



# Cumulative cultural learning: Development and diversity

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**The complexity and variability of human culture is unmatched by any other species. Humans live in culturally constructed niches filled with artifacts, skills, beliefs, and practices that have been inherited, accumulated, and modified over generations. A causal account of the complexity of human culture must explain its distinguishing characteristics: It is cumulative and highly variable within and across populations. I propose that the psychological adaptations supporting cumulative cultural transmission are universal but are sufficiently flexible to support the acquisition of highly variable behavioral repertoires. This paper describes variation in the transmission practices (teaching) and acquisition strategies (imitation) that support cumulative cultural learning in childhood. Examining flexibility and variation in caregiver socialization and children's learning extends our understanding of evolution in living systems by providing insight into the psychological foundations of cumulative cultural transmission—the cornerstone of human cultural diversity.**

cumulative culture | cultural evolution | cross-cultural comparison | teaching | imitation

Human and nonhuman animals engage in behaviors that are culturally created and subsequently transmitted (1–3). Long-term studies of nonhuman animal species in their natural habitats have demonstrated that many species respond to, and learn from, social information (4–9). Nonhuman animals also transmit group-specific behavior through what could be considered rudimentary forms of cultural transmission (10–14). However, cultural transmission in humans differs markedly from that in nonhuman animals in both its extent and structural complexity (15, 16). The psychological foundations of cultural complexity are multifaceted. Explanations require drawing together developmental, cross-cultural, and comparative research that extends biology through culture.

Culture is defined as “group-typical behaviors shared by members of a community that rely on socially learned and transmitted information” (17). Humans are “ultra” cultural (18); they live in culturally constructed niches filled with artifacts, skills, beliefs, and practices that have been inherited, accumulated, and modified over generations (19–22). What explains the technological and social complexity of human culture? A causal account must explain the distinguishing characteristics of human culture: It is cumulative, transmitted horizontally within groups and vertically across generations, and varies within and between populations. Cumulative culture is a process by which innovations are progressively incorporated into a population's stock of skills and knowledge, generating more complex repertoires (23–26). Cumulative culture requires psychological adaptations that ensure the high-fidelity transmission of knowledge, skills, and practices (27–29). However, innovation is also necessary to ensure cultural and individual adaptation to novel and changing challenges (30–33).

Cumulative cultural transmission accelerates innovation because each generation can build upon the technologies passed down by previous generations (34). Much of human technology is too complex and sophisticated to be recreated within individual lifetimes (35). The growth of cultural complexity is not exponential

or linear but instead is a process of punctuated accumulation; it involves the conservation of some features, incremental innovation, and occasionally dramatic qualitative shifts (36).

The diversity of skills, practices, beliefs, and values among populations is another distinguishing feature of human culture. Cultural groups are heterogeneous populations of individuals that differ along complex ecological, social, and structural variables. Socially acquired and transmitted behaviors vary more distinctly among human populations than in any other species (37). Cultural variability is one of our species' most distinctive features, and a causal account of human culture must explain its diversity. The psychological adaptations supporting cumulative cultural transmission are hypothesized to be universal features of human psychology, but they must be sufficiently flexible to support the acquisition of highly variable skill sets and behavioral repertoires (38).

What psychological adaptations explain the species-specific capacity to accumulate and build upon the cultural innovations of previous generations? To what extent do cultural transmission practices (teaching) and cultural acquisition strategies (imitation) vary across populations? How do caregivers use teaching to transmit information, skills, and practices to children? How do children use imitation to acquire the knowledge and skills of their groups? The objective of this paper is to answer these questions using data on teaching and imitation from developmental and cross-cultural research.

One potential explanation for cross-species variation in cultural complexity is social learning (2). Social learning is defined as “learning that is influenced by observation of or interaction with another animal (typically a conspecific) or its products” (39, p. 207). Young children are well equipped with a complex repertoire of social learning capacities (1, 40). Cumulative culture transmission requires a particular kind of social learning that allows the accumulation of successful modifications over time through a process of cultural ratcheting (41–43). For example, humans improved upon the Oldowan single-face stone tool, used more or less intact for a million years, by creating bifacial Acheulean handaxes with dramatically improved functionality—an example of cultural continuity followed by punctuated innovation (44).

Cumulative cultural learning is psychologically prepared by a set of adaptations that facilitate the transmission and acquisition of information within and across generations (29, 45–47). Teaching, high-fidelity imitation, and language are three linked abilities that work in concert to support cultural transmission in humans (48). Teaching and imitation reflect the distinction between instructed and imitative learning (43). Language allows

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information transfer between individuals, supporting both teaching and imitation. These cognitive abilities are supported by a psychological system that has evolved to understand the minds of others and to navigate complex social group behavior (49–51). Well-documented cognitive biases reinforce cultural transmission, including preferences for similar others (homophily) (52) and proclivities for conformity (53), consensus (54–56), prestige (57, 58), and social norms (59–62).

If teaching and imitation provide the foundation for cumulative culture, they should be early developing and universal (63). They also must afford the capacity to respond flexibly to diverse ontogenetic contexts and cultural ecologies (38, 64–66). Understanding cultural continuity and variation in teaching and imitation provides insight into the process by which cumulative culture allows humans to adapt to highly diverse environments. Teaching and imitation conserve cultural knowledge, thus increasing the potential for innovation or modification at the group level, which further increases cultural complexity (67). Greater cultural complexity increases the repertoire of socially transmitted beliefs and practices, which increases the prevalence and necessity of teaching (46). High-fidelity transmission may be more central to maintaining cumulative culture than to innovation (68). Teaching and imitation conserve and transmit both group-specific behavioral repertoires and cultural innovations.

To understand variability in teaching and imitation better, research must be conducted on childrearing environments and practices across diverse populations. The great majority of psychological research has been conducted in populations that are unrepresentative of human culture globally and historically—those from Western, educated, industrialized, rich, and democratic (WEIRD) backgrounds (38, 69). A growing literature within developmental psychology and the anthropology of childhood aims to correct the bias in studying WEIRD populations within the discipline (18, 37, 38, 70–78).

Using evidence from cross-cultural, developmental research, I will first describe variation in cultural transmission practices and then cultural acquisition strategies. My objective is to provide insight into the origins of variation in cumulative cultural learning and the processes by which knowledge is acquired and transmitted during development. A comprehensive account of teaching and imitation requires systematic study of variations in childrearing practices and beliefs.

### Variation in Cultural Transmission Practices

The universal goals of childrearing include promoting the survival, health, and cultural competency of children (79). Children, in collaboration with their caregivers and peers, interact in ways that ensure the transmission of cultural practices and beliefs across generations (37, 80). Teaching, defined as “a behavior in which one animal intends that another learn some skill or acquire some bit of information or knowledge that it did not have previously” (48, p. 374), promotes the efficient transfer of information and is a recurrent feature of human cultural transmission.

Human caregivers are unique among animals in their motivation to transmit information to children through teaching (81). Human adults expect children to learn and provide assistance when needed (82). The ability to share psychological states and intent with others during (intersubjectivity and metacognition), to engage in mutually recognized, shared focus (joint attention), and to engage in collaborative and coordinated interactions contributes to efficient scaffolding and teaching (83–87).

Substantial quantitative and qualitative variation exists in teaching both within (88) and among (89) populations. For example, in different populations, caregivers respond differently to infants’ emotional displays (90), speak to and structure their infants’ social interactions and expectations in distinct ways (74, 91), and display variability in the modalities (e.g., physical, visual, vocal) used to transmit information to infants (92, 93).

Teaching is not a monolithic process. It consists of a repertoire of cultural transmission strategies that vary based on the kind of information or skill being transmitted, the effort required, and beliefs about how children learn. Kline (77) developed a taxonomy of teaching based on data from a teaching ethogram for cross-cultural human research (TEACH) to describe the variation and function of different pedagogical styles. For example, when teaching by social tolerance, a teacher grants the learner access for close observation. When teaching by opportunity provisioning, teachers provide access to activities that are too difficult or dangerous for the learner to explore independently, without modification. When teaching by evaluative feedback, the teacher provides positive or negative reinforcement of the learner’s behavior through positive or negative verbal or gestural feedback, positive or negative consequences, teasing, warning of danger, or commands to stop, to say or to do. When teaching by social or local enhancement, the teacher directs the learner’s attention toward the task at hand. Direction of this kind can include calling attention to an object or person and commands to watch. When engaging in direct active teaching, the teacher makes relevant aspects of the task accessible or observable. Direct active teaching involves defining the boundaries of what is to be learned and can include direct communication, abstract communication, and demonstration.

Opportunity provisioning and direct active teaching are relatively effortful compared with the other types of teaching, because the behaviors required are less compatible with teachers’ ongoing behaviors, requiring an interruption of the teacher’s behavior at some cost. Some of the indicators in the TEACH ethogram are established in the literature as behavioral markers of teaching, including ostensive cues and behaviors that facilitate shared attention (48). Pedagogical style varies predictably based on the costs and benefits of the mode of transmission, the cultural domain and complexity, learner, and teacher identity (94, 95).

Direct active teaching has much in common with didactic pedagogy (i.e., adults structuring and guiding children’s learning). When engaging in direct active teaching, caregivers in WEIRD populations scaffold and manage children’s learning environment, often engaging in extensive face-to-face interaction, eye contact, and instruction (92). According to this pedagogical model, the caregiver is a teacher—a model of child socialization based on Western formal educational practices. The extensive reliance on direct active teaching may be a relatively recent historical phenomenon in caregiver–child interactions and reflects cultural beliefs about children’s learning, the structure of formal educational institutions, and the extensive body of abstract knowledge and skills children are expected to master (e.g., literacy and numerical computation). Direct active teaching is such a normative feature of cultural transmission in WEIRD populations that some are calling for limiting its use because of its potentially detrimental effects on self-directed discovery and exploration (96).

Populations vary widely in the amount of direct active teaching in which caregivers engage. For example in Fiji, direct active teaching is relatively rare compared with less time-intensive and costly forms of teaching, such as teaching by social tolerance or allowing children to observe behaviors they may need to learn (77, 95, 97). Cross-cultural research in the United States and Vanuatu has demonstrated that, in contrast to caregivers from Vanuatu, caregivers from the United States rely heavily on verbal communication. They scaffold through language by asking children questions, encourage planning, and provide high levels of verbal praise and encouragement. Caregivers in the United States also use extensive verbal instruction and repetition to introduce new objects or unfamiliar tasks and to establish common ground in information sharing (98). They engage in high levels of visual contact with children, consistent with previous research on joint attention in WEIRD populations. In contrast, caregivers

from Vanuatu use substantially more nonverbal forms of communication, such as gesture and physical touch (92).

Ethnographic accounts of caregiver–child interaction emphasize variation in parental ethnotheories (i.e., cultural beliefs) about children’s capacity to self-educate through observational learning (99, 100). Children routinely engage in third-party observation of adult activity and often learn by close observation without being directly addressed or involved (101–104). Caregiver expectations that will children learn through attentive observation before participating impacts the caregiver’s pedagogical style (105). If caregivers expect children to learn through observation instead of through interactive conversation, they may be less likely to engage in verbal scaffolding or to direct active teaching (77). Formal education also impacts childrearing practices and values (76, 93, 106). These practices include how parents interact with their infants (107), direct children’s attention (108), and use verbal instruction (109).

There is substantial variation in how caregivers structure children’s learning opportunities (102, 110–112). The kinds of tasks caregivers and children engage in together vary (113), as does the amount of time children spend with nonparental caregivers and peers (79, 114). Cultural groups also vary in the degree to which children are segregated from or are participants in adult economic and social activity (100, 115). For example, children living in communities that rely on labor-intensive subsistence agriculture are expected to assist adults in subsistence-based labor (e.g., cooking, planting and harvesting crops, and helping with the childcare of younger siblings) at a young age (116).

Variation in cultural transmission practices also reflects the kinds of skills and behaviors children must acquire. For example, learning a complex or abstract skill often requires direct active instruction to acquire that skill efficiently. Caregivers play a critical role in transmitting the beliefs, skills, and practices of particular populations. Cultural transmission alone does not explain high-fidelity cultural acquisition. Young children are adept at acquiring the beliefs and practices of the groups they are born into, an extraordinary learning achievement that requires substantial flexibility (38). Next I review evidence for high-fidelity imitation, describe evidence for variation between populations, and discuss the implications for acquiring knowledge.

### Variation in Cultural Acquisition Practices

Our species-typical proclivity for high-fidelity imitation is critical for cumulative cultural transmission (42, 117, 118). High-fidelity imitation plays a central role in both horizontal and vertical transmission of group-specific cultural practices. Young children possess cognitive and communication systems that support the transmission of complex technical skills and social conventions (46, 65, 75).

Children learn the skills and practices of their communities by imitating others. The ability and motivation to engage in high-fidelity copying allows children to acquire an extraordinary variety of skills and information they otherwise would not be able to acquire through direct exploration or experimentation alone (29). For acquired behavior to count as cultural, it must disseminate in a social group and remain stable across generations (119, 120). The conservation of knowledge and skills across generations supports individual and group-level innovation (121). The propensity for overimitation, or copying actions that are causally irrelevant to achieving an instrumental end goal (122, 123), develops early. Children often copy when uncertain about the underlying causal structure of a behavior. This proclivity is useful, given that a vast amount of behavior that children acquire is opaque from the perspective of physical causality (124, 125). High-fidelity imitation is an adaptive human strategy facilitating more rapid social learning of instrumental skills than would be possible if copying required a full causal representation of an event (126).

Cumulative culture requires the high-fidelity transmission of two qualitatively different behaviors: instrumental knowledge and skills (e.g., how to keep warm during winter) and social conventional knowledge and skills (e.g., how to perform a ceremonial dance) (127). Acquiring the behavior of other group members may be the function of an individual-level adaptation for imitation in our species. Thus, the transmission of cumulative culture across generations can be seen, in part, as a product of our propensity for imitative flexibility (128).

The unique demands of acquiring instrumental skills and social conventions provide insight into when children imitate and when they innovate. The objective of imitating instrumental behavior is reproducing the end goal by discerning which actions are causally relevant to producing the desired outcome (127). Attending to the causal relationship between the actions and the end goal allows for innovation and variability in the reproduction of the behavior and, as a result, lower-fidelity imitation. In contrast, the objective of imitating conventional behavior is reproducing all the steps in the process (129), which requires attending to the way in which the behavior ought to be executed. In contrast to imitating instrumental behaviors, imitating conventional behaviors requires consistently high-fidelity imitation. Children may encode causally irrelevant actions not because they think that they are causally efficacious in some way, or even to demonstrate shared intentions, but rather to conform to social conventions (130). Although learning an instrumental skill often allows for variability and innovation in methods of execution, learning social conventions requires close conformity to the way other group members perform the actions.

Imitation has social functions, such as encoding normative behavior (131). The adaptive benefits of group membership have favored individuals who engage in affiliative behaviors, such as high-fidelity imitation (132, 133). Children imitate social conventions as a means of affiliation with group members (127). High-fidelity imitation also may function as a reinclusion behavior in reaction to the threat of social exclusion from an in-group in childhood in ways that parallel the increase in motor mimicry following social exclusion by in-group members observed in adults (134). Children ostracized by in-group members display higher levels of anxiety and engage in higher imitative fidelity of a group convention than children ostracized by out-group members (135). They imitate instrumental tasks with higher fidelity when primed with ostracism (136, 137). When status or inclusion within a group is threatened, children may be particularly motivated to enhance their standing in a group through affiliative behavior such as high-fidelity imitation.

Imitation is used to acquire instrumental skills as well as to engage in social conventions such as rituals. However, it is often difficult to determine whether a behavior is instrumental or conventional based on observation of the behavior alone. For example, lighting a candle could have an instrumental goal (lighting a dark room) or a conventional goal (worshipping a deity). How do children determine whether a behavior is instrumental or conventional? Young children are highly sensitive to contextual variation in social information (138). Children use a number of social and contextual cues when making inferences about the goal of behavior. Cues to conventionality increase imitative fidelity. One is causal opacity (i.e., lack of a physical causal mechanism). A second is consensus (i.e., multiple actors performing the same actions). A third is synchrony (i.e., multiple actors performing the same actions at the same time) (56). Children are also highly sensitive to verbal cues to conventionality and to the presence of a social norm (65, 127, 139). Even infants are sensitive to language cues to conventionality (140).

There is both continuity and variation in imitative flexibility across populations (141–143). For example, children in industrialized, Western populations (e.g., the United States) and subsistence-based, non-Western populations (e.g., Vanuatu) imitate conventional

tasks with higher fidelity than instrumental tasks—an example of continuity. Children in Vanuatu, however, engage in higher imitative fidelity of instrumental tasks than in the United States, a potential consequence of greater socialization for conformity in some populations than in others (139, 144).

Cues to conventionality also increase expectations for conformity and attention to behavioral variation. Children's accuracy in detecting differences between the performances of two actors is greater when an action is interpreted as a social convention, potentially because of expectations for conformity to conventional behavior (127). The social conventionality of an action may trigger affiliative behavior through conformity, motivating greater attention to detail and alertness to deviations from procedure. Children also transmit conventional behavior with higher fidelity than instrumental tasks when teaching a peer (65).

Imitative flexibility improves over the course of childhood. For example, there are age-related improvements in object memory-based imitation between 2 and 5 y of age (145, 146). Children's understanding of the social and contextual cues that distinguish instrumental from conventional behavior increases with age (127, 139). They may become more sensitive to these cues as a result of learning about social conventionality (50, 147). Understanding the development of imitative flexibility requires examining the extent to which caregivers scaffold this ability. Caregivers in the United States adjust their interactions with children according to the goal of the behavior. For example, they encourage higher-fidelity imitation of social conventions than of instrumental tasks and, conversely, encourage more creativity and innovation for instrumental tasks than for social conventions. They also engage in more encouragement, demonstration, and monitoring when teaching their children conventional tasks than when teaching instrumental behavior (148).

Adults across a wide range of global populations view high-fidelity imitation as an efficient method of learning. For example, parents in the United States and Vanuatu encourage children to conform to the behavior of others (144). However, there is variation in beliefs about the relationship between conformity and competency. For example, when evaluating US children, US adults are more likely to endorse low- than high-conformity children as intelligent, often citing creativity as a justification for their judgments. In contrast, Vanuatu adults are more likely to endorse high- than low-conformity children as intelligent and are more likely to endorse high-conformity children as well behaved than are US adults (144). The perceived relations between intelligence, conformity, and creativity vary across populations. Perceived intelligence is critical to social esteem and status within a group. The variation in beliefs about indicators of intelligence based on conformity and creativity has implications for the kinds of behaviors that are transmitted as well as for the kinds of behaviors associated with prestige within groups.

As novice learners, children must acquire the practices and beliefs of the group they are born into. To understand cultural continuity and variability in cultural acquisition strategies better, research must be conducted with children across diverse populations. There is substantial evidence that high-fidelity imitation is universal in human children. However, imitation, like teaching, is not a monolithic capacity. Efficient cultural learning requires flexible imitation of instrumental skills and social conventions. The skills and conventions children must acquire vary enormously among populations, as do expectations for conformity versus innovation. Cross-cultural data demonstrate that variation of this kind impacts the extent to which children engage in high-fidelity imitation versus innovation.

Recent decades have produced a large literature on cumulative cultural transmission. Children, in collaboration with their caregivers and peers, interact in ways that ensure the transmission of cultural practices and beliefs across generations. However, we currently lack a complete causal explanatory account of cultural

variation. Next I describe future directions for research designed to explain variation between populations.

### Explaining Cultural Variation

Despite evidence that cultural transmission practices and cultural acquisition strategies vary across populations, to date we cannot predict and explain the sources of this variation. Do caregivers in populations with lower levels of Western-style education engage in less direct active teaching and more observational learning? If so, is this difference explained by participation in Western-style education or other factors such as social organization or degree of market participation? Do caregivers in hierarchical populations engage in more active teaching than caregivers in egalitarian populations? Do peers, older siblings, or cousins use different teaching styles than caregivers, and does age-heterogeneity of the peer group impact learning? More research is needed to collect the kind of demographic and mixed-methodological data required to answer such questions.

Cultural groups vary along multiple continua. These include level of integration into the global economic marketplace, social organization, urbanicity, kinship networks, peer-group age heterogeneity, and formal versus informal education. Systematic comparisons among multiple groups will provide much stronger support for causal claims that a particular variable of interest is responsible for variation in dependent measures (149). For example, studying Melanesian populations in Yasawa Islands, Fiji, and Tanna, Vanuatu, would allow a comparison of populations that are similar in terms of subsistence agricultural practices and limited exposure to Western-style education but are different in terms of social organization (hierarchical social organization in Fiji versus egalitarian chiefdoms in Vanuatu). Conducting research with multiple populations that are similar along some variables but different along others will (i) reveal the impact of sources of variation on outcomes; (ii) prevent inadvertently describing idiosyncratic features of particular cultural contexts; and (iii) provide opportunities to reveal social and psychological processes not possible if data were collected only from a narrow range of populations.

The dearth of systematic research outside Western populations presents a major impediment to theoretical progress in the psychological sciences in general (47) and to the developmental sciences in particular (18). Despite growing recognition that most of what we know about child development is based on a very narrow sample of children, cross-cultural developmental studies are still rare, often unsystematic, and typically rely on convenience sampling (29, 150). A new path forward in developmental science is needed to understand better the ontogeny of a species that inhabits diverse cultural ecologies and faces complex adaptive problems.

Building a comprehensive understanding of cultural transmission practices and acquisition strategies requires studying cultural contexts that differ in theoretically relevant ways. There is a pressing need for systematic, cross-cultural, and mixed-methodological research on this topic. The lack of infrastructure for conducting research across multiple field sites has previously posed a major impediment to understanding cultural variation. Collaborative networks of international fieldsites are needed to generate data from diverse populations—an undertaking that requires the expertise and cooperation of multiple international and interdisciplinary partners. Another obstacle to conducting research of this kind is gaining approval to work in diverse populations. Connections need to be established with diverse communities and relationships developed based on trust and respect, an issue that is even more critical when working with children. In each community being studied, a network of local research assistants and translators must be established and maintained, and special care must be taken to ensure that the methodologies and stimuli used in research are culturally salient and appropriate.

## Summary

The unparalleled intellectual success of humans is widely attributed to our ability for cumulative cultural transmission, a process by which we take the discoveries, behaviors, and inventions of others and build upon them further to create increasingly complex reserves of socially heritable knowledge and technology (121). Evidence for culture in nonhuman species continues to grow, but there are few candidate examples of cumulative culture outside humans' distinctively complex achievements. Human culture is uniquely variable in nature, as exemplified by the extraordinary diversity across technological skills and social practices within and among populations. Human psychological flexibility provides the foundation for cultural diversity and is a prerequisite for cumulative culture. It allows humans to build upon established behaviors by relinquishing old solutions and flexibly switching to more productive or efficient ones (128).

Cultural transmission practices and acquisition strategies support cumulative culture: our species-specific capacity to accumulate and build upon the cultural innovations of previous generations. A comprehensive account of teaching and imitation requires systematic study of cultural variation and continuity in childrearing practices (151). Variable socialization strategies support different culturally specific childrearing goals. Teaching practices reflect the values, educational institutions, and skill sets of diverse cultural and ecological contexts. Children around the globe use imitation flexibly to acquire the specific practices, beliefs, and values of their groups. Future cross-cultural research on teaching and imitation will enrich our understanding of cognitive and social development and will substantially increase our knowledge about the developmental origins of a psychological hallmark of our species—cumulative cultural transmission.

The psychological foundations of cultural complexity are multifaceted. Explanations that extend biology through culture require drawing together developmental, cross-cultural, and

comparative research (18, 38). The vast majority of studies attempting to elucidate the evolutionary origins and ontogenetic processes of cultural learning focus on children raised in WEIRD societies (69, 151). Children living in technologically complex cultural environments provide excellent opportunities to study the early-developing capacity to adopt, capitalize upon, and build increasingly sophisticated and opaque technologies. These populations, however, do not reflect the childrearing environments that *Homo sapiens* and their close ancestors experienced through much of their cultural evolutionary history or the diverse ways in which children are raised across the world today. Cross-cultural research highlights not only the varied effects of the ontogenetic environment on behavior and cognition but also strengthens claims about universal and phylogenetically endowed mechanisms.

Children experience enculturation from infancy through their interaction with caregivers, artifacts, and cultural institutions. For this reason, it is also necessary to look to other species to understand better how evolution has shaped the human mind. Chimpanzees, arguably the second most cultural extant species (81), are an ideal comparative sample for studying the mechanisms and processes which may be unique to human culture or inherited from our shared ancestors. Studying a wide age range of chimpanzees, raised in different environments, will also increase our understanding of the evolutionary origins of when and why developmental processes shaped the hominin mind.

Humans engage in a wider variety of socially acquired and transmitted behaviors that vary more distinctly across communities than any other animal species. Data from cross-cultural, comparative, and developmental research are needed to increase our understanding of the evolution of cumulative cultural transmission. Examining the flexibility and variation in cultural transmission practices and acquisition strategies provides insight into the psychological foundations of cumulative cultural transmission—the cornerstone of human cultural diversity.

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