



Expanding the interpretive power of psychological science by attending to culture

Laura M. Brady^{a,1}, Stephanie A. Fryberg^a, and Yuichi Shoda^a

^aDepartment of Psychology, University of Washington, Seattle, WA 98195

Edited by Douglas L. Medin, Northwestern University, Evanston, IL, and approved June 14, 2018 (received for review March 25, 2018)

A lack of interpretive power (i.e., the ability to understand individuals' experiences and behaviors in relation to their cultural contexts) undermines psychology's understanding of diverse psychological phenomena. Building interpretive power requires attending to cultural influences in research. We describe three characteristics of research that lacks interpretive power: normalizing and overgeneralizing from behaviors and processes of people in Western, educated, industrialized, rich, and democratic (WEIRD) contexts; making non-WEIRD people and processes invisible; and misapplying WEIRD findings in non-WEIRD contexts. We also describe research in which leveraging interpretive power prevented these negative consequences. Finally, using the culture-cycle framework, we outline a vision for creating culture change within psychology by implementing culture-conscious practices to guide the formation of research questions, empirical design, and data analysis and interpretation.

culture | interpretive power | scientific practice | scientific norms | culture change

In 1973, William McGuire called for psychologists to better understand human behavior by fully considering the people from whom psychological data derive:

In our holy determination to confront reality and put our theory to the test of nature, we have plunged through reality, like Alice through the mirror, into a never-never land in which we contemplate not life but data. All too often the scientific psychologist is observing not the mind or behavior but summed data and computer printout. He is thus a self-incarcerated prisoner in a platonic cave, where he has placed himself with his back to the outside world, watching its shadows on the walls (1).

We build on this call by asking psychologists to intentionally observe and leverage an understanding of diverse people and experiences to improve psychological science. This shift involves recognizing that people are cultural beings whose histories, values, and experiences shape their understanding of what constitutes good or normative behavior and how they make sense of the world. We use the lens of interpretive power—the ability to understand individual experiences and behaviors in relation to cultural contexts—to illustrate how instilling culture-conscious scientific norms and practices will improve psychological science.

To set the stage for our discussion, we first define culture in the context of psychology. Then, we use the concept of interpretive power to illustrate how insufficient attention to culture obscures our understanding of psychological processes by (i) normalizing and overgeneralizing Western, educated, industrialized, rich, democratic (WEIRD) (2) processes, (ii) making non-WEIRD people and processes invisible, and (iii) misapplying WEIRD findings in non-WEIRD contexts.* We then use existing research to demonstrate that accounting for the ways in which culture shapes individuals' experiences and behaviors—and thus leveraging interpretive power—renders a more comprehensive understanding of human functioning. Finally, we offer a vision for cultivating interpretive power in psychological science by instilling norms and practices that promote attention to culture at all phases of research.

Defining Culture in Psychological Science

While “culture” takes on many meanings in psychology, we draw upon Kroeber and Kluckhohn's (3) work to highlight two key features. First, culture consists of explicit and implicit historically derived and selected patterns of behavior. That is, culture is context laden and develops through time and experience. While some outcomes of this experience are visible (e.g., behaviors), others are not (e.g., ideas, assumptions, values). Second, culture encompasses both products of action and conditioning elements of further action. The prevailing values and norms shape cultural products (e.g., societal institutions; individual thoughts and behaviors). When cultural products align with prevailing values and norms, they reinforce these values and norms and strengthen their legitimacy. For instance, laws both reflect cultural beliefs about how people should behave and reinforce these beliefs by punishing behavior that deviates from what is considered “good” or “acceptable.” When cultural products do not align with the prevailing cultural values and norms but are not dismissed as “bad” or “unacceptable,” they can challenge the legitimacy of these values and norms and elicit cultural change. For example, Saudi Arabian activists recently challenged and succeeded in overturning a longstanding law banning women from driving. Such challenges to the status quo cause people within a given culture to question the prevailing cultural values and norms and change the patterns of behavior deemed acceptable in that context. Culture therefore is not a static characteristic that differentiates people (e.g., Easterners vs. Westerners), but a set of dynamic processes that both shape and change in response to cultural products (4–7).

Group characteristics (e.g., geography, race, gender) function as proxies for culture inasmuch as they suggest that people who share certain characteristics likely participate in similar cultural processes. However, cultural influences are not uniform (8, 9); variation exists both within and between individuals and groups of individuals in a given cultural context (10–13). The same individual may demonstrate different psychological and behavioral processes in different contexts, depending on both the prevailing norms and expectations and the group characteristics made salient in those contexts (14–17). For example, Asian American women

This paper results from the Arthur M. Sackler Colloquium of the National Academy of Sciences, “Pressing Questions in the Study of Psychological and Behavioral Diversity,” held September 7–9, 2017, at the Arnold and Mabel Beckman Center of the National Academies of Sciences and Engineering in Irvine, CA. The complete program and video recordings of most presentations are available on the NAS website at www.nasonline.org/pressing-questions-in-diversity.

Author contributions: L.M.B., S.A.F., and Y.S. wrote the paper.

The authors declare no conflict of interest.

This article is a PNAS Direct Submission.

Published under the PNAS license.

¹To whom correspondence should be addressed. Email: laurab33@uw.edu.

Published online November 5, 2018.

*We use the terms “WEIRD” and “non-WEIRD” to describe which cultural contexts have been included/excluded in psychological science. However, we do not wish to imply that these are the only important contexts to consider in psychological research or that the cultural influences within each of these contexts are uniform. A great deal of cultural variation exists both within and between WEIRD and non-WEIRD contexts, and understanding this variation is key to understanding human behavior.



perform worse in math when reminded of their female identity (negatively stereotyped in math) but better when reminded of their Asian American identity (positively stereotyped in math) (18). Such findings suggest that individuals are inextricably linked to the cultural contexts in which they participate. Fully understanding human behavior necessitates understanding the cultural influences on individuals in a given context.

Psychological Science Often Overlooks Cultural Influences

Although culture plays a critical role in shaping cognitions, emotions, and behaviors across contexts, psychologists often overlook cultural influences on the phenomena they study by failing to consider (i) the people from whom data derive [as McGuire critiqued (1)] and (ii) how psychologists' own cultural experiences shape their assumptions and practices. While certain subfields (e.g., cultural psychology, racial/ethnic minority psychology) place a more explicit emphasis on culture than do others, the field as a whole lacks agreed-upon mechanisms by which to attend to and report on cultural influences. Published papers, for example, rarely discuss which groups are—and are not—represented among subjects (2, 19–24) and which cultural influences are likely to shape subjects' experiences. Many researchers report basic sample demographics in the methods section but otherwise pay little attention to cultural influences until the discussion section, where culture—if mentioned at all—is described only as a potential moderating variable with little further theorizing about how culture shapes phenomena (25). This lack of attention to culture likely arises from the historical assumption that, unless otherwise shown, psychological research reflects “fundamental” or “universal” truths about human experiences. While many psychologists now reject this notion, assumptions and practices within the field have been slower to change (25–28).

Psychologists also often overlook how culture shapes their approach to research. Although work in related fields such as sociology and education highlights the importance of reporting on researcher positionality or social location (i.e., identities, values, and experiences in relation to the populations or phenomena studied) (29–32), psychologists rarely offer such information. Outside of cultural and racial/ethnic minority psychology (e.g., refs. 20 and 33), there is little discussion of how researchers' experiences shape their questions, methods, and interpretations. The underlying assumption is that this reflection is unnecessary because the scientific method is “objective.”

Attending to Culture Builds Interpretive Power

When psychologists ignore variation in psychological processes within and between cultural contexts or rely only on culturally homogenous samples, their theories reflect a narrow—and inaccurate—understanding of human behavior. Improving psychological science involves attending to who is represented in research; how culture shapes subjects' experiences and researchers' interpretations; and how, where, and why research is conducted. In other words, improving psychological science involves leveraging interpretive power. In the following sections, we illustrate interpretive power, describe how interpretive power manifests in psychological science, and argue that leveraging interpretive power enhances the understanding of diverse psychological phenomena.

The notion of interpretive power originates in the education literature, where it refers to a teacher's ability to understand diverse cultural ways of knowing (34–36). Teachers with interpretive power consider the cultural contexts in which students participate and how their experiences in these contexts shape their ways of knowing. These teachers assume that if they do not understand a student's reasoning or engagement, it may be because the student's cultural experiences differ from their own (36).

Greenfield et al. (37), for example, described an interaction in which a lack of interpretive power undermined a teacher's ability to understand a student. When a preschool teacher asked

students to describe an egg, a Latina student began telling a story about cooking eggs with her grandmother. The teacher ignored her in favor of students who described the physical properties of eggs. As Greenfield et al. discussed, the student was not wrong; she was trying to convey her understanding based on her cultural way of knowing, in which objects are important because of the social relationships to which these objects are tied. Because the teacher did not recognize the student's contribution as a reflection of her cultural experiences, she assumed the student did not understand the question and inadvertently gave the student negative feedback.

In contrast, Warren and Rosebery (38) described an interaction in which interpretive power enabled a teacher to recognize a cultural difference, allowing her to connect with and enhance learning for a student from a different cultural background. In the first lesson about plant growth, the class planted seeds in soil to observe how stems and leaves grow. In the next lesson, the teacher showed the class a seed that she germinated in a Petri dish of water. An African American student interrupted, asking, “Did you put magic beans in there or something?” While the question was unexpected, the teacher gave the student the benefit of the doubt. She did not immediately know what the student was conveying but considered whether his cultural experiences may have shaped his engagement. As Warren and Rosebery discussed, African American discourse involves expressive argumentation, metaphors, counterfactual reasoning, and language play. The teacher asked the student to explain his thinking. He responded by asking how seeds can germinate without soil, demonstrating that he was trying to reconcile the necessity of soil for growth in the first lesson with the absence of soil in the subsequent lesson. His response showed that he was in fact deeply engaged in learning. Instead of assuming negative intent on the part of the student and potentially undermining motivation, the teacher used the student's question to explain the apparent contradiction to the class.

Interpretive Power in Psychological Science

In educational contexts, interpretive power allows teachers to understand how students' diverse cultural ways of knowing shape students' contributions. Although the term “interpretive power” is rarely used in psychology, interpretive power plays a similar role in researchers' ability to understand diverse people and psychological processes. All data include variation. While some variations are random noise, others reflect meaningful differences arising from individuals' cultural experiences. How psychologists make sense of variation depends upon their interpretive power. When researchers do not attend to culture, they dismiss culturally derived variations as errant and misunderstand the people showing these variations. Without interpretive power, psychologists also risk overlooking variation, even in cases when it may be informative precisely because it is nonnormative (e.g., people who show exceptional resilience; ref. 39). Even with otherwise strong methodological and statistical skills, researchers who lack interpretive power miss opportunities to learn from a wide range of psychological processes.

Interpretive Power Improves Psychological Science

When researchers cultivate interpretive power, their knowledge of cultural influences becomes a tool that guides their empirical approach and interpretation. They expect psychological processes to differ cross-culturally and include diverse perspectives in their work. However, researchers with interpretive power go beyond simply documenting cross-cultural differences; they use their understanding of how culture shapes cognition, motivation, and emotion to build theories that explain why, how, and when psychological processes manifest differently in diverse cultural contexts. Furthermore, these researchers reflect on how culture shapes their own assumptions and empirical decisions. They recognize that their culturally informed experiences may differ from the subjects',

and they use methodologies that capture psychological processes as they occur for the populations being studied.

As an example, throughout the 1980s and 1990s Western psychology largely viewed self-esteem as beneficial for well-being (40). Cross-cultural research, however, demonstrated that East Asian samples showed lower self-esteem and higher self-criticism than Western samples (10). Without interpretive power, Western researchers might conclude that these differences represent an objective reality and assume East Asians feel badly about themselves. However, as Heine et al. (41) argued, this conclusion is misguided because it overlooks cultural differences in how the self is defined and which factors are important to well-being. While self-esteem is beneficial in Western contexts, where cultural norms encourage differentiation and individuation, it is often less so in Eastern contexts, where cultural norms encourage fitting in and maintaining social harmony (4). When researchers fail to recognize such cultural differences, they often use measures that reflect culturally incongruent psychological experiences (e.g., individualistic measures of self-esteem) and thus generate misunderstandings of entire groups of people (41).

While differences in psychological processes are easier to see when the overarching cultural context (e.g., East vs. West) differs, the consequences of overlooking culture are often greater when differences lie between cultural subgroups, particularly when one group is viewed as normative. The emphasis on self-esteem in US education provides one such example. Because research linked self-esteem with positive life outcomes, educators focused on building students' self-esteem, assuming these efforts would improve performance, particularly among racial minority and low-income students. However, the research did not demonstrate causality or question the extent to which findings generalized beyond predominantly white, middle-class samples. In fact, later work suggested that many efforts to boost self-esteem did not improve academic outcomes for many students and that positive effects of self-esteem interventions were likely limited to white students (42–44). Thus, in working to improve minority and low-income students' outcomes, teachers who focused on self-esteem often used ineffective, culturally incongruent methods. At the same time, they inadvertently located the cause of educational disparities within racial minority and low-income students themselves (i.e., their lack of self-esteem) rather than in the systemic disadvantages these students face.

In these examples, a lack of interpretive power undermined psychologists' understanding of psychological phenomena and led to the application of psychological research with little knowledge of how this work would affect the intended beneficiaries. Had researchers attended to culture, however, these problems could have been prevented. When psychologists leverage interpretive power, they can use cultural differences to build theories that explain a greater range of phenomena with greater nuance. For example, they can describe how social structures, norms, and relationships shape how self-esteem is conceptualized and expressed both within and between populations and what effect, if any, self-esteem has on well-being for different individuals in different contexts. These insights improve our understanding of diverse groups and result in more effective interventions. In the following sections, we discuss three characteristics of psychological science that lacks interpretive power and illustrate how attending to culture renders a more accurate and complete understanding of psychological processes. Unless otherwise specified, we focus on psychological science conducted in WEIRD settings by WEIRD researchers and published in the most selective journals, as this research represents a place in which interpretive power is particularly relevant but often lacking.

Characteristic #1: WEIRD Ways of Being Are Normalized and Overgeneralized

Research that lacks interpretive power often recruits culturally narrow samples and draws overgeneralized conclusions about

psychological processes based on culturally specific findings. In psychological science, the great majority of research is conducted in WEIRD contexts, with limited attention to the fact that the majority of participants are WEIRD (2). While this work provides a wealth of information about WEIRD psychological processes, psychologists know very little about the extent to which these findings generalize. Due to the assumption of homogeneity of psychological processes across people (i.e., the same behaviors reflect the same processes for all people), psychologists often presuppose that processes documented among WEIRD people are normative and thus do not think to explore variations in these processes among non-WEIRD populations or do not believe such investigations are necessary (2, 20, 27, 45).

For example, for decades psychologists studied attributional processes almost exclusively with WEIRD samples. One of the key theories in this area regards the fundamental attribution error (FAE), the tendency to attribute causes of behavior to individuals' dispositions and to discount situational influences (46–50). The FAE appeared robust in US samples, but rather than examining whether all cultures exhibit FAE, psychologists went on to document the cognitive processes that give rise to this phenomenon (e.g., refs. 47, 49, 51, and 52) among WEIRD samples, thus implicitly supporting the view that the phenomenon is universal. However, psychology's understanding of the FAE was revolutionized when research included non-WEIRD samples.

Miller (53) demonstrated that the FAE does not occur to the same extent in all cultural contexts: Middle-class American subjects made more dispositional attributions and fewer situational attributions than middle-class Hindu Indian subjects. Miller hypothesized that differences in cultural meaning systems explained FAE variation: While Western cultures promote an individualistic view of the person, Eastern cultures promote a holistic view that considers both the person and situation. Thus, in the West, dispositional attributions are culturally congruent, while in the East, situational attributions are culturally congruent. Furthermore, Miller demonstrated that even within a given cultural context attributional tendencies vary according to individuals' exposure to different cultural meaning systems. Lower-class Anglo-Indian subjects, who had more exposure to Western cultural norms, made more dispositional attributions than did lower- or middle-class Hindu Indian subjects, who had less exposure to Western cultural norms. These findings challenged decades of research that largely failed to consider how culture shapes attributional processes. A PsycInfo (www.apa.org/pubs/databases/psycinfo/index.aspx) search for the terms “fundamental attribution error,” “correspondence bias,” or “attribution” reveals 5,120 papers published between 1965 and 1984, when Miller's work was published. These papers provide a deep knowledge, not of a fundamental human process, but of a culturally specific process. Later research (54–60) replicated and extended Miller's finding, advancing psychology's understanding of attributions and of how culture shapes meaning making.

As this example demonstrates, decentering WEIRD ways of being by considering non-WEIRD findings as valid and important in their own right can build psychology's interpretive power. This practice allows researchers to expand theories by documenting variations in how psychological phenomena manifest in different cultural contexts and explaining why these variations occur. However, given the discrepancy in knowledge of WEIRD compared with non-WEIRD groups, cross-cultural comparisons must be executed with caution. Findings that do not hold across cultures—weighted against the larger WEIRD knowledge base—can perpetuate deficit perspectives of non-WEIRD people (61). For example, Hilliard (33) argued that the misuse of culturally biased IQ tests leads to the inaccurate conclusion that African Americans are less intelligent than whites. Hilliard offered guidelines for understanding how and when cultural comparisons are appropriate in psychological science. Merely making cross-cultural comparisons without a deeper understanding of how culture shapes

individuals and how culture guides researchers' assumptions can perpetuate beliefs about cultural superiority rather than improving psychological theories.

Psychological science that lacks interpretive power normalizes WEIRD ways of being and produces inaccurate conclusions about human functioning (see ref. 62). When research focuses on certain populations while overlooking others, it renders an incomplete understanding of psychological processes on a broad scale. Building interpretive power requires recognizing the need to understand diverse cultural experiences in research to build more comprehensive psychological theories.

Characteristic #2: Non-WEIRD Ways of Being Are Rendered Invisible

A second characteristic of psychological research lacking interpretive power is that it overlooks psychological processes occurring in non-WEIRD contexts and thus renders non-WEIRD people and processes invisible. Psychologists often dismiss non-WEIRD data as outliers and consider research with non-WEIRD populations "applied," "niche," or "culturally specific." For example, there are outlets specific to non-WEIRD populations (e.g., the *Journal of Black Psychology*) but no WEIRD-specific outlets. Compared with general outlets, non-WEIRD outlets are often regarded as less prestigious and have lower scientific impact. Furthermore, when researchers study non-WEIRD groups to which they belong, their work is often criticized as politically motivated "me-search" or "advocacy," while WEIRD researchers studying WEIRD populations do not face these criticisms. These norms make it difficult to publish non-WEIRD research and ultimately deter psychologists from studying non-WEIRD processes. Indeed, psychologists studying non-WEIRD populations (e.g., racial/ethnic minorities) argue that psychology's norms and practices preclude inclusion and understanding of non-WEIRD groups (19–23). When top-tier journals do publish research with non-WEIRD samples, reporting norms often undermine the importance of these findings. For instance, many journals request or even require that research using non-WEIRD samples include a WEIRD comparison group, but non-WEIRD samples are rarely, if ever, requested for research reporting findings from WEIRD samples (63–65). This process continues to center theory and praxis around WEIRD processes.

Our own research offers an example of how one non-WEIRD group—Native Americans—remains invisible in social psychology. While 5.4 million US citizens identify as Native American/American Indian/Alaska Native, alone or in combination with another race (66), Native Americans are vastly underrepresented in the psychological literature. Fryberg and Eason (67) found that less than 0.5% of ~40,000 papers about prejudice, stereotyping, stigma, or intergroup relations mentioned Native Americans, and only 0.2% included Native American subjects. Although Native Americans face disparate outcomes due to prejudice and discrimination, research on these phenomena has paid virtually no attention to Native Americans. Furthermore, much of the literature on prejudice and discrimination focuses on black–white relations, but these findings do not always generalize to groups such as Native Americans, whose histories and relationships with whites differ (68). Failing to include Native Americans in research not only renders Native Americans and their disparate outcomes invisible but also implies that the black/white dichotomy is representative of all types of bias and/or that the forms of bias and discrimination that Native Americans face are not as important to understand as the forms faced by other groups.

Responses to our research with Native Americans similarly suggest that many psychologists are resistant to research that focuses on non-WEIRD groups. Reviewers at top-tier journals, including the *Journal of Personality and Social Psychology* and *Social Psychology Quarterly*, have commented, "What can we learn from Natives?," "How do we know that Native Americans are

simply not less intelligent than whites?," and "Because this research was conducted on a reservation, it doesn't involve true random assignment." The first comment suggests that non-WEIRD research does not contribute to psychology's understanding of human behavior, while the second illustrates a lack of interpretive power, and the third, a failure to appreciate the value of research in non-WEIRD samples for enhancing our understanding of human behavior (33). While all research involves limitations, such resistance suggests that many members of the scientific community do not believe that research with small or hard-to-reach groups is informative.

Rendering non-WEIRD populations invisible in research also perpetuates these groups' underrepresentation among researchers. Indeed, in 2016, only 1% of associate professors, 1% of undergraduates, and no full professors or graduate student members of the Society for Personality and Social Psychology identified as American Indian or Alaska Native (69). Seeing that non-WEIRD groups are largely excluded from research may imply that psychology does not value non-WEIRD perspectives and may prevent people from these backgrounds—who are crucial to expanding psychological science (22, 64)—from entering or persisting in the field.

The invisibility of non-WEIRD populations also leaves gaps in the field's understanding of diverse cultural contexts, processes, and people and limits understanding of human functioning as a whole. Rather than building an understanding of psychological processes that includes WEIRD samples as one of many types of samples, psychology has largely built an understanding of WEIRD psychological processes and behaviors under the guise of understanding general human behavior. While our example focuses on Native Americans, many non-WEIRD groups remain underrepresented in research, including transgender people, people living with disabilities or chronic illness, people who have experienced adversity, veterans, working-class and poor people, and many more. All of these populations have something to contribute to psychological research, and all stand to benefit from a better understanding of the issues they face.

Characteristic #3: Misapplication of WEIRD Findings in Non-WEIRD Contexts

When psychologists overlook how culture shapes key psychological processes, they at best develop ineffective interventions for problems in non-WEIRD contexts. At worst, they implement culturally inappropriate treatments that exacerbate negative outcomes among non-WEIRD populations (20, 25, 45). Indeed, psychologists working internationally caution against exporting Western ideas and methods to non-Western contexts (28, 70–75). Watters' *Crazy Like Us: The Globalisation of the American Psyche* (76) provides a vivid illustration of the dangers involved. Watters documented how Western countries dominate the study and treatment of mental illness and export Western treatments to contexts in which people's understanding of and responses to adversity differ. The result is a rise in mental illness among the intended beneficiaries of treatment. Thus, a lack of interpretive power—particularly the failure to question whether WEIRD findings generalize and how cultural factors shape treatment efficacy—harms people psychology intends to help.

On the other hand, research on education and social class illustrates the importance of attending to culture and including non-WEIRD samples to avoid ineffective or detrimental interventions. Stephens et al. (77) found that well-meaning but culturally incongruent messages from universities undermine working-class students' academic success. Initial studies demonstrated that universities promote independent motives for attending college, and students who endorse these motives perform better academically (i.e., achieve higher grade-point averages), while students who endorse interdependent motives perform less well. Importantly, working-class students, who often struggle in college, endorse interdependent motives more strongly than middle-class students,

suggesting that the discrepancy between working-class students' motives and university motives contributes to social class disparities in performance. Without interpretive power, researchers might conclude that working-class students' motives are the problem.

However, Stephens et al. leveraged an understanding of how cultural contexts, specifically culturally incongruent contexts, shape academic performance to understand why social class disparities in performance emerge. In one study, students read a university's welcome letter that included either independent or interdependent values endorsed by the university. When participants read the independent letter, working-class students performed worse than middle-class students on a subsequent academic task. However, when students read the interdependent letter, working-class students performed as well as middle-class students. By focusing on the relationship between individuals and cultural contexts, the research demonstrated that the problem was not with working-class students' motives (i.e., a deficit perspective) but was with universities' failure to acknowledge or legitimate these motives.

Recent work has built on these findings, searching for ways to alleviate non-WEIRD students' anxiety and underperformance in educational contexts (78–81), arguing for culturally grounded (vs. one-size-fits-all) educational interventions (82), and creating interdependent school cultures to improve non-WEIRD students' outcomes (83). This work provides a starting point for understanding how cultural factors such as race and social class interact with contextual factors to shape students' outcomes. Future research can further cultivate interpretive power by exploring how multiple sociocultural factors interact to differentiate educational outcomes both within and between diverse populations. Understanding how culture shapes experiences and behavior and making non-WEIRD populations visible in research—in other words, leveraging interpretive power—allows researchers to create more effective interventions.

Moving Forward: Building Interpretive Power by Changing Scientific Practices

As the examples above suggest, including diverse groups in psychological research is a necessary but not sufficient condition to improve psychological science. Greater sampling diversity provides opportunities to learn how culture, social structures, interactions, and individual experiences shape psychological processes. However, using this understanding to improve psychological science requires changing scientific practices and assumptions that undermine attention to culture. In the remainder of this paper, we use the culture-cycle framework (Fig. 1) (5) to illustrate how the scientific community can achieve this change. According to this framework, cultural ideas give rise to the norms, assumptions, and practices that shape processes at all levels of culture. Ideas include beliefs about what is right, good, or moral and offer scripts for acceptable behavior. In psychological science, cultural ideas consist of beliefs about which questions, methodologies, and practices represent “good” science. Institutions reflect and foster these cultural ideas. For example, scientific institutions (e.g., professional organizations, journals, funders, universities) provide professional standards rooted in cultural ideas about what constitutes good science that determine who/what gets funded, published, and tenured (84, 85). These standards set the stage for interactions within the scientific community and between scientific and lay communities. Ideas about which subjects and practices are valuable or normative determine how scientists conduct their research and which people feel welcome to participate (22). Finally, individual psychologists' beliefs, attitudes, and behaviors are shaped by the ideas, practices, and norms handed down through all levels of the culture cycle. “Successful” psychologists are those who conduct research in ways that align with the dominant cultural ideas and practices.

The culture-cycle framework provides a helpful guide for building psychology's interpretive power by ensuring that all relevant

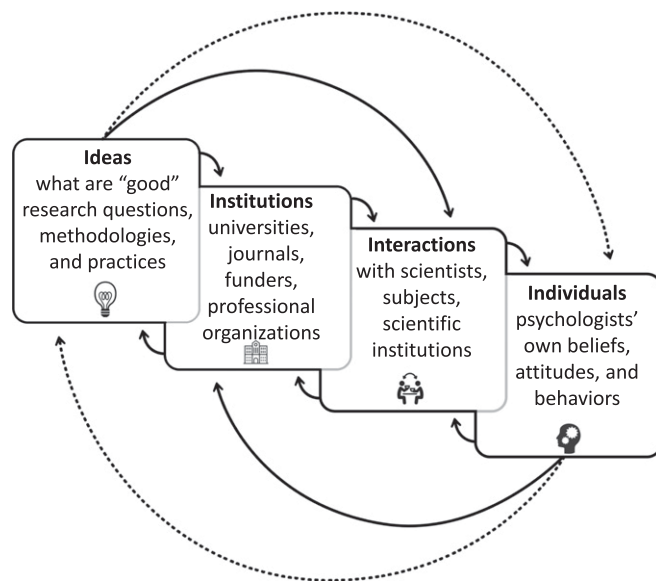


Fig. 1. Culture cycle of psychological science. Adapted from ref. 12. Ideas about “good science” shape practices that occur within scientific institutions, in interactions between individuals and the scientific community, and among individual psychologists. Psychology can cultivate interpretive power by promoting the idea that culture is an important influence throughout all levels of the culture cycle.

processes, from intraindividual to interpersonal to institutional/societal, are given sufficient attention. These processes mutually reinforce one another to create sustainable cultural change. A culture-cycle approach also explains why psychology often lacks interpretive power. If, for example, psychological science views WEIRD populations as normative, then, over time, all levels of the culture cycle reinforce this idea and convey that studying non-WEIRD populations confers little benefit. Publications, grants, and tenure decisions favor WEIRD research, which is easier and faster to publish, and the notion that WEIRD findings are generalizable goes unquestioned. These norms create uncertainty about why researchers, especially pretenure, would choose to study non-WEIRD populations. To interrupt this process and create change in psychological science, psychologists can replace problematic cultural ideas with ideas that promote attention to and understanding of culture. Psychologists can also make an effort to understand cultural influences in their research, and scientific institutions can implement policies and practices that support and encourage these efforts. While we cannot speak to all the factors that limit psychology's interpretive power, the next section illustrates how accounting for culture in research questions, design, and analysis/interpretation renders a more complete understanding of human behavior.

Culture-Conscious Research Questions. To exercise interpretive power in developing research questions, psychology can begin by abandoning the notion that any one group or context demonstrates normative or generalizable psychological processes. The field can instead affirm that culture plays a critical role in shaping human experiences (including WEIRD experiences) and is an essential component of developing an accurate view of human functioning. This culture-consciousness challenges existing ideas about what represents good psychological science by acknowledging that (i) WEIRD findings are culturally specific; (ii) WEIRD findings are not more representative of human nature than non-WEIRD findings; and (iii) non-WEIRD research enhances understanding of human nature in meaningful and legitimate ways.

Scientific institutions have the power to change research questions by setting standards that encourage psychologists to consider

how culture shapes the processes they study. Journals can highlight research that includes non-WEIRD groups and make space for reexaminations of WEIRD findings with non-WEIRD samples. They can also require researchers to specify the cultural contexts to which they expect findings to generalize [e.g., freshmen psychology students at large, public universities (27)]. In tandem, universities can support non-WEIRD research by adjusting tenure standards for scientists whose research progresses more slowly because it focuses on non-WEIRD populations (20, 22, 86). Professional organizations can recognize and reward non-WEIRD research as being equally important as WEIRD research. Most importantly, scientific institutions can intentionally include diverse people as members, leaders, and decision makers so that institutional standards and rules reflect a variety of perspectives (see ref. 24).

By attributing equal importance to WEIRD and non-WEIRD research, these institutional standards will set the stage for positive interactions among psychologists that enhance understanding of culture. For example, as the field promotes attention to culture and exploration of non-WEIRD processes, psychologists may embrace cumulative science practices (e.g., data sharing, cross-laboratory collaboration) that allow them to explore questions about culture that are difficult or impossible to explore individually and to compare diverse non-WEIRD samples with one another rather than with WEIRD samples. Certain subfields of psychology that struggle with small sample sizes already embrace cumulative research practices (87), providing a model for the field as a whole to cultivate a deeper understanding of culture through collaboration.

As psychology places greater importance on understanding and including diverse perspectives, interactions between scientists and non-WEIRD populations are also a critical point of change. Historically, these interactions were characterized by distrust, as some scientists mistreated, misunderstood, or ignored non-WEIRD populations (33). Researchers can connect with historically marginalized populations, reserving judgment, and working with these communities to learn about the issues that are important to them (86). Rather than entering non-WEIRD communities as outsiders, researchers might engage community partners who can identify and correct misassumptions. These relationships create avenues for developing culturally informed research questions and improve psychology's understanding of and ability to help diverse populations (73).

With the support of scientific institutions and their peers in the scientific community, individual psychologists can cultivate interpretive power and develop culture-conscious research questions by seeking input from diverse interdisciplinary scholars. For example, some psychologists have advocated for intersectional research that considers how multiple social identities shape individuals' experiences (88–92). These discussions provide a framework for building research questions that explore how culture shapes psychological processes. Psychologists can also consult experts in other disciplines to learn about diverse sociopolitical and historical contexts and integrate this information into their research questions. Similarly, collaborating with diverse people elucidates otherwise invisible cultural assumptions. For example, Markus and Kitayama (4) developed their influential theory of culture by interrogating their own cultural experiences to generate and test hypotheses about various psychological consequences of culturally shaped models of self. These practices produce research questions that leverage interpretive power, but they require institutions and individuals to work together to enhance their understanding of and attention to culture.

Culture-Conscious Research Design. Given the tendency to overlook culture when developing research questions, it is not surprising that the prevailing ideas about what constitutes good research design also exacerbate, albeit unintentionally, psychology's lack of interpretive power. In particular, valuing hypothesis testing over hypothesis generation plays a significant role. Hypothesis testing is the gold standard in psychological science, and nearly

all published research involves hypothesis testing (74, 75, 93–96). However, new hypotheses are often based on researchers' intuition, which is informed by their personal experiences. Even theory-derived hypotheses reflect the experiences of theory originators. This approach is not intrinsically problematic, but when a majority of researchers come from WEIRD cultures, the majority of hypotheses tested reflect only WEIRD psychological processes. Researcher diversification will reduce this bias, but such changes take time. In the meantime, psychology can ameliorate this problem by conferring greater value on hypothesis-generating research that expands understanding of cultural experiences with which researchers are unfamiliar. For example, ethnographic observations, focus groups, case studies, content analyses, and archival analyses provide immense information about non-WEIRD groups. To cultivate interpretive power, the field should value such methodologies as expanding knowledge about understudied groups and contexts.

Thus, we recommend that scientific institutions make space for a wider range of data. Journals can incentivize research with understudied populations and be more accepting of non-WEIRD findings that seem to defy theories built with predominantly WEIRD samples. As long as it is clear that findings are not due to chance and authors refrain from overgeneralizing, the size of the population to which the finding applies should not affect the publishing decision. The goal is not to claim that people, or even certain groups of people, generally do X when Y but to provide an existence proof (i.e., some people predictably do X when Y). Journals can also develop mechanisms for sharing such findings without increasing false positives, for example, by clearly specifying the subpopulation to whom the results likely apply and creating infrastructure for systematically accumulating findings with small and difficult-to-reach populations (e.g., ref. 97). Making such findings available will encourage further research into factors that distinguish these populations, which we predict will often involve culture. Funding agencies might also increase access to non-WEIRD populations by creating non-WEIRD research grants and financing pilot studies that allow researchers to develop and validate measures for use with non-WEIRD populations. These efforts not only improve psychology's understanding of diverse cultural contexts but also pave the way for research predicated on a more substantive understanding of relevant cultural processes. It is a simple but significant shift to view hypothesis-generating work with understudied populations as being on the forefront of knowledge.

As psychologists work to design projects that offer a better understanding of diverse cultural experiences and processes, their interactions with other scientists will also help expand their methodological repertoires. Certain psychology subfields make extensive use of information-rich methodologies (e.g., case studies and focus groups) to glean new, potentially generalizable information from small samples. Newer methodologies, such as the highly repeated within-person design for quantitative idiography (98), also generate much more information, sensitive enough to detect the presence of a subgroup of participants for whom the effects observed at the group level do not apply, or are in the opposite direction. For example, rather than the usual conclusion that a certain situational variable had a statistically significant effect for participants on average, the finding would be reported as follows: For the majority (X%) of the participants, the situational variable had a statistically significant within-person effect, but for a minority (Y%) of the participants, there was a statistically significant within-person effect of the same situational variable in the opposite direction. Rather than the findings that apply only to the minority of individuals being averaged out by the majority and thus becoming invisible, this methodology makes those findings recognizable to the researchers, possibly leading to discoveries of cultural influences for which there is little prior research. Thus, even within the field of psychology, there is a wealth of knowledge and experience to

help psychologists develop research that expands the understanding of diverse cultural contexts.

As individuals, psychologists can be vigilant in identifying over-generalizations that create misguided assumptions about the appropriateness of psychological measures and methodologies in diverse contexts. At the same time, psychologists can reflect on the values and assumptions of their own cultural contexts and consider how these cultural influences shape their empirical approach. Just as researchers conduct a priori statistical power analyses, so too could they conduct a priori interpretive power analyses to ensure that they have the necessary conceptual and methodological tools to accurately document psychological processes as they unfold in a particular cultural context.

Culture-Conscious Data Analysis and Interpretation. Many of the statistical analyses psychologists use to test hypotheses treat unexplained variations as noise and use these variations as a basis for estimating error variance. However, not all variations are noise. With new research designs that can differentiate meaningful individual-to-individual differences from noise (ref. 98), psychology can better account for culture in data analysis and interpretation by viewing variation not as noise but as potentially meaningful and informative.

Scientific institutions can encourage psychologists to attend to and explore cultural variations, even when data are collected in one cultural context, by adjusting standards for reporting findings. As the American Psychological Association Task Force on Statistical Inferences recommended (99), journals can require authors to report not just central tendencies but also variations, for example by plotting line or bar graphs over scatterplots or histograms of raw scores. Journals can also encourage researchers to identify outliers and report what is known about these participants that may explain their variation. While space in print journals is limited, such information could be included easily and inexpensively in online supplements. These changes not only force psychologists to contend with rather than ignore variation but also make this information accessible to researchers who can generate hypotheses about the cultural sources of that variation.

Because outliers are by definition a small minority of any particular dataset, researchers need to interact with one another and learn from each other's data. One laboratory may not have an explanation for all the variability in a given study, but others may have ideas that spark interlaboratory dialogue and lead to collaborative analyses (potentially of pooled data) and new studies including a greater diversity of participants. These interactions between scientists reduce the pressure to portray "flawless" data and reinforce the notion that quality data include variation. For example, variation may reflect sample diversity,

which is desirable in working to understand human behavior on a broad scale. Furthermore, such interactions encourage collaboration and meta-analyses to understand puzzling variations and build theories that account for these variations.

Even as individuals, psychologists can make a concerted effort to understand variation within their data via statistical modeling. In addition to scatterplots and histograms, graphics for examining the diversity of effects, such as spaghetti plots, illustrate the extent to which responses, associations, and effects vary across subjects. Programs such as *R* (100) offer customizable graphing functions, allowing researchers to plot data according to subject characteristics or to combine variables to produce 3D graphs, heat maps, and other sophisticated visual representations of data. These graphics offer a useful supplement to model fitting and null hypothesis significance testing to describe the true range of effects within studies and generate new hypotheses about when, how, and why culture shapes psychological processes.

Conclusion

When psychologists leverage interpretive power, they expand and improve psychological science. Building interpretive power requires understanding how culture, experience, and context shape both researchers' and subjects' perspectives, experiences, and behaviors. It requires understanding that people are products of their cultural environments just as their thoughts, attitudes, and behaviors shape and reinforce these environments (5). Rather than regarding differences as problematic or dismissing them as noise, psychologists with interpretive power view differences as generative and work to understand their causal influences.

By implementing culture-conscious practices throughout the culture cycle, psychological science can challenge WEIRD-centric ideas and norms that create inaccurate understandings of human behavior. As these practices take hold, psychologists as individuals and as a scientific community will cultivate interpretive power. We will no longer be confined to the questions, theories, samples, and methodologies that have impeded our understanding of diverse people and rendered our theories simultaneously incomplete and overreaching. Instead, we will be empowered to conduct research that better captures psychological processes and behaviors as they occur in many different cultural contexts. By consciously and explicitly attending to culture, we will build a science that better understands all human functioning.

ACKNOWLEDGMENTS. We thank Hazel Rose Markus, Douglas Medin, and Arianne Eason for feedback on early drafts of this paper. This research was supported by Raikes Foundation grants (to S.A.F.).

- McGuire WJ (1973) The yin and yang of progress in social psychology: Seven koan. *J Pers Soc Psychol* 26:446–456.
- Henrich J, Heine SJ, Norenzayan A (2010) The weirdest people in the world? *Behav Brain Sci* 33:61–83, discussion 83–135.
- Kroeber AL, Kluckhohn C (1952) *Culture: A Critical Review of Concepts and Definitions* (Peabody Museum, Cambridge, MA).
- Markus HR, Kitayama S (1991) Culture and the self: Implications for cognition, emotion, and motivation. *Psychol Rev* 98:224–253.
- Markus HR, Kitayama S (2010) Cultures and selves: A cycle of mutual constitution. *Perspect Psychol Sci* 5:420–430.
- Triandis HC (1989) The self and social behavior in differing cultural contexts. *Psychol Rev* 96:506–520.
- Markus HR, Hamedani MG (2007) Sociocultural psychology: The dynamic interdependence among self systems and social systems. *Handbook of Cultural Psychology*, eds Kitayama S, Cohen D (Guilford, New York), pp 3–39.
- Gelfand MJ (2012) Culture's constraints: International differences in the strength of social norms. *Curr Dir Psychol Sci* 21:420–424.
- Gelfand MJ, Jackson JC (2016) From one mind to many: The emerging science of cultural norms. *Curr Opin Psychol* 8:175–181.
- Lerner RM (2004) Diversity in individual-context relations as the basis for positive development across the life span: A developmental systems perspective for theory, research, and application (the 2004 Society for the Study of Human Development presidential address). *Res Hum Dev* 1:327–346.
- Rogoff B (2003) *The Cultural Nature of Human Development* (Oxford Univ Press, New York).
- Markus HR, Conner A (2013) *Clash: 8 Cultural Conflicts That Make Us Who We Are* (Penguin, New York).
- Cohen AB (2009) Many forms of culture. *Am Psychol* 64:194–204.
- Orellana MF, Bowman P (2003) Cultural diversity research on learning and development: Conceptual, methodological, and strategic considerations. *Educ Res* 32: 26–32.
- Benet-Martinez V, Leu J, Lee F, Morris MW (2002) Negotiating biculturalism: Cultural frame switching in biculturals with oppositional versus compatible cultural identities. *J Cross Cult Psychol* 33:492–516.
- Cheng C-Y, Lee F, Benet-Martinez V (2006) Assimilation and contrast effects in cultural frame switching: Bicultural identity integration and valence of cultural cues. *J Cross Cult Psychol* 37:742–760.
- Benet-Martinez V (2006) Biculturalism and cognitive complexity: Expertise in cultural representations. *J Cross Cult Psychol* 37:386–407.
- Shih M, Pittinsky TL, Ambady N (1999) Stereotype susceptibility: Identity salience and shifts in quantitative performance. *Psychol Sci* 10:80–83.
- Guthrie R (1976) *Even the Rat Was White: A Historical View of Psychology* (Harper & Row, New York), 1st Ed.
- Sue S (1999) Science, ethnicity, and bias: Where have we gone wrong? *Am Psychol* 54:1070–1077.
- Graham S (1992) Most of the subjects were white and middle class in selected APA journals, 1970–1989. *Am Psychol* 47:629–639.

22. Iwamasa GY, Smith SK (1996) Ethnic diversity in behavioral psychology: A review of the literature. *Behav Modif* 20:45–59.
23. Gannon L, Luchetta T, Rhodes K, Pardie L, Segrist D (1992) Sex bias in psychological research. Progress or complacency? *Am Psychol* 47:389–396.
24. Arnett JJ (2008) The neglected 95%: Why American psychology needs to become less American. *Am Psychol* 63:602–614.
25. Gergen KJ, Gulerce A, Lock A, Girishwar M (1996) Psychological science in cultural context. *Am Psychol* 51:496–503.
26. Gergen KJ (2001) Psychological science in a postmodern context. *Am Psychol* 56:803–813.
27. Simons DJ, Shoda Y, Lindsay DS (2017) Constraints on generality (COG): A proposed addition to all empirical papers. *Perspect Psychol Sci* 12:1123–1128.
28. Misra G, Gergen KJ (1993) On the place of culture in psychological science. *Int J Psychol* 28:225–243.
29. Milner HR (2007) Race, culture, and researcher positionality: Working through dangers seen, unseen, and unforeseen. *Educ Res* 36:388–400.
30. St. Louis K, Barton AC (2002) Tales from the science education crypt: A critical reflection of positionality, subjectivity, and reflexivity in research. *Forum Qual Soc Res* 3:19.
31. Bourke B (2014) Positionality: Reflecting on the research process. *Qual Rep* 19:1–9.
32. Carter C, Lapum JL, Lavalée LF, Martin LS (2014) Explicating positionality: A journey of dialogical and reflexive storytelling. *Int J Qual Methods* 13:362–376.
33. Hilliard AG, 3rd (1996) Either a paradigm shift or no mental measurement: The nonscience and the nonsense of The Bell Curve. *Cult Divers Ment Health* 2:1–20.
34. Ball DL, Cohen DK (1999) Developing practice, developing practitioners: Toward a practice-based theory of professional education. *Teaching as the Learning Profession: Handbook of Policy and Practice*, eds Sykes G, Darling-Hammond L (Jossey-Bass, San Francisco), pp 3–32.
35. Rosebery AS, Warren B, Tucker-Raymond E (2016) Developing interpretive power in science teaching. *J Res Sci Teach* 53:1571–1600.
36. Nickerson SD, Masarik DK (2010) Assessing teachers' developing interpretive power: Analysing student thinking. *Math Teach Educ Dev* 12:19–29.
37. Greenfield PM, Raef C, Quiroz B (1996) Cultural values in learning and education. *Closing the Achievement Gap: A Vision for Changing Beliefs and Practices*, ed Williams B (Association for Supervision and Curriculum Development, Alexandria, VA), pp 37–55.
38. Warren B, Rosebery A (2011) Navigating interculturality: African American male students and the science classroom. *J Afr Am Males Educ* 2:98–115.
39. Shoda Y, Wilson NL, Whitsett DD, Lee-Dussard J, Zayas V (2014) The person as a cognitive-affective processing system: From quantitative idiography to cumulative science. *Handbook of Personality Processes and Individual Differences*, eds Cooper ML, Larsen RJ (American Psychological Association, Washington, DC), pp 491–513.
40. Zeigler-Hill V (2013) *Self-Esteem* (Taylor and Francis, New York).
41. Heine SJ, Lehman DR, Markus HR, Kitayama S (1999) Is there a universal need for positive self-regard? *Psychol Rev* 106:766–794.
42. Baumeister RF, Campbell JD, Krueger JI, Vohs KD (2003) Does high self-esteem cause better performance, interpersonal success, happiness or healthier lifestyle? *Psychol Sci Public Interest* 4:1–44.
43. Baumeister RF, Campbell JD, Krueger JI, Vohs KD (2005) Exploding the self-esteem myth. *Sci Am* 292:70–77.
44. Eaton MJ, Dembo MH (1997) Differences in the motivational beliefs of Asian American and non-Asian students. *J Educ Psychol* 89:433–440.
45. Coyne JC (1994) Self-reported distress: Analog or ersatz depression? *Psychol Bull* 116: 29–45.
46. Gilbert DT, Malone PS (1995) The correspondence bias. *Psychol Bull* 117:21–38.
47. Heider F (1958) *The Psychology of Interpersonal Relations* (Wiley, New York).
48. Ichheiser G (1949) Misunderstandings in human relations: A study in false social perception. *Am J Sociol* 55(Suppl):1–70.
49. Jones EE, Nisbett RE (1972) *The Actor and the Observer: Divergent Perceptions of the Causes of Behavior*, Advances in Experimental Social Psychology, ed Berkowitz L (Academic, New York), pp 219–266.
50. Ross L (1977) The intuitive psychologist and his shortcomings: Distortions in the attribution process. *Adv Exp Soc Psychol* 10:173–220.
51. Kelly HH (1972) *Causal Schemata and the Attribution Process* (General Learning, New York).
52. Trope Y (1986) Identification and inferential processes in dispositional attribution. *Psychol Rev* 93:239–257.
53. Miller JG (1984) Culture and development of everyday social explanation. *J Pers Soc Psychol* 46:961–978.
54. Morris MW, Peng K (1994) Culture and cause: American and Chinese attributions for social and physical events. *J Pers Soc Psychol* 67:949–971.
55. Lee F, Hallahan M, Herzog T (1996) Explaining real-life events: How culture and domain shape attributions. *Pers Soc Psychol Bull* 22:732–741.
56. Morris MW, Menon T, Ames DR (2001) Culturally conferred conceptions of agency: A key to social perception of persons, groups, and other actors. *Pers Soc Psychol Rev* 5:169–182.
57. Choi I, Dalal R, Kim-Prieto C, Park H (2003) Culture and judgment of causal relevance. *J Pers Soc Psychol* 84:46–59.
58. Mason MF, Morris MW (2010) Culture, attribution and automaticity: A social cognitive neuroscience view. *Soc Cogn Affect Neurosci* 5:292–306.
59. Choi I, Nisbett RE, Norenzayan A (1999) Causal attribution across cultures: Variation and universality. *Psychol Bull* 125:47–63.
60. Kitayama S, Park H, Sevincer AT, Karasawa M, Uskul AK (2009) A cultural task analysis of implicit independence: Comparing North America, Western Europe, and East Asia. *J Pers Soc Psychol* 97:236–255.
61. Medin D, Bennis W, Chandler M (2010) Culture and the home-field disadvantage. *Perspect Psychol Sci* 5:708–713.
62. Medin D, Ojalehto B, Marin A, Bang M (2017) Systems of (non-)diversity. *Nat Hum Behav* 1:0088.
63. McLoyd VC, Randolph SM (1985) Secular trends in the study of Afro-American children: A review of child development, 1936–1980. *Monogr Soc Res Child Dev* 50:78–92.
64. Korchin SJ (1980) Clinical psychology and minority problems. *Am Psychol* 35:262–269.
65. ya Azibo DA (1988) Understanding the proper and improper usage of the comparative research framework. *J Black Psychol* 15:81–91.
66. US Census Bureau (2017) American Indian and Alaska Native Heritage Month: November 2015. Available at <https://www.census.gov/newsroom/facts-for-features/2015/cb15-ff22.html>. Accessed January 1, 2017.
67. Fryberg SA, Eason AE (2017) Making the invisible visible: Acts of commission and omission. *Curr Dir Psychol Sci* 26:554–559.
68. Duckitt JH (1992) Psychology and prejudice: A historical analysis and integrative framework. *Am Psychol* 47:1182–1193.
69. Society for Personality and Social Psychology (2017) SPSP member demographics. Available at spsp.org/membership/demographics. Accessed November 10, 2017.
70. Kâğıtçıbaşı Ç (1984) Socialization in traditional society: A challenge to psychology. *Int J Psychol* 19:145–157.
71. Sinha JBP (1984) Towards partnership for relevant research in the third world. *Int J Psychol* 19:169–177.
72. Eskell-Blokland LM (2009) Listening to oral traditions in a re-searching for praxis in a non-western context. *J Health Manag* 11:355–373.
73. Osafo J (2017) From cross-cultural to cultural thinking in psychological research and practice in Ghana. *Int J Cult Ment Health*, 10.1080/17542863.2017.1409780.
74. Dueck A, Ansoos J, Johnson A, Fort C (2017) Western cultural psychology of religion: Alternatives to ideology. *Pastoral Psychol* 66:397–425.
75. Marsella AJ (2009) Some reflections on potential abuses of psychology's knowledge and practices. *Psychol Stud (Mysore)* 54:23–27.
76. Watters E (2010) *Crazy Like Us: The Globalisation of the American Psyche* (Scribe, Carlton North, Australia).
77. Stephens NM, Fryberg SA, Markus HR, Johnson CS, Covarrubias R (2012) Unseen disadvantage: How American universities' focus on independence undermines the academic performance of first-generation college students. *J Pers Soc Psychol* 102:1178–1197.
78. Covarrubias R, Fryberg SA (2015) The impact of self-relevant representations on school belonging for Native American students. *Cult Divers Ethnic Minor Psychol* 21:10–18.
79. Covarrubias R, Herrmann SD, Fryberg SA (2016) Affirming the interdependent self: Implications for Latino student performance. *Basic Appl Soc Psych* 38:47–57.
80. Stephens NM, Hamedani MG, Destin M (2014) Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. *Psychol Sci* 25:943–953.
81. Stephens NM, Townsend SSM, Hamedani MG, Destin M, Manzo V (2015) A difference-education intervention equips first-generation college students to thrive in the face of stressful college situations. *Psychol Sci* 26:1556–1566.
82. Brady LM, Germano AL, Fryberg SA (2017) Leveraging cultural differences to promote educational equality. *Curr Opin Psychol* 18:79–83.
83. Fryberg S, Covarrubias R, Burack JA (2016) The ongoing psychological colonization of North American indigenous people: Using social psychological theories to promote social justice. *The Oxford Handbook of Social Psychology and Social Justice*, ed Hammack PL (Oxford Univ Press, Oxford).
84. Wachtel PL (1980) Investigation and its discontents: Some constraints on progress in psychological research. *Appl Prev Psychol* 33:399–408.
85. Kazdin AE (2007) Methodological diversity can augment progress in psychological research. *Appl Prev Psychol* 12:27–30.
86. Rowley SJ, Camacho TC (2015) Increasing diversity in cognitive developmental research: Issues and solutions. *J Cogn Dev* 16:683–692.
87. Yarkoni T, Poldrack RA, Van Essen DC, Wager TD (2010) Cognitive neuroscience 2.0: Building a cumulative science of human brain function. *Trends Cogn Sci* 14:489–496.
88. Remedios JD, Snyder SH (2015) Where do we go from here? Toward an inclusive and intersectional literature of multiple stigmatization. *Sex Roles* 73:408–413.
89. Remedios JD, Snyder SH (2015) How women of color detect and respond to multiple forms of prejudice. *Sex Roles* 73:371–383.
90. Mohr RI, Purdie-Vaughns V (2015) Diversity within women of color: Why experiences change felt stigma. *Sex Roles* 73:391–398.
91. Williams SL, Fredrick EG (2015) One size may not fit all: The need for a more inclusive and intersectional psychological science on stigma. *Sex Roles* 73:384–390.
92. Brannon TN, Higginbotham GD, Henderson K (2017) Class advantages and disadvantages are not so Black and White: Intersectionality impacts rank and selves. *Curr Opin Psychol* 18:117–122.
93. Papatthomas A, Lavalée D (2012) Eating disorders in sport: A call for methodological diversity. *Rev Psicol Deporte* 21:387–392.
94. Rosiek J (2003) A qualitative research methodology psychology can call its own: Dewey's call for qualitative experimentalism. *Educ Psychol* 38:165–175.
95. Munley PH, et al. (2002) Methodological diversity of research published in selected psychological journals in 1999. *Psychol Rep* 91:411–420.
96. Marsella AJ, Bubanoski J, Hamada WC, Morse H (2000) The measurement of personality across cultures—Historical, conceptual, and methodological issues and considerations. *Am Behav Sci* 44:41–62.
97. Chartier CR (February 12, 2018) BBBRRR: “Brick by brick” registered replication reports. Available at <https://christopherchartier.com/2018/02/12/bbbrrrr-brick-by-brick-registered-replication-reports/>. Accessed March 16, 2018.
98. Whitsett DD, Shoda Y (2014) An approach to test for individual differences in the effects of situations without using moderator variables. *J Exp Soc Psychol* 50:94–104.
99. Willkinson L (1999) Statistical methods in psychology journals. *Am Psychol* 54: 594–604.
100. R Core Team (2017) R: A language and environment for statistical computing. (R Foundation for Statistical Computing, Vienna).