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Ethical and Epistemic Costs of a Lack of Geographical and Cultural Diversity in Developmental Science

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Increasing geographical and cultural diversity in research participation has been a key priority for psychological researchers. In this article, we track changes in participant diversity in developmental science over the past decade. These analyses reveal surprisingly modest shifts in global diversity of research participants over time, calling into question the generalizability of our empirical foundation. We provide examples from the study of early child development of the significant epistemic and ethical costs of a lack of geographical and cultural diversity to demonstrate why greater diversification is essential to a generalizable science of human development. We also discuss strategies for diversification that could be implemented throughout the research ecosystem in the service of a culturally anchored, generalizable, and replicable science.

Public Significance Statement

Developmental psychology has been greatly limited by a lack of geographic and cultural diversity. This article discusses the costs of these limitations for what we know about human development and provides a roadmap for greater diversification. Expanding our base of knowledge about human development is significant and relevant to the population at large.

Keywords: cultural diversity, globalization, low-to-middle income countries

Psychology has traditionally defined itself as a discipline focused on universal laws of human behavior (Brady et al., 2018; Muthukrishna et al., 2021; Wang, 2018). This viewpoint grew out of the desire to create a science of *human* psychology, one that reveals human capacities, potential, and achievements over the lifespan. Unfortunately, this desire also contributed to a tendency to extrapolate broadly from a very select and small sample of the world's population to advance particular psychological processes as human and, therefore, universal (Rad et al., 2018). A quest for universalism has been called into question by many, reiterating longstanding concerns by cultural psychologists (e.g., Kim, 2000) and by some developmental psychologists who have long advocated for contextualist approaches (e.g., Coll et al., 1996; N. Rogoff, 2003; Spencer et al., 1997; Turiel, 2002).

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The Promise of Contextualist Approaches for Generalizability and Replicability

Contextualist approaches to development situate the study of human development within space and time, acknowledging the enormous variation in human behavior across geographies, lived experiences, and cultures. At the same time, there are indisputable commonalities in human development that transcend space and time. Developmental psychology would benefit from a more careful reconciliation of contextual variation and contextual consistency, recognizing that all humans share some developmental capacities but that meaningful variation also exists (Singh, D'Souza, & Frank, 2024). Understanding where this meaningful variation resides is critical to our knowledge of reported effects and their boundary conditions (Doebel & Frank, 2024; Legare, 2017).

Over recent years, the need to incorporate context and culture by broadening the sample of individuals represented in mainstream research has taken hold across multiple domains of psychology (e.g., Arnett, 2008; Henrich et al., 2010) including developmental psychology (Killen et al., 2022; Moriguchi, 2022; Nielsen et al., 2017; B. Rogoff et al., 2018; Singh, Cristia, et al., 2023; Wang, 2018). In large part, these contributions have argued for integrating culture and context into all developmental research. This marks an important shift away from viewing culture and context as being the sole provenance of cultural psychologists and/or only relevant to underrepresented or minoritized participants (see Causadias et al., 2018; Roberts & Mortenson, 2023) but as central to all domains of psychology and to all populations (Syed, 2023).

Contextualist approaches are essential for addressing the dual crises of generalizability and replicability confronted by developmental researchers. No human being develops independent of their environment, and there exists no dearth of examples of how developmental trajectories are responsive to environmental conditions even before birth. For these reasons, integrating cultural context into our scientific narrative of human development is critical to our goals for generalizable and replicable science. The need for contextualism is relevant to each stage of the research pipeline. This includes attending to samples, diversifying methodologies and approaches, and grounding inferences formed from empirical studies within their context (Arnett, 2008; Graham, 1992; Henrich et al., 2010; E. Kidd & Garcia, 2022; Rogers et al., 2021; Turiel et al., 2016).

In an influential article published by Henrich et al. (2010), the authors provided salient examples of how a lack of contextualism poses a threat to scientific credibility and utility. Henrich et al. demonstrated a clear reliance on Western, educated, industrialized, rich, democratic (WEIRD) samples in psychological research and also provided multiple examples of how these populations can be atypical in their behavioral responses in a broad range of domains and tasks.

While this article constituted a critical call to action for the entire community of psychological scientists, we advocate for a broad and granular view of human diversity that goes beyond bisecting the world into WEIRD and non-WEIRD contingents. Although not due to the progenitors of the label, the use of WEIRD and non-WEIRD to describe populations/cultures/settings collapses across significant variation within regions, imputing similarity to populations that inhabit these regions and differences to those that straddle them. A more precise set of organizing principles by which to define human diversity is desirable.

Overview

In this article, we focus on the need for greater diversification, more specificity with respect to sampling, and a move toward context-driven accounts of development. We make this case on both epistemic and ethical grounds. We first examine whether there has been greater global diversification in developmental science in the wake of Henrich et al. (2010). Next, we discuss the ethical and epistemic costs of a geographically and culturally limited science (summarized in Figure 1). Finally, we propose actionable pathways to a culturally anchored and globally representative developmental science that advances generalization and replication (summarized in Figure 2). We center our discussion of epistemic and ethical costs around three questions that are interrelated: Who are we studying in human development? What are we studying about human development? How are we studying human development? We center our discussion of strategies for reform around three key agents of change: researchers, journals, and funding agencies.

Who Are We Studying in Human Development? Sampling Practices in Selected Developmental Science Journals

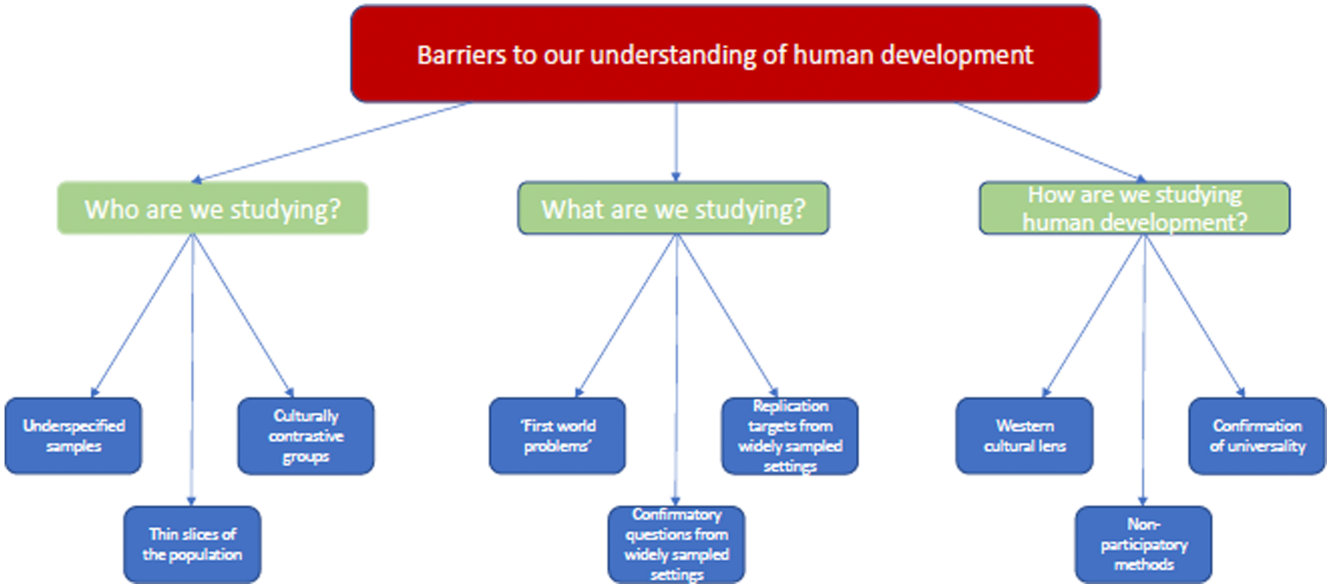
A fundamental question concerns who is being sampled in developmental research and, in particular, whether the alarm bells sounded by Henrich et al. (2010) diversified sampling practices on the part of researchers. To investigate this, we examined changes in sampling practices in mainstream developmental journals over the past decade. Figure 3 below displays geographical representation of all participants sampled in all empirical articles published in five developmental science journals: *Developmental Science, Developmental Psychology, Child Development, Journal of Experimental Child Psychology*, and *Infant and Child Development*. Participant location was coded for all empirical articles published in 2011 and 2021 for comparison, which comprised 2.4 million participants distributed over 756 studies in 2021 and 410,141 participants distributed over 575 studies in 2011, totaling almost 3 million participants.

By no means do these outlets represent the breadth of journals in developmental psychology. We expect that other outlets that are explicitly committed to studying cultural variation (e.g., *Journal of Cross-Cultural Psychology*, *International Journal of Behavioral Development*) would paint a very different picture. However, we selected these outlets because they are generalist journals, have some of the highest impact factors in developmental psychology, and have a stated commitment to greater inclusion in their publications. Rather than limit the study of culture and context to culturally oriented outlets, we advocate for sample diversity to be a key component of all journals, in particular, those that have high citation records and therefore, by definition, contain articles that have maximally proliferated through the scientific community. Finally, many developmental psychologists aspire to publish in these journals; consequently, they serve as a model for the types of research that would advance the field toward a more representative science.

As can be seen in Figure 3, participant representation remains heavily concentrated in North America and regions of Europe with large areas of underrepresentation (or nonrepresentation) in highly populous areas of the world. For comparison, the same data are plotted in Figure 4 for 2011, a decade prior. A comparison of

Figure 1

A Summary of Costs of a Decontextualized Developmental Science



Note. See the online article for the color version of this figure.

Figures 3 and 4 reflects very modest change in global representation of participants between 2011 and 2021. There has been some increase in representation notably from the Indian subcontinent and from a limited set of African and Southeast Asian countries. Of note, of the 1,331 studies sampled between 2011 and 2021, there was a sharp increase (88%) in cross-national comparison studies versus single-location studies. Therefore, there has been a greater number of publications studying culturally and geographically contrastive groups.

In the aggregate, developmental research published in high impact outlets remains firmly entrenched in North America and regions of Europe. Most critically, Figures 3 and 4 reveal that there is least participant representation in regions where most of the world's children live. This equation directly opposes what is needed for a generalizable science of child development.

A lack of visible diversification is surprising in light of high awareness of the need for a globalized science of human development. This awareness is reflected in numerous articles, editorials, journal diversification policies, and strategic goals set by professional organizations to advocate for sample diversification and for a more global developmental science (Arnett, 2008; Bauer, 2023; Cheung, 2012; IJzerman et al., 2021; Killen et al., 2022; Singh, Cristia, et al., 2023; Singh, Killen, et al., 2023; Thalmayer et al., 2021; van de Vijver, 2013). Given the intense attention that has been devoted to a lack of diversity in developmental science, one might expect these maps (Figures 3 and 4) to diverge from each other to a much greater extent. We certainly acknowledge the lag between conducting and publishing research as a contributing factor, which may underestimate the extent of true change.

We acknowledge that geographic representation is not equivalent to cultural representation. Unlike geographical location of testing, culture refers to selected patterns of visible and invisible behaviors that are far more complex than site of testing (Brady et al., 2018). Nevertheless, nested within geographical imbalances are imbalances in culture, language, socioeconomic status (SES), and other lived experiences. Moreover, within the articles sampled, there was minimal description of cultural identity or cultural belonging of participants; at the most, articles reported site of testing as a sole indicator of participants' cultural origins. This is consistent with prior meta-analyses, using a different data set, demonstrating that authors of highly ranked developmental journals often do not state participants' communities of descent (e.g., race/ethnicity/tribal affiliation), national origin, or SES (Singh, Cristia, et al., 2023; Singh & Rajendra, 2024). Omissions in sociodemographic reporting make it challenging to contextualize research findings in participants' lived experiences.

In sum, there are three take-home messages from the analyses presented above. First, because samples are generally underspecified, we know very little about who we are sampling. Second, at the country level, we know that we are still sampling isolated pockets of the world that represent a small percentage of the global population. Third, since 2011, our mainstream outlets have published more research on cross-national comparison studies. In the following, we discuss how participation selection prescribes the scientific foci of developmental research.

What Are We Studying in Human Development? Ethical and Epistemic Costs of a Lack of Global Diversity in Developmental Research

Who we study in developmental research constrains what we study in developmental research. For example, Figures 3 and 4 bring into sharp relief the clear invisibility of participants from low- to middle-income countries (LMICs). This invisibility is striking given that close to 90% of children are raised in LMICs (Zhou et al., 2020). The selective invisibility of LMICs renders less visible issues of

Figure 2
Roadmap to a Contextualized Developmental Science

<table>
<tr><th>Stage of research pipeline</th><th>Researchers</th><th>Journals</th><th>Funding agencies</th></tr>
<tr><td rowspan="6">Conceptualization</td><td rowspan="3">Broaden the range of scientific foci</td><td colspan="2">Evaluate scientific questions based on broad global relevance and applicability</td></tr>
<tr><td>Journal priorities for core content

Curate special issues</td><td>Crowdsource research priority areas

Issue special calls for funding</td></tr>
<tr><td>Broaden methodological toolkit</td><td colspan="2">Evaluate methods in relation to context (consider measurement invariance; appropriateness of tasks; cultural frameworks; mixed-methods)</td></tr>
<tr><td rowspan="2">Diversify samples</td><td colspan="2">Evaluate representativeness of samples within- and between-regions</td></tr>
<tr><td colspan="2">Incentivize greater diversification</td></tr>
<tr><td>Build equity-centered collaborations</td><td>Require local expertise</td><td>Evaluate collaborative structures</td></tr>
<tr><td rowspan="3">Dissemination</td><td>Responsible generalizability from sample to population</td><td colspan="2">Evaluate claims of generalizability from sample to population</td></tr>
<tr><td>Provide demographic description of samples</td><td colspan="2">Require demographic reporting, granting flexibility to researchers in how demographic constructs are queried</td></tr>
<tr><td>Careful interpretation of cultural variation</td><td colspan="2">Evaluate claims of cultural sameness and difference in relation to research questions, samples, and methods</td></tr>
<tr><td rowspan="3">Evaluation</td><td></td><td>Diversify editorial participation</td><td>Diversify research evaluation</td></tr>
<tr><td></td><td colspan="2">Examine barriers to editorial/reviewer diversity and incentivize broader participation</td></tr>
<tr><td colspan="3">Examine structural biases in review processes (e.g., triage criteria; reviewer biases)</td></tr>
</table>

Note. See the online article for the color version of this figure.

primary concern within these regions and foregrounds issues of primary concern in high-income countries (HICs), centering "first world problems" as scientific targets.

One such issue is the impact of economic hardship on child development. In LMICs, socioeconomic hardship is often more extreme and different in form from HICs (Aboud & Yousafzai, 2015; Engle et al., 2011; Haft & Hoeft, 2017). Despite this, the potent and lasting effects of socioeconomic hardship on development and opportunities for repair are much better understood in HICs than in LMICs (Ward et al., 2016). Understanding the impact of economic hardship using contextualist approaches is therefore critical to characterizing developmental outcomes. For instance, while greater household socioeconomic affluence is generally associated with lower rates of child overweight/obesity in HICs, this relationship is typically reversed in low-income countries (Dinsa et al., 2012). This may be due to environmental/structural factors like differences in food deficits experienced among poor households in high- versus low-income countries as well as sociocultural factors such as differences in social perceptions of smaller versus larger body sizes. In this instance, overfitting findings from HICs to LMICs would be very misleading.

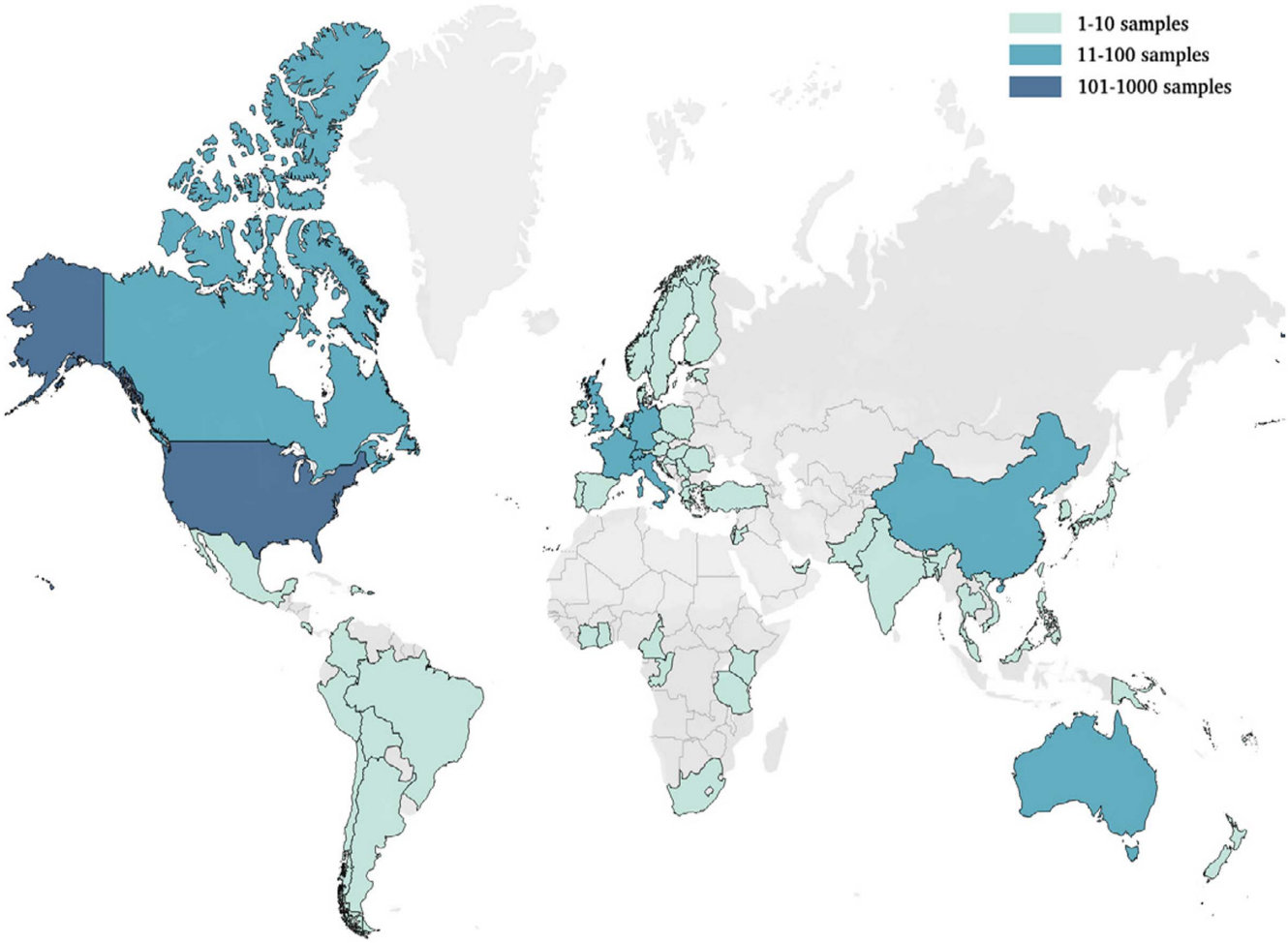
The ethical cost of overlooking so much of the world in child development research is also significant. More so than any other point in the lifespan, early childhood provides an ideal window of opportunity to intervene to protect children against adversity and maximize survival and thriving (Clark et al., 2020). Therefore, while the question of how socioeconomic conditions impact child development is contextually unbounded (i.e., of universal interest and relevance), the answers to this question are contextually bounded. In this respect, it is imperative that knowledge of critical developmental threats be cultivated in a range of contexts.

In addition to significant knowledge gaps that characterize our science, how we interpret and utilize the knowledge that we generated from widely studied samples is problematic based on the frequent presumption that this knowledge generalizes to understudied settings. We provide an example below from language development. Developmental psycholinguistics have sought to understand what factors facilitate language uptake in children. There have been longstanding empirically driven claims that the use of North American-associated infant-directed speech facilitates child language acquisition (Fernald, 1989) and that this form of input, although highly variable across cultures (Fernald et al., 1989), promotes linguistic uptake (Saint-Georges et al., 2013). This perspective was drawn from limited samples within North America and has idealized a particular framework for caregiver–child interaction (Fernald, 2010).

Within this framework, ideal conversational dynamics are generally characterized as one-on-one, "serve-and-return," object-centered interaction between a child and a parent. Although all children undoubtedly hear overheard speech and have nonreciprocal

Figure 3

Participant Representation in Developmental Journals in 2021



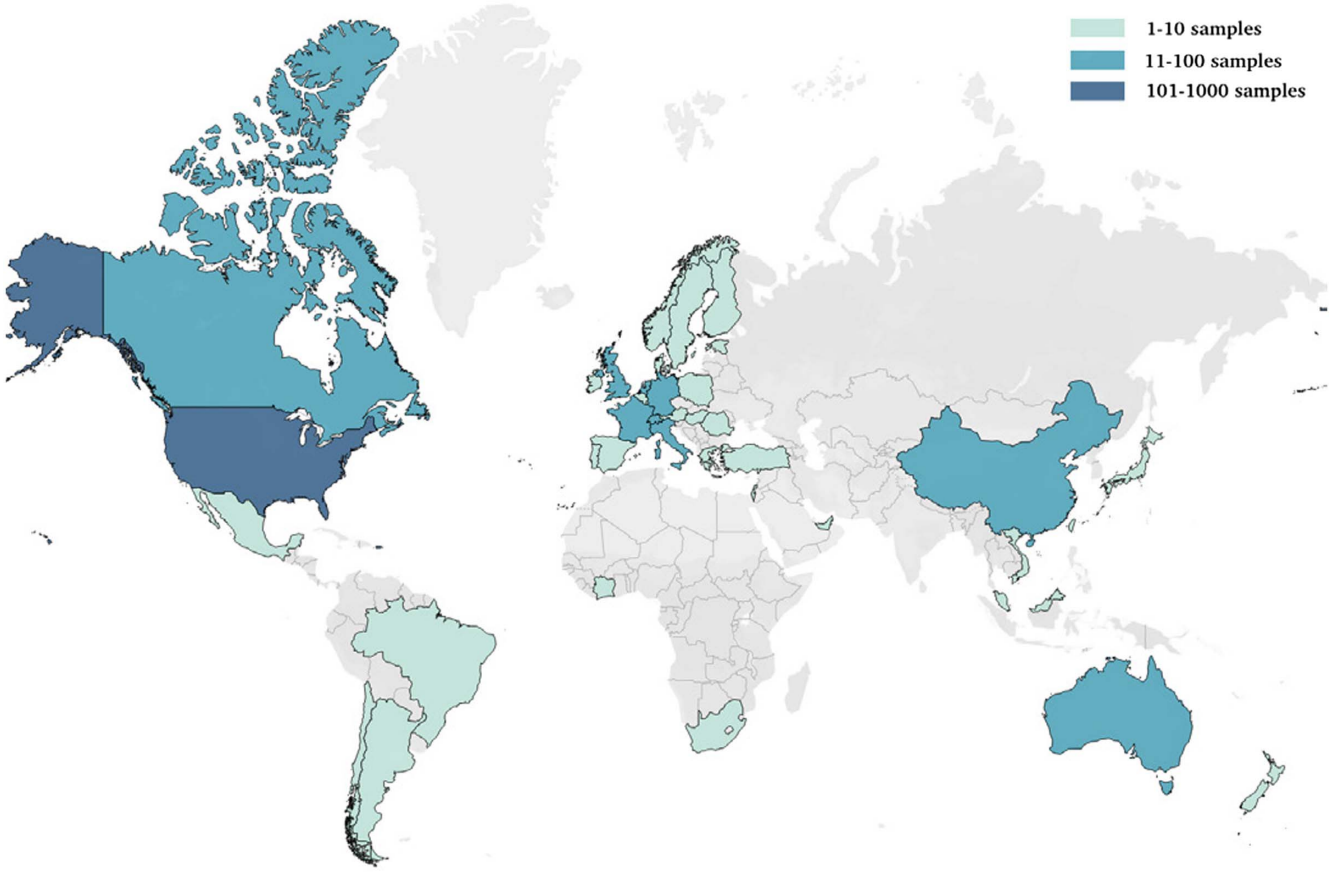
Note. National representation of participants for empirical articles published in 2021 (*Developmental Science*, *Developmental Psychology*, *Child Development*, *Journal of Experimental Child Psychology*, and *Infant and Child Development*). From "Global Science Requires Greater Equity, Diversity, and Cultural Precision," by L. Singh, M. Killen, and J. Smetana, 2023, *Association for Psychological Science Observer, 36*(5) (https://www.psychologicalscience.org/observer/gs-equity-diversity-cultural-precision). Copyright 2023 by the Association for Psychological Science. Adapted with permission. See the online article for the color version of this figure.

linguistic experiences, it is direct and reciprocal input that is thought to drive language learning (Fernald & Weisleder, 2015; Weisleder & Fernald, 2013). In providing this direct input, parents are reported to produce a particular "singsong-like" speech register that undulates in pitch and highlights key words via stress placement, all of which is thought to make language more learnable (Weisleder & Fernald, 2013). This framework has guided multiple interventions aimed at bolstering early language development in at-risk children (Wong et al., 2020; but see Kuchirko, 2019, for a critique of this approach).

This interactional style is not globally normative: Most children do not learn to communicate via one-on-one object-centered interactions typified in studies from North America. Globally, alloparenting is the norm such that caregiving arrangements are most often distributed across individuals (H. Keller & Chaudhary, 2017). Language input often comes from siblings or a range of other social figures in the child's environment (Cristia et al., 2023; Loukatou et al., 2022). Moreover, in many contexts, children are not directly addressed and receive considerable overheard input within their environment (Loukatou et al., 2022). These cultural practices contradict scientific guidance from U.S. researchers (Fernald & Weisleder, 2015). This in turn raises the questions of whether language development suffers when input is largely indirect, delivered by multiple caregivers, and consists primarily of overheard speech, which research from the United States would suggest.

Culturally adapted methods used to query language development under these conditions reveal no evidence of a developmental cost to language learning (Casillas et al., 2020; Cristia et al., 2023). Recent evidence suggests that in cultures where children hear overheard input, they learn from overheard input (see Foushee & Srinivasan, 2023). Similarly, where children are reliant on child-directed input, they learn from child-directed input (Fernald & Weisleder, 2015).

Figure 4
Participant Representation in Developmental Journals in 2011



Note. National representation of participants for empirical articles published in 2011 (*Developmental Science*, *Developmental Psychology*, *Child Development*, *Journal of Experimental Child Psychology*, and *Infant and Child Development*). From "Global Science Requires Greater Equity, Diversity, and Cultural Precision," by L. Singh, M. Killen, and J. Smetana, 2023, *Association for Psychological Science Observer, 36*(5) (https://www.psychologicalscience.org/observer/gs-equity-diversity-cultural-precision). Copyright 2023 by the Association for Psychological Science. Adapted with permission. See the online article for the color version of this figure.

This points to robust mechanisms for developmental adaptation to varying sociolinguistic ecologies.

The normalization of a particular form of North American infant-directed speech has resulted in interventions to inculcate these behaviors in others. For example, A. Weber et al. (2017) evaluated an intervention to teach rural West African mothers how to use American-style infant-directed speech in an article with a title that betrayed a cultural deficit lens, "When Cultural Norms Discourage Talking to Babies." Underlying the intervention was the assumption that local indigenous caregiving practices were harmful to children, and these norms should be subordinated to North American cultural practices of communication. West African mothers in rural Senegal were taught to speak in North American infant-directed speech. As anticipated, Weber et al. found greater maternal use of North American infant-directed speech in a short, videotaped conversational setting because of their intervention. The alignment of Western Senegalese mothers' speech with North American ideals was interpreted as an indicator of success. However, there was no evidence that the use of North American infant-directed speech led to greater communicative competence within the culture over the longer term, a critical question for any intervention. There was also no evidence that North American infant-directed speech would be beneficial to learners in the local context in communicating within their environment.

In a further illustration of how projecting behaviors onto communities from widely studied settings can be misguided, Schröder et al. (2012) investigated language input in two culturally distal settings: Delhi, India and Berlin, Germany. Both groups were from middle-class, urban families and were matched on maternal education. They demonstrated that the very same mother–child interactions style that positively predicted language development in a group of infants in Berlin negatively predicted language development in a group of infants in Delhi. In both samples, it was children's attunement to *local* forms of mother–child interaction that predisposed children to language achievement. This underscores the necessity of adapting expectations and interventions to contextual norms. In a positive example of a culturally inclusive approach to the study of language input, Bergelson et al. (2023) adopted a broader

definition of language input in a multicontinent study with diverse samples, defining language input as *child-available* language input instead of *child-directed* language input.

A significant threat to our field is a tendency to presume that behaviors, findings, and interventions attested in widely represented settings apply to underrepresented settings (Adetula, Forscher, Basnight-Brown, et al., 2022). This impacts new questions that we ask in underrepresented settings, which are often directly informed by knowledge and methods from widely sampled settings. It also impacts replication efforts, which tend toward seeking one-way generalizability of Western phenomena. For developmental psychological scientists, this practice represents a missed opportunity to move beyond projection of Western scientific foci to contexts where they may be a poor fit to codeveloping a scientific agenda that is truly multilaterally relevant and jointly implemented (Adetula, Forscher, Basnight-Brown, et al., 2022). This requires that researchers familiarize themselves with developmental psychology in its varying forms across diverse contexts, a goal which would be assisted by broader cultural representation in mainstream journals.

In summary, a scientific focus on first world problems, a focus on cross-national studies that serve as confirmation of Western phenomena, and an orientation toward replicating studies from widely sampled settings has hampered our scientific progress. Broadening *who* we study and *what* we study invites reflection on *how* we study human development, the focus of the next section.

How Do We Study Developmental Psychology? Developing Research Methods In Situ

The question of how we study development in context relates inextricably to the structure and positionality of researchers. While we need more cross-cultural research and analyses of demographic representation confirm that our field is indeed engaged in more cross-cultural research, how we study development across diverse contexts then becomes ever more critical. In offering guidance for cross-cultural research, researchers have outlined the need for participatory research practices that both articulates the costs of centering Western constructs as universally relevant targets of study and emphasizes the promises of local participation throughout the research pipeline (Harkness & Super, 2020; Morelli, Quinn, et al., 2018). Approaches that do not align with these suggested practices neglect basic codes of respect and beneficence. In particular, local participation and expertise are often subjugated to foreign academically credentialed individuals, who are deemed subject matter experts although they may lack cultural familiarity and literacy. However, cultural familiarity and literacy constitute subject matter expertise. Working with local experts and within existing culturally organized frameworks is critical to robust research design, implementation, and interpretation.

In the following, we provide an example of how a Western cultural lens can contort scholarship in developmental science in a manner that has impacted a fundamental theory of development. Developmental psychologists have long sought to understand the origins of learning—how children first discover meaning and structure in their environment. Western developmental theories foreground objects as early targets for learning in terms of how infants and young children navigate their physical world (e.g., Spelke & Kinzler, 2007). The use of object exploration as a pathway to learning has been argued to be universal (Spelke, 2022). However, objects may be particularly salient in a manufactured world consisting of a high proportion of toys and other artifacts, privileging experiences and affordances for learning about objects. Object-centered interaction in non-Western societies is far less prevalent (e.g., Haight et al., 1999). Nomadic/seminomadic tribes (e.g., Biederman et al., 2009) have sparse contact with manufactured objects, and in many societies, the notion of object play is uncommon (Lancy, 2007).

Many small-scale rural societies adopt apprenticeship models of parenting that situate child–caregiver interactions in routines and practices rather than objects (H. Keller, 2003; Lancy, 2010). Rural populations are not marginal segments of the world: They are estimated to be about half of the world's population (Ritchie et al., 2018), raising questions about the generalizability of object-centered play via one-on-one interactions as a universal platform for learning. In spite of this, theories that center objects as a basis for learning explicitly cite universality of object knowledge as a key feature (e.g., Stahl & Feigenson, 2015) and argue for the primacy of object knowledge as a developmental primitive (Spelke, 2022); yet, these theories consistently fail to acknowledge that the empirical foundation for these claims is far from universal.

Object knowledge is so central in early cognitive development such that it is commonly invoked as a key developmental milestone. For example, object permanence, the notion that objects continue to exist even when out of view, is perceived to be a fundamental milestone that all infants attain (Gómez, 2005). At the same time, object permanence provides a particularly striking example of selective generalizability. Intriguingly, tests of generalizability of object permanence come from Western scrubjays, orangutans, squirrel monkeys, great apes, giraffes, dogs, magpies, and African grey parrots (e.g., de Blois et al., 1998; Pepperberg & Funk, 1990; Pollok et al., 2000; Salwiczek et al., 2009). However, there are no published studies, to our knowledge, from traditional, small-scale, or rural human populations. This is an illustration of how the perception of universality based on data from widely sampled populations may lead researchers to bypass vast segments of the human population, reflecting presumptions of generalizability. These examples illustrate that both in the empirical and theoretical record, presumptions of universality are often not aligned with cumulative data. Unexamined conclusions are put forth to explain universal developmental phenomena based on querying a limited diversity of children with a narrow range of highly circumscribed experiences.

In sum, reflecting on the presumptions associated with a Western cultural lens, engaging in participatory research with local communities, and moving away from a quest for defining human universality in development are critical to a contextualized developmental science. In the following, we present a pathway toward a culturally anchored science of human development. This requires an intentional and coordinated commitment on the part of multiple stakeholders. We focus on a set of intersecting practices that can be implemented by researchers, journals and publishing houses, and funding agencies (see Figure 2 for a summary).

Pathways to a Culturally Anchored Science of Human Development

The combined impact of who we have studied, what we have studied, and how we have studied human development has limited the explanatory depth of developmental research. As a field, we have

made slow progress in engaging more broadly with communities, methods, and epistemologies that ground developmental research in context (see Syed, 2023, for relevant discussion).

This is somewhat surprising given that developmentalists have long posited widely cited frameworks to incorporate children's contexts into developmental theory, such as Bronfenbrenner's ecological systems theory (Bronfenbrenner & Morris, 2006), García Coll's integrative model of child development (Coll et al., 1996), and Spencer's phenomenological variant of ecological systems theory (Spencer et al., 1997). However, the application of these theories to global developmental research remains underdeveloped. Moreover, the ecological emphasis of these theories has not permeated mainstream research practices, which still publish a predominance of studies from limited cultures and contexts without acknowledging their narrow scope. Journals continue to disseminate research narratives that often omit sociodemographic details about participants in published studies, providing minimal or often no insight into culture and context (Singh, Cristia, et al., 2023; Singh et al., 2022; Singh, Killen, et al., 2023; Singh & Rajendra, 2024).

Given the significant attention that has been drawn to these issues, it is unlikely that a lack of attention to culture and context derives from an information deficit about the importance of these factors. Instead, it is possible that a lack of clarity around how to effect change (including who represents agents of change) limits structural reform. In addition, there are deeply entrenched norms that are challenging to reset but that undermine our goals for a more representative developmental science. In the following, we propose actionable strategies to incentivize greater attention to context and culture and to de-incentivize overgeneralization and presumptions of universality.

Reporting Sociodemographic Data

At a minimum, a first step is to define who we are sampling. Author practices have not changed in spite of multiple calls to attend to sample composition (Singh, Cristia, et al., 2023; Singh & Rajendra, 2024). An analysis of editorial policies requiring these data demonstrates that journal requirements are effective in increasing sociodemographic reporting if robustly implemented (see Singh, Cristia, et al., 2023). However, key challenges are determining what to report on the part of authors and determining compliance on the part of journals.

Demographic data are not always easy to collect nor to report. In a recent publication aimed at addressing some of the inherent complexity in facilitating demographic data collection and reporting for developmental researchers, Singh, Barokova, et al. (2024) provide a standardized framework for obtaining and reporting sample demographics. Central to this framework are dual goals of standardization and flexibility. Typical journal guidance, in aiming to standardize, emphasizes fixed demographic categories. However, demographic variation around the world does not fall into a single universal framework. It is therefore incumbent upon researchers to determine which aspects of demographic representation are most reflective of the culture and context within which they are working and are most relevant to their research questions. A contextually adapted approach to demographic reporting therefore requires (a) identification of demographic constructs that are developmentally relevant, (b) development of context-appropriate and measurable demographic markers that map onto these constructs, and (c) clear and precise definitions of samples along multiple and intersecting levels of demographic representation. A contextually adapted approach to demographic data collection is critical to interpretation.

An additional consideration is the "grain size" of demographic reporting. Demographic reporting often involves characterizing the entire sample (e.g., "Most of the participants were …"). However, precision in demographic reporting requires an equal focus on central tendencies and distributional characteristics to capture within-sample variation. The latter is often absent in research articles. For example, in descriptions of SES, simply casting a sample as "predominantly mid- to high SES" greatly reduces the explanatory power of this often-influential variable and limits the potential for any meaningful analysis of SES (Bornstein & Bradley, 2002). However, such descriptors of SES remain commonplace to this day, and in many instances, this type of phrasing within articles makes it unclear as to whether SES data were collected at all or whether presumptions were made about the sample (see Singh & Rajendra, 2024). Precise measurement and characterization of demographic variables at the participant level including distributional statistics would facilitate analysis of demographic data in relation to development.

Clearly stating how sample demographics correspond to the underlying population to whom researchers hope to generalize is a critical element of responsible generalizability. Here, we provide a positive example of such a statement from a recent article by Kosie and Lew-Williams (2024):

> All of our participants come from relatively higher-SES, predominantly white, English-speaking families in the Northeast of the United States. Thus, while some of our findings may reflect characteristics of caregiver-infant interactions that apply across communities and cultures, we do not intend to make broad generalizations beyond this particular group. Second, we strive to consider and appreciate the substantial variation that exists even across families in this restricted sample. Our goal in describing variation is not to place value on families who fall on either end of the spectrum. Instead, we encourage appreciation of the natural variation that exists even in this relatively homogenous sample.

Requiring demographic reporting and justifications for such reporting (or for nonreporting), as is currently the norm for open science practice, lies within the purview of journals and funding agencies in evaluating research both when research plans are initially proposed and when research has been completed and is disseminated via publication. Just as our field has come to accept a *de facto* commitment to open science and transparency within acceptable parameters, a similar *de facto* set of expectations around demographic reporting within acceptable parameters (privacy laws, ethical considerations, risks of reidentification; for a discussion of these issues, see Singh, Barokova, et al., 2024) is implementable in equal measure. Funding agencies and editors are well-positioned to integrate provision of sample demographics into their evaluation of whether the study meets its own goals for generalizability based on this information. Incentivizing systematic demographic reporting will go a long way toward situating developmental research within its culture and context and toward disincentivizing presumptions of universality.

Interpreting Cross-Cultural Variation in Developmental Research

The aforementioned recommendations focus on treatment of culture and context within settings. However, likely in response to growing awareness of narrow representation, increasingly,

developmental psychologists have begun to sample across settings. This was evident in our analysis at the outset where there was a sharp increase in the number of cross-country comparisons between 2011 and 2021. For the most part, cross-national comparisons that showed the largest increase between 2011 and 2021 consisted of comparison studies between high- and low-income settings. This reflects a common pattern in developmental research where a particular process that is well-documented in widely sampled U.S. contexts is experimentally queried in remote small-scale rural societies (e.g., Aknin et al., 2015; Barrett, 2020; Callaghan et al., 2011; Dehaene et al., 2006; Hernik & Broesch, 2019). While cross-country comparisons are indisputably valuable, in particular, comparisons between culturally distal settings must be carefully motivated and cautiously interpreted.

First, such comparisons often presume that measuring the same behavior across distal cultures brings us closer to distinguishing the universal origins of behavior; confirmation of universality often serves as the motivation for such studies. However, individuals across different settings respond in similar and different ways to stimuli for a broad range of reasons, which may not necessarily regress to the target variable of interest alone. There are many examples of studies conducted in a reportedly WEIRD and non-WEIRD setting where a particular task is imported from a WEIRD setting to a non-WEIRD setting with the goal of adjudicating on questions of universality. Different methods may be essential for evaluating the same developmental phenomenon across distal settings. Moreover, determining true universality is inordinately complex. Factors such as gene–environment interactions that drive developmental variation at the population level complicate attributions of universality even for behaviors present at birth (Meaney, 2010). Additionally, universality is also not binary: Behaviors are often not universal or culturally conditioned (D. S. Brown, 2004). It is doubtful that the requisite evidence basis for determining true universality is ever achievable. All of these factors make the confirmation of universality, as a scientific quest, challenging to realize.

Second, this approach often disregards within-culture variation. Unless all relevant sources of variation are captured, the presumption of between-culture variation as the sole explanatory variable for group differences remains unqualified. Many demographic variables, such as gender, ethnicity, SES, and religion, vary considerably within countries. Without capturing sample variation in sufficient detail, simply concluding that a given sample represents the prototypic country-level variable may lead to inaccurate conclusions.

Third, the research questions that drive cross-national comparisons often originate from widely sampled regions, as mentioned in the previous section. Instead of this approach, soliciting diverse voices and orienting cross-cultural research toward two-way generalizability (or bidirectionality) can inform knowledge and practice in both over- and underrepresented settings. In a positive example of two-way generalizability, ManyLabs Africa (https://osf.io/vh6td/) has sought the perspectives of African researchers in identifying replication targets in Africa, North America, and Europe. This type of multilateral engagement in the creation of a research agenda is a positive model for bidirectional research (Adetula, Forscher, Basnight-Brown, & Ijzerman, 2022). These types of changes also lie within the purview of researchers, journals, and funding agencies. All three sets of stakeholders are well-positioned to coordinate efforts to develop and promulgate best practices for cross-cultural research that are predicated on equity and inclusion. Funding agencies and journals can also crowdsource ideas for cross-national comparisons across proposed testing settings and issue special issue calls or calls for funding that target identified areas of need. Central to conducting greater cross-cultural research is developing research questions that are of broad relevance and in, doing so, expanding the range of tools that we use to study human development in diverse settings. The breadth of a research question at a global scale should be used as an evaluation of scientific quality in journal and grant evaluations.

Expanding Our Methodological Toolkit

Methodologies developed for and by Western researchers have long influenced how developmental science is studied across contexts. The origins of this are clear: Current methods in psychology trace back to logical positivism (Bridgman, 1927), an outgrowth of experimental psychology laboratories established in the 1870s in Germany. The rapid spread of these methods to the United States established a dominant and long-lasting methodological toolbox for understanding human behavior. Political power and associated scientific status hierarchies have since elevated and reified these approaches (G. Adams et al., 2018; Maldonaldo-Torres, 2007). As a result, specific methodologies, now ingrained in our field, have had tremendous influence and longevity in spite of clear recognition of their limitations and modest replicability (Y. Wu et al., 2022).

The practices inherent in these methodologies, specifically, operationalizing abstract constructs into numeric data and conducting research within the bounds of psychological laboratories, continue to prevail as the gold standard for psychological research (Breen & Darlaston-Jones, 2010). These practices, valorized to this day, continue to prevail despite increasing concerns about ecological validity, stability, and replicability of reported effects (Anderson et al., 1999; Y. Wu et al., 2022). Moreover, although these methods were initially developed through specific cultural lenses, this fact often goes unacknowledged (Castro-Gómez, 2007). Instead, these methods are often granted the presumption of scientific rigor, neutrality, and objectivity (Abo-Zena et al., 2022; S. A. Kidd, 2002). In general, the focus of these methodologies was on stripping away contextual variables and examining underlying laws on behavior with a focus on internal psychological processes. As a result, the very same practices that once conferred epistemic legitimacy on Psychology as a credible scientific discipline now pose a threat to its core identity.

The credibility assigned to specific methods that prevail in psychological research has resulted in what some have termed a *colonial science* (G. Adams et al., 2018). An example is when researchers uncritically import methods and knowledge from the United States or other widely sampled settings to distal societies. One might argue that this approach has the perceived benefit of allowing direct comparison across research sites and standardizing methods. This is true: This approach allows researchers to determine how children in different sites respond to precisely the same stimuli under precisely the same conditions. However, it also presumes that these methods hold equal validity across contexts. It disregards the fact that participants may engage with methods and tasks in relation to their own lived experience and cultural surroundings. For example, a common methodology, self-report questionnaires, may be appropriate for particular populations and widespread in widely

studied contexts. However, for societies that rely on oral traditions, such tools may not be appropriate (see Maar et al., 2011). In other instances, tools that have been developed and normed within specific populations may lead to high exclusion rates from other populations. For example, many hardware electroencephalogram systems are not designed to work well for curly, dense, or coily hair, which has led to disproportionate exclusion of Black and Latinx populations in neuroscientific research (E. J. Adams et al., 2024).

In terms of inference making, this approach makes presumptions about how to interpret differences or sameness in responding across sites. The *absence* of a particular behavior in an underrepresented group combined with the *presence* of the same behavior in a Western context can lead to culturally deficit models of development (Kline et al., 2018). The reverse situation where Western populations demonstrate an absence of a particular behavior or skill, by contrast, is rarely seen as a deficit (e.g., Karasik et al., 2023). The interpretation of sameness is often equally problematic: There have been several instances where similar behaviors in small samples of infants or children across a single Western and non-Western setting has been interpreted as evidence for universality, conclusions that are rarely justified by sampling patterns of a small single study (for a review, see Singh, Cristia, et al., 2023). For all of these reasons, use of common methodological tools can be problematic. As we diversify our samples and epistemologies, so too must we diversify our methods.

Contextualist approaches to methods include *adaptation*, where stimuli or other factors are adapted to context using the same underlying method (see Yanaoka et al., 2022, for a positive example of how a stimulus change in a well-established delay-of-gratification task increased validity of this task in a non-U.S. context). Another approach, *assembly*, where an entirely new method is constructed for use in a new setting, limits direct comparison as the resulting methods necessarily contain a high proportion of culture-specific items. This is also often the most resource-consuming approach. However, critically, the practice of assembly often involves local participation and engagement and allows for tools and methods to be developed in situ with the benefit of local expertise. In that sense, this approach holds the greatest promise for maximizing ecological validity.

Assembly of new approaches for new settings requires engaging with local informants and therefore elevating local knowledge as critical elements of the research process. This requires us to suspend assumptions about validity and reliability of widely established and familiar methods and to intentionally "de-bias" unfamiliar sources of knowledge. For example, when working with indigenous communities, indigenous practices are essential to designing culturally appropriate methods in context but are sometimes dismissed as primitive, nonscientific, or folkloric (Knopf, 2015). These are unfortunate but pervasive biases that need to be set aside in developing diverse methods that are adapted to new contexts and cultures. Measuring developmental phenomena and experiences in ways that are most naturally expressed and communicated by a population will improve validity and reliability.

Broadening methodologies is critical to decolonizing scientific practices. Several developmental researchers have called for such efforts (e.g., R. C. Keller, 2007; Lancy, 2022; N. Rogoff, 2003; Singh, 2024). Central to a decolonial science is the use of methods and approaches that are valid in context and the direct involvement of communities being sampled in decision-making roles. To this end, a comprehensive set of best practices for conducting cross-cultural research, focused on validity, equity, local participation, and inclusivity, has been put forth by Burger et al. (2023).

Authors, journals, and funders are potential partners in creating a set of best practices for methodological innovation toward a contextualized science of human development. This involves going beyond the content areas to be queried and questioning whether tried-and-tested methods truly maintain the reliability and validity often attributed to them in new contexts. Developing new and convergent methods that maximize construct validity in context are critical priorities. Perhaps most importantly, a receptivity toward these forms of innovation on the part of journals and/or funders is key. Many of our research evaluation practices remain steeped in traditionalism, and we frequently attribute to well-established methods (i.e., controlled laboratory environments) a level of precision and accuracy that makes it challenging to deviate from these norms. Broadening our interpretation of what methods make for "good science" requires examining entrenched practices and scrutinizing how our methods map onto the underlying constructs that we aspire to investigate. This mapping is likely context-relative.

Broadening Epistemic Approaches in Developmental Research

Closely linked to methodological choices is the fundamental question of who sets the scientific agenda in the study of human development. All too often, high-status scholars in well-resourced settings determine the questions that are asked about human development. As scientific gatekeepers, journals and funding agencies are in a very strong position to shape development of research questions and to elevate a broader range of questions.

Diversifying samples and methodologies requires journals and funders to broaden the scope of questions that are valued in developmental science. For example, the most pressing scientific questions in many parts of the world may include the impact of nutrition and growth restriction on neurocognitive development, effects of extreme poverty and maternal stress on mother–infant attachment, and effects of disease exposure on infant mental health (see Tomlinson & Morgan, 2015). These are critical factors that shape many children's developmental trajectories (e.g., Alam et al., 2020; Crookston et al., 2011; Woldehanna et al., 2017), but it is unclear whether mainstream developmental psychology journals would view these topics as relevant. Instead, submissions on these topics may be desk-rejected out of concern that they are of marginal relevance to the readership despite their clear and widespread global impact on the lives of children around the world (Tomlinson & Morgan, 2015; see Draper et al., 2022, for relevant discussion).

Moving forward, greater intergroup contact and opportunities for collaboration may uncover both commonalities and differences that can be leveraged toward a globalized science. For example, a recent survey of African psychological researchers to identify key topics of interest revealed some commonalities with mainstream psychological research in the United States and Europe, such as effects of gender, criminality, and family on psychological processes. However, there was also interest expressed in the impact of land-use conflicts, polygamy, spiritual practices, and corruption on psychological well-being (Adetula, Forscher, Basnight-Brown, et al., 2022). These types of exercises provide new insights into developmental topics that rarely surface in mainstream developmental journals but represent culturally relevant knowledge for

many around the world. Increased global exposure to developmental science around the world, whether or not it is explicitly labelled "developmental science," may serve as the connective tissue to unite diverse researchers toward a contextualized science.

One way to engage a greater diversity of voices in setting a research agenda is to crowdsource ideas for new investigation and replication. A positive example of this is a recent initiative to agree on the most urgent questions facing developmental psychology solicited by a large internationally diverse team (see R. H. Brown et al., 2021). Central to this initiative was an acknowledgment of the need to rebalance global representation. The questions deemed most critical for the field were examining effects of the environment on child development, the intergenerational transmission of disadvantage, and interventions to promote the health and well-being of children worldwide.

Efforts such as these to identify broader scientific foci at a global scale could be pursued by journal editors, funders, and professional organizations to guide the process of incorporating greater breadth into journal content. In particular, this process could inform selection of special issue topics and special calls for research funding such that these initiatives are driven by broader considerations of global relevance and set funding priorities for developmental researchers.

At a larger scale, efforts to set diversifying research agendas would ideally be nested within international entities aiming to establish globally relevant priorities. For example, member states of the United Nations agreed on a set of 17 sustainable development goals to be enacted over the following 15 years, estimated to cost US $3 trillion to fulfill (The New York Times, 2015; United Nations, n.d.). Child and youth development are central to these goals, which were heavily shaped by research in developmental science (Britto et al., 2017). The goals place in focus numerous factors, such as poverty, nutrition, health, clean water, sanitation, violence, trafficking, and the promotion of peace, all of which impact human thriving and sustainability on a global scale (Broome, 2008; Currie & Deschênes, 2016) and have close relevance to a global understanding of child development. These goals bring to the fore areas of focus in child development that differ from areas often represented in our mainstream journals but that are globally significant issues in child development. A reconciliation of global interests with our scientific foci could therefore be informed by engaging with governmental initiatives such as United Nations Sustainable Development Goals.

Broadening Engagement in Research Evaluation

A shift toward epistemic plurality involves greater involvement of diverse scholars in the process of research evaluation. The global skew so clearly evident at the participant and researcher level is mirrored by a global skew in evaluator representation. Editorial boards and editorships for mainstream developmental journals remain dominated by U.S. and European scholars (Moriguchi, 2022; Singh, Killen, et al., 2023). In psychology journals more broadly, U.S. dominance in editorships has not shifted significantly over the past 2 decades (Lin & Li, 2023). In large part, many editors-in-chief select their associate editor team and editorial board. Migrating to an application-based system with an intent to diversify editorial leadership would address selection biases (e.g., availability heuristics). A notable example is *Infant and Child Development*, which put out a call for associate editors in November 2022. The incoming editor-in-chief subsequently assembled an associate editor team and editorial board with global and disciplinary diversity often uncommon among developmental journals.

As noted by Lin and Li (2023), this imbalance perpetuates publication bias: There is strong evidence for "home country bias" with journal ownership being closely tied to same-country representation in authors and editor representation (also see Rubin et al., 2023). Alarmingly, it is the highest ranked Psychology journals owned by organizations within the United States (72% of journals) that maintain the lowest global diversity in terms of authors and editors. Of equal concern is that editorial representation from regions of the global south is reduced relative to author representation from these same regions (Liu et al., 2023). These factors may be related in that editor demographics may interact with author demographics: More diverse authors may attract more diverse editors and vice versa (see Auelua-Toomey & Roberts, 2022).

The ownership of journals in specific environments not only directs the selection of research questions but also prescribes the way research is evaluated. One step is diversifying the review process to solicit more diverse reviewers by broadening editorial boards and offering editorships to a more diverse range of scholars. This is a complex issue to remediate. At an individual level, researchers' time constraints often vary considerably between research-intensive universities in the United States. (i.e., Research 1 (R1) institutions, defined as having very high research activity; Carnegie Classification of Institutions of Higher Education, 2019) and lesser resourced institutions. Faculty members in underresourced environments are often saddled with heavy teaching loads and supervision or service requirements. Financial incentives for research participation and editorial involvement, which are often modest relative to workload, may make editorial service difficult to justify for researchers from lesser resourced environments. Editorial participation may not be valued and incentivized in terms of career progression as much as it is in research-intensive U.S. R1 institutions. It may therefore seem like a simple and "quick fix" to simply invite scholars from underrepresented backgrounds to editorial boards of mainstream developmental journals; yet, there may be limited incentives for them to accept. This warrants a systematic examination of the incentive structure of editorial service and, potentially, reform of the incentive structures in a way that is impactful for a broader range of scholars.

Last, we discuss the notion of integrated versus segregated efforts to broaden participation within the scientific community. One approach to greater diversification is to create special spaces for underrepresented populations. This can include special sections within journals, preconference workshops, or diversity symposia that exist outside of the mainstream spaces. On one hand, this provides a venue that reflects an intentional commitment to diversification that is presumably hospitable to the need for incorporating cultural factors. On the other hand, self-selection often drives participation in these spaces, which can result in "preaching to the choir." Spaces that annex diversification efforts from core scientific activities imply that diversification efforts are optional adjuncts to scientific endeavors versus critical components of a robust and generalizable science (i.e., the "Culture as Chapter 13" problem; Syed & Kathawalla, 2022). Moreover, the use of separate spaces subtracts cultural scholarship from main conference programs and regular journal issues, forums that attract a much larger audience and where such knowledge may be more beneficial. Consequently, greater inclusivity may result from the creation of such spaces as well as intentional and active integration of

researchers and research output from underrepresented regions into mainstream and more central spaces (see R. H. Brown et al., 2021).

Mitigating Financial and Equity Barriers to Participation

There is no doubt that variation in financial capacity for research is an organizing factor in our science. Some countries simply have higher budgets for research and development, which have contributed to a research infrastructure that facilitates high research activity, whereas others have more limited means. In general, higher resourced contexts have been centered in developmental science as is evident in Figures 3 and 4, although there are many countries with very high research and development budgets (e.g., Japan, India, South Korea, Brazil) with limited representation in the outlets surveyed. Nonetheless, funding capacity does contribute significantly to variation in global capacity for research.

Broadening the range of contexts represented in our field requires attention to research funding. Funding agencies are well-positioned to address and mitigate some equities in research capacity. In particular, funders can consider the extent to which different institutions and researchers would benefit from financial capital for building research capacity. Indirect cost provision to underresourced institutions on the part of funders is a powerful mechanism for capacity building for research. Moreover, considering some of the more tacit factors that privilege particular researchers and settings and disadvantages others is critical. For example, in the United States, most published research originates from research-intensive institutions, specifically from R1 institutions (Carnegie Classification of Institutions of Higher Education, 2019). Such institutions have dedicated structures, resources, and processes aimed at galvanizing and producing a large quantum of research. Incentives are closely tied to research activity at individual, departmental, and faculty levels. Faculty members at such institutions commonly benefit from labor available to them for research (Zhang et al., 2022). In addition, academic promotion opportunities are closely tied to research activity (e.g., publications, presentations, sponsorship for research). Moreover, the financial model of institutions often depends crucially on funds from sponsored research (National Center for Science and Engineering Statistics, 2021). On many levels, therefore, there is a strong foundation and deeply rooted incentive structure for high research activity.

This scenario represents the antithesis of the situation in many institutions in underrepresented and underresourced regions. Such regions may be underrepresented in research because they are underresourced for research. At a national level, there may be fewer funds overall based on variation in how much governments commit to research and development in the social sciences. In addition, there is often greater instability of research funds once acquired (e.g., Kowaltowski, 2021). These factors may lead some researchers within these environments to pursue collaborations with researchers with greater resources. An example of this is collaborations between LMICs and HICs (Shumba & Lusambili, 2021). We discuss some of the complexities around these collaborations.

Although well-intentioned, collaborations between researchers from HICs and LMICs can be fraught with challenges caused by uneven power dynamics. For example, in such partnerships, it is not uncommon for LMIC partners to be regarded and treated as field workers who are assigned the work of an HIC thought leader (Boshoff, 2009; Parker & Kingori, 2016). This is an undesirable starting point for research in that it subordinates local and proximate expertise to foreign and distal expertise (Sewankambo et al., 2023). It is also antithetical to the meaning of collaboration, which refers to nonhierarchical structures that distribute labor based on knowledge and expertise rather than status or privilege (Kerasidou, 2019). Hierarchical structures in a collaboration can erode trust, encourage self-interest, and reduce future participation. Relatively simple structural changes to funding schemes away from subsidiary funding (i.e., subawards) from HICs toward collaborative awards (where each collaborating institution receives its own award consisting of direct and indirect cost provision) can lay a foundation for greater equity.

In order to develop equitable norms for such collaborations, a long history of extractive norms must be acknowledged and redressed. For example, common practices in psychological research, such as "helicopter research" that mimics the colonial dynamics that fuelled existing regional inequities, should be explicitly disincentivized. To address this, some journals prohibit publication of data collected in an LMIC without explicit collaboration agreements and authorship representation from the LMIC, a practice which has been adopted in certain Global Health journals but has yet to be introduced to any Psychology journals to our knowledge. Democratizing research collaboration, where uneven power dynamics quickly take hold, is both a moral and scientific imperative if we are to advance toward a more global and equitable science (see Urassa et al., 2021, for guidance on equitable collaboration models). Funding agencies, in providing awards, are well-positioned to closely examine the collaborative model of a proposed project and to define best practices for equity-centered collaborations. In addition, requiring the participation and joint leadership of communities being sampled can avoid extractivism in diverse research collaborations.

Refocusing the Lens of Developmental Research

Critical to progress is a clear and actionable vision for a contextualized developmental science. This vision relies on a theoretical, methodological, and epistemic reorientation. Here, we discuss three priorities for this reorientation. First, developmental scientists must prioritize the generation of relevant knowledge of how children develop in diverse contexts (Raikes et al., 2017). Scientifically, this requires an unequivocal theoretical disavowal of fixed or unitary developmental pathways and an espousal of developmental adaptation as a stable developmental mechanism (Bornstein et al., 2012). A recent example of such a theory is developmental cascades (Oakes, 2023; Tamis-LeMonda & Lockman, 2023), predicated on core notions of variability, contextualism, and adaptation. Theoretical frameworks that presume at the outset that development is environmentally conditioned represent a major advance toward a more precise and diversified science. Integrating these frameworks into our practices remains a key priority for our field.

Second, there needs to be a stronger focus on generating reliable and contextually valid metrics for measuring development across diverse settings. At a very basic level, this requires methodologists to establish measurement invariance for target constructs before launching studies in new and underrepresented settings. Rather than presuming that constructs are invariant across cultures, constructs of interest should be interrogated for relevant forms of invariance. Both

invariance and noninvariance can be scientifically informative in designing contextually appropriate studies as both measures provide insight into commonalities and differences that can be leveraged. A lack of sufficient attention a priori to these factors can be limiting and can contribute to misleading beliefs about child development. For example, the use of parents kissing their child can serve as a measure of parental warmth in some contexts but not in others (Wu & Chao, 2005). To conclude from the lack of kissing or other highly specific displays of affection that there is a deficit in parental warmth negates the fact that parental warmth can be communicated in a range of ways. This knowledge could in turn inform a context-appropriate measure of parental warmth (Putnick & Bornstein, 2016). This provides one illustration of how measurement invariance of target constructs is a key component of diversification.

Third, there must be an epistemic reorientation such that scientific priorities that are central to understanding development in underrepresented environments—although rarely present in published research and potentially dismissed as marginally relevant topics—are instead recognized as valid and important scientific goals (Adetula, Forscher, Basnight-Brown, et al., 2022; Syed et al., 2018). Such topics may be viewed as outside of the domain of mainstream developmental psychology as we know it in the United States, or other widely studied contexts, and judged to be more pertinent to cultural psychology or global health in spite of clear relevance to the psychological development of the majority of children. Greater interdisciplinarity in our scholarship may reduce scientific orthodoxy and usher in a greater range of globally relevant topics. Additionally, greater international collaboration via equitable platforms for intergroup engagement can help to identify areas of strategic importance at a global scale.

A Diversified Science Is a More Robust and Representative Science

The goals of science are to describe, predict, and explain. Within this triad, psychologists have placed great value on explanation over description. Description of samples, ecologies, and global contexts are often viewed as an optional adjunct to prediction and explanation. This is reflected in our everyday research norms and practices, exemplified by minimalist descriptions of who we are testing in developmental research (Singh, Cristia, et al., 2023; Singh & Rajendra, 2024). A limited emphasis on description sharply contrasts with the type of verbal generalization that is routinely used to venture broad explanations of behavior (Yarkoni, 2022).

In addition to an underemphasis on description, there is often a narrow view of how we arrive at accurate explanations of development that can detract from diversification. Canonized within the behavioral sciences is the notion that explanations of behavior most effectively stem from manipulation via experimentation. In this way, our methodological orientation has set in place a belief that variables that define experiments are dominant causal factors at the cost of variables that define participants' everyday experiences and ecologies. The latter are likely more pervasive and enduring causal factors in determining development. A focus on contextualism requires integrating these factors into description and explanation. At a metascientific level, this requires disavowing the widely held notion that internal and external validities trade off against each other in scientific pursuits, and that in prioritizing scientific rigor, we need to sanitize our methods of contextual details (Esterling et al., 2023). An intellectual expansion of how we converge on accurate explanations, which seeks to integrate rather than suppress effects of culture and context, is a necessary component of methodological diversification.

Last, we note that biases within the research enterprise are not confined to researchers, scientific laboratories, or the institutions that house them. All scientific discovery takes place within a broader societal context. Societal events can serve as critical inflection points for scientific discovery, training the spotlight on particular populations, methods, societal problems, and end goals. In this way, macrolevel societal events can be valuable catalysts for scientific transformation. For example, in 1967, shortly before his assassination, Dr. Martin Luther King Jr. addressed the American Psychological Association. In his address, he charged scientific researchers with a call to participate in an equitable and inclusive democracy, recognizing scientific research as a crucible of social change. In our field, there sometimes exists the notion that science that intersects with societal change reflects a "value-laden ideology," an approach that is cast in opposition to "value-free science." The notion that good science should be insulated from societal values, contexts, and events is itself an ideology that challenges the foundational utility of scientific research.

As we align our scientific endeavors within societal frameworks, it is critical to embed all scientific conduct in an ethical foundation. We do not need to look too far to recall the harm inflicted by the scientific community on historically marginalized populations as these populations were both belatedly and reprehensibly integrated into scientific research. For example, early theories of psychological functioning conveyed egregious biases about human capacities based on gender, race, ethnicity, and SES (Turiel et al., 2016; also see Eagly & Chaiken, 1993; Elisha et al., 2023; Gould, 1982). In this way, discriminatory societal attitudes, behaviors, and institutional practices were legitimized in the name of science. Many "scientific" practices violated basic codes of ethics expected of psychological researchers, such as those reflected in the American Psychological Association ethics code, which centers principles of beneficence, fidelity and responsibility, integrity, justice, and respect for people's rights and dignity as basic scientific responsibilities. A contextualized science must diversify and broaden its activities in a manner that upholds core ethical principles.

Conclusion

The study of child development remains firmly entrenched in specific world regions, introducing various forms of sociodemographic skew (e.g., geographic, cultural, experiential, and socioeconomic) in our data; yet, many theories remain broad and decontextualized. This skew has been persistent and is at odds with the clear focus on increasing diversity, introducing significant constraints in generalization and replication. In spite of changing ideologies and aspirations, behavioral change has been very slow to come about. There remains a clear predominance of research questions, methodologies, and theoretical frameworks associated with widely represented areas that limit global participation in developmental research. Until our ideals for a contextualized science are reconciled with our research practices, threats to generalizability and replicability will continue to loom large over our science. To this end, globalization and generalization are companion end goals, both of which require a contextualized science of human development.

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