. (2010). The cognitive niche: Coevolution of intelligence, sociality, and language. *Proceedings of the National Academy of Sciences*, *107*(Supplement 2), 8993–8999. https://doi.org/10.1073/pnas.0914630107

Pluckrose, H., & Lindsay, J. A. (2020). *Cynical theories: How activist scholarship made everything about race, gender, and identity—and why this harms everybody*. Pitchstone Publishing. https://books.google.com/books?id=md7sDwAAQBAJ.

Purzycki, B. G. (2011). Tyvan cher eezi and the socioecological constraints of supernatural agents' minds. *Religion, Brain and Behavior*, *1*(1), 31–45. https://doi.org/10.1080/2153599X.2010.550723

Purzycki, B. G. (2013). The minds of gods: A comparative study of supernatural agency. *Cognition*, *129*(1), 163–179. https://doi.org/10.1016/j.cognition.2013.06.010

Purzycki, B. G., Finkel, D. N., Shaver, J., Wales, N., Cohen, A. B., & Sosis, R. (2012). What does god know? Supernatural agents' access to socially strategic and non-strategic information. *Cognitive Science*, *36*(5), 846–869. https://doi.org/10.1111/j.1551-6709.2012.01242.x

Purzycki, B. G., & Holland, E. C. (2019). Buddha as a God: An empirical assessment. *Method & Theory in the Study of Religion*, *31*(4–5), 347–375. https://doi.org/10.1163/15700682-12341453

Purzycki, B. G., Pisor, A. C., Apicella, C., Atkinson, Q., Cohen, E., Henrich, J., McElreath, R., McNamara, R. A., Norenzayan, A., Willard, A. K., & Xygalatas, D. (2018). The cognitive and cultural foundations of moral behavior. *Evolution and Human Behavior*, *39*(5), 490–501. https://doi.org/10.1016/j.evolhumbehav.2018.04.004

Racimo, F., Sikora, M., Linden, M. V., Schroeder, H., & Lalueza-Fox, C. (n.d.). *Beyond broad strokes: Sociocultural insights from the study of ancient genomes*. 28.

Raffield, B., Price, N., & Collard, M. (2017a). Polygyny, concubinage, and the social lives of women in viking-age scandinavia. *Viking and Medieval Scandinavia*, *13*, 165–209. https://doi.org/10.1484/J.VMS.5.114355

Raffield, B., Price, N., & Collard, M. (2017b). Male-biased operational sex ratios and the Viking phenomenon: An evolutionary anthropological perspective on Late Iron age Scandinavian raiding. *Evolution and Human Behavior*, *38*(3), 315–324. https://doi.org/10.1016/j.evolhumbehav.2016.10.013

Reich, D. (2018). *Who we are and how we got here: Ancient DNA and the new science of the human past*. Oxford University Press.

Scheidel, W. (2009). A peculiar institution? Greco-Roman monogamy in global context. *The History of the Family*, *14* (3), 280–291. https://doi.org/10.1016/j.hisfam.2009.06.001

Schroeder, H., Margaryan, A., Szmyt, M., Theulot, B., Włodarczak, P., Rasmussen, S., Gopalakrishnan, S., Szczepanek, A., Konopka, T., Jensen, T. Z. T., Witkowska, B., Wilk, S., Przybyła, M. M., Pospieszny, Ł, Sjögren, K.-G., Belka, Z., Olsen, J., Kristiansen, K., Willerslev, E., … Allentoft, M. E. (2019). Unraveling ancestry, kinship, and violence in a late Neolithic mass grave. *Proceedings of the National Academy of Sciences*, *116*(22), 10705–10710. https://doi.org/10.1073/pnas.1820210116

Schulz, J. F., Bahrami-rad, D., Beauchamp, J. P., & Henrich, J. (2019). The Church, intensive kinship, and global psychological variation. *Science*, *366*(707), https://doi.org/10.1126/science.aau5141

Shaw, B. D., & Saller, R. P. (1984). Close-Kin marriage in Roman society? *Man*, *19*(3), 432. https://doi.org/10.2307/2802181

Singh, M. (2018). The cultural evolution of shamanism. *Behavioral and Brain Sciences*, *41*, https://doi.org/10.1017/S0140525X17001893

Singh, M. (2021). Magic, explanations, and evil: The origins and design of witches and sorcerers. *Current Anthropology*, *62*(1), 2–29. https://doi.org/10.1086/713111

Singh, M., & Henrich, J. (2020). Why do religious leaders observe costly prohibitions? Examining taboos on Mentawai shamans. *Evolutionary Human Sciences*, *2*, e32. https://doi.org/10.1017/ehs.2020.32

Singh, M., Kaptchuk, T. J., & Henrich, J. (2021). Small gods, rituals, and cooperation: The Mentawai water spirit Sikameinan. *Evolution and Human Behavior*, *42*(1), 61–72. https://doi.org/10.1016/j.evolhumbehav.2020.07.008

Sperber, D., Clement, F., Heintz, C., Mascaro, O., Mercier, H., Origgi, G., & Wilson, D. (2010). Epistemic vigilance. *Mind & Language*, *25*(4), 359–393. https://doi.org/10.1111/j.1468-0017.2010.01394.x

Sterelny, K. (2012). *The evolved apprentice: How evolution made humans unique*. The MIT Press.

Thonemann, P. (2017). Close-Kin marriage in Roman Anatolia. *The Cambridge Classical Journal*, *63*, 143–166. https://doi.org/10.1017/S1750270516000142

Tooby, J., & Cosmides, L. (1992). The psychological foundations of culture. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind* (pp. 19–136). Oxford University Press.

Wildman, W. J., & Sosis, R. (2011). Stability of groups with costly beliefs and practices. *Journal of Artificial Societies and Social Simulation*, *14*(3), 1–25. https://doi.org/10.18564/jasss.1781

Willard, A. K., & Cingl, L. (2017). Testing theories of secularization and religious belief in the Czech Republic and Slovakia. *Evolution and Human Behavior*, *38*(5), 604–615. https://doi.org/10.1016/j.evolhumbehav.2017.01.002

Willard, A. K., Henrich, J., & Norenzayan, A. (2016). Memory and belief in the transmission of counterintuitive content. *Human Nature*, https://doi.org/10.1007/s12110-016-9259-6

Willard, A. K., & McNamara, R. A. (2019). The minds of God (s) and humans: Differences in mind perception in Fiji and North America. *Cognitive Science*, *43*(1), e12703. https://doi.org/10.1111/cogs.12703

Winterhalder, B. D., & Smith, E. (2000). Analyzing adaptive strategies: Human behavioral ecology at twenty-five. *Evolutionary Anthropology*, *9*(2), 51–72. https://doi.org/10.1002/(SICI)1520-6505(2000)9:2<51::AID-EVAN1>3.0.CO;2-7

Wrangham, R. (2019). *The Goodness Paradox: The Strange Relationship Between Virtue and Violence in Human Evolution*. Pantheon Books. https://books.google.com/books?id=IdFkDwAAQBAJ

Zeng, T. C., Aw, A. J., & Feldman, M. W. (2018). Cultural hitchhiking and competition between patrilineal kin groups explain the post-Neolithic Y-chromosome bottleneck. *Nature Communications*, *9*(1), 1–12. https://doi.org/10.1038/s41467-018-04375-6