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A Dual Inheritance Perspective on Cultural Bias, Psychological Science, and Human Diversity



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Abstract




Psychological science has become increasingly aware that its empirical foundation relies on samples drawn from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies. Accumulating evidence suggests that individuals from these contexts differ systematically from the majority of the world's population—and from the broader evolutionary history of *Homo sapiens*—across various psychological domains. Despite this recognition, the WEIRD problem is still often framed primarily as a methodological issue of sampling bias. In this article, we clarify and consolidate existing arguments by situating the WEIRD problem within a coherent explanatory framework that generates new theoretical insights into cultural and psychological variation accessible to both psychologists and anthropologists. Drawing on a Dual Inheritance perspective, we conceptualize psychological variation as the product of interacting genetic and cultural evolutionary processes, highlighting mechanisms such as social learning, norm transmission, and institutional reinforcement. From this perspective, cultural norms, institutions, and practices are not merely background variables but active mechanisms shaping cognition across historical time. WEIRD psychological patterns are therefore interpreted not as anomalies requiring statistical correction, but as culturally evolved configurations emerging from specific ecological, institutional, and historical conditions that systematically structure learning environments and behavioral tendencies. We review four interrelated challenges associated with the overreliance on WEIRD samples and reinterpret them through a cultural evolutionary framework: limited generalizability, cultural bias and ethnocentrism, insufficient attention to within-culture variation, and the absence of historical depth in psychological explanation. Integrating evidence from psychology, anthropology, archaeology, and cultural evolution, we show these challenges are mutually reinforcing rather than independent. Finally, we outline theoretically grounded strategies for improving psychological research, emphasizing interdisciplinary collaboration, attention to underrepresented populations, and methodological pluralism.


Keywords

WEIRD problem · culture · diversity · Dual Inheritance Theory · sampling bias · psychological science



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Introduction: Deciphering the WEIRD Phenomenon

Psychological science has long relied on empirical evidence generated from a narrow segment of the global population. A substantial proportion of psychological research has been conducted with participants drawn from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies, often relying on undergraduate students from American universities (Arnett, 2008; Henrich et al., 2010). This sampling pattern has raised sustained concerns regarding the representativeness and generalizability of psychological findings. However, these concerns are often framed primarily as issues of sampling bias, leaving their broader theoretical implications underdeveloped. Individuals living in WEIRD societies differ systematically from most of the world's population—and from the broader evolutionary history of *Homo sapiens*—across a wide range of cognitive, emotional, and social domains (Henrich, 2020).

The recognition of this imbalance has led to a growing body of research documenting how psychological mechanisms observed in WEIRD populations diverge from those observed in small-scale, non-Western, or historically traditional societies. These differences have been reported in domains such as self-construal, moral judgment, cognitive style, emotional experience, and social reasoning (Barrett et al., 2016; Chua et al., 2005; Ma & Schoeneman, 1997; Wallbott & Scherer, 1995). As a result, the WEIRD problem is now widely acknowledged within the field of psychological science. However, despite this growing awareness, research practices remain largely unchanged, with the majority of studies continuing to rely on WEIRD samples (Rad et al., 2018; Thalmayer et al., 2021).

Importantly, the WEIRD problem is often framed as a methodological limitation—an issue of biased sampling that can be addressed by collecting data from more diverse populations. While this diagnosis is accurate, it is incomplete. Treating WEIRDness solely as a sampling artifact risks obscuring a deeper explanatory issue: the tendency to interpret psychological patterns emerging from historically specific cultural contexts as reflecting universal features of the human mind. When findings derived from societies exhibiting high WEIRDness are implicitly treated as normative or species-typical, psychological theory risks conflating culturally evolved cognitive patterns with general human capacities (Henrich, 2015, 2020).

In this article, we argue that the WEIRD problem is best understood not only as a methodological concern but also as a theoretical challenge concerning the relationship between cognition, culture, and history. Psychological mechanisms do not operate in a cultural vacuum. Rather, they are shaped, stabilized, and expressed within social environments that differ systematically across time and place. Cultural norms, institutions, subsistence strategies, and ecological pressures create structured environments in which certain cognitive tendencies are reinforced while others are deemphasized. Consequently, psychological variation across societies reflects not random noise around a universal mean, but patterned differences rooted in long-term cultural and historical processes (Muthukrishna et al., 2021).

Earlier approaches in psychological science have often treated culture as a contextual variable that influences otherwise universal cognitive processes or have focused primarily on identifying cross-cultural differences without explaining how these differences emerge. In contrast, Dual Inheritance Theory conceptualizes culture as an active system of inheritance, emphasizing the processes through which norms, practices, and institutions are transmitted and stabilized over time. This shift allows psychological variation to be understood not merely as a descriptive difference, but as the outcome of identifiable cultural evolutionary processes. To clarify this point, the present article adopts a Dual Inheritance perspective, which conceptualizes human behavior as the product of interacting genetic and cultural evolutionary processes (Henrich, 2020; Muthukrishna, 2023). From this standpoint, culture is not merely a contextual variable that moderates psychological processes; it is an active system of inheritance that transmits norms, practices, and institutions across generations (Boyd & Richerson, 1985). These cultural elements generate selection pressures through processes such as social learning, norm transmission, and institutional reinforcement, shaping how cognitive

capacities develop, how social behavior is regulated, and how moral judgments are formed. Importantly, this perspective does not deny the existence of broadly shared psychological capacities. Instead, it emphasizes that the expression, prioritization, and functional role of these capacities vary systematically across cultural environments (Henrich, 2020).

Although Dual Inheritance Theory encompasses both genetic and cultural evolutionary processes, the present paper focuses primarily on cultural and institutional dynamics, which are most directly relevant for explaining variation in WEIRD psychological patterns. At the same time, the genetic component of the framework remains important because it provides the evolved cognitive and motivational mechanisms that support social learning, norm internalization, imitation, cooperation, language, and cultural transmission. From this perspective, cultural variation does not emerge independently of human biology, but through the interaction between evolved learning capacities and historically transmitted cultural environments.

Within this framework, WEIRD psychology can be understood as the outcome of a distinctive cultural evolutionary trajectory rather than as a universal benchmark. Historical developments, including the weakening of kinship ties, the rise of impersonal markets, formal legal systems, mass education, and transformations in religion and institutions, have contributed to a cultural environment that emphasizes individual autonomy, analytic reasoning, intention-based moral judgment, and cooperation among strangers (Henrich, 2020). These features are not arbitrary; they reflect adaptive responses to specific social and institutional conditions. These institutional features shape the learning environments in which individuals acquire norms and behaviors. Through repeated social interactions, exposure to formalized rules, and participation in structured educational systems, individuals internalize patterns of reasoning and social expectations that are reinforced across generations (Henrich, 2015; Henrich, 2020). However, they are also historically contingent and unevenly distributed across human societies (Muthukrishna et al., 2021).

Recognizing this contingency has important implications for how psychological findings are interpreted. Differences between WEIRD and non-WEIRD populations should not be understood as deviations from a cognitive norm, nor as deficits relative to an implicit standard. Instead, they should be examined as alternative configurations of shared cognitive capacities shaped by different cultural and ecological pressures. From a Dual Inheritance perspective, cultural variation becomes a source of explanatory insight rather than a threat to theoretical coherence.

The goals of the present article are integrative, conceptual and theory-driven. Rather than proposing a new model of culture or cognition, the article seeks to systematize existing critiques of WEIRD psychology by embedding them within a coherent explanatory framework that bridges the fields of psychology and anthropology. Specifically, the paper reviews four interrelated challenges associated with overreliance on WEIRD samples: limited generalizability, cultural bias and ethnocentrism, insufficient attention to variation within cultures, and the lack of historical depth in psychological explanation. These challenges are treated not as isolated methodological issues, but as mutually reinforcing consequences of studying human psychology without adequate attention to cultural evolutionary processes. In particular, the present article advances a conceptual reframing of the WEIRD problem by showing how a Dual Inheritance perspective reorganizes existing critiques, identifies underlying cultural evolutionary mechanisms, and generates new implications for understanding psychological variation across societies.

By synthesizing evidence from psychology, anthropology, archaeology, and cultural evolution, the article aims to clarify why WEIRD populations appear psychologically distinctive, why these distinctions matter for theory building, and how psychological research can move toward a more context-sensitive and historically informed understanding of human behavior. In doing so, it seeks to contribute to ongoing interdisciplinary efforts to develop a psychology that is not only empirically broader but also theoretically better aligned with the diversity of human cultural experience. This perspective differs from earlier approaches by linking psychological outcomes to specific processes of cultural transmission and selection, rather than treating culture as a static background variable. Unlike earlier perspectives that emphasized either universal cognition or surface-level cultural differences, a Dual Inheritance approach provides a framework for explaining how such differences emerge and persist over time.

The WEIRD Problem Reconsidered

The overrepresentation of WEIRD populations in psychological research has implications that extend beyond issues of sampling bias. When psychological mechanisms are inferred primarily from a narrow set of cultural contexts, theoretical models risk being calibrated to historically and culturally specific environments. This section reviews four interrelated challenges arising from overreliance on WEIRD samples: limited generalizability, cultural bias and ethnocentrism, insufficient attention to variation within cultures, and the lack of historical perspective. Rather than treating these challenges as independent concerns, this section approaches them as mutually reinforcing consequences of neglecting the cultural and historical conditions that shape psychological processes. Furthermore, each of these challenges is reconsidered through the lens of Dual Inheritance Theory, with particular attention to the cultural transmission processes that shape psychological variation.

Limited Generalizability

Psychological research has long relied on empirical evidence drawn predominantly from Western societies. Estimates indicate that approximately 96% of psychological studies are based on Western samples, despite these populations representing a small fraction of the global population (Arnett, 2008; Henrich et al., 2010). As a result, the psychological experiences of Africans, Asians, Latin Americans, Muslims, and contemporary hunter-gatherer populations have been largely underrepresented in the literature. This imbalance poses a fundamental challenge to the generalizability of psychological findings.

Western societies have been shaped by distinctive social, economic, and institutional conditions that differ markedly from those experienced in many non-WEIRD contexts (Henrich, 2020). In agricultural societies, for example, subsistence activities require close coordination among kin, with families collectively managing land, labor, and resources to ensure survival (Wolf, 1966). Similar patterns are observed in foraging societies, where hunting and gathering activities are embedded within small, tightly knit social groups, and food is distributed according to established norms of sharing and reciprocity (Shearn, 2020). In such environments, cooperation with strangers or the accumulation of surplus resources plays a limited role in everyday life.

In contrast, WEIRD societies emerged through processes such as industrialization, urbanization, and the formalization of economic and legal institutions. These transformations weakened kin-based social organization and increased reliance on impersonal cooperation, markets, and abstract rules. As a result, cultural environments in WEIRD societies tend to reward individual autonomy, mobility, and the ability to coordinate with unfamiliar others. Although globalization and technological change have contributed to the spread of some WEIRD characteristics worldwide, many societies remain more collectivistic and are shaped by distinct religious traditions, historical experiences, and conflict histories.

Empirical research demonstrates that such differences are associated with systematic psychological variation. Societies historically exposed to ecological threats such as famine, disease, and pathogen prevalence tend to exhibit higher levels of social conservatism and collectivism (Fincher et al., 2008; Inbar et al., 2009). Additional contrasts between WEIRD and non-WEIRD populations have been documented in attention to intentions, dominant emotional experiences, and cognitive styles (Henrich, 2020). These findings suggest that psychological mechanisms observed in WEIRD contexts cannot be assumed to generalize to populations living under different cultural and ecological conditions. Consequently, research restricted to WEIRD samples provides a limited basis for understanding human psychology as a whole.

From a Dual Inheritance perspective, this limitation reflects the fact that psychological findings derived from WEIRD populations are shaped by specific cultural transmission processes and institutional environments. As a result, these findings capture patterns that are locally reinforced through social learning and may not generalize populations embedded in different cultural evolutionary contexts.



Cultural Bias and Ethnocentrism

Cultural bias and ethnocentrism arise when researchers implicitly assume that the norms and values of their own culture are universal standards. Historically, such biases were reinforced by racial typologies that conflated biological variation with cultural hierarchy. In earlier classifications, human populations were grouped into racial categories such as Europeans, Africans, Asians, and Americans, with these categories often assigned both biological and moral attributes (Gould, 1981; Montagu, 1997). Europeans and Americans were frequently described using positive descriptors, whereas other groups were characterized in ways that suggested inferiority or backwardness.

Contemporary anthropology rejects these typologies, emphasizing that race is a social rather than a biological category and that biological variation reflects adaptation to different environmental pressures rather than discrete racial divisions (Lewontin, 1972; Wagner et al., 2016). Cultures, similarly, emerge from specific historical, ecological, and social conditions, and individuals within any given culture exhibit substantial heterogeneity. From this perspective, culture can be understood as a repertoire of solutions to recurrent problems faced by groups across time. Because these problems vary across environments and historical contexts, cultural practices cannot be meaningfully ranked along a single hierarchy.

Overreliance on WEIRD samples exacerbates ethnocentric tendencies by positioning WEIRD cultures as the implicit default. Psychological differences observed in non-WEIRD populations are then interpreted as deviations from a presumed norm rather than as outcomes of distinct cultural trajectories. This framing obscures the adaptive logic of cultural variation and limits the explanatory scope of psychological theory. Recognizing culture as an active system shaped by historical constraints allows psychological variation to be interpreted without recourse to deficit-based comparisons.

Within a Dual Inheritance framework, such biases can be understood as the outcome of culturally transmitted assumptions that become stabilized within particular research communities. These assumptions reflect the researchers' own cultural learning environments and may be reproduced through academic institutions, shaping both the questions asked and the interpretations considered plausible.

Variation Within Cultures

Even within WEIRD societies, psychological research often relies on samples that fail to capture internal diversity. Participants are frequently drawn from left-leaning, middle-class undergraduate populations, leaving large segments of society underrepresented. Rural residents, older adults, devoutly religious individuals, ethnic and religious minorities, immigrants, sexual minorities, and individuals from lower socioeconomic backgrounds are systematically less likely to be included in psychological studies.

Large-scale reviews highlight the consequences of this imbalance. An analysis of over 26,000 psychological research articles published between 1974 and 2018 revealed that race was infrequently reported in sampling procedures and that editorial boards were overwhelmingly composed of white scholars (Roberts et al., 2020). Underrepresentation extends beyond Black participants to include Hispanic populations (Case & Smith, 2000) and same-sex couples, who were excluded from the majority of studies on romantic relationships published between 2002 and 2012 (Andersen & Zou, 2015). Participants with low socioeconomic status are also underrepresented due to the time, financial, and technological demands associated with common research practices (Emery et al., 2023).

These patterns demonstrate that cross-cultural comparisons alone are insufficient. Psychological variation exists not only between societies but also within them, reflecting differences in subcultural norms, material conditions, and lived experiences. Without attention to intra-cultural diversity, psychological models risk being based on narrow and unrepresentative segments of the populations they aim to describe.

From a Dual Inheritance perspective, such within-culture variation reflects differences in local learning environments, social networks, and institutional exposures. These micro-level variations influence how norms and behaviors

are transmitted and reinforced, leading to systematic psychological diversity even within the same broader cultural context.

Lack of a Historical Perspective

Psychological research typically provides a snapshot of cognition and behavior as they are observed in the present. However, cultures are the cumulative product of historical processes, and psychological mechanisms develop in response to long-term patterns of environmental and social change. Groups that share a common historical trajectory are therefore more likely to exhibit similar psychological patterns than groups that have faced different challenges across time (Muthukrishna et al., 2021).

Historical examples illustrate how cultural norms emerge as responses to ecological constraints. Dietary prohibitions in Islam and Hinduism, for instance, have been interpreted as culturally evolved solutions to environmental and economic conditions specific to their regions of origin (Harris, 1977). Understanding such practices requires situating them within the historical contexts that shaped their adaptive value.

Cognitive archaeology seeks to extend psychological inquiry into the deep past by examining the cognitive capacities implied by ancient tools and artifacts (Coolidge & Wynn, 2016). By studying not only modern *Homo sapiens* but also earlier hominin species, this approach aims to reconstruct the evolutionary roots of human cognition. Nevertheless, cognitive archaeology often relies on psychological theories developed within WEIRD contexts, raising concerns about the extent to which contemporary models are projected onto past populations (Killin & Pain, 2023). For instance, earlier research assumed a universal right-hemisphere bias in face recognition. However, more recent evidence indicates that this bias is, at least in part, a consequence of neural reorganization driven by literacy (Dehaene et al., 2015). This raises concerns that relying on such culturally contingent effects—rooted in relatively recent developments—may lead to misleading interpretations of the cognitive and behavioral capacities of past populations. Despite these limitations, incorporating historical and archaeological perspectives offers an opportunity to move beyond static accounts of the human mind. By attending to the temporal dimension of cultural change, psychological research can better distinguish between cognitive features that are widely shared across human populations and those that reflect historically contingent cultural adaptations.

A Dual Inheritance perspective highlights that these historical processes are not merely background conditions but active components of cultural evolution, shaping the transmission and stabilization of psychological traits over time. Ignoring this temporal dimension therefore limits the ability to explain why particular cognitive and behavioral patterns emerge and persist across generations.

How Do WEIRD Cultures Differ from Non-WEIRD Cultures?

In the previous section, the challenges associated with the overrepresentation of WEIRD populations in psychological research were discussed. These challenges raise a broader explanatory question: in what ways do WEIRD cultures differ systematically from non-WEIRD cultures, and why do these differences matter for psychological theory? Unlike earlier approaches that primarily document cross-cultural differences, a Dual Inheritance perspective seeks to explain how these differences emerge through culturally transmitted learning environments. Addressing this question requires moving beyond binary distinctions and recognizing that cultures vary along multiple dimensions rather than falling neatly into WEIRD versus non-WEIRD categories. WEIRDness is not a strict category that dichotomously divides cultures into WEIRD and non-WEIRD; rather, it is continuous, with cultures located at different positions along this spectrum (Muthukrishna et al., 2020). It is also multidimensional, as cultures possess multiple factors that shape their degree of WEIRDness. While we use WEIRD and non-WEIRD comparisons in this article, they are intended as heuristic tools and do not refer to rigid categories or fixed distinctions located at different positions along this spectrum, rather than forming discrete groups.

Cultures can possess some characteristics associated with WEIRDness while lacking others. For example, a society may be Western but not economically affluent, as in the case of countries such as Ukraine, Albania, or Moldova, or it may be industrialized without being Western, as seen in China, Taiwan, or Japan. Moreover, substantial variation exists within countries. In Türkiye, for instance, some subpopulations—often concentrated in coastal and metropolitan regions—are highly educated, economically affluent, and integrated into Western cultural norms. In contrast, other subpopulations living in rural areas may be more influenced by traditional and Islamic lifestyles. In recent decades, Türkiye has undergone rapid industrialization, accompanied by a demographic shift from a predominantly agricultural society to an increasingly urban and industrial one. These structural transformations have been paralleled by significant changes in psychological orientations. Research suggests that younger generations in Türkiye have become more individualistic in some domains, accompanied by declining authoritarian attitudes and increasing support for gender egalitarianism (Sunar, 2002). However, this shift has not involved a complete departure from traditional relational structures. Instead, emotional interdependence and strong family ties have largely persisted despite increasing autonomy, consistent with Kağıtçıbaşı's model of the "autonomous-related self" and psychological interdependence (Kağıtçıbaşı, 2005, 2017). This pattern suggests continuity between Türkiye's rural, agrarian past and its urban, industrial present, rather than a linear transition from collectivism to individualism. Thus, WEIRDness is best understood as a matter of degree rather than a categorical distinction.

Despite this variability, distinguishing societies with a high level of WEIRD features from much of the rest of the world remains analytically sound, as these societies occupy a distinctive position in cultural and psychological space. Muthukrishna et al. (2020) proposed a method for quantifying psychological and cultural distance between societies using data from the World Values Survey. By comparing countries to the United States—treated as the WEIRDest reference point—and to China as a contrasting case, they demonstrated that Western societies such as Australia, Canada, Finland, and New Zealand cluster closely with the United States. In contrast, countries such as Qatar, Egypt, Bahrain, and Indonesia are located at greater cultural and psychological distances. These findings underscore that societies with greater WEIRD-related tendencies are not merely different from one another but are collectively distinct from many non-Western populations.

One of the most extensively documented differences concerns individualism versus collectivism. Societies with higher WEIRD-related features tend to emphasize individual autonomy, self-expression, and personal achievement, whereas many societies with lower WEIRD-related features prioritize relational obligations, group harmony, and interdependence (Henrich, 2020). These orientations are reflected in how individuals conceptualize the self. In a cross-cultural study examining responses to the question "Who am I?", Ma and Schoeneman (1997) found that members of the Maasai and Samburu tribes overwhelmingly described themselves in terms of social roles and relationships. In contrast, American undergraduates were more likely to refer to personal attributes, achievements, and aspirations. Importantly, variation was also observed within countries: Kenyan workers in Nairobi provided more collectivist responses, whereas Kenyan university students exhibited more individualistic patterns similar to those observed in the United States.

Differences in self-construal are closely linked to broader patterns of social organization. In societies closer to the WEIRD end of the spectrum, maintaining a consistent, context-independent identity is often regarded as desirable and authentic. In contrast, in many collectivist societies, identity is expected to be flexible and responsive to situational demands, reflecting the primacy of social roles and group membership (Suh, 2002). From a cultural evolutionary perspective, these patterns can be understood as responses to differing social ecologies. In environments where social relationships are stable and embedded within kinship networks, adapting behavior to context may be more advantageous than maintaining a rigid sense of individual identity (Henrich, 2020; Muthukrishna et al., 2021).

Systematic differences are also observed in moral cognition, particularly in the role of intentions in moral judgment. Research conducted across multiple societies has shown that the extent to which intentions are prioritized varies substantially across cultural contexts (Barrett et al., 2016). Participants from societies exhibiting high WEIRDness, such

as the United States and Eastern Ukraine, tended to judge actions with benign intentions more leniently than actions with malicious intentions, even when the outcomes were similar. In contrast, participants from small-scale societies, such as the Hadza and Yasawa, placed less emphasis on intentions, consistently evaluating outcomes regardless of mental states. These differences have been linked to variations in kinship intensity and social structure, with intention-based reasoning being more adaptive in societies characterized by flexible social networks and frequent interaction with non-kin (Curtin et al., 2020).

Cognitive style represents another domain in which populations vary systematically as a function of their degree of WEIRDness. In cross-cultural psychology, analytic and holistic thinking are commonly used constructs referring to different cognitive processing styles. Societies shaped more strongly by Western cultural and institutional traditions tend to favor analytic thinking, which involves focusing on objects independently of their context and categorizing them according to abstract rules. In contrast, holistic thinking—emphasizing relationships, context, and functional connections—is more prevalent in many Eastern and non-Western cultural contexts (Henrich, 2020; Saribay & Yılmaz, 2024). Evidence for this distinction comes from a large body of cross-cultural research using the triad task. Across multiple studies and large-scale online samples spanning dozens of countries, individuals from WEIRD societies (e.g., Finland, Sweden, the United States) are more likely to engage in rule-based categorization, whereas participants from non-WEIRD contexts (e.g., Bolivia, Serbia, the Philippines, Thailand) more frequently rely on functional and relationship-based matching (Nisbett et al., 2001; Henrich et al., 2010; Henrich, 2020). Visual cognition studies further support this distinction. Chua et al. (2005) demonstrated that American participants tended to focus attention on focal objects within visual scenes, whereas Chinese participants allocated more attention to contextual elements.

Emotional experience also varies across cultural contexts. A cross-cultural study involving participants from 37 countries found that individuals from more individualistic and WEIRD societies reported experiencing guilt more frequently. In contrast, those from collectivist societies reported higher levels of shame (Wallbott & Scherer, 1995). These emotions serve different social functions: guilt is typically associated with internalized moral standards and personal responsibility, whereas shame is linked to social evaluation and conformity to group (Tangney et al., 2007). Thus, although shame and guilt serve different functions in social organization and moral regulation across societies, their distinction primarily lies in the focus of evaluation: shame involves a negative appraisal of the global self, whereas guilt is oriented toward specific behaviors and their impact on others (Tangney, 1998). These patterns likely persist because in societies where social behavior is regulated primarily through internalized norms, individuals rely more on guilt, whereas in contexts where behavior is closely monitored and evaluated by others, shame becomes a more effective mechanism for maintaining social conformity (Tangney et al., 2007; Wallbott & Scherer, 1995).

Taken together, these findings indicate that societies exhibiting high WEIRDness differ from societies further from the WEIRD end of the spectrum across multiple psychological domains, including self-construal, moral reasoning, cognitive style, perception, and emotion. Importantly, these differences should not be interpreted as evidence of psychological advancement or deficiency. Instead, they reflect culturally evolved configurations of shared human capacities shaped by distinct historical, ecological, and institutional conditions. From this perspective, cultural variation is not an obstacle to psychological explanation but a key source of insight into how cognition and behavior are organized across diverse human societies.

How Can We Improve Our Research?

If psychological variation is shaped by culturally transmitted learning environments, then improving research practices requires approaches that can capture this diversity more effectively. The challenges associated with the WEIRD problem are not limited to identifying bias; they also raise questions about how psychological research can be reorganized better to capture the diversity and historical depth of human behavior. If psychological mechanisms are shaped by long-term interactions between cultural environments and cognitive capacities, then improving research practices requires changes not only in sampling strategies but also in who conducts research, how research questions are

framed, and which methods are employed. This section outlines several complementary strategies for addressing these challenges, focusing on researcher diversity, interdisciplinary integration, the study of underrepresented populations, and methodological pluralism.

3.1. Broadening Horizons: Nurturing Diversity in Researcher Profiles

From a Dual Inheritance perspective, researchers themselves are embedded within culturally shaped learning environments that influence which questions are considered important, which behaviors appear psychologically salient, and how findings are interpreted. Psychological research has been mainly conducted by researchers from a narrow set of cultural, socioeconomic, and ideological backgrounds. This homogeneity has implications for the types of questions that are asked, the assumptions embedded in research designs, and the populations that are considered accessible or relevant. Evidence from the United States indicates that doctoral-level training pipelines in psychology underrepresent Black Americans, Latinos, individuals with disabilities, and men relative to their proportions in the general population (Callahan et al., 2018). In addition, surveys of social psychologists suggest that the field is overwhelmingly left-leaning in terms of political ideology, raising concerns that specific research questions or interpretations may be systematically neglected (Buss & Von Hippel, 2018; Duarte et al., 2015).

Diversifying researcher profiles can therefore play a critical role in mitigating WEIRD bias. Researchers from underrepresented cultural or ideological backgrounds may be more attuned to social phenomena that are overlooked by dominant perspectives and may have greater access to populations that are otherwise difficult to reach. This is particularly relevant when studying vulnerable or marginalized groups, where issues of trust, ethical sensitivity, and cultural competence are paramount. Researchers who share similar cultural backgrounds or lived experiences with participants can help identify context-specific risks, enhance participant comfort, and improve the validity of the collected data.

Researcher diversity also facilitates cross-cultural collaboration. Conducting research in unfamiliar cultural contexts poses logistical and ethical challenges that are difficult to address without local expertise. Collaborative networks that include researchers from non-WEIRD societies can reduce these barriers and help ensure that research designs are culturally appropriate (Meadon & Spurrett, 2010). Ultimately, interdisciplinary research teams combine distinct theoretical assumptions and methodological strengths, enabling the examination of complex social phenomena from multiple angles rather than through the lens of a single disciplinary tradition.

Beyond Borders: Embracing the Interconnectedness of Varied Fields

From a Dual Inheritance perspective, understanding psychological variation requires integrating insights from disciplines that examine both individual cognition and the cultural and historical processes through which it is transmitted. Improving psychological research requires engagement not only with diverse researchers but also with diverse intellectual traditions. Each discipline is shaped by its own theoretical commitments, methods, and explanatory priorities, which inevitably constrain the scope of inquiry. Psychology has traditionally emphasized present-focused, individual-level explanations, often abstracted from broader cultural and historical contexts (Muthukrishna et al., 2021). While this focus has yielded valuable insights, it also limits the ability to explain how psychological mechanisms emerge and change over time (Muthukrishna & Henrich, 2019).

Anthropology, history, and archaeology offer complementary perspectives that can enrich psychological explanation. Anthropological research documents the range of cultural practices and social organizations that characterize human societies, providing a comparative foundation for distinguishing between widespread psychological tendencies and context-specific adaptations. Historical scholarship emphasizes how large-scale events, such as wars, pandemics, economic transformations, and institutional reforms, shape collective behavior and moral norms. Archaeology extends this perspective further by examining material evidence from periods beyond written history, shedding light on how cognition and social organization evolved over deep time.

Psychological science has been slow to integrate these perspectives systematically, in part because most psychological data are derived from WEIRD societies, limiting the empirical basis for broader generalization (Gurven, 2018). Nevertheless, interdisciplinary integration is essential for developing explanations that account for both universality and variation. By situating psychological findings within anthropological, historical, and archaeological contexts, researchers can better assess the conditions under which particular cognitive patterns emerge and persist.

Exploring the Margins: Researching Underrepresented Populations

From a Dual Inheritance perspective, studying underrepresented populations is essential because different cultural and social environments give rise to distinct learning processes and psychological patterns. Even within WEIRD societies, psychological research samples often fail to reflect population diversity. Studies typically rely on white, urban, middle-class undergraduate participants, leaving conservatives, ethnic minorities, immigrants, low-income individuals, rural residents, older adults, and people with disabilities underrepresented. In the Turkish context, for example, conservative populations, devout Muslims, Kurdish-speaking individuals, refugees, and sexual minorities are rarely included in psychological studies, despite constituting a substantial portion of the population.

The absence of these groups limits the explanatory power of psychological models. Different segments of society are exposed to different social pressures, economic constraints, and cultural norms, which can shape psychological processes in systematic ways. Consequently, representative sampling is necessary not only for descriptive accuracy but also for theoretical development (Yılmaz, 2025). In some cases, targeted studies of specific underrepresented populations may be more informative than attempts to achieve broad representativeness within a single study.

Beyond national contexts, studying populations that are less influenced by modern industrial institutions—such as Indigenous groups, pastoralist societies, or nomadic populations—can provide insights into how recent cultural innovations have reshaped human psychology. Comparative research across minority populations in different cultural settings is also essential, as similar social categories may function differently depending on local norms and histories. For instance, gender and sexual identities are expressed and interpreted in culturally specific ways, making it inappropriate to generalize findings from one context to another without careful analysis (Haviland et al., 2011).

Innovate to Elevate: Diversifying Research Methodologies

From a Dual Inheritance perspective, different methodological approaches are necessary to capture the multiple pathways through which cultural environments shape behavior and cognition. Psychological research has traditionally relied heavily on self-report measures, particularly surveys assessing intentions, attitudes, and beliefs. While such methods are efficient and scalable, they provide limited insight into actual behavior and are subject to well-documented discrepancies between intentions and actions (Sheeran & Webb, 2016). Addressing the WEIRD problem, therefore, requires expanding the methodological toolkit used to study psychological phenomena.

Behavioral measures such as economic games offer a means of observing decision-making in controlled yet ecologically relevant contexts. Neuropsychological methods, including functional neuroimaging and electrophysiological techniques, can provide insight into the neural processes underlying social cognition and moral behavior (Ellemers & Van Nunspeet, 2020). Qualitative approaches, such as semi-structured interviews and ethnographic observation, provide rich contextual data that capture how individuals interpret norms, values, and social relationships within their cultural environments (Fein & Yahalom, 2023).

In addition, the use of secondary data sources—such as large-scale surveys collected by international research programs—allows researchers to examine patterns that would be difficult to capture through primary data collection alone (Sear, 2020). Emerging tools from machine learning and artificial intelligence offer further opportunities to analyze complex datasets, although they also raise concerns about the reproduction of existing biases embedded in available data (Adjerid & Kelley, 2018; Mehrabi et al., 2021).

Taken together, methodological pluralism is not merely a practical recommendation but a theoretical necessity. Different methods capture different aspects of psychological phenomena, and integrating these approaches is essential for understanding how cultural, social, and historical forces shape cognition and behavior.

Limitations

Efforts to address the WEIRD problem face substantial practical, ethical, and structural limitations. Expanding sample diversity and incorporating underrepresented populations into psychological research is not simply a matter of methodological preference; it often involves challenges that are difficult to resolve within existing institutional and resource constraints. Disadvantaged and vulnerable groups—such as refugees, sexual and gender minorities, and individuals with severe mental health conditions—may be reluctant to participate in research due to concerns about privacy, discrimination, and mistrust toward researchers or authorities. Similarly, politically sensitive populations, such as devoutly religious individuals or those holding extreme political views, may avoid participation due to fear of social or legal repercussions.

Access barriers further complicate efforts to diversify samples. Geographic isolation in rural or mountainous regions can make data collection logistically challenging. Physical or cognitive disabilities may limit participants' ability to engage with standard research procedures, particularly those that rely on written surveys or digital platforms. Economic constraints also play a significant role: individuals facing financial hardship may lack the time, technological resources, or flexibility required to participate in research studies. Language barriers present an additional obstacle when working with immigrant or refugee populations who may not be fluent in the dominant language of the host country, such as Syrian refugees in Türkiye or Latin American immigrants in the United States.

These challenges highlight that achieving fully representative samples may be unrealistic in many contexts. Addressing the WEIRD problem, therefore, requires pragmatic trade-offs rather than idealized solutions. Collaborative research practices can help mitigate some of these limitations. Partnerships with researchers who possess local expertise or cultural familiarity can enhance access to hard-to-reach populations and foster greater trust between researchers and participants. Similarly, interdisciplinary collaboration can provide methodological alternatives when direct data collection is infeasible.

Secondary data sources offer another partial solution. Large-scale datasets collected by international organizations or prior research programs, such as the World Values Survey, allow scholars to examine patterns across diverse populations without the logistical demands of primary data collection (Sear, 2020). However, some of these datasets are themselves shaped by the availability of data from WEIRD societies and may reproduce existing biases. As a result, secondary analyses should be interpreted with caution and situated within their broader data-generating contexts.

Emerging computational approaches, including machine learning and artificial intelligence, are increasingly used to analyze large volumes of qualitative and quantitative data that would otherwise be difficult to process (Adjerid & Kelley, 2018). While these tools hold promise for expanding the scope of psychological research, they are not immune to bias. Algorithms trained on skewed datasets may amplify existing inequalities, and the predominance of WEIRD-generated data raises concerns about the cultural generalizability of computational models (Mehrabi et al., 2021). Consequently, technological innovation alone cannot resolve the WEIRD problem without parallel efforts to diversify data sources and theoretical assumptions.

Taken together, these limitations underscore that the WEIRD problem cannot be eliminated through isolated methodological adjustments. Instead, it reflects broader structural constraints related to access, resources, and disciplinary traditions. Recognizing these constraints is essential for setting realistic goals and for interpreting psychological findings with appropriate caution.

Conclusion

Human populations exhibit substantial variation in attitudes, behaviors, and cognitive patterns across cultural contexts because they confront distinct ecological, social, and historical challenges (Apicella et al., 2020). Consequently, the overrepresentation of WEIRD populations in psychological research constitutes a significant limitation for the accuracy and generalizability of empirical findings. As initially emphasized by Henrich et al. (2010), psychological studies based primarily on undergraduate samples from Western societies capture only a narrow segment of human diversity. Although awareness of this limitation has increased over the past decade, empirical practices have not shifted accordingly, and psychological research continues to rely disproportionately on WEIRD samples (Rad et al., 2018; Thalmayer et al., 2021).

In this article, we argued that the WEIRD problem should not be understood solely as a technical issue of sampling bias. Instead, it reflects a broader explanatory challenge concerning how psychological mechanisms are theorized in relation to culture and history. Psychological processes are often modeled as context-independent features of the human mind, despite growing evidence that their expression, salience, and functional role vary systematically across cultural environments (Henrich, 2020). When findings derived from WEIRD populations are implicitly treated as normative or universal, theoretical models risk conflating culturally evolved patterns with species-typical psychological capacities.

By situating the WEIRD problem within a Dual Inheritance perspective, this article has sought to clarify how genetic and cultural evolutionary processes jointly shape human cognition and behavior. From this standpoint, culture is not merely an external context in which psychological mechanisms operate, but an active system of inheritance that transmits norms, practices, and institutions across generations (Boyd & Richerson, 1985; Henrich, 2015, 2020; Muthukrishna, 2023). These cultural systems generate structured environments that favor particular cognitive tendencies and social behaviors while constraining others. Accordingly, WEIRD psychological patterns are best interpreted as the outcome of historically contingent cultural evolutionary trajectories rather than as deviations from a universal human baseline.

We reviewed four interrelated challenges arising from overreliance on WEIRD samples: limited generalizability, cultural bias and ethnocentrism, insufficient attention to variation within cultures, and the lack of historical depth in psychological explanation. Each of these challenges reflects, in different ways, the consequences of studying human psychology without adequately accounting for the cultural and historical processes that shape it. Differences between WEIRD and non-WEIRD populations—whether in self-construal, moral judgment, cognitive style, emotional experience, or social reasoning—should therefore be understood as patterned outcomes of distinct cultural environments rather than as anomalies requiring correction.

In response to these challenges, we outlined several strategies for improving psychological research. These include diversifying researcher profiles, fostering interdisciplinary collaboration, increasing attention to underrepresented populations both within and across societies, and adopting a pluralistic methodological approach that integrates quantitative, qualitative, behavioral, and computational methods. Importantly, these recommendations are not presented as exhaustive solutions. Structural, ethical, and logistical constraints limit the extent to which sample diversity can be achieved, and emerging technologies such as machine learning may reproduce existing biases if applied uncritically (Adjerid & Kelley, 2018; Mehrabi et al., 2021). Nevertheless, acknowledging these constraints is preferable to treating WEIRD-based findings as unqualified representations of human psychology.

More broadly, this article emphasizes the value of closer dialogue between psychology and anthropology. Anthropological research provides essential insights into cultural variation, social organization, and historical context, while psychological research contributes tools for examining cognitive processes and behavioral patterns. Integrating these perspectives enables a more nuanced understanding of which aspects of human psychology are widely shared and which are shaped by specific cultural and institutional conditions. Archaeological and historical evidence further extends this inquiry by situating contemporary psychological patterns within longer evolutionary timelines.

This perspective also generates testable theoretical implications. A Dual Inheritance framework suggests that societies organized around different institutional and social environments should show systematic differences in cognitive styles, moral reasoning, emotional regulation, and norm internalization. For example, institutional settings that rely more heavily on formal rules, impersonal coordination, and individual autonomy may encourage analytic cognition, abstract categorization, and more universalistic forms of moral reasoning. By contrast, social environments structured more strongly around kinship ties, relational obligations, and context-sensitive coordination may promote holistic cognition, relational reasoning, and greater sensitivity to interpersonal context and social harmony. These differences are not treated as fixed cultural traits, but as outcomes shaped by historically transmitted learning environments and institutional arrangements. From this perspective, cultural norms, social learning processes, and institutions become central explanatory mechanisms linking historical environments to psychological variation. The framework therefore opens new directions for comparative research on how changes in education, market integration, institutional complexity, and patterns of social coordination shape cognition and behavior across societies over time.

Rather than aspiring to a single, context-free model of human psychology, a more productive goal may be to develop theories that explicitly specify the cultural and historical conditions under which particular psychological mechanisms emerge and operate. From this perspective, cultural diversity is not a threat to theoretical coherence but a critical source of explanatory leverage. By treating cultural variation as informative rather than problematic, psychological science can move toward a more inclusive, historically informed, and empirically grounded understanding of human behavior—one that reflects the full breadth of human cultural experience rather than a narrow and historically unusual subset.



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