



Beyond WEIRD: A review of the last decade and a look ahead to the global laboratory of the future



1. Introduction

Marking a decade since the publication of “The weirdest people in the world,” this special issue is dedicated to exploring how to improve the quality of the science produced by the interdisciplinary field of evolution and human behavior. In particular, we are focused on how the field can both broaden and deepen our understanding of *Homo sapiens* by widening our lens to capture the world's vast diversity, including both extant and historical diversity in psychology, behavior, norms and institutions as well as in climate and ecology (among other important dimensions). In different ways, the contributions to this volume both highlight diversity as a key feature of humanity, and show how it can also be turned into research opportunities that not only allow us to test and challenge existing theories, but also to generate fresh insights that point in new theoretical directions.

In this introductory piece, we'll first assess our progress in describing and explaining a wider range of psychological and behavioral phenomena over the last decade, starting from [Henrich, Heine, and Norenzayan \(2010\)](#); then we'll summarize and contextualize the contributions made by the articles in this special issue; finally, we'll briefly highlight how important new approaches and methods further improve the quality of the scientific enterprise in evolutionary studies of human behavior. [Box 1](#) puts out the call for commentaries.

Box 1

Call for Commentaries

We anticipate that this special issue will spark additional discussion. To this end, we welcome submissions of commentaries on articles published in this special issue. To be considered, please submit a commentary *proposal* of no more than 500 words in which you detail the aspect of the paper(s) you intend to comment on. Please DO NOT submit a full commentary without an invitation to do so. Proposals will be reviewed by the Editors of the Special Issue and the Editor-in-Chief and will be selected based on how interesting the commentary is, the commentator's expertise, and whether the research of the commentator is mentioned in the special issue. We anticipate publishing between 6–8 commentaries, but will decrease or increase this number based on the quality of submissions. In addition, we may invite commentaries from scholars who do not submit proposals based on expertise and the desire to include a diversity of viewpoints.

If you wish to contribute a commentary, please submit your proposal—and only your proposal—to Deb Lieberman (debra@miami.edu) by November 1st, 2020. Decisions will be made by November 15th and completed commentaries will be due by December 15th. Instructions for commentaries will be provided

upon proposal acceptance. All completed commentaries will be reviewed and selected based on quality by the Editors with the aim of publishing the collection in the 2nd issue of 2021.

2. Where are we with WEIRD?

The development of the WEIRD concept, which is an acronym that stands for Western, Educated, Industrialized, Rich and Democratic, was part of a broader and ongoing interdisciplinary efforts at developing an understanding human psychology and behavior that is more reflective of human diversity on the planet ([Atran, Medin, & Ross, 2005](#); [Henrich et al., 2004](#); [Markus & Kitayama, 1991](#); [Norenzayan & Heine, 2005](#); [Rozin, 2001](#); [Shweder, 1990](#)). Referring to the most common participants in behavioral and psychological experiments as WEIRD, puts the spotlight on the value of sample diversity ([Hruschka, Medin, Rogoff, & Henrich, 2018](#)). We'll begin this section by first clarifying the WEIRD concept in light of its applications over the last ten years. Second, we'll highlight a few findings since 2010 that underscore the importance of tapping diverse populations. Lastly, we consider the progress made in diversifying the samples in relevant disciplines and journals.

2.1. Understanding the WEIRD concept

The original purpose of [Henrich et al.'s \(2010\)](#) WEIRD label was as a consciousness-raising device, to remind researchers that their participants, at least those most commonly used in psychological and behavioral experiments, are often not particularly representative of *Homo sapiens*. The WEIRD concept was also intended to reflect back at the researchers themselves as a reminder that their own personal and professional interests, intuitions, introspections and insights arise from a particular cultural milieu and set of experiences. The WEIRD concept was explicitly *not* intended to imply a dichotomous distinction between WEIRD vs. non-WEIRD or to suggest psychological uniformity within and under these two labels – a common misunderstanding that persists to this day. To the contrary, WEIRD is a rhetorical device meant precisely to raise concerns about sample diversity and the generalization of findings from one population to another. To make these points as starkly as possible, [Henrich et al. \(2010\)](#) depicted—both visually in their plots, and verbally in their prose—the broad variation among societies, always discussing the substantial variation that exists among non-WEIRD societies (see their Figs. 2–5). Further, rather than assuming that WEIRD societies represent a monolith, full sections were devoted to arguing that variation exists (1) among European and European-descent societies, with Americans (70% of participants in psychology) often

riding the extreme, and (2) within the U.S.—the authors point to evidence showing variation across time in the U.S. and among social classes, demographic groups and ethnic communities that are not well-represented in traditional participant pools. Finally, as the authors repeatedly state, in no way was the WEIRD concept meant to deny a human nature nor was it meant to undermine or criticize efforts to develop an evolutionary science of human psychology and behavior (to the contrary, that was a main stated goal of the paper). Conversely, it was meant to highlight a major challenge—sample diversity—and inspire researchers to develop new and creative ways to tackle that challenge. In fact, we can think of no other field more aptly suited to making predictions about when, why, and how much variation might be expected for a broad sundry of behavioral and psychological phenomena.

Unfortunately, despite these explicit statements and clear illustrations, some researchers seem to have misconstrued the label to variously imply (1) the existence of a discrete WEIRD vs. non-WEIRD dichotomy without substantial internal variation, (2) a knock-down critique of evolutionary psychology or (3) a scientific concept or theory of psychological variation that can be decoded by breaking down the acronym *W-E-I-R-D* and then either interrogating each term (and finding them complex) or measuring each, using global data on Westernness, Educatedness, Industrialness, etc. (Clancy & Davis, 2019; Klein et al., 2018). None of these is consistent with the original coinage.

Some biological anthropologists have even claimed that the WEIRD label exoticizes non-WEIRD populations (Clancy & Davis, 2019). Of course, the word “weird” was turned into an acronym precisely to *de-exoticize* the diversity of non-WEIRD populations by shining a light on the numerous social and psychological peculiarities of WEIRD populations, which stand out when one looks at them from a broader global and historical perspective. Henrich et al.’s (2010) opening two paragraphs unmistakably make this de-exoticization point.

To summarize, the WEIRD concept, as it was originally formulated, does not imply a dichotomy between WEIRD and non-WEIRD societies, let alone the exoticizing of such a dichotomy; to the contrary, it is an invitation to fully engage with the world’s cultural diversity in all its gradations and complexity. Neither does WEIRD imply the absence of a shared human nature, but instead it is an invitation to place our understanding of human nature on firmer empirical ground; and finally, the WEIRD concept as was introduced by Henrich et al. (2010), is not a theoretical construct; rather it is a rhetorical device or a pointer that calls for new and better theorizing about the origins of the regularities, as well as the differences, in human behavior found across the globe.

2.2. Taking stock

In the last ten years, several fields including economics, cognitive science, philosophy, and psychology, have seen a rising tide of empirical work that has pursued the preliminary observations found in Henrich et al.’s (2010) review of psychological diversity. Here, we highlight a few of the most important contributions that document the extent and nature of global psychological variation.

2.2.1. Economic preferences

A number of studies have expanded the variation in economic decision-making and preferences discussed by Henrich et al. (2010), Fehr and Leibbrandt (2011); Hruschka and Henrich (2013a); Hruschka and Henrich (2013b); Lang et al. (2019); Purzycki et al. (2017); Tanaka, Camerer, and Nguyen (2010). In the largest study by far, Falk et al. (2018) measured economically-relevant preferences or motivations related to risk-taking, temporal discounting, impersonal trust, altruism and reciprocity in 80,000 people in 76 countries. They found substantial global variation, both within and between countries. At the individual-level, these psychological preference measures reliably correlated with many important real-world economic outcomes and social behaviors, including volunteering, helping strangers, saving money,

staying in school and starting businesses.

Powerfully, the same data also confirmed previous (Costa Jr, Terracciano, & McCrae, 2001; Schmitt, Realo, Voracek, & Allik, 2008), albeit non-intuitive, reports that gender differences in social and economic preferences are more pronounced in societies with greater wealth and gender equality (Falk et al., 2018). While correlational, the findings help to inform debates about the origins of gender differences, a topic of interest to researchers in evolution and human behavior and one that has been intensely debated for decades. Juxtaposed to evolutionary accounts of gender differences originating from natural selection favoring different psychologies in men and women (Buss, 2007), social role theory suggests that gender differences result from shared expectations of how men and women are supposed to behave (Eagly & Wood, 1999). The latter explanation predicts that gender gaps should close as equality increases. The evolutionary account however, does not make any explicit predictions about how gender differences will specifically interact with wealth and equality. Thus, from the point of view of social role theory, the findings by Falk et al. (2018) are contradictory. However, from an evolutionary point of view, the findings are compatible. And to evolutionists who take culture seriously (e.g., by not using “generic samples,” see Barrett, this volume), they are easily folded into an enriched evolutionary account. For instance, Schmitt et al. (2008) suggest that in poorer and less egalitarian societies, “innate personality” expression may be more constrained, but in richer and more equal societies where there are fewer constraints, differences can be accentuated. To be clear, while this set of findings undermine social role theory specifically, and may complement standard evolutionary accounts, they also underscore the importance of culture and social norms in gender formation. Below, we discuss exciting new work that helps account for the historical origins of contemporary cultural variation in gender inequality.

New approaches to the measurement of social preferences and motivations have addressed many of the old concerns about these techniques. For example, working with undergraduates in 15 populations, Gächter and Schulz (2016) used a design to measure people’s willingness to engage in impersonal dishonesty using a dice-rolling protocol in which the researchers could only detect dishonesty at an aggregate level. This substantially reduces concerns about the impact of experimenter demand effects or reputation management. The experimental measures here correlate strongly with measures of corruption at the national level, and the technique has also been shown to predict dishonesty at the individual-level in real-world behavior in competitive markets (Kröll & Rustagi, 2018).

2.2.2. Cognitive and social development

Recent research using incentivized experimental techniques to study social behavior in children has revealed widely varying patterns in the development of positive reciprocity, prosocial sharing and patience (Amir et al., 2020; Blake et al., 2015; House, 2017; House et al., 2013; House et al., 2019; Lamm et al., 2018). Comparative and cross-cultural developmental psychology is crucial for understanding the reliably developing features of human psychology and how they can be (and have been) shaped by cultural learning, ecological factors and childhood experience, such as the shock of war (Bauer, Cassar, Chytilová, & Henrich, 2014). Notably, the development of direct reciprocity in repeated interactions doesn’t parallel that of one-shot prosociality, suggesting that one-shot prosociality in adults does not arise from an evolved reciprocity psychology (House, 2017). As we describe below, Amir and McAuliffe (this volume) provide an excellent review that incorporates this more recent work with older lines of research and provide an integrative framework.

2.2.3. Personality structure

While much work seems to confirm the robustness of the Big-5 factor model of personality structure among urban-dwelling student populations around the world (Heine & Buchtel, 2009), the universality

of this model has been brought into question by detailed studies in diverse societies (Bailey et al., 2013; Gurven, von Rueden, Massenkoff, Kaplan, & Lero Vie, 2013; Laajaj et al., 2019). Among the Tsimane in Bolivia, for example, the best fit factor structure involves only two dimensions that look nothing like the Big-5 or the other personality configurations fitted to WEIRD societies. Inspired by these initial empirical insights, new evolutionary models have delivered fresh theoretical understandings of personality (Smaldino, Lukaszewski, von Rueden, & Gurven, 2019), which, in turn, have led to new empirical results (Lukaszewski, Gurven, von Rueden, & Schmitt, 2017).

2.2.4. Moral judgment

Trolley and trolley-like dilemmas have long been used to explore the conditions under which people will make utilitarian moral judgments (saving more vs. fewer lives) and have provided the empirical foundations for claims about the shape of a pan-human moral grammar (Hauser, 2006; Mikhail, 2007). Recently however, using a platform developed to study how self-driving cars should make life and death tradeoffs, researchers analyzed the judgments of over 1 million participants in 233 countries (Awad et al., 2018). This work reveals both reliable patterns in moral judgment across societies and substantial global variation. For example, relative to a base case in which one person is killed as a side-effect to a decision to save several people (the “switch case”), people in all countries were less likely to endorse an action that saved lives if it involved instrumentally sacrificing another person to save the same number of lives as in the base case (Awad, Dsouza, Shariff, Rahwan, & Bonnefon, 2020). Despite this robust qualitative pattern, the absolute degree of utilitarianism varied substantially across populations. The sample sizes and global variation here are impressive, but the sampling strategy used was also highly biased and self-selected: all participants had internet access, actively sought out doing moral dilemmas online, and could read one of only 10 languages.

Research in two traditional societies, the Tzeltal Maya in Chiapas (Mexico) and the Yali of Irian Jaya (on the Indonesian of New Guinea), has begun to fill this gap. Paralleling the online findings, the results among the Maya reveal an increased preference for utilitarian choices when the person was killed as the result of a side-effect. But, unlike the online populations, these Mayan participants didn't see important differences between acts of omission vs. commission. That is, participants found it just as bad to stand by, doing nothing and thereby allowing others to be harmed, as it was to take an action that resulted in the same harm (Abarbanell & Hauser, 2010). Also consistent with the online findings, results comparing Yali and Canadian participants in the same trolley-like dilemma reveal that Yali are much less likely to endorse the utilitarian option. Ethnographic interviews with both the Maya and Yali suggest that local social norms related to kinship (see Curtin et al., 2020), witchcraft, vengeance for the deaths of kinfolk and religious beliefs played a role in decision-making. “Moral cognition,” at least as measured by trolley and trolley-like problems, may be more a kludge, shaped by local social norms and other features of cognition than a unified cognitive architecture (Stich, 2006).

2.2.5. Tightness vs. looseness

Research over the last decade has shown that important psychological variation exists in how constrained, or “tight”, people perceive the social norms of their society to be (Gelfand et al., 2011; Gelfand, Nishii, & Raver, 2006; Harrington & Gelfand, 2014). Evolutionary approaches, including those rooted in cultural evolution, provide ready explanations for this variation based on the impact of pathogens (Enke, 2019), effective government safety nets, intensive kinship (Schulz, Bahrami-Rad, Beauchamp, & Henrich, 2019) and historical shocks, including wars, natural disasters and economic downturns (Gelfand et al., 2011; Winkler, 2020).

2.2.6. Heuristics and biases: the endowment effect

The endowment effect, which is the tendency to attach additional value to personally owned items more than non-owned items, is one of the more well-known departures from the neoclassical economics model of rational choice. Because it leads to market inefficiencies by generating price gaps between buyers and sellers and a general reluctance to trade, explanations for its origins abound. While little was known about the universality of the bias or its presence in evolutionarily-relevant populations, it had been proposed that the endowment effect evolved in humans because its possessors would have demanded more resources during bilateral trades. Apicella, Azevedo, Christakis, and Fowler (2014) asked whether, and how, market exposure affects the bias by studying it in the Hadza of Tanzania, a population of hunter-gatherers with varying levels of market integration. Like subjects in Western samples, Hadza living in market regions also displayed an endowment effect. However, those living in more remote regions further from markets, did not show the bias (they were fully rational). Though these findings challenge universal accounts of the bias, they lead to new and interesting questions about its origins and the mechanisms underlying it (see also Jaeger, Brosnan, Levin, & Jones, 2020).

To assume that the behavior of Hadza in the more remote setting represents humans' “natural” or “ancestral” nature would be off-target. In fact, it is possible that the bias is quelled precisely because of the strong norms of sharing, egalitarianism, and communal ownership that typify hunter-gatherer life. These norms may help to solidify a collective rather than individual mindset. Additional support for this idea comes from research conducted on students studying in North America; students of East Asian descent experience less of an endowment effect when compared to students of European descent (Maddux et al., 2010). And, in experiments involving students in China, Canada and Japan, the researchers also found that the bias can be dialed-up or down, by shifting the participants' mindsets to be either self-focused or other-focused, respectively.

2.2.7. Mating psychology

Some of the oldest and best studied topics in evolutionary psychology concern gender differences in mating psychology. One such area is the emotion of jealousy. In the context of a mating relationship, jealousy is viewed as an adaptive response whose function is to prevent infidelity by a mate. Owing to the different adaptive problems men and women faced (i.e., the threat of paternity uncertainty for men and the loss of valuable resources for women), the response is hypothesized to be sexually differentiated, such that women will experience greater jealousy in response to emotional infidelity, whereas men will be more upset by sexual infidelity (Buss, Larsen, Westen, & Semmelroth, 1992). Despite its long-standing interest to evolutionary researchers and numerous cross-cultural examinations, most research had, until recently, involved college students and participants from industrialized nations (Edlund & Sagarin, 2017). Scelza et al. (2020) studied jealousy in 11 different societies, including 8 small-scale societies, to both test the robustness of previously reported gender differences and explore the variation in how jealousy manifests cross-culturally. In nearly all societies, the group found that men reported greater upset toward sexual jealousy than women. Using evolutionary logic, the group also theorized that in societies where paternal investment is greater, the relative costs of infidelity for both men and women should also be greater. In support of this, Scelza et al. (2020), found that severity ratings of infidelity were greater in societies with greater male parental investment. Together, these findings provide some of the most powerful evidence to date for genetically evolved gender differences in jealousy but also highlight how variation in culture and ecology can be used to generate and test novel evolutionary predictions.

2.2.8. Olfactory perception and categorization

Among the five sensory modalities, olfaction has long been thought to be the least important in humans, especially in comparison to other

species. While this has been the standard view presented to students in both psychology and anthropology (McGann, 2017), it may, in fact, reflect a WEIRD bias. Recent cross-cultural research suggests that olfaction may be particularly depauperate among agricultural populations, in part, because they tend to be more deodorized and desensitized (Roberts, Havlíček, & Schaal, 2020). Using an odor threshold task, researchers found that Tsimané forager-horticulturalists of Bolivia were better at detecting odors compared to a German sample (Sorokowska, Sorokowski, Hummel, & Huanca, 2013). In fact, the Tsimané were deemed really good smellers. And contrary to previously held views that smell is impossible to define abstractly, – English for instance, does not have an odor lexicon – extensive odor lexicons have been observed in the languages of hunter-gatherers. There is also emerging evidence that odor lexicons may reflect differences in subsistence modes. Majid and Kruspe (2018), for example, recently compared people's ability to describe both colors and odors among two Malaysian groups living in the same environment, one a community of subsistence hunter-gatherers and another of horticulturalists. The horticulturalists reveal the standard patterning seen among WEIRD populations, participants were skilled at naming colors, where they used an array of abstract concepts, but not at odors, where they mostly relied on explaining what something “smelled like” (“like a banana”). The hunter-gatherers, by contrast, were equally good at naming both colors and odors, relying on mostly abstract concepts in both modalities. Because the researchers compared two relatively similar groups, they argue that environment and genetics are unlikely to account for the differences observed. While cross-cultural research on olfaction is still in its infancy, it is clear that odor experience is not universal, and that by incorporating a cultural component, we can develop a richer and more complete understanding of human olfaction.

There are striking parallels with research on visual acuity that should have served as a prescient warning against drawing generalizations about human sensory abilities based on narrow samples. Patterns of refractive errors in the eyes have long been associated with ecology; for instance, the dramatic rise in myopia is closely associated with increased urbanization. Astonishingly, while over 25% of the world's population are now thought to be myopic (Holden et al., 2016), early examinations employing refraction tests and acuity tests with Snellen eye charts suggest that myopia was close to absent in several forager populations (Cordain, Eaton, Brand Miller, Lindeberg, & Jensen, 2002).

Findings related to both vision and olfaction belie the common intuition among psychologists and others that there are certain “basic” or “fundamental” psychological processes that are impenetrable and we can tell which ones these are. This challenge is underlined by the findings reviewed above on vision, olfaction, cognitive development and personality structure. We remain open to this idea, but a decade hence has still not produced a set of clear criteria that tells us how to identify the impenetrable domains (Henrich et al., 2010; McCauley & Henrich, 2006). Below and elsewhere in this volume, you'll see that similar cautions apply well beyond psychology and include human physiology, anatomy and health (Gurven & Lieberman, 2020).

2.3. The needle hasn't moved

Despite this rising tide of findings and new insights revealing heretofore unappreciated levels of psychological variation on many dimensions, the population-level diversity found in both psychology and our interdisciplinary field has not changed much in the last decade. Most publications still rely mostly or entirely on WEIRD samples, and perhaps more concerning, most still fail to acknowledge the potential existence of population-level variation or even defend the generalization of their WEIRD findings to the species. In *Psychological Science* in 2014 and 2017, Rad and colleagues (2018) show that roughly 95% of participants were sampled from WEIRD populations. This value is close to the 96% found by Arnett (2008) for a collection of articles published

in top psychology journals between 2003–2007. In 2014, 11% of studies actually provided no information on the populations from which they sampled, apparently relying on “generic humans.” By 2017, the use of these generic humans had more than doubled: 1 in 4 studies now fail to provide any information on this important methodological and inferential question. We worry that researchers neglect to describe their population-sampling because they fear opening themselves up to criticism for biased and narrow sampling. The situation is similar when surveying journals in developmental psychology. In 2015, 92.4% of participants were drawn from WEIRD populations, a fraction that has increased since 2008 when it was 91.7%. Happily, the use of generic infants and children is relatively rare in the three leading journals in developmental psychology as researchers are careful to describe where their samples come from.

In the journals *Evolution and Human Behavior* (EHB) and *Evolutionary Psychology* in 2015–16, Pollet and Saxton (2019) show that 81% of participants were WEIRD and only 8% were both non-students and non-WEIRD. For EHB, Barrett (2020) updates and further analyzes these publishing patterns, noting that most EHB studies don't mention the populations studied in the abstract. While still less than ideal, researchers in the evolutionary human sciences continue to sample more broadly than those in mainstream psychology. Though we lack a systematic review of this kind for other fields, our sense is that diversity of samples in economics using behavioral or psychological measures has been steadily increasing over the decade. This has been driven, not primarily by behavioral or experimental economists, but by those coming from economic history or development economics (Apicella et al., 2014; Bauer et al., 2016; Falk et al., 2018; Lowes, Nunn, Robinson, & Weigel, 2017; Moscona, Nunn, & Robinson, 2017; Nunn & De La Sierra, 2017).

We close this section by noting that there have been some recent and promising signs of progress in addressing the WEIRD people problem. *Psychological Science's* new Editor, Patricia Bauer, recently encouraged submissions involving diverse samples in her vision statement, confirming that “diversity will be recognized as contributing to the novelty and uniqueness of submissions”. Similarly, the *Journal of Personality and Social Psychology* has encouraged sampling diversity in submissions. Researchers have also called for caution in inferring generality of findings without diverse sampling (Simons, Shoda, & Lindsay, 2017). Shinobu Kitayama, the new incoming president of the Association for Psychological Science, has called for a firmer commitment to sampling from diverse populations. And Debra Lieberman, EHB's progressive and spirited Editor-in-Chief, has also made a concerted effort to enact meaningful change, in part, by encouraging and supporting this special issue, but also by instituting new policies to prevent generic sample descriptions—authors are now required to fully describe their samples, including in the abstract.

2.4. The power of the global laboratory

Our main goals in this special issue are to show that using diverse populations can (1) generate a deeper and more complete understanding of our evolved psychological mechanisms, (2) test theories that predict population-level psychological and behavioral variation, including cultural evolutionary theories, and (3) explore the breadth and depths of human psychological diversity in an effort to overcome our cultural blinders and more fully map what Barrett (2020) called the human phenome. Well-designed comparative studies that take advantage of the natural variation in history occurring around the globe, several of which can be found in this special issue, often deliver on two or even all three of the above points.

To illustrate the breadth and importance of this enterprise, our special issue opens by highlighting how the WEIRD people problem limits, and sometimes distorts, our understanding of human physiology, anatomy and health. In *WEIRD bodies: mismatch, medicine and missing diversity*, Gurven and Lieberman (2020) begin by first confirming that

the world's elite medical journals rely heavily on WEIRD samples: 80% of studies rely on WEIRD people. But, does this matter for understanding the functioning of our evolved physiology and health? Indeed, it does. The authors review some of the myriad ways that medical science has misunderstood basic aspects of human physiology, anatomy and health by focusing their research on populations where development occurs in germ-free environments with unlimited calories, soft beds, hard soled shoes, backed chairs and few physical demands. The authors review how an overreliance on WEIRD subjects has led to misunderstandings of the function of everything from our immune system to the microbiome as well as the etiology of various maladies from flat feet to osteoarthritis.

This opening paper underlines a key point. The issue of psychological diversity is not simply one of universality vs. variation or generalizability. It's about seeing the evolved system operate under a sufficient diversity of conditions to infer both its proximate operation and ultimate functions. And, given the army of relatively well-funded researchers focused on human physiology, anatomy and health who end up misled by relying too heavily on WEIRD samples, it seems hard to overestimate the magnitude of the problem in the realm of psychology and behavior.

Moving from physiology to psychology, [Matthew and Zefferman \(2020\)](#) illustrate the value of integrating ethnographic and psychological methods in a well-chosen population to better understand Post-Traumatic Stress Disorder (PTSD). Nearly all research on PTSD has been done with American veterans. To both test an existing theory of the pan-mammalian nature of some PTSD symptoms and explore a new approach to some PTSD symptoms not covered by that theory, the authors collected data among Turkana pastoralists in Kenya. There, nearly all men have experienced combat with 72% reporting having killed someone and 28% showing clinical symptoms that would qualify them for a provisional PTSD diagnosis. Specifically, [Matthew and Zefferman \(2020\)](#) explore the idea that a subset of PTSD symptoms related to “moral injury” arise from a reaction to having committed serious norm violations, such as murder of the innocent. By contrasting the situations that confront American soldiers with those of Turkana warriors, the authors explain why the Turkana suffer substantially less from these moral injury symptoms of PTSD. Among many insights, the authors discuss the supportive and cleansing role that rituals may play in the wake of mortal combat.

This study illustrates the potential insight that can be gathered from a single, judiciously chosen population. We emphasize such examples because the current thrust of many high-profile efforts in psychology seems to be toward “bigger N,” both in the number of study participants and the number of populations sampled ([Klein et al., 2018](#)). Increasing the statistical power of psychology experiments is an important step toward improving replicability. But unfortunately, simply sweeping up as many samples as is convenient without regard to a specific question or theory often misses the crucial axes of variation or potential window of insight. Further compounding this is the failure of researchers, especially in psychology, to adequately address statistical issues surrounding shared history, geographic proximity, migration and the massive intercorrelations among many variables in cross-country analyses. We now turn to two other studies in our special issues that take advantage of carefully chosen populations to develop new insights.

Theories for the evolution of cooperation based on partner choice have risen in popularity, but nearly all empirical tests have relied on samples drawn from industrialized societies. [Smith and Apicella \(2020\)](#) address this paucity by studying partner choice in the Hadza hunter-gatherers of Tanzania. Modern foragers, like the Hadza, may provide insights into the evolution of cooperation because their socioecology is more similar to our hunter-gatherer ancestors further back in time. The team begins by outlining a number of reasons why the conditions for partner choice to operate may be unusually favorable in WEIRD societies and, consequently why a strong preference for cooperative partners may not be observed in foragers. For instance, they suggest

that when there is greater relational freedom and a strong reliance on impersonal relationships, as found in WEIRD societies, the value of drawing distinctions between the cooperativeness of potential partners increases. They also highlight how features common in hunter-gatherers, including strong norms of communal sharing of food and labor not only reduce the importance of choosing inherently cooperative partners but also make it difficult to distinguish between people's cooperative dispositions.

In two separate years (2016, 2019), [Smith and Apicella](#) asked participants to rank their campmates on a number of traits as well as their preference for them as a future campmate. Because the Hadza are a population in transition, the team was interested in exploring how preferences change over time and with reported exposure to outside cultural institutions such as having a job or attending school. They find evidence that Hadza prefer to live with people they view as cooperative, a preference that not only appears to be strengthening with time but is also associated with outside cultural influences. These conclusions are bolstered by previous work conducted nearly a decade earlier finding no evidence that Hadza individuals prefer to live with those who score higher on measures of generosity ([Apicella, Marlowe, Fowler, & Christakis, 2012](#)). Like [Matthew and Zefferman \(2020\)](#), these results demonstrate the value of working with a single, carefully selected group. But they further underscore the value of longitudinal research over one-off, proof of concept demonstrations ([Apicella & Barrett, 2016](#)), especially with populations transitioning out of their traditional way of life. Such data are scarce but present a unique opportunity to study how psychology and behavior are affected by such transitions, including the consequences of becoming more WEIRD.

Despite their deep historical record and cultural importance, psychological research in Iran and the Middle East is lacking (Israel aside). [Atari, Graham, and Dehghani \(2020\)](#) take a step in filling this void by providing a rich analysis of moral foundations theory (MFT) in Iran. While the authors find some support for MFT, they also discover that one commonly used instrument, the Moral Foundations Questionnaire, fares poorly in Iran. Moreover, they argue for an additional, important moral foundation in Iran, above and beyond the five identified in MFT (i.e., Care, Fairness, Loyalty, Authority, and Purity). The authors provide empirical evidence indicating that “qeirāt” values, loosely translated to “honor” in English, guides moral decision-making in their Iranian samples. The authors discuss these values, which center around the protection and guarding of female kin, romantic partners, extended family, and land or country, within an historical but, ultimately, evolutionary framework. Drawing on prior work ([Atari, Barbaro, Sela, Shackelford, & Chegeni, 2017](#)), they suggest that these values are closely related to mate retention and mate guarding strategies - values that are designed to increase behaviors associated with monitoring, protecting and retaining exclusivity in relationships. The Middle East, with a total population that eclipses that of the United States, and its significance in world affairs, is an important but currently underexplored slice of human diversity in the world.

Most research linking religious beliefs, large-scale cooperation and morality has focused on participants in the Abrahamic religions, and in Christianity in particular ([Norenzayan, 2016](#); [White, Kelly, Shariff, & Norenzayan, 2019](#)). This focus on Christianity, and even more narrowly, Protestantism, is in fact a common feature of the psychology of religion, as has been observed by cross-cultural researchers of religion (e.g., [Saroglou & Cohen, 2013](#)). Tapping into the religious diversity and syncretism available in Singapore, [Willard, Baimel, Turpin, Jong, and Whitehouse \(2020\)](#) test the links between moral judgments and religious beliefs using Buddhists, Taoists, Christians and non-religious folks. Among other goals, the researchers wanted to explore the impact of beliefs about karma and ancestor veneration on judgments about prosocial behavior. Broadly, while adherents to these different religious traditions clearly judge the impact of accidental, intentional and intended harms differently, all operate along broadly similar lines. Interestingly, while priming a moral afterlife (karma, and heaven/hell)

increased prosocial intentions toward all strangers, within this religiously syncretic community, priming ancestor- veneration beliefs favored more parochial cooperation with one's family. Overall, this study suggests that cultural evolution has generated a rich variety of ways to expand the cooperative sphere and shape human sociality.

The research on leadership is vast and stretches across several fields, though it is mostly WEIRD or at least from industrialized societies (Garfield & Hagen, 2019; Von Rueden, Gurven, Kaplan, & Stieglitz, 2015). To help fill this void, Garfield and Hagan (2020) assembled a database on leadership from the Human Area Relations File (HRAF), a compilation of thousands of ethnographic texts spanning a few centuries and including thousands of societies. As if in response to Barrett's (2020) call for more open ended, exploratory research, the authors coded 109 dimensions of leadership from 1212 texts on 59 different populations, including hunter-gatherers, horticulturalists and pastoralists. They found several robust patterns: candidate universals in leadership along with important variation by continent, subsistence type and group type (e.g., kin group). For example, leaders were always associated with high social status, often based on intelligence and knowledge, and were capable of resolving conflicts. In contrast to essentially all the WEIRD work on leadership, Garfield and Hagan (2020) found that shamans, with their otherworldly powers, stood out uniquely as leaders because they embodied both the persuasive influence of prestigious individuals and the coercive threat of dominant leaders. In their discussion, the authors consider the existing approaches to leadership in light of their new empirical evidence.

What is the role of mentalizing, and particularly the intentions of others, in moral judgment? Based on research in WEIRD societies, inferences about the mental states of others play a pivotal role judging others, in how bad their actions are, how much reputational damage they'll suffer, and how much punishment they deserve. In the current volume, Curtin et al. (2020) develop and test a set of related theories predicting that societies with more dense and interconnected kin networks—intensive kin-based institutions—will rely less on using mental states in judging others and instead rely more strictly on the observable outcomes of actions. To test this idea, Curtin et al. (2020) combined experimental data from two vignette studies in Barrett et al. (2016) with new data on kin-based institutions from those same societies. Their analysis reveals a robust correlation between less intensive kin-based institutions and the use of mental states in both datasets.

Worryingly, however, the data reported in Barrett et al. (2016) comes only from 10 diverse societies, so one should wonder if these are an unusual anthropological slice of cultural variation. To explore just how widespread the focus on outcomes over mental states might be—both cross-culturally and historically—Curtin et al. (2020) review the prevalence of three social norms that have been associated with less attention to mental states. These norms relate to (1) an opacity of mind ('people should not infer others' mental states'), (2) strict liability in criminal adjudication ('crimes are judged on outcomes only'), and (3) collective guilt (e.g., a man can be punished for a murder committed by his brother). To explore strict liability and collective guilt more deeply, Curtin et al. (2020) coded ethnographies from the HRAF for the presence or absence of these norms. Across continents and subsistence systems, strict liability and/or collective guilt were found in half the societies for which there was sufficient data to judge. In short, the evidence suggests that many societies may have inhibited the use of mental states in moral judgments, which mitigates concerns about the generalizability of the results using Barrett's vignette data.

3. Moving forward: key elements and new approaches

To stimulate thought and discussion regarding how to improve evolutionary approaches to the study of human psychology and behavior, we invited Clark Barrett to contribute a target article on where our community needs to go; we also invited Dorsa Amir and Katie McAuliffe to provide a programmatic review of how to build a research enterprise

that integrates cross-cultural and developmental approaches into a synthetic research program. In response to Barrett's provocative piece, we solicited a wide range of leading researchers to respond, and received insightful commentaries from Zak Witkower, Jessica Tracy, Paul Rozin, Paul Smaldino, Rebecca Sear, Dan Hruschka and Mike Gurven.

In his target article, Barrett argues that the EHB community has been limited by its over-reliance on evolutionary theory—"theory worship"—and calls for a "Star Trek approach": the Enterprise-D begins its ongoing mission when Captain Picard says, "Let's see what's out there. Engage." Barrett's topic analysis of our flagship journal reveals a narrow set of topics, dominated by papers about cooperation, life history, mating and cultural evolution. Echoing sentiments of Paul Rozin from a prior decade, Barrett thinks we need to spend more time letting the world tell us what's important and focus more on studying the billions of people who are neither WEIRD nor living in subsistence societies.

The five commentaries build on this argument in various ways.

- 1) Offering what they see as a counterpoint to Barrett's concerns about generic samples, Witkower and Tracy (2020) argue the study of emotions has long taken seriously the use of diverse human populations as well as primates. Of course, debates of the emergence and existence of the basic emotions across human societies has recently been stoked by new research (Gendron, Crivelli, & Barrett, 2018; Hoemann et al., 2018).
- 2) Gurven, (2020), meanwhile, builds on Barrett's points by emphasizing the need to also engage with applied and policy-relevant questions in addition to, or alongside theoretically-driven questions.
- 3) Hruschka, (2020) pushes Barrett's agenda further by emphasizing the importance of honing our methodological tools and better adapting them to diverse populations and environments. This concern is, of course, the reason why interdisciplinary research teams have been emphasizing the need to integrate experimental and ethnographic approaches (Apicella & Barrett, 2016; Henrich et al., 2004, 2010; Purzycki et al., 2017)
- 4) Jostling with Barrett's concerns about "theory worship," Smaldino, (2020) argues that these arise from a lack of proper training in formal evolutionary modeling. What we need, he argues, are more models and a better general understanding of what goes into modeling and what these mental prostheses can do for us. Smaldino claims that those not proficient in modeling are most in danger of fetishizing particular models.
- 5) Sear, (2020) highlights the untapped potential of secondary datasets from around the globe with information on health, demography, social practices, economics outcome, cultural beliefs and much more. We would add two points to Sear's comments. First, our ability to locate where data are in geographic space (e.g., African villages GPS coordinates or U.S. counties) permits researchers to link data from diverse sources in a relatively fine-grained way. This approach, for example, has revealed the role of early Christian missions and the slave trade to rates of contemporary polygynous marriage (Dalton & Leung, 2014; Fenske, 2015). Second, the use of secondary data would receive the substantial boost it deserves if advisors, departments and hiring committees were more open to Ph.D. dissertations that are entirely based on secondary data.
- 6) In Paul Rozin's, (2020) entertaining allegory that pointedly captures the essence of Barrett's concerns, pigment analyses of sports balls, correlations between players' body fat and shirt numbers, investigations of body arrangements in football huddles, and a blimp designed to administer fMRIs en masse to everyone in a stadium were just some of the research ideas submitted to a Martian research institute in response to a call for understanding "human sports". Rozin has, for many years, called on researchers to "slow down" and think more about what aspects of human life should be studied.

Complementing Barrett's critique, Amir and McAuliffe (2020) provide their own vision of an interdisciplinary evolutionary science of

human behavior and psychology, guided by formal models, that synthesize both cross-cultural and developmental studies that harness anthropological depth and psychological breadth. In setting the background for their vision, the authors provide a valuable review of prior work going back 60 years on ontogeny across diverse societies. This work is rich with empirical insights and methodological approaches that many readers may be unfamiliar with. Its major shortcoming is that it needs to be integrated into an evolutionary approach. With the stage set, the authors layout the key elements of an evolutionary approach to psychology that is both cross-cultural and developmental, using a broad range of case examples, including studies of life history, personality, decision-making preferences, social norms and inequity aversion. Looking ahead, Amir and McAuliffe put forward a set of guiding principles (quoting):

- 1) Draw research questions from evolutionary plausible **theoretical frameworks**, considering both the ultimate and proximate levels of analysis.
- 2) When possible, use **computational models** to clarify assumptions and derive predictions.
- 3) Create **standardized, reproducible protocols** with extensive comprehension checks and low reliance on formal education and numeracy.
- 4) Seek out **interdisciplinary collaborators** from anthropology, psychology, economics, and related fields.
- 5) Choose cultural samples based on the variables that are most relevant to the research questions, even if they are so-called “**inconvenient samples**”.
- 6) When possible, utilize **within-culture variation** to run natural experiments and test key predictions.
- 7) Provide information about and situate the work within the broader **ethnographic context** of the culture.

We think combining developmental and cross-cultural data, and whenever possible comparative cross-species data, is crucial for tackling core evolutionary questions. In particular, adult variation in psychological or behavioral phenotypes could arise from cultural learning (and less proximately, cultural evolution), evoked phenotypic plasticity (e.g., the evolved “jukebox”) or genetic differences, perhaps due to culture-gene evolution as is the case for much contemporary genetic variation. Moreover, the relevant input into either cultural learning or evoked responses could occur during ontogeny or in adulthood. Of course, some responses include facultative components.

Finally, although we concur with Amir and McAuliffe that selecting study sites is ideally done based on well-defined theoretical expectations about the nature of the variation, sometimes researchers may just want to “see what’s out there” (following Barrett, 2020) or they may want to use their limited funding to test for the universality of a particular aspect of psychology. Taking advantage of global datasets, recent work by Muthukrishna et al. (2020) have provided a webtool for aggregating and mapping cultural distances using a theoretically grounded measure of difference (Bell, Richerson, & McElreath, 2009; Handley & Mathew, 2020). This webtool allows researchers to select study sites that are maximally different from wherever they did their initial research or select several populations that are spread out along a spectrum of variation, giving them their best opportunity to explore variation or confirm universality.

4. History and psychology

Alongside the integrative empirical projects exemplified by several contributions to this special issue and highlighted by Amir and McAuliffe, there is another important new cluster of approaches that has matured in the last decade. Taking advantage of the increasing availability of digitized data and historical sources—secondary data as Sear refers to it—researchers have sought to explain contemporary

psychological and behavioral variation using various kinds of historical data, including detailed data on ecology, environmental variation and historical legacies (cultural phylogenetic effects). Here, we provide only a few appetizers, but refer interested readers to a recent review (Muthukrishna et al., 2020).

4.1. Polygamy

For decades evolutionary anthropologists, often working in Africa, have sought to describe the observed patterns of polygynous marriage using behavioral ecological approaches and environmental or economics variables (Lawson et al., 2015; Pollet & Nettle, 2009; Ross et al., 2018). Recently however, economists have argued for a substantial impact of both Christianity and the slave trade, factors rarely mentioned in earlier work. Fenske (2015), for example, shows that the farther contemporary African villages are from the historical locations of early Christian missions (which disappeared decades ago), the higher the rates of polygynous marriage. This shouldn’t be surprising since Christian missionaries have energetically been working to end polygynous marriage for over 1500 years, beginning with the Franks, Celts and Anglo-saxons. Using data on slaves taken from different African ethnic populations, economists have argued that the horrific and disproportionate extraction of males sold in the slave trade between 1500 and 1900, meant that husbands were often in short supply and the demographic conditions favorable to high levels of polygyny. Dalton and Leung (2014) argue that social norms emerged during this period that persisted to a degree, though a gradual decline in polygynous marriage can be observed over the last half century in many parts of Africa. It seems that if you want to explain the variation in polygynous marriage, researchers can’t ignore religion, social norms and historical legacies.

4.2. Gender inequality

Addressing the question of why men and women are relatively more or less unequal across diverse populations, research has traced contemporary variation back to traditional economic systems, specifically to both plow-based agriculture (Alesina, Giuliano, & Nunn, 2013) and pastoralism (Becker, 2019, 2020). The economic argument is simple: the higher the female contribution is to household production, the less unequal the gender norms. Crucially, these economic incentives, arising from the interaction of the organization of production and sex differences (e.g., physical strength required by the plow), imbed themselves in social norms that persist long after the originating conditions have shifted.

4.3. Individualism, conformity, obedience and impersonal prosociality

By anchoring social norms on aspects of our evolved psychology related to inbreeding avoidance, pair-bonding and kin altruism, cultural evolution has constructed a diversity of institutions built around descent and marriage, such as clans or kindreds, that organize social life, shape interpersonal networks and influence patterns of cooperation. Recent research suggests that people psychologically adapt to the social environments created by these institutions. More specifically, people from populations with denser and tighter kin-based social networks tend to be psychologically less individualist, independent and willing to cooperate with strangers, but more conformist, obedience and contextual (or relational) in their morality (Enke, 2019; Schulz et al., 2019). Much of this work connects historical measures of kinship, drawn from sources such as the *Ethnographic Atlas* or Vatican records of cousin marriages, to contemporary psychological variation.

The variation in kin-based institution has no doubt been shaped by many factors, but a growing body of evidence suggests that religious beliefs, including divinely-inspired (purportedly) incest taboos, inheritance prescriptions and constraints on spousal number, may have

played an substantial role (Henrich, 2020). Using the historical diffusion of Catholic Bishoprics in Europe from roughly 500 to 1500 CE, Schulz et al. (2019) link the influence of the Roman Catholic Church's family regulations to both the dissolution of complex kinship in medieval Europe and to contemporary psychological variation within European countries. Europeans from regions with more centuries of the Church are more individualistic, less conforming and more inclined toward trust and fairness with strangers.

4.4. Learning strategies

For decades, evolutionary theorists have studied and predicted the impact of climatic variation on the optimal learning strategy (Aoki & Feldman, 2014). Earlier on, modelers explored how the speed of climatic fluctuations impacted how much individuals should rely on social vs. individual learning (Boyd & Richerson, 1985; Boyd & Richerson, 1988; Rogers, 1988). Among other insights, when climates change quickly, natural selection often favors individual learning over social learning because the information embedded in the behavior of the prior generation gets “outdated.” More recent work has considered how fluctuating climates might impact the choice of particular social learning strategies. For example, Nakahashi, Wakano, and Henrich (2012) show that less stable environments favor more pay-off cultural transmission and less conformist transmission.

In a recent paper, Giuliano and Nunn (2020) test these ideas on a scale that would have been difficult to imagine 20 years ago. They compiled detailed data on climatic variability around the globe from 1500 to 1900 and used these measures to predict people's preferences for novelty vs. adhering to tradition. Across an amazing array of datasets, they find that people whose recent ancestors experienced greater climatic variability are today more inclined to prefer novelty over tradition.

5. Conclusion

This introductory review has highlighted a number of important developments made in the last decade, including striking empirical discoveries, novel methodological approaches and fresh theoretical insights, following the publication of “The weirdest people in the world?” Taken together, these reinforce what we consider the most important lesson of all: a potpourri of lifeways exists around the world and only through their scientific exploration and theoretical integration can we develop a richer and more complete understanding of *Homo sapiens*. We hope this lesson, and the exciting findings included in this special issue, will inspire researchers to escape the confines of their university laboratories in search of sprawling collaborations and new empirical riches, which may lie in the historical record or among the 7 billion people who have never been sampled in a psychological study.

While we advocate for increased sample diversity, we also recognize that there are both important practical and ethical considerations for research involving non-WEIRD societies. Therefore, we end with a short discussion of some of these considerations and a few recommendations for new and experienced researchers interested in going beyond WEIRD. Those interested in a more comprehensive discussion of best practices in cross-cultural research with an ethical focus should see Broesch et al. (2020).

Whether the world's cultural diversity is increasing or decreasing is debated. What is not debated is that cultures are, by definition, changing and more traditional ways of life are disappearing. Today, for instance, only a handful of foraging societies exist in the world, including the Hadza featured in this issue. But as Smith and Apicella (2020) forewarn, based on their survey showing rising rates of schooling, employment and time spent outside of the bush, their status as foragers may be ending.

While the knee-jerk reflex might be to rapidly document the world's current diversity before it dissolves, we think that this would be

misguided except perhaps in specific circumstances—notably, the Boasian program of the mid 20th century was inspired precisely by this concern. To the contrary, and in a similar spirit to that captured by Barrett (2020), we argue that this too is a reason to slow down and to take stock of the things we really want or ought to learn before these traditional lifeways disappear. Thus, as a practical matter, we urge researchers to develop their research programs with a more deliberate eye to the future.

Concerns about the loss of traditional lifeways should also be qualified in two related ways. First, societies have always been dynamic, and there has long been substantial and impactful interactions between diverse societies, which stretch back well into the Paleolithic (Reich, 2018). Second, all existing societies have already been substantially impacted by the European expansion and globalization to some degree. As we saw above, rates of polygynous marriage in the most remote parts of Africa today have been shaped by both the spread of early Christian missions and the slave trade. Similarly, epidemic diseases long ago decimated South American populations, and shaped the societal complexity there. And, many of the surviving indigenous populations in parts of Amazonia were those who were best able to evade the slaving parties, a threat that began in the pre-Columbian era and ran through the rubber boom of the early 20th century. The current processes of change occurring throughout the world, even the horrific ones, are windows into the operation of cultural evolution. And, of course, many researchers working with vulnerable populations engage in both scientific and applied endeavors, helping the communities they conduct research in to deal with natural disasters, epidemic diseases, political conflict and the challenges of economic development.

Researchers need to be cognizant of the impact their work has on the groups they study. They leave “footprints”, directly through their own interactions with the people they study, but also indirectly through their science, which can have unintended popularizing effects. With increased visibility, visits from other groups including tourists, missionaries, journalists and filmmakers may increase. To help minimize these effects, Broesch et al. (2020), advise against “uncritical exoticism” where societies are selected *only* because they are different and consequently, described as such in writing. Instead, they argue that samples should be chosen based on theoretically-grounded predictions about how the trait in question is expected to manifest in different cultural and environmental contexts. While we agree that this is generally how much cross-cultural hypothesis testing should proceed, we also recognize that in rare circumstances – for instance, the prediction of strict universality – there may be theoretical ground to select societies on the basis of diversity alone (Apicella & Barrett, 2016). Moreover, as Barrett (2020) explains, an exclusive focus on theory-driven research could stifle discovery and lead to an incomplete, if not biased, picture of humans. As an alternative to prohibiting theory-neutral research altogether, we advise authors working with more vulnerable groups to slow down and be more exacting in their research endeavors. And, of course, to consider studying the literally billions of other thriving people out there who are not living in WEIRD societies (e.g., Atari et al., 2020; Willard et al., 2020).

Researcher footprints are particularly concerning in small populations because the impact is concentrated on fewer people. It is also concerning for rarer groups, such as foragers, where such data may be particularly prized. These populations risk becoming flooded with researchers and, ironically, may wind up being overrepresented among non-WEIRD samples. In addition to the obvious ethical concerns this raises (again, see Broesch et al., 2020), there are practical ones to consider as well. To the extent that we are concerned about “experienced” laboratory participants, we should also worry about research in small populations and often shrinking populations. Again, this is more reason to think strategically and long-term, as research conducted now may come at the expense of future work on more important topics.

As an ethical matter, Broesch et al. (2020) explicitly call for more involvement of the communities themselves in the research process –

including having a voice on *which* topics should be studied and *how* – and less “extractive” research that exclusively benefits the researcher. We agree that it is important for researchers to give back to the societies that they work with. And undoubtedly, this type of involvement can benefit the research process itself, lending more to the type of theory-neutral data collection that Barrett calls for. We are once again reminded of Rozin's allegory where the Martian research institute entertained every outlandish research proposal designed to understand different human sports, but rejected the one that proposed simply engaging the humans in discussion.

Of course, we acknowledge the difficulty this advice may pose as the trend in psychology is toward rapidly administering big-N studies, featuring both more participants and more societies. While there are obvious benefits to having more data, the benefits are often overestimated, as many psychologists don't think about the non-independence of populations with shared history (cultural phylogeny), the limitation of online studies, or the problems associated with clumping samples gathered from the same country together as “cultures” (e.g., Klein et al., 2018). There are also opportunity costs: funding used to get large, often highly biased, online samples could be better used—from a scientific perspective—to develop in-person, community-based research that obtains proper random samples from populations that are carefully chosen based on firm theoretical or empirical justifications.

The global laboratory is big, and there remains bountiful untapped diversity in the world – the diversity in the ecologies people inhabit, the modes of subsistence they practice, the languages they speak, the gods they worship, and more. Even the seemingly simple task of tallying the number of distinct societies or communities currently in existence is monumental, and any such efforts will surely produce underestimates. Thus, there is a vast space for us to expand our sample base. We encourage researchers, especially younger ones, to continue to push the field forward by exploring those people and groups that have hitherto been ignored.

Finally, the global laboratory is evolving. The world population is expected to increase by nearly 25% in just 50 years (United Nations, 2019). Some societies will grow, others will be lost, and new ones will be formed. New traditions and customs will be constructed, others abandoned. Novel technological innovations and discoveries will continue to transform how we learn and interact in our social worlds. And, we will face recurrent challenges, such as infectious diseases, and new ones brought on by climate change and population growth. There is little doubt that as the future arrives, evolutionary researchers will be increasingly called upon to understand the effects these changes have on our minds and behavior. We believe that we will be better equipped to meet the demands of the future by investing the time now to understand the complex and adaptive relationship between evolution, culture and psychology.

References

Abarbanell, L., & Hauser, M. D. (2010). Mayan morality: An exploration of permissible harms. *Cognition*, 115(2), 207–224. <https://doi.org/10.1016/j.cognition.2009.12.007>.

Alesina, A. F., Giuliano, P., & Nunn, N. (2013). On the origins of gender roles: Women and the plough. *The Quarterly Journal of Economics*, 128(2), 469–530.

Amir, D., Jordan, M. R., McAuliffe, K., Valeggia, C. R., Sugiyama, L. S., Bribiescas, R. G., ... Dunham, Y. (2020). The developmental origins of risk and time preferences across diverse societies. *Journal of Experimental Psychology: General*, 149(4), 650–661. <https://doi.org/10.1037/xge0000675>.

Amir, D., & McAuliffe, K. (2020). Cross-cultural, developmental psychology: Integrating approaches and key insights. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.06.006>.

Arnett, J. J. (2008). The neglected 95%: Why American psychology needs to become less American. *American Psychologist*, 63, 602–614. <https://doi.org/10.1037/0003-066X.63.7.602>.

Aoki, K., & Feldman, M. W. (2014). Evolution of learning strategies in temporally and spatially variable environments: A review of theory. *Theoretical Population Biology*, 91, 3–19.

Apicella, C. L., Azevedo, E. M., Christakis, N. A., & Fowler, J. H. (2014). Evolutionary

origins of the endorsement effect: Evidence from hunter-gatherers. *American Economic Review*, 104(6), 1793–1805. <https://doi.org/10.1257/aer.104.6.1793>.

Apicella, C. L., & Barrett, H. C. (2016). Cross-cultural evolutionary psychology. *Current Opinion in Psychology*, 7, 92–97. <https://doi.org/10.1016/j.copsyc.2015.08.015>.

Apicella, C. L., Marlowe, F. W., Fowler, J. H., & Christakis, N. A. (2012). Social networks and cooperation in hunter-gatherers. *Nature*, 481(7382), 497–501. <https://doi.org/10.1038/nature10736>.

Atari, M., Barbaro, N., Sela, Y., Shackelford, T. K., & Chegeni, R. (2017). The Big Five personality dimensions and mate retention behaviors in Iran. *Personality and Individual Differences*, 104, 286–290. <https://doi.org/10.1016/j.paid.2016.08.029>.

Atari, M., Graham, J., & Dehghani, M. (2020). Foundations of morality in Iran. *Evolution and Human Behavior*, 41.

Atran, S., Medin, D. L., & Ross, N. (2005). The cultural mind: Environmental decision making and cultural modeling within and across populations. *Psychological Review*, 112(4), 744–776.

Awad, E., Dsouza, S., Kim, R., Schulz, J., Henrich, J., Shariff, A., ... Rahwan, I. (2018). The moral machine experiment. *Nature*, 563(7729), 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(5), 2332–2337. <https://doi.org/10.1073/pnas.1911517117>.

Bailey, D. H., Walker, R. S., Blomquist, G. E., Hill, K. R., Hurtado, A. M., & Geary, D. C. (2013). Heritability and fitness correlates of personality in the ache, a natural-fertility population in Paraguay. *PLoS One*, 8(3), Article e59325. <https://doi.org/10.1371/journal.pone.0059325>.

Barrett, H. C. (2020). Deciding what to observe: Thoughts for a post-WEIRD generation. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.05.006>.

Barrett, H. C., Bolyanatz, A., Crittenden, A. N., Fessler, D. M. T., Fitzpatrick, S., Gurven, M., ... Henrich, J. (2016). Small-scale societies exhibit fundamental variation in the role of intentions in moral judgment. *Proceedings of the National Academy of Sciences*, 113(17), 4688–4693. <https://doi.org/10.1073/pnas.1522070113>.

Bauer, M., Blattman, C., Chytilová, J., Henrich, J., Miguel, E., & Mitts, T. (2016). Can war foster cooperation? *Journal of Economic Perspectives*, 30(3), 249–274.

Bauer, M., Cassar, A., Chytilová, J., & Henrich, J. (2014). War's enduring effects on the development of egalitarian motivations and in-group biases. *Psychological Science*, 25(1), 47–57. <https://doi.org/10.1177/0956797613493444>.

Becker, A. (2019). *On the economic origins of restrictions on women's sexuality*. CESifo Working Paper 7770. <https://ssrn.com/abstract=3432818>.

Becker, A. (2020). Pastoralism and female entrepreneurship. https://e43d1e13-a-62cb3a1a-s-sites.googlegroups.com/site/ankebeckerecon/EntrepreneurshipJanuary2020.pdf?attachauth=ANoY77cpgOJdHvYyHbP-6-YjEq_5R1QLrPtyb3XR3L_7MbdPilos4gmFukzN8RNhzTiMe2xg9DB1THuUjRqadGFRUNmT4f4c1lZEdLQ-scjjjOt4-I8Q6anQRafDp8t7vQACAX1b21D40KnHOqP-7-gcYR2X0utiyuH0Xf8grbwKxcg8GyVBowfQCM8Z6k17pzEIrMcCsDkizYtptal9yhU-hblw3RbG-KyHGWj-OaCik8felWqc0%3D&attredirects=0.

Bell, A. V., Richerson, P. J., & McElreath, R. (2009). Culture rather than genes provides greater scope for the evolution of large-scale human prosociality. *Proceedings of the National Academy of Sciences of the United States of America*, 106(42), 17671–17674. <https://doi.org/10.1073/pnas.0903232106>.

Blake, P. R., McAuliffe, K., Corbit, J., Callaghan, T. C., Barry, O., Bowie, A., ... Warneken, F. (2015). The ontogeny of fairness in seven societies. *Nature*, 528(7581), 258–261. <https://doi.org/10.1038/nature15703>.

Boyd, R., & Richerson, P. J. (1988). An evolutionary model of social learning: The effects of spatial and temporal variation. In T. R. Zentall, & B. G. Galef (Eds.), *Social learning: Psychological and biological perspectives* (pp. 29–48). Lawrence Erlbaum Associates.

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

Broesch, T., Crittenden, A. N., Beheim, B., Blackwell, A. D., Bunce, J., Colleran, H., ... Borgerhoff Mulder, M. (2020). Navigating cross-cultural research: Methodological and ethical considerations. [Preprint]. [PsyArXivhttps://doi.org/10.31234/osf.io/thqsw](https://doi.org/10.31234/osf.io/thqsw).

Buss, D. (2007). *Evolutionary psychology: The new science of the mind* (3rd ed.). Allyn & Bacon.

Buss, D. M., Larsen, R. J., Westen, D., & Semmelroth, J. (1992). Sex differences in jealousy: Evolution, physiology, and psychology. *Psychological Science*, 3(4), 251–256. <https://doi.org/10.1111/j.1467-9280.1992.tb00038.x>.

Clancy, K. B. H., & Davis, J. L. (2019). Soyent 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>.

Cordain, L., Eaton, S. B., Brand Miller, J., Lindeberg, S., & Jensen, C. (2002). An evolutionary analysis of the aetiology and pathogenesis of juvenile-onset myopia. *Acta Ophthalmologica Scandinavica*, 80(2), 125–135. <https://doi.org/10.1034/j.1600-0420.2002.800203.x>.

Costa, P. T., Jr., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology*, 81(2), 322–331.

Curtin, C. M., Barrett, H. C., Bolyanatz, A., Crittenden, A., Fessler, D. M., Fitzpatrick, S., & Henrich, J. (2020). Kinship intensity and the use of mental states in moral judgment across societies. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.07.002>.

Dalton, J. T., & Leung, T. C. (2014). Why is polygyny more prevalent in Western Africa?: An African slave trade perspective. *Economic Development and Cultural Change*, 62(4), 599–632. <https://doi.org/10.1086/676531>.

Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior:

- Evolved dispositions versus social roles. *American Psychologist*, 54(408–423), 408.
- Eldlund, J. E., & Sagarin, B. J. (2017). Sex differences in jealousy. *Advances in experimental social psychology* (pp. 259–302). Elsevier. <https://doi.org/10.1016/bs.aesp.2016.10.004> Vol. 55.
- Enke, B. (2019). Kinship, cooperation, and the evolution of moral systems. *The Quarterly Journal of Economics*, 134(2), 953–1019. <https://doi.org/10.1093/qje/qjz001>.
- Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D., & Sunde, U. (2018). Global evidence on economic preferences. *Quarterly Journal of Economics*, 91(1), 335–341.
- Fehr, E., & Leibbrandt, A. (2011). A field study on cooperativeness and impatience in the tragedy of the commons. *Journal of Public Economics*, 95(9–10), 1144–1155. <https://doi.org/10.1016/j.jpubeco.2011.05.013>.
- Fenske, J. (2015). African polygamy: Past and present. *Journal of Development Economics*, 117, 58–73. <https://doi.org/10.1016/j.jdevco.2015.06.005>.
- Gächter, S., & Schulz, J. F. (2016). Intrinsic honesty and the prevalence of rule violations across societies. *Nature*, 531(7595), 496–499. <https://doi.org/10.1038/nature17160>.
- Garfield, Z. H., & Hagan, E. H. (2020). Universal and variable leadership dimensions across human societies. *Evolution and Human Behavior*, 41.
- Garfield, Z. H., & Hagen, E. H. (2019). Investigating evolutionary models of leadership among recently settled Ethiopian hunter-gatherers. *The Leadership Quarterly*. <https://doi.org/10.1016/j.leaqua.2019.03.005>.
- Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., ... Arndt, J. (2011). Differences between tight and loose cultures: A 33-nation study. *Science*, 332(6033), 1100–1104.
- Gelfand, M. J., Nishii, L. H., & Raver, J. L. (2006). On the nature and importance of cultural tightness-looseness. *Journal of Applied Psychology*, 91(6), 1225.
- Gendron, M., Crivelli, C., & Barrett, L. F. (2018). Universality reconsidered: Diversity in making meaning of facial expressions. *Current Directions in Psychological Science*, 27(4), 211–219. <https://doi.org/10.1177/0963721417746794>.
- Giuliano, P., & Nunn, N. (2020). Understanding cultural persistence and change. *Review of Economics & Statistics*. <https://doi.org/10.1007/BF01091620> (forthcoming).
- Gurven, M., & Lieberman, D. (2020). WEIRD bodies: Mismatch, medicine and missing diversity. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.04.001>.
- Gurven, M., von Rueden, C., Massenkoff, M., Kaplan, H., & Lero Vie, M. (2013). How universal is the Big Five? Testing the five-factor model of personality variation among forager–farmers in the Bolivian Amazon. *Journal of Personality and Social Psychology*, 104(2), 354–370. <https://doi.org/10.1037/a0030841>.
- Gurven, M. D. (2020). Greater humility can help expand evolutionary social science. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.07.006>.
- Handley, C., & Mathew, S. (2020). Human large-scale cooperation as a product of competition between cultural groups. *Nature Communications*, 11(1), Article 702. <https://doi.org/10.1038/s41467-020-14416-8>.
- Harrington, J. R., & Gelfand, M. J. (2014). Tightness–looseness across the 50 United States. *Proceedings of the National Academy of Sciences*, 111, 7990–7995. <https://doi.org/10.1073/pnas.1317937111>.
- Hauser, M. (2006). *Moral minds: How nature designed our universal sense of right and wrong*. Ecco/HarperCollins Publishers.
- Heine, S. J., & Buchtel, E. E. (2009). Personality: The universal and the culturally specific. *Annual Review of Psychology*, 60, 369–394.
- Henrich, J. (2020). *The WEIRDest people in the world: How the West became psychologically peculiar and particularly prosperous*. Farrar, Straus and Giroux (forthcoming).
- 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. *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., Heine, S. J., & Norenzayan, A. (2010). Beyond WEIRD: Towards a broad-based behavioral science. *Behavioral and Brain Sciences*, 33(2–3), <https://doi.org/10.1017/S0140525X10000725>.
- Hoemann, K., Crittenden, A. N., Msafiri, S., Liu, Q., Li, C., Roberson, D., ... Feldman Barrett, L. (2018). Context facilitates performance on a classic cross-cultural emotion perception task. *Emotion*, 19(7), 1292–1313.
- Holden, B. A., Fricke, T. R., Wilson, D. A., Jong, M., Naidoo, K. S., Sankaridurg, P., ... Resnikoff, S. (2016). Global prevalence of myopia and high myopia and temporal trends from 2000 through 2050. *Ophthalmology*, 123(5), 1036–1042. <https://doi.org/10.1016/j.ophtha.2016.01.006>.
- House, B. R., Silk, J. B., Henrich, J., Barrett, H. C., Scelza, B. A., Boyette, A. H., ... Laurence, S. (2013). Ontogeny of prosocial behavior across diverse societies. *Proceedings of the National Academy of Sciences*, 110, 14586–14591. <https://doi.org/10.1073/pnas.1221217110>.
- House, B. R. (2017). Diverse ontogenies of reciprocal and prosocial behavior: Cooperative development in Fiji and the United States. *Developmental Science*, 20(6), Article e12466. <https://doi.org/10.1111/desc.12466>.
- House, B. R., Kanngiesser, P., Barrett, H. C., Broesch, T., Cebiglu, S., Crittenden, A. N., ... Silk, J. B. (2019). Universal norm psychology leads to societal diversity in prosocial behaviour and development. *Nature Human Behaviour*. <https://doi.org/10.1038/s41562-019-0734-z>.
- Hruschka, D. J. (2020). “What we look with” is as important as “what we look at”. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.07.011>.
- Hruschka, D. J., & Henrich, J. (2013a). Institutions, parasites and the persistence of in-group preferences. *Plos One*, 8(5) (/000319330200057).
- Hruschka, D. J., & Henrich, J. (2013b). Economic and evolutionary hypotheses for cross-population variation in parochialism. *Frontiers in Human Neuroscience*, 7. <https://doi.org/10.3389/fnhum.2013.00559> No. 559.
- Hruschka, D. J., Medin, D. L., Rogoff, B., & Henrich, J. (2018). Pressing questions in the study of psychological and behavioral diversity. *Proceedings of the National Academy of Sciences*, 115(45), 11366–11368. <https://doi.org/10.1073/pnas.1814733115>.
- Jaeger, C. B., Brosnan, S. F., Levin, D. T., & Jones, O. D. (2020). Predicting variation in endowment effect magnitudes. *Evolution and Human Behavior*, 41, 253–259.
- Klein, R. A., Vianello, M., Hasselman, F., Adams, B. G., Adams, R. B., Alper, S., ... Nosek, B. A. (2018). Many labs 2: Investigating variation in replicability across samples and settings. *Advances in Methods and Practices in Psychological Science*, 1(4), 443–490. <https://doi.org/10.1177/2515245918810225>.
- Kröll, M., & Rustagi, D. (2018). Reputation, dishonesty, and cheating in informal milk markets in India. Working Paper <https://ssrn.com/abstract=2982365>.
- Laajaj, R., Macours, K., Pinzon Hernandez, D. A., Arias, O., Gosling, S. D., Potter, J., ... Vakis, R. (2019). Challenges to capture the big five personality traits in non-WEIRD populations. *Science Advances*, 5(7), eaaw5226. <https://doi.org/10.1126/sciadv.aaw5226>.
- Lamm, B., Keller, H., Teiser, J., Gudi, H., Yovsi, R. D., Freitag, C., ... Lohaus, A. (2018). Waiting for the second treat: Developing culture-specific modes of self-regulation. *Child Development*, 89(3), e261–e277. <https://doi.org/10.1111/cdev.12847>.
- 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(1898), Article 20190202. <https://doi.org/10.1098/rspb.2019.0202>.
- Lawson, D., James, S., Ngadaya, E., Ngowi, B., Mfinanga, S. G. M., & Borgerhoff Borgerhoff, M. (2015). No evidence that polygynous marriage is a harmful cultural practice in northern Tanzania. *Proceedings of the National Academy of Sciences of the United States of America*, 25, 22–24. <https://doi.org/10.1073/pnas.1507151112>.
- Lowes, S., Nunn, N., Robinson, J. A., & Weigel, J. L. (2017). The evolution of culture and institutions: Evidence from the Kuba Kingdom. *Econometrica*, 85(4), 1065–1091. <https://doi.org/10.3982/ECTA14139>.
- Lukaszewski, A. W., Gurven, M., von Rueden, C. R., & Schmitt, D. P. (2017). What explains personality covariation? A test of the socioecological complexity hypothesis. *Social Psychological and Personality Science*, 8(8), 943–952. <https://doi.org/10.1177/1948550617697175>.
- Maddux, W. W., Yang, H., Falk, C., Adam, H., Adair, W., Endo, Y., ... Heine, S. J. (2010). For whom is parting with possessions more painful? Cultural differences in the endowment effect. *Psychological Science*, 21(12), 1910–1917. <https://doi.org/10.1177/0956797610388818>.
- Majid, A., & Kruspe, N. (2018). Hunter-gatherer olfaction is special. *Current Biology*, 28(3), 409–413.e2. <https://doi.org/10.1016/j.cub.2017.12.014>.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 244–253.
- Matthew, S., & Zefferman, M. R. (2020). An evolutionary theory of moral injury with insight from Turkana warriors. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.04.001>.
- McCauley, R., & Henrich, J. (2006). Susceptibility to the Muller-Lyer illusion, theory-neutral observation, and the diachronic penetrability of the visual input system. *Philosophical Psychology*, 19(1), 1–23.
- McGann, J. P. (2017). Poor human olfaction is a 19th-century myth. *Science*, 356(6338), eaam7263. <https://doi.org/10.1126/science.aam7263>.
- Mikhail, J. (2007). Universal moral grammar: Theory, evidence and the future. *Trends in Cognitive Sciences*, 11(4), 143–152.
- Moscona, J., Nunn, N., & Robinson, J. A. (2017). Keeping it in the family: Lineage organizations and the scope of trust in Sub-Saharan Africa. *American Economic Review*, 107(5), 565–571.
- Muthukrishna, M., Bell, A. V., Henrich, J., Curtin, C. M., Gedranovich, A., et al. (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.
- Muthukrishna, M., Henrich, J., & Slingerland, E. (2020). Psychology as a historical science. *Annual Review of Psychology* (forthcoming).
- Nakahashi, W., Wakano, J. Y., & Henrich, J. (2012). Adaptive social learning strategies in temporally and spatially varying environments. *Human Nature*, 23(4), 386–418.
- Norenzayan, A., & Heine, S. J. (2005). Psychological universals: What are they and how can we know? *Psychological Bulletin*, 131(5), 763–784.
- Norenzayan, A. (2016). Theodiversity. *Annual Review of Psychology*, 67(1), 465–488. <https://doi.org/10.1146/annurev-psych-122414-033426>.
- Nunn, N., & De La Sierra, R. S. (2017). Why being wrong can be right: Magical warfare technologies and the persistence of false beliefs. *American Economic Review*, 107(5), 582–587. <https://doi.org/10.1257/aer.p20171091>.
- Pollet, T. V., & Nettle, D. (2009). Market forces affect patterns of polygyny in Uganda. *Proceedings of the National Academy of Sciences of the United States of America*, 106(7), 2114–2117. <https://doi.org/10.1073/pnas.0810016106>.
- Pollet, T. V., & Saxton, T. K. (2019). How diverse are the samples used in the journals “Evolution & Human Behavior” and “Evolutionary Psychology”? *Evolutionary Psychological Science*, 5(3), 357–368. <https://doi.org/10.1007/s40806-019-00192-2>.
- 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(2), 101–132. <https://doi.org/10.1080/2153599X.2016.1267027>.
- Rad, M. S., Martingano, A. J., & Ginges, J. (2018). Toward a psychology of Homo sapiens: Making psychological science more representative of the human population. *Proceedings of the National Academy of Sciences*, 115(45), <https://doi.org/10.1073/pnas.1721165115>.
- Reich, D. (2018). *Who we are and how we got here: Ancient DNA and the new science of the human past*. Oxford University Press.
- Roberts, S. C., Havlíček, J., & Schaal, B. (2020). Human olfactory communication: current

- challenges and future prospects. *Philosophical Transactions of the Royal Society B*, 375, Article 20190258. <https://doi.org/10.1098/rstb.2019.0258>.
- Rogers, A. R. (1988). Does biology constrain culture. *American Anthropologist*, 90(4), 819–831.
- Ross, C. T., Mulder, M. B., Oh, S., Bowles, S., Beheim, B., Bunce, J., ... Ziker, J. (2018). Greater wealth inequality, less polygyny: Rethinking the polygyny threshold model. *Journal of the Royal Society Interface*, 15, Article 20180035. <https://doi.org/10.1098/rsif.2018.0035>.
- Rozin, P. (2001). Social psychology and science: Some lessons from Solomon Asch. *Personality and Social Psychology Review*, 5, 2–14.
- Rozin, P. (2020). Expanding on Barrett: The value of valleys. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.07.005>.
- Saroglou, V., & Cohen, A. B. (2013). Cultural and cross-cultural psychology of religion. *Handbook of the psychology of religion and spirituality* (pp. 330–354). (2nd ed.). The Guilford Press.
- Sorokowska, A., Sorokowski, P., Hummel, T., & Huanca, T. (2013). Olfaction and environment: 'Tsimane' of Bolivian rainforest have lower threshold of odor detection than industrialized German people. *PLoS one*, 8(7), Article e69203. <https://doi.org/10.1371/journal.pone.0069203>.
- Scelza, B. A., Prall, S. P., Blumenfeld, T., Crittenden, A. N., Gurven, M., Kline, M., ... McElreath, R. (2020). Patterns of paternal investment predict cross-cultural variation in jealous response. *Nature Human Behaviour*, 4(1), 20–26. <https://doi.org/10.1038/s41562-019-0654-y>.
- 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(1), 168–182. <https://doi.org/10.1037/0022-3514.94.1.168>.
- 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>.
- Sear, R. (2020). Strengthening the evolutionary social sciences with more data, less "theory-worship". *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.07.010>.
- Shweder, R. A. (1990). Cultural psychology: What is it? In J. W. Stigler, R. A. Shweder, & G. Herdt (Eds.). *Cultural psychology: Essays on comparative human development* (pp. 1–43). Cambridge University Press.
- Simons, D. J., Shoda, Y., & Lindsay, D. S. (2017). Constraints on generality (COG): A proposed addition to all empirical papers. *Perspectives on Psychological Science*. <https://doi.org/10.1177/1745691617708630>.
- Smaldino, P. E. (2020). Evolutionary social science needs programmatic training in how models work. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.06.004>.
- Smaldino, P. E., Lukaszewski, A., von Rueden, C., & Gurven, M. (2019). Niche diversity can explain cross-cultural differences in personality structure. *Nature Human Behaviour*, 3(12), 1276–1283. <https://doi.org/10.1038/s41562-019-0730-3>.
- Smith, K. M., & Apicella, C. L. (2020). Partner choice in human evolution: The role of cooperation, foraging ability, and culture in Hadza campmate preferences. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.07.009>.
- Stich, S. (2006). Is morality an elegant machine or a kludge? *Journal of Cognition and Culture*, 6(1–2), 181–189. <https://doi.org/10.1163/156853706776931349>.
- Tanaka, T., Camerer, C. F., & Nguyen, Q. (2010). Risk and time preferences: Linking experimental and household survey data from Vietnam. *American Economic Review*, 100(1), 557–571.
- United Nations, D. of E. and S. A. (Population D) (2019). *World population prospects*. (online edition, rev. 1).
- Von Rueden, C. R., Gurven, M., Kaplan, H., & Stieglitz, J. (2015). Leadership in an egalitarian human society. *American Journal of Physical Anthropology*, 156, 315.
- White, C. J. M., Kelly, J. M., Shariff, A. F., & Norenzayan, A. (2019). Supernatural norm enforcement: Thinking about karma and god reduces selfishness among believers. *Journal of Experimental Social Psychology*. <https://doi.org/10.1016/j.jesp.2019.03.008>.
- Willard, A. K., Baimel, A., Turpin, H., Jong, J., & Whitehouse, H. (2020). Rewarding the good and punishing the bad: The role of karma and afterlife beliefs in shaping moral norms. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.07.001>.
- Winkler, M. (2020). *Shocks, norms, and cooperation*. Online63. https://mxwinkler.github.io/files/Winkler_Shock_Norm_Conformity.pdf.
- Witkower, Z., & Tracy, J. L. (2020). We don't make WEIRD faces: A brief history of emotion expression research in small-scale societies. *Evolution and Human Behavior*, 41. <https://doi.org/10.1016/j.evolhumbehav.2020.06.005>.

Coren Apicella^a, Ara Norenzayan^b, Joseph Henrich^{c,*}

^a Department of Psychology, University of Pennsylvania, 3720 Walnut Street, Philadelphia, PA 19104, United States of America
^b Department of Psychology, University of British Columbia, 2136 West Mall, Vancouver, Canada

^c Department of Human Evolutionary Biology, Harvard University, 11 Divinity Ave, Cambridge, MA 02138, United States of America
 E-mail addresses: capicella@psych.upenn (C. Apicella),
ara@psych.ubc.ca (A. Norenzayan),
henrich@fas.harvard.edu (J. Henrich).

* Corresponding author.