Evolutionary Psychological Science (2024) 10:33–39
https://doi.org/10.1007/s40806-024-00383-6

RESEARCH ARTICLE

Why All Evolutionary Psychological Theories Must be Tested in WEIRD Societies

Satoshi Kanazawa[1]

Received: 6 December 2023 / Revised: 3 January 2024 / Accepted: 4 January 2024 / Published online: 26 January 2024

Abstract

Henrich et al. (*Behavioral and Brain Science* 33:61–135, 2010), with their call to increase the number of samples from non-WEIRD (Western, Educated, Industrialized, Rich, and Democratic) societies, represented a major roadblock in the steady progress of the science of evolutionary psychology and caused a significant detour. Whatever merit Henrich et al.'s (*Behavioral and Brain Science* 33:61–135, 2010) article might have had for social and behavioral sciences in general, it is the wrong call for evolutionary psychology. In this essay, I explain why evolutionary psychologists must continue to test their general theories about evolved human nature mainly in WEIRD societies.

Keywords "Gender-Equality Paradox" · Alexandra R. Maryanski · Nicholas A. Christakis · One child only policy · Franz Boas

Since its inception in 1992 (Barkow et al., 1992), the new scientific field of evolutionary psychology enjoyed a steady theoretical and empirical progress. However, the field, along with the rest of psychology and human behavioral sciences in general, encountered a significant roadblock to its progress in 2010, when Henrich et al. (2010) published their extremely influential and popular article "The weirdest people in the world?" in the most prestigious journal in psychology, *Behavioral and Brain Sciences* (*BBS*). Many psychologists responded to the publication of this article by scrambling to denounce scientific studies conducted solely in the so-called WEIRD (Western, Educated, Industrialized, Rich, and Democratic) societies and by virtue signaling by increasing the samples taken from non-WEIRD nations. According to Google Scholar, the article has hitherto been cited more than 13,000 times.

For example, after the publication of Henrich et al. (2010), social and behavioral sciences witnessed a sudden surge of publications with dozens of authors, necessary to collect data from a large number of societies in every corner of the world (Awad et al., 2018, 2020; Gebauer et al., 2017; Kowal et al., 2022; Lang et al., 2019; Pick et al., 2022; Purzycki et al., 2017). Typically, these studies specifically mention in the manuscript title the number of societies in which they collected data, in order to tout the fact that their data are not limited to WEIRD societies. Quite ironically, one of the original such studies (Buss, 1989, Buss et al., 1990) collected data from a large number of societies in order to demonstrate cross-cultural universality of human nature. Now authors rush to collect data from a large number of societies in order to demonstrate cross-cultural variability.

In this essay, I will argue that, *for the field of evolutionary psychology*, this response was both unfortunate and wrongheaded, because it deterred the field's progress for more than a decade. I will explain why, despite the success and popularity of Henrich et al. (2010), evolutionary psychologists should continue to conduct most of their studies in WEIRD societies because they represent the best locations for testing evolutionary psychological theories.

The Roadblock

In their comprehensive article, Henrich et al. (2010) presented extremely convincing evidence that individuals from non-WEIRD societies—contemporary hunter-gatherers, horticulturalists, citizens of non-Western nations, even Americans who are not middle-class or college-educated—were often very different from typical subjects in psychological research—American college

✉ Satoshi Kanazawa
S.Kanazawa@lse.ac.uk

[1] Department of Management, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, UK

students—in their visual perception, morality, spatial reasoning, cooperative behavior in experimental games, among others. Their comprehensive review of available comparative evidence showed that empirical findings from studies conducted with typical subjects in psychological experiments and studies did not necessarily generalize to all of humanity. It was truly eye-opening for most psychologists that even "low-level" or "basic" cognitions seemingly unaffected by culture or socialization, such as vision, could vary by culture. For example, individuals in hunter-gatherer societies were much less likely to fall for visual illusions that psychologists typically take as universally human, such as the Müller-Lyer illusion, than American undergraduates were.

Right off the bat, however, there are two major problems with both Henrich et al.'s (2010) original recommendation to increase representativeness of human subjects by including more samples from non-WEIRD societies and psychologists' generally enthusiastic affirmative response to such a recommendation. First, science, at least from the philosophically realist perspective (Laudan, 1990; Weinberg, 1992), does not progress by collecting more data; it progresses by formulating and refining general theories, by testing competing theories with empirical data, and by proposing truer and truer theories. (To be fair, Henrich did later accomplish this in Schulz et al. (2019).) The data are always equivocal and do not tell us how the world works; true theories do. As Maryanski (1995) astutely pointed out a decade and half earlier, Henrich et al.'s (2010) goal of collecting more and more data from more and more non-WEIRD human samples would amount to a project in Boasian cultural relativism, whose goal is to demonstrate that each human culture is different *and equally well adapted and rational in its own ways.* The goal of science is to generalize, not to particularize.

Second, whatever value Henrich et al.'s (2010) call for more inclusion of non-WEIRD samples may have for other behavioral sciences, it is counterproductive for evolutionary psychology. Evolutionary psychology is the study of evolved psychological mechanisms and how they express themselves as observable cognitions, emotions, and behaviors (Barkow et al., 1992). External constraints and circumstances often modify the expressions of evolved psychological mechanisms in given environments, and thus, in order to observe the purest expressions of evolved psychological mechanisms, one would ideally want the fewest constraints on their expressions. And it just so happens that, compared to individuals in non-WEIRD societies, those in WEIRD societies face far fewer (albeit not no) social, cultural, institutional, and economic constraints on free expressions of their evolved tendencies. The "D" in WEIRD—Democratic—is key here, as citizens of democracies are typically much freer to behave and express their views as they wish, without fear of state punishment or other negative consequences.

On Monday 24 September 2007, the then President of Iran, Mahmoud Ahmadinejad, gave a speech at Columbia University. After the speech, in response to an audience question about the human rights abuses in Iran, particularly its treatment of women and homosexuals, Ahmadinejad claimed that there were no homosexuals in Iran. "In Iran, we don't have homosexuals like in your country. We don't have that in our country. In Iran, we do not have this phenomenon. I don't know who's told you that we have it." (http://ahmadinejadspeech.blogspot.com/2007/09/ahmadinejads-speech-columbia.html).

In a very limited and perverted sense, Ahmadinejad might have been correct. Under the Iranian theocracy, male homosexual behavior is punishable by death, as is also the case in many other Muslim and sub-Saharan African societies (https://www.humandignitytrust.org/lgbt-the-law/map-of-criminalisation/). Thus, to the extent that Iranian law enforcement and criminal justice system are efficient, there should be no homosexual men in Iran, alive. Under such a law, even men whose sexual orientation is kept private would be insane to admit their homosexual preferences in surveys and interviews.

If scientists wanted to estimate the prevalence of homosexuality and what proportion of men have genetic and hormonal predisposition to be gay, then they would want to conduct the study in places like San Francisco or Brighton or many other WEIRD nations, where gay men do not face legal, social, cultural, institutional, or economic constraints on the free expression of their genetic, biological, hormonal, and evolved tendencies. The World Values Surveys, which typically ask an identical set of survey questions in samples taken from a large number of nations, routinely omit questions about sexuality and sexual behavior in their surveys conducted in Muslim nations, so even the scientific data on the questions are lacking.

It is important to note that, strictly speaking, the key factor is *not* the binary distinction between WEIRD and non-WEIRD societies, but the number of social, cultural, institutional, and economic constraints under which individuals find themselves. In the proverbial exception that proves the rule, if individuals in a non-WEIRD society face fewer constraints on their sexual and reproductive behavior than their counterparts in WEIRD societies typically do, then it is ideal to study sexual and reproductive behavior in such a non-WEIRD society (Yong & Li, 2022). However, most studies of mate preferences are conducted in WEIRD societies for good reason, because mate selection is often constrained by parental influences and arranged marriages in non-WEIRD societies (Apostolou, 2007, 2010a, b). It would also make sense to test evolutionary psychological theories in hunter-gatherer societies, as many evolutionary psychologists and anthropologists do on the assumption that they are closest to the environment of evolutionary adaptedness, *if and only*

if such societies impose fewer constraints on the behavior under study. My claim is that, typically and in general, citizens of WEIRD societies find themselves under far fewer social, cultural, institutional, and economic constraints than those in non-WEIRD societies do. However, exceptions do exist, albeit few and far between.

Sex research on sexual preferences is far from the only example where non-WEIRD samples might produce inappropriate tests of evolutionary psychological theories. Some evolutionary psychologists study creativity in imaginative culture, such as art, music, and literature (Kanazawa, 2003; Miller, 1999). Once again, Sharia laws practiced in many Muslim nations ban certain types of music, dance, and other forms of artistic expressions, so evolutionary psychologists would not be able to study the species-typical human evolutionary capacity for art in such societies (Dutton, 2009). And, since the same Sharia laws ban women from engaging in artistic—or any public—expressions, evolutionary psychologists would not be able to study potential sex differences in such expressions (Kanazawa, 2003; Miller, 1999). In fact, given that women are generally placed under greater social, cultural, institutional, and economic constraints in many non-WEIRD societies, it would be difficult, if not impossible, to reach valid conclusions about sex differences in the expressions of evolved psychological mechanisms, not just in artistic expressions, but in most other behaviors, in such societies.

Religion is another aspect of human imaginative culture that is particularly difficult to study in non-WEIRD societies. Even though S—Secular—is not part of the definitions of WEIRD, WEIRD societies tend to be much more secular than non-WEIRD societies. It is part of the D—Democratic—and I—Industrialized, in particular, the constitutionally and legally guarantee freedom of and from religion in democratic societies. Many non-WEIRD societies have state religions, and, in such societies, it is not possible to study whether and to what extent citizens are religious and which religion they practice. Religiosity—belief in higher powers—appears to be part of evolved human nature (Atran, 2002; Guthrie, 1993; Kanazawa, 2015), but not all humans are equally religious and there are individual differences in religiosity. Data from non-WEIRD societies would not allow scientists to explore such individual differences.

The Sole Dissenter

Altogether 55 scholars provided peer commentaries on Henrich et al.'s (2010) original *BBS* article. Virtually all of them were positive and applauded Henrich et al.'s (2010) effort to point out how peculiar and unrepresentative WEIRD human samples were. Nine commentators attempted to best the original article by proposing their own cute acronyms to describe how peculiar and unrepresentative human and nonhuman subjects used in typical psychological research are—WRONG (When Researchers Overlook uNderlying Genotypes) (Gaertner et al., 2010), BIZARRE (Barren, Institutional, Zoo, And other Rare Rearing Environments) (Leavens et al., 2010), and ODD (Observation- and Description-Deprived) (Rai & Fiske, 2010)—none nearly as successful or cute as WEIRD. Virtually all peer commentators agreed with Henrich et al. (2010) that psychologists needed to expand the pool of human subjects to include non-WEIRD samples to make their conclusions more representative of and generalizable to humanity as a whole.

The sole dissenter among the 55 commentators was Alexandra Maryanski. Against the original authors and 54 of the peer commentators, Maryanski (2010) claimed that psychological research should continue to rely on WEIRD samples. She noted: "And oddly enough, since the days of hunter-gathering, the society that best fits this view of human nature – at least in terms of placing a high value on individualism, mobility in space, relative autonomy, verification of self, sexual equality, and freedom of choice – are WEIRD populations. For, despite all the multiple ills of industrialized societies, WEIRD societies may be more compatible with our human nature than the high-density kinship constraints of horticultural societies or the "peasant" constraints of agrarian societies with their privileged few" (p. 104). However, Maryanski's sole dissent was entirely drowned by the orchestrated chorus of praise for and agreement with Henrich et al. (2010) among the 54 other peer commentators, and, later, the rest of psychology and behavioral sciences. According to Web of Science, Henrich et al.'s (2010) original article and their responses to the peer commentators have been cited for a combined total of more than 6,300 times; Maryanski's commentary (2010), only seven times.

The "Gender-Equality Paradox"

It merely took eight years for Maryanski to be proven prescient and correct. In 2018, Stoet and Geary discovered in their international data that the sex differences in academic achievement in STEM (Science, Technology, Engineering, and Mathematics) fields were greater in more gender-egalitarian societies, such as WEIRD societies, and smaller in gender-inegalitarian societies, such as non-WEIRD societies. Thus, boys achieve greater test scores than girls do in STEM fields in the USA, the UK, Canada, Denmark, Belgium, the Netherlands, Australia, and New Zealand, but girls achieve greater test scores than boys do in Jordan, United Arab Emirates, Qatar, Indonesia, Trinidad and Tobago, and Thailand. The more

gender-egalitarian a society is, the more boys outachieved girls in STEM. Stoet and Geary (2018) labeled this discovery the "gender-equality paradox." Many other sex differences are also larger in gender-egalitarian countries (Geary, 2021; Lippa et al., 2010; Schmitt et al., 2008; Stoet & Geary, 2020). How could this be?

Evolutionary psychologists have long known that, due to the strict division of labor by sex throughout human evolutionary history, the typical male brain is systemizing, while the typical female brain is empathizing (Baron-Cohen, 2003). Because STEM fields require extreme systemizing skills, men are naturally more interested in pursuing extremely systemizing fields like STEM than women are. More generally, men are more interested in pursuing "things" occupations while women are more interested in pursuing "people" occupations (Lippa, 1998; Tay et al., 2019). When men and women are freest of traditional social, cultural, institutional, and economic constraints, as they are in WEIRD societies, they pursue what they are naturally inclined and evolutionarily designed to pursue.

In the Soviet Union, nearly 60% of engineers were women (Barabanova et al., 2013) because the Soviet government, in defiance of evolved human nature, forced many women to pursue engineering (Rosenthal, 1975). Obviously, the strong state-planned economy of the communist Soviet Union, where citizens were not free to pursue education and occupation of their choice, would not have been an ideal place to study human nature and its sex differences in what occupational interests men and women naturally have. Had psychologists studied sex differences in educational and occupational interests and aptitudes only in non-WEIRD societies like Jordan, United Arab Emirates, or the Soviet Union, they would have reached the invalid conclusion that women were more interested in STEM fields than men were. I should hasten to add, however, that sex differences found in studies conducted in non-WEIRD societies are sometimes consistent with those found in WEIRD societies (Cashdan et al., 2012; Vashro & Cashdan, 2015; Vashro et al., 2016).

If you would like to see a dramatic demonstration of men's greater interest in "things" and women's greater interest in "people," pay close attention the next time you see a man and a woman simultaneously being interviewed, side-by-side at the same location, on TV, ideally in a WEIRD society. In such interviews, the male interviewee and the female interviewee usually take turns, speaking and answering the interviewer's questions. You almost always see that, when the man is speaking, the woman is looking at the man almost the entire time, but, when the woman is speaking, the man is looking straight at the camera almost the entire time. Men are typically more interested in things (like the TV camera), whereas women are typically more interested in people (like the fellow interviewee).

Why Do Some Women Choose to Have Only One Child?

Some demographers are interested in the question of why some women and couples choose to have only one child (Breton & Prioux, 2009; Dudová et al., 2022; Goldstein et al., 2003; Sobotka & Beaujouan, 2014). In recent years, however, research on only children—or *onlies*—has been predominated by Chinese scholars and/or Chinese samples. Chinese scholars studying onlies in China account for a vast majority of studies on onlies, and a significant proportion of them focuses on a single phenomenon—*shidu* (parents who lost their only children). Such a strong interest in onlies among Chinese scholars is quite understandable, given the history of Chinese government's one child only policy. From 1979 to 2015, the Central Committee of the Chinese Communist Party enforced the draconian policy, under which Chinese parents, with very few exceptions, were allowed to have only one child (Cai & Feng, 2021). As a result, there are 150 million onlies in China, and there is correspondingly strong academic interest in studying them, both by Chinese and non-Chinese scholars (Cai et al., 2012; Cameron et al., 2013, Jiao et al., 1986).

The problem with studying onlies in China—and with the predominance of Chinese studies in the literature on onlies—is that one cannot study *why* parents choose to have onlies, because, for four decades, they did not have a choice not to. The legal constraints on parental choice, imposed by the Central Committee of the Chinese Communist Party, ensured that there was no variance in the expressed behavior, no matter what the genetic, biological, hormonal, and other individual differences among Chinese parents might have been. Just as it was impossible to study sex differences in educational attainment and occupational choices in the planned economy of the Soviet Union, it is impossible to study parental choice in the number of desired children under the Communist rule in the People's Republic of China. I should hasten to add, however, that, while it does not make sense to study why Chinese parents choose to have only one child, there are other why questions one can study in China, for example, why some Chinese parents remain childless or why a few Chinese parents defy the government order and choose to have two or more children at the risk of legal punishment or economic costs.

The Genetic Blueprint for Human Society

In his latest tome, *Blueprint: The Evolutionary Origins of a Good Society* (2019), Nicholas A. Christakis explores the question of what type of society humans have been evolutionarily designed to produce. By using a large

number of wide-ranging examples from all over the world and throughout human history, Christakis comes to the conclusion that humans everywhere and at all times have been genetically and evolutionarily equipped to produce a good society—one that is remarkably similar everywhere despite varied environments and historical times—because of the human capacity for love, friendships, cooperation, and learning.

Yet we do not always observe good societies in human history, and there have been frequent episodes characterized by aggression, cruelty, prejudice, and self-interest. Why is this? Christakis's (2019, pp. 55–56) answer: economic constraints. "But ideally, if we want to identify a universal society and study bedrock, innate social features rather than the impact of environmental constraints, we should observe the emergence of a natural social organization in areas *without* severely limited natural resources. Even this would not guarantee success, of course…. But our imagined experiment… would involve taking a population, dividing it into groups of founders, and dispersing the groups onto many islands that had similar, plentiful resources, and then addressing questions such as: What sort of society would the people make? How great or small would the variations be among this set of societies? What features would be observed consistently?"

In other words, evolutionary psychologists would be in the best position to observe what type of society our human evolutionary and genetic endowments would produce in WEIRD societies, not in non-WEIRD societies. Even the most resourceful WEIRD societies do not have unlimited resources, but they nonetheless have far greater resources—and far fewer economic constraints—than non-WEIRD societies do. The "R" in WEIRD—Rich—is key here.

Conclusion

Whatever virtues and benefits Henrich et al.'s (2010) *BBS* article might have had for other behavioral sciences, it represented a major roadblock for the progress of the new science of evolutionary psychology. The goal of evolutionary psychology is to study evolved human nature and how the evolved psychological mechanisms manifest themselves as observable cognitions, emotions, and behaviors. The best sites for the empirical testing of evolutionary psychological theories under fewest constraints on the expressions of evolved psychological mechanisms remain the WEIRD societies. Albeit far from perfect, they provide much less biased samples than non-WEIRD societies do, with their significant social, cultural, institutional, and economic constraints on human expressions and behavior. This is why all evolutionary psychological theories must (continue to) be tested in WEIRD societies.

Although W is the first in WEIRD, and D is the last, ironically, W (Western) is probably the least important, and D (Democratic) is probably the most important, in determining the ideal site for testing evolutionary psychological theories. Any democratic society—East or West—is likely to provide its citizens with the freedom to express preferences and values freely and thus allow evolutionary psychologists to observe the full expression of evolved human nature. As I have repeatedly emphasized throughout this essay, what is important is *not* the distinction between WEIRD and non-WEIRD societies. What is important is the number of social, cultural, institutional, and economic constraints that individuals face in expressions of their evolved preferences and value.

Evolutionary psychological study of imaginative culture would particularly be difficult, if not impossible, in non-WEIRD societies. Imaginative culture—literature, art, music, dance, religion, philosophy—*by definition* requires free and unconstrained expressions of human thoughts, emotions, beliefs, and values. Scientists are not likely to observe unconstrained expressions of evolved human nature into imaginative culture in non-WEIRD societies. Imaginative culture *requires* the freedom and (near) absence of social, cultural, legal, and economic constraints afforded in WEIRD societies. It is difficult to compose haiku when one is starving.

Henrich et al.'s (2010) call for more and more data to be collected from more and more non-WEIRD societies could only demonstrate how humans in different cultures and societies behave differently, only to confirm the preconceived notion of cultural relativism. Henrich et al.'s (2010) call for inclusion of more non-WEIRD samples only leads to purely empiricist cataloging and classification of human cultures and behavior in different societies. It would not aid in the testing of evolutionary psychological theories about evolved psychological mechanisms and their operations in the purest, least constrained environments. Nor would it lead to refinement of theory toward a truer and truer theory. That is not science; that is anthropology, still in pursuit of a grand political goal set out and promulgated by one of the field's founding heroes more than a century ago.

Acknowledgements I thank Simon S. Groome, Norman P. Li, Jose C. Yong, and anonymous reviewers for their comments on earlier drafts.

Author Contribution As the sole author, SK is responsible for all aspects of the work reported.

Declarations

Ethics Approval Not applicable. There are no human or animal subjects involved.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

Conflict of Interest The author declares no competing interests.

References

Apostolou, M. (2007). Sexual selection under parental choice: The role of parents in the evolution of human mating. *Evolution and Human Behavior, 28*, 403–409. https://doi.org/10.1016/j.evolhumbehav.2007.05.007

Apostolou, M. (2010a). Sexual selection under parental choice: Evidence from sixteen historical societies. *Evolutionary Psychology, 10*, 504–518.

Apostolou, M. (2010b). Sexual selection under parental choice in agropastoral societies. *Evolution and Hu Man Behavior, 31*, 39–47. https://doi.org/10.1016/j.evolhumbehav.2009.06.010

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

Awad, E., Dsouza, S., Kim, R., Schulz, J., Henrich, J., Shariff, A., ... & Rahwan, I. (2018). The moral machine experiment. *Nature, 563,* 59–64. https://doi.org/10.1038/s41586-018-0637-6

Awad, E., Dsouza, S., Shariff, A., Rahwan, I., & Bonnefon, J.-F. (2020). Universals and variations in moral decisions made in 42 countries by 70,000 participants. *Proceedings of the National Academy of Sciences, 117*, 2332–2337. https://doi.org/10.1073/pnas.1911517117

Barabanova, S. V., Sanger, P. A., Ziyatdinova, J., Sokolova, A., & Ivanov, V. G. (2013). The decline of women in Russian engineering education: Historical and societal forces at play. Paper presented at the ASEE Annual Conference And Exposition, Atlanta, GA.

Barkow, J. H., Cosmides, L., & Tooby, J. (1992). *The adapted mind: Evolutionary psychology and the generation of culture.* Oxford University Press.

Baron-Cohen, S. (2003). *The essential difference*. Penguin.

Breton, D., & Prioux, F. (2009). The one-child family: France in the European context. *Demographic Research, 20*, 657–692. https://doi.org/10.4054/DemRes.2009.20.27

Buss, D. M., Abbott, M., Angleitner, A., Asherian, A., Biaggio, A., Blanco-Vilasenor, A., ... & Yang, K.-S. (1990). International preferences in selecting mates: A study of 37 cultures. *Journal of Cross-Cultural Psychology, 21,* 5–47.

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*, 1–49.

Cai, H., Kwan, V. S. Y., & Sedikides, C. (2012). A sociocultural approach to Narcissism: The case of modern China. *European Journal of Personality, 26*, 529–535. https://doi.org/10.1002/per.852

Cai, Y., & Feng, W. (2021). The social and sociological consequences of China's one-child policy. *Annual Review of Sociology, 47*, 587–606. https://doi.org/10.1146/annurev-soc-090220-032839

Cameron, L., Erkal, N., Gangadharan, L., & Meng, X. (2013). Little emperors: Behavioral Impacts of China's one-child policy. *Science, 339*, 953–957. https://doi.org/10.1126/science.1230221

Cashdan, E., Marlowe, F. W., Crittenden, A., Porter, C., & Wood, B. M. (2012). Sex differences in spatial cognition among Hadza foragers. *Evolution and Human Behavior, 33*, 274–284. https://doi.org/10.1016/j.evolhumbehav.2011.10.005

Christakis, N. A. (2019). *Blueprint: The evolutionary origins of a good society.* Little, Brown Spark.

Dudová, R., Hašková, H., & Chaloupková, J. K. (2022). Disentangling the link between having one child and partnership trajectories: A mixed-methods life-course research. *Journal of Family Studies, 28*, 1466–1487. https://doi.org/10.1080/13229400.2020.1839534

Dutton, D. (2009). *The art instinct: Beauty, pleasure, and human evolution.* Bloomsbury.

Gaertner, L., Sedikides, C., Cai, H., & Brown, J. D. (2010). It's not WEIRD, it's WRONG: When researchers Overlook uNderlying Genotypes, they will not detect universal processes. *Behavioral and Brain Sciences, 33*, 93–94. https://doi.org/10.1017/S0140525X10000105

Geary, D. C. (2021). Now you see them, now you don't: An evolutionarily informed model of environmental influences on human sex differences. *Neuroscience and Biobehavioral Reviews, 125*, 26–32. https://doi.org/10.1016/j.neubiorev.2021.02.020

Gebauer, J. E., Sedikides, C., Schönbrodt, F. D., Bleidorn, W., Rentfrow, P. J., ... & Gosling, S. D. (2017). The religiosity as social value hypothesis: A multi-method replication and extension across 65 countries and three levels of spatial aggregation. *Journal of Personality and Social Psychology, 113,* e18–e39. https://doi.org/10.1037/pspp0000104

Goldstein, J., Lutz, W., & Testa, M. R. (2003). The emergence of sub-replacement family size ideas in Europe. *Population Research and Policy Review, 22*, 479–496.

Guthrie, S. E. (1993). *Faces in the clouds: A new theory of religion.* Oxford University Press.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*, 61–135. https://doi.org/10.1017/S0140525X0999152X

Jiao, S., Ji, G., Jing, Q., & (Ching, C. C.),. (1986). Comparative study of behavioral qualities of only children and sibling children. *Child Development, 57*, 357–361.

Kanazawa, S. (2003). Why productivity fades with age: The crime–genius connection. *Journal of Research in Personality, 37*, 257–272. https://doi.org/10.1016/S0092-6566(02)00538-X

Kanazawa, S. (2015). Where do gods come from? *Psychology of Religion and Spirituality, 7*, 306–313.

Kowal, M., Sorokowski, P., Pisanski, K., Valentova, J. V., Varella, M. A. C., Frederick, D. A., ... & Zumárraga-Espinosa, M. (2022). Predictors of enhancing human physical attractiveness: Data from 93 countries. *Evolution and Human Behavior, 43,* 455–474. https://doi.org/10.1016/j.evolhumbehav.2022.08.003

Lang, M., Purzycki, B. G., Apicella, C. L., Atkinson, Q. D., Bolyanatz, A., Cohen, E., ... & Henrich, J. (2019). Moralizing gods, impartiality and religious parochialism across 15 societies. *Proceedings of the Royal Society B: Biological Sciences, 286,* 20190202. https://doi.org/10.1098/rspb.2019.0202

Laudan, L. (1990). *Science and relativism: Some key controversies in the philosophy of science.* University of Chicago Press.

Leavens, D. A., Bard, K., & Hopkins, W. D. (2010). BIZARRE chimpanzees do not represent "the chimpanzee." *Behavioral and Brain Sciences, 33*, 100–101. https://doi.org/10.1017/S0140525X10000166

Lippa, R. (1998). Gender-related individual differences and the structure of vocational interests: The importance of the people-things dimension. *Journal of Personality and Social Psychology, 74*, 996–1009.

Lippa, R. A., Collaer, M. L., & Peters, M. (2010). Sex differences in mental rotation and line angle judgments are positively associated with gender equality and economic development across 53 nations. *Archives of Sexual Behavior, 39*, 990–997. https://doi.org/10.1007/s10508-008-9460-8

Maryanski, A. R. (1995). What is the good society for hominids? *Critical Review, 9*, 483–499.

Maryanski, A. (2010). WEIRD societies may be more compatible with human nature. *Behavioral and Brain Sciences, 33*, 103–104. https://doi.org/10.1017/S0140525X10000191

Miller, G. F. (1999). Sexual selection for cultural display. In R. Dunbar, C. Knight, & C. Power (Eds.), *The evolution of culture: An interdisciplinary view* (pp. 71–91). Rutgers University Press.

Pick, C. M., Ko, A., Wormley, A. S., Wiezel, A., Kenrick, D. T., Al-Shawaf, L., ... & Varnum, M. E. W. (2022). Family still matters: Human social motivation across 42 countries during a global pandemic. *Evolution and Human Behavior, 43,* 527–535. https://doi.org/10.1016/j.evolhumbehav.2022.09.003

Purzycki, B. G., Henrich, J., Apicella, C. L., Atkinson, Q. D., Baimel, A., Cohen, E., ... & Norenzayan, A. (2017). The evolution of religion and morality: A synthesis of ethnographic and experimental evidence from eight societies. *Religion, Brain & Behavior, 8,* 101–132. https://doi.org/10.1080/2153599X.2016.1267027

Rai, T. S., & Fiske, A. (2010). ODD (observation- and description-deprived) psychological research. *Behavioral and Brain Sciences, 33*, 106–107. https://doi.org/10.1017/S0140525X10000221

Rosenthal, B. G. (1975). The role and status of women in the Soviet Union: 1917 to the present. In R. Rohrlich-Leavitt (Ed.), *Women cross-culturally: Change and challenge* (pp. 429–455). Aldine.

Schmitt, D. P., Realo, A., Voracek, M., & Allik, J. (2008). Why can't a man be more like a woman? Sex differences in Big Five personality traits across 55 cultures. *Journal of Personality and Social Psychology, 94*, 168–182. https://doi.org/10.1037/0022-3514.94.1.168

Schultz, J. F., Bahrami-Rad, D., Beauchamp, J. P., & Henrich, J. (2019). The Church, intensive kinship, and global psychological variation. *Science, 366,* eaau5141. https://doi.org/10.1126/science.aau5141

Sobotka, T., & Beaujouan, É. (2014). Two is best? The persistence of a two-child family ideal in Europe. *Population and Development Review, 40*, 319–419.

Stoet, G., & Geary, D. C. (2018). The gender-equality paradox in science, technology, engineering, and mathematical education. *Psychological Science, 29*, 518–593. https://doi.org/10.1177/095679761989289

Stoet, G., & Geary, D. C. (2020). Sex-specific academic ability and attitude patterns in students across developed nations. *Intelligence, 81*, 101453. https://doi.org/10.1016/j.intell.2020.101453

Tay, P. K. C., Ting, Y. Y., & Tan, K. Y. (2019). Sex and care: The evolutionary psychological explanations for sex differences in formal care occupations. *Frontiers in Psychology, 10*, 867. https://doi.org/10.3389/fpsyg.2019.00867

Vashro, L., & Cashdan, E. (2015). Spatial cognition, mobility, and reproductive success innorthwestern Namibia. *Evolution and Human Behavior, 36,* 123–129. https://doi.org/10.1016/j.evolhumbehav.2014.09.009

Vashro, L., Padilla, L., & Cashdan, E. (2016). Sex differences in mobility and spatial cognition: A test of the fertility and parental care hypothesis in northwestern Namibia. *Human Nature, 27*, 16–34. https://doi.org/10.1007/s12110-015-9247-2

Weinberg, S. (1992). *Dreams of a final theory: The search for the fundamental laws of nature*. Vintage.

Yong, J. C., & Li, N. P. (2022). Elucidating evolutionary principles with the traditional Mosuo: Adaptive benefits and origins of matriliny and "walking marriages." *Culture and Evolution, 19,* 22–40. https://doi.org/10.1556/2055.2022.00017