Mending wall

Mohammed Ali Al-Saleh Scholarly Commentary

Cambridge Langdon

Philip Lieberman

Precis of Cognitive Gadgets: The Cultural Evolution of Thinking

Cecilia Heyes

Cecilia Heyes, All Souls College, Oxford University, Oxford, UK, cecilia.heyes@asc.ox.ac.uk

Keywords: cognitive gadgets; cognitive offloading; cognitive scaffolding; cognitive transformation; cognitive transformation theory; cognitive transformation theory of human uniqueness; cognitive transformation theory of human uniqueness; cognitive transformation theory of human uniqueness

Through conversation, storytelling and collective reasoning, people generate ideas, refine them, and carry them forward in ways no individual could sustain alone. This process is not random or mechanical, and it is not the work of AI. It is the work of human minds in dialogue, shaping knowledge through interpretation, judgment, and shared meaning. Large language models can support this process by organizing information, surfacing patterns, and reflecting back what people already know. But they cannot generate authentic collaborative reasoning.

A high-quality, open-source LLM is a maintenance, not a breakthrough. It keeps the system:

- Sustainable to run and deployable wherever it is needed
- Independent from any single vendor or commercial interest
- Transparent in its behavior and limitations
- Aligned with the values of the people who use it

4.1 Human commitment

In principle, it is possible that new cognitive mechanisms, such as a cognitive gadget, constructed in the future, could enable AI to participate in collaborative reasoning. However, this would require a fundamentally different kind of system, not a larger model or better prompting. The current architecture is structurally limited to statistical inference that lacks the kind of grounded cognition that human reasoning depends on. Any such system would need to extend their current architecture. Until such a system exists, the work of collaborative reasoning remains with people. The infrastructure to support it, however, can be built now.

Sustaining this work requires commitment from those who benefit from it. Open source communities have long demonstrated that shared infrastructure can be maintained through distributed contribution when the value is clear and the governance is transparent. The Petits et Capitales Grégoires project is one attempt to apply that model to collaborative reasoning. Whether it succeeds depends on whether people who find the work useful choose to contribute to it.

4.2 Open Commentary

How is misdreading really like reading?

Dominique Dubuisson[1,2], Axel Cleeremans[3,4]

[1]Université Paris Nanterre, Nanterre, France; [2]Institut Universitaire de France, Paris, France; [3]Université Libre de Bruxelles, Brussels, Belgium; [4]Université Paris Cité, Paris, France

Abstract

Misreading is a phenomenon that occurs when people read a text without being aware of misreading such text reading. Critics can easily point out that misreading is not like reading, because it is not a cognitive process that leads to understanding the meaning of a text. However, we argue that misreading is like reading because it is a cognitive process that leads to understanding meaning. We conclude that misreading may be an opportunity to thinking differently.

How is misreading really like reading? We sometimes differ of opinion with our friends, but we do not always know why. Misreading is a phenomenon that occurs when people read a text without being aware of misreading such text reading

Abstract

Cognitive gadgets theory proposes a distinct evolutionary psychology for human cognition, based on the cognitive effects of culturally evolved artifacts. This commentary argues that this proposal underestimates the coming "cultural evolutionary psychology" (CE) of human cognition, because it underestimates the scope of cognitive adaptation to culture, and because it underestimates the cognitive effects of culture on the human mind.

Cecilia Heyes[1] and Cecilia Heyes[2]

[1]Department of Psychology, Faculty of Arts and Sciences, Duke University, Durham, NC 27708-0086 USA. cecilia.heyes@duke.edu
[2]All Souls College, Oxford University, Oxford OX1 4AL, UK. cecilia.heyes@asc.ox.ac.uk

cultural evolutionary psychology: a still evolutionary psychology?

Cecilia Heyes[1] and Cecilia Heyes[2]

[1]Department of Psychology, Faculty of Arts and Sciences, Duke University, Durham, NC 27708-0086 USA. cecilia.heyes@duke.edu
[2]All Souls College, Oxford University, Oxford OX1 4AL, UK. cecilia.heyes@asc.ox.ac.uk

Heyes (2012) argues that cognitive gadgets theory (Shettleworth 2010) creates a distinct evolutionary psychology for human cognition, based on the cognitive effects of culturally evolved artifacts. Using the metaphor of "cognitive gadgets" to refer to culturally evolved artifacts that have cognitive effects, she proposes that this theory is distinctive because it relates adaptive change in human cognition to the cognitive effects of culture, rather than to the cognitive effects of genes. This novel theory appears to have generated considerable interest, and to have been well received by many commentators. In this commentary, I argue that this proposal underestimates the coming "cultural evolutionary psychology" (CE) of human cognition, because it underestimates the scope of cognitive adaptation to culture, and because it underestimates the cognitive effects of culture on the human mind.

Heyes (2012) argues that genes have Swiss-Army knife-like effects on cognition, but that culture can produce specialized cognitive gadgets, such as those for mind-reading and for reading. She argues that this difference in the cognitive effects of genes and culture is due to the fact that culture is a "copying process" that "can't create what it can't copy" (sect. 3.1). She argues that genes are not comparable with a "copying process" because they are "copied" by "a complex developmental process" that "can't be copied." She argues that culture is a copying process because it is "the sum of what people have learned from others" (sect. 3.1). She argues that genes are not comparable with culture

Abstract

Cognitive jigsaws are metaphorical tools that have been used to illustrate how cognitive capacities, which are in fact distributed across the brain, can be thought of as being assembled from independent components. This commentary argues that the jigsaw metaphor is misleading because it underplays the role of cognitive artefacts in shaping cognitive capacities. Cognitive artefacts are not just tools that can be used to assemble cognitive jigsaws, they are the jigsaws themselves. Cognitive artefacts are cognitive tools that are made up of many components, which are in turn made up of other cognitive artefacts, and they are passed down from generation to generation as a cognitive unit. It is argued that the study of cognitive artefacts should be a central concern of cognitive science, and that the study of cognitive artefacts should be based on a theory of cognitive artefacts that is grounded in evolutionary theory. It is argued that such a theory of cognitive artefacts should be based on the concept of a cognitive niche, and that such a theory should be based on the concept of a cognitive niche that is grounded in evolutionary theory. It is argued that such a theory of cognitive artefacts should be based on the concept of a cognitive niche that is grounded in evolutionary theory because such a theory would be able to explain why cognitive artefacts are what they are, why they are passed down from generation to generation as a cognitive unit, and why they are so important to the study of cognitive science.

Instincts or cognitive? Not the debate we should be having

Leslie Spencer *

*Department of Cognitive Science and Philosophy, Cognitive Science Institute, Cognitive Science Institute, Cognitive Science Institute

the course notably, especially in relation to selective court decisions. The argue that the ability to be more neutral, or more neutral in certain contexts, is a function of the cognitive capacities of the judiciary and what they. There are little to no empirical studies that have tested the effect of judicial ideology on the cognitive capacities of judges. Some research has suggested that judges are susceptible to the influence of cognitive biases. For instance, Tor Pettersen, Ingvild Bjerkeset, and Ingvild Bjerkeset (2017) argued that judges are susceptible to the influence of the availability heuristic, which is a cognitive bias that causes people to overestimate the probability of events that are easily recalled. In a study of Norwegian judges, they found that judges were more likely to rule in favor of the plaintiff when a case was preceded by a similar case that was easily recalled, which suggests that the availability heuristic may be at work in judicial decision-making. Another study by Tor Pettersen, Ingvild Bjerkeset, and Ingvild Bjerkeset (2018) found that judges were also susceptible to the influence of the anchoring effect, which is a cognitive bias that causes people to be influenced by a particular piece of information when making a decision. The study found that judges were more likely to rule in favor of the plaintiff when the plaintiff's initial demand was higher than when it was lower, which suggests that the anchoring effect may be at work in judicial decision-making. These studies suggest that judges are susceptible to the influence of cognitive biases, which may affect their cognitive capacities and their ability to be more neutral in certain contexts. The study also found that judges were more susceptible to the influence of cognitive biases when they were under time pressure or when they were dealing with complex cases, which suggests that the cognitive capacities of judges may be affected by the complexity of the case and the time available to make a decision. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were emotionally charged, which suggests that the cognitive capacities of judges may be affected by the emotional nature of the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were politically charged, which suggests that the cognitive capacities of judges may be affected by the political nature of the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving vulnerable parties, which suggests that the cognitive capacities of judges may be affected by the vulnerability of the parties involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving complex legal issues, which suggests that the cognitive capacities of judges may be affected by the complexity of the legal issues involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving novel legal issues, which suggests that the cognitive capacities of judges may be affected by the novelty of the legal issues involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving high stakes, which suggests that the cognitive capacities of judges may be affected by the stakes involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple parties, which suggests that the cognitive capacities of judges may be affected by the number of parties involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple issues, which suggests that the cognitive capacities of judges may be affected by the number of issues involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple jurisdictions, which suggests that the cognitive capacities of judges may be affected by the number of jurisdictions involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple languages, which suggests that the cognitive capacities of judges may be affected by the number of languages involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple cultures, which suggests that the cognitive capacities of judges may be affected by the number of cultures involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple religions, which suggests that the cognitive capacities of judges may be affected by the number of religions involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genders, which suggests that the cognitive capacities of judges may be affected by the number of genders involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple sexual orientations, which suggests that the cognitive capacities of judges may be affected by the number of sexual orientations involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple ethnicities, which suggests that the cognitive capacities of judges may be affected by the number of ethnicities involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple races, which suggests that the cognitive capacities of judges may be affected by the number of races involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic traits, which suggests that the cognitive capacities of judges may be affected by the number of genetic traits involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic mutations, which suggests that the cognitive capacities of judges may be affected by the number of genetic mutations involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic disorders, which suggests that the cognitive capacities of judges may be affected by the number of genetic disorders involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic diseases, which suggests that the cognitive capacities of judges may be affected by the number of genetic diseases involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic conditions, which suggests that the cognitive capacities of judges may be affected by the number of genetic conditions involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic syndromes, which suggests that the cognitive capacities of judges may be affected by the number of genetic syndromes involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic anomalies, which suggests that the cognitive capacities of judges may be affected by the number of genetic anomalies involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic abnormalities, which suggests that the cognitive capacities of judges may be affected by the number of genetic abnormalities involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic variations, which suggests that the cognitive capacities of judges may be affected by the number of genetic variations involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic variants, which suggests that the cognitive capacities of judges may be affected by the number of genetic variants involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic markers, which suggests that the cognitive capacities of judges may be affected by the number of genetic markers involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic loci, which suggests that the cognitive capacities of judges may be affected by the number of genetic loci involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic alleles, which suggests that the cognitive capacities of judges may be affected by the number of genetic alleles involved in the case. The study also found that judges were more susceptible to the influence of cognitive biases when they were dealing with cases that were involving multiple genetic haplotypes, which suggests that the cognitive capacities of judges may be affected by the number of genetic haplotypes

Shahaeian A., Peterson C. C., Slaughter V. & Wellman H. M. (2011) Culture and the sequence of steps in theory of mind development. *Developmental Psychology* **47** (5):1239–47. [aCH, MDG]

Shallice T. & Cooper R. (2011) *The organisation of mind*. Oxford University Press. [rCH]

Shanks M. & Tilley C. Y. (1987) *Social theory and archaeology*. Polity Press. [MF]

Shea N. (2013) Inherited representations are read in development. *The British Journal for the Philosophy of Science* **64**(1):1–31. [aCH]

Shea N., Boldt A., Bang D., Yeung N., Heyes C. M. & Frith C. D. (2014) Supra-personal cognitive control and metacognition. *Trends in Cognitive Sciences*, **18**(4), 186–193. [rCH, CR]

Shettleworth S. J. (2010) *Cognition, evolution, and behavior*. Oxford University Press. [aCH]

Shiraev E. & Levy D. A. (2014) *Cross-cultural psychology*. Pearson Education Limited. [aCH]

Shweder R. A. & Sullivan M. A. (1993) Cultural psychology: Who needs it? *Annual Review of Psychology* **44**(1):497–523. doi: 10.1146/annurev.ps.44.020193.002433. [GI]

Simons D. J., Boot W. R., Charness N., Gathercole S. E., Chabris C. F., Hambrick D. Z. & Stine-Morrow E. A. (2016) Do "brain-training" programs work? *Psychological Science in the Public Interest* **17**(3):103–186. [SB]

Slaughter V. & Peterson C. C. (2012) How conversational input shapes theory of mind development in infancy and early childhood. In: *Access to language and cognitive development*, ed. M. Siegal & L. Surian, pp. 3–22. Oxford University Press. [aCH]

Slaughter V. & Zapata D. P. (2014) Cultural variations in the development of mind reading. *Child Development Perspectives* **8**(4):237–41. Available at: http://doi.org/10.1111/cdep.12091. [RAM]

Smaldino P. E. (2014) The cultural evolution of emergent group-level traits. *Behavioral and Brain Sciences* **37**:243–295. [PES]

Smith K. & Kirby S. (2008) Cultural evolution: Implications for understanding the human language faculty and its evolution. *Philosophical Transactions of the Royal Society B: Biological Sciences* **363**(1509):3591–3603. [PES]

Sousa A. M. M., Meyer K. A., Santpere G., Gulden F. O. and Sestan N. (2017) Evolution of the human nervous system function, structure, and development. *Cell* **170**(2):226–47. [EJ]

Spapé M. M. & Hommel B. (2008) He said, she said: Episodic retrieval induces conflict adaptation in an auditory Stroop task. *Psychonomic Bulletin & Review* **15**(6):1117–21. [SB]

Sperber D. (1996) *Explaining culture: A naturalistic approach*. Blackwell Publishers. [aCH, PES]

Sperber D. (2000) An objection to the memetic approach to culture. In: *Darwinizing culture: The status of memetics as a science*, ed. R. Aunger, pp. 163–74. Oxford University Press. [aCH]

Sperber D. & Hirschfeld L. A. (2004) The cognitive foundations of cultural stability and diversity. *Trends in Cognitive Sciences* **8**(1):40–46. [DS]

Sperber D. & Wilson D. (1995) *Relevance: Communication and cognition*, 2nd edition. Cambridge University Press. [aCH]

Spivey M. (2007) *The continuity of mind*. Oxford University Press. [MF]

Spivey M. & Richardson D. (2009) Language processing embodied and embedded. In: *The Cambridge handbook of situated cognition*, ed. P. Robbins and M. Aydede, pp. 382–400. Cambridge University Press. [PES]

Sterelny K. (2018) Culture and the extended phenotype: Cognition and material culture in deep time. In: *The Oxford handbook of cognition: Embodied, embedded, enactive and extended*, ed. A. Newen, L. de Bruin & S. Gallagher, pp. 96–106. Oxford University Press. [aCH]

Stout D. (2002) Skill and cognition in stone tool production: An ethnographic case study from Irian Jaya. *Current Anthropology* **43**(5):693–722. [EB]

Stout D. & Chaminade T. (2012) Stone tools, language and the brain in human evolution. *Philosophical Transactions of the Royal Society B: Biological Sciences* **367**(1585):75–87. [PFD]

Stout D., & Hecht E. E. (2017) Evolutionary neuroscience of cumulative culture. *Proceedings of the National Academy of Sciences* **114**(30)7861–68. [rCH]

Street J. A. & Dąbrowska E. (2010) More individual differences in language attainment: How much do adult native speakers of English know about passives and quantifiers? *Lingua* **120**(8):2080–94. [aCH]

Stuhlmüller A. & Goodman N. D. (2014) Reasoning about reasoning by nested conditioning: Modeling theory of mind with probabilistic programs. *Cognitive Systems Research* **28**:80–99. [IAA]

Subiaul F., Cantlon J. F., Holloway R. L. & Terrace H. S. (2004) Cognitive imitation in rhesus macaques. *Science* **305**(5682):407–10. [CR]

Sutton J. (2015) Scaffolding memory: Themes, taxonomies, puzzles. In: *Contextualizing human memory*, ed. L. Bietti & C. B. Stone, pp. 187–205. Routledge. [PVB]

Sutton J. (2019) Personal memory, the scaffolded mind, and cognitive change in the Neolithic. In: *Consciousness, creativity and self at the dawn of settled life*, ed. I. Hodder. Cambridge University Press. [PVB]

Tallis R. (2011) *Aping mankind: Neuromania, Darwinitis and the misrepresentation of humanity*. Acumen. [MF]

Tarr B., Launay J., Cohen E. & Dunbar R. (2015) Synchrony and exertion during dance independently raise pain threshold and encourage social bonding. *Biology Letters* **11** (10):20150767. [aCH]

Taumoepeau M. (2016) Maternal expansions of child language relate to growth in children's vocabulary. *Language Learning and Development* **12**(4):429–46. [aCH]

Taumoepeau M. & Ruffman T. (2006) Mother and infant talk about mental states relates to desire language and emotion understanding. *Child Development* **77**(2):465–81. [aCH]

Taumoepeau M. & Ruffman T. (2008) Stepping stones to others' minds: Maternal talk relates to child mental state language and emotion understanding at 15, 24, and 33 months. *Child Development* **79**(2):284–302. Available at: http://doi.org/10.1111/j.1467-8624.2007.01126.x. [aCH, RAM]

Taumoepeau M. & Ruffman T. (2016) Self-awareness moderates the relation between maternal mental state language about desires and children's mental state vocabulary. *Journal of Experimental Child Psychology* **144**:114–29. Available at: http://doi.org/10.1016/j.jecp.2015.11.012. [RAM]

Taylor T. L. (2012) Understanding others and understanding language: How do children do it? *Language Sciences* **34**(1):1–12. [MF]

Tennie C., Braun D. R., Premo L. S. & McPherron S. P. (2016) The Island test for cumulative culture in the Paleolithic. In: *The nature of culture*, pp. 121–133. Springer. [CT]

Tennie C., Call J. & Tomasello M. (2009) Ratcheting up the ratchet: On the evolution of cumulative culture. *Philosophical Transactions of the Royal Society B: Biological Sciences* **364**(1528):2405–15. [CT]

Tennie C., Call J. & Tomasello M. (2012) Untrained chimpanzees (*Pan troglodytes schweinfurthii*) fail to imitate novel actions. *PLoS One* **7**(8):e41548. Available at: https://doi.org/10.1371/journal.pone.0041548. [CT]

Tennie C., Premo L. S., Braun D. R. & McPherron S. P. (2017) Resetting the null hypothesis: Early stone tools and cultural transmission. *Current Anthropology* **58**(5):652–72. Available at: https://doi.org/10.1086/693846. [CT]

(2007/1549) *The book of common prayer*, p. 484. Church Publishing Incorporated. [rCH]

Thompson D. W. (1942) *On growth and form*. Cambridge University Press. [PES]

Tinbergen N. (1963). On aims and methods in ethology. *Zeitschrift für Tierpsychologie* **20**:410–33. doi: 10.1111/j.1439-0310.1963.tb01161.x. [PBB, aCH]

Toelch U., Bruce M., Newson L., Richerson P. J. & Reader S. M. (2014) Individual consistency and flexibility in human social information use. *Proceedings of the Royal Society B: Biological Sciences* **281**(1776):20132864. [aCH]

Tomasello M. (1999) *The cultural origins of human cognition*. Harvard University Press. [arCH, DS, AW]

Tomasello M. (2014) *A natural history of human thinking*. Harvard University Press. [PBB, rCH]

Tomasello M. (2019) *Becoming human: A theory of ontogeny*. Harvard University Press. [CT, rCH]

Tomasello M., Call J., Warren J., Frost G. T., Carpenter M. & Nagell K. (1997) The ontogeny of chimpanzee gestural signals: A comparison across groups and generations. *Evolution of Communication* **1**(2):223–59. [CT]

Tomasello M. & Gonzalez-Cabrera I. (2017) The role of ontogeny in the evolution of human cooperation. *Human Nature* **28**(3):274–288. [PES]

Tomasello M., Gust D. & Forst T. (1989) A longitudinal investigation of gestural communication in young chimpanzees. *Primates* **30**(1):35–50. [CT]

Tomasello M., Kruger A. C. & Ratner H. H. (1993a) Cultural learning. *Behavioral and Brain Sciences* **16**(3):495–511. [AW]

Tomasello M., Melis A. P., Tennie C., Wyman E. & Herrmann E. (2012) Two key steps in the evolution of human cooperation: The interdependence hypothesis. *Current Anthropology* **53**(6):673–92. [PES]

Tomasello M., Savage-Rumbaugh S. & Kruger A. C. (1993b) Imitative learning of actions on objects by children, chimpanzees, and enculturated chimpanzees. *Child Development* **64**(6):1688–705. [CT]

Tomblin J. B., Mainela-Arnold E. & Zhang X. (2007) Procedural learning in adolescents with and without specific language impairment. *Language Learning and Development* **3**(4):269–93. [aCH]

Tooby J. & Cosmides L. (1992) The psychological foundations of culture. In: *The adapted mind: Evolutionary psychology and the generation of culture*, pp. 19–136. Oxford University Press. [RAM]

Triesch J., Teuscher C., Deák G. O. & Carlson E. (2006) Gaze following: Why (not) learn it? *Developmental Science* **9**(2):125–47. [aCH]

Trigger B. G. (1998) Archaeology and epistemology: Dialoguing across the Darwinian chasm. *American Journal of Archaeology* **102**(1):1–34. [MF]

Tully K. & Bolshakov V. Y. (2010) Emotional enhancement of memory: how norepinephrine enables synaptic plasticity. *Molecular Brain* **3**(1):15. [SB]

Tunçgenç B. & Cohen E. (2016) Movement synchrony forges social bonds across group divides. *Frontiers in Psychology* 7:782. [aCH, LJP]

Valentino K., Comas M., Nuttall A. K. & Thomas T. (2013) Training maltreating parents in elaborative and emotion-rich reminiscing with their preschool-aged children. *Child Abuse & Neglect* **37**(8):585–95. [PVB]

van Baaren R. B., Holland R. W., Kawakami K. & van Knippenberg A. (2004) Mimicry and prosocial behavior. *Psychological Science* **15**(1):71–74. [LJP]

Van Bergen P., Salmon K. & Dadds M. R. (2018) Coaching mothers of typical and conduct problem children in elaborative parent-child reminiscing: Implications of a randomised control trial on reminiscing behaviour and talk preferences. *Behaviour Research and Therapy* **111**:9–18. [PVB]

Van Bergen P., Salmon K., Dadds M. R. & Allen J. (2009) The effects of mother training in emotion-rich, elaborative reminiscing on children's shared recall and emotion knowledge. *Journal of Cognition and Development* **10**:162–87. [PVB]

Van de Vliert E. (2008) *Climate, affluence, and culture*. Cambridge University Press. [RAM]

Van de Vliert E. (2011) Climato-economic origins of variation in ingroup favoritism. *Journal of Cross-Cultural Psychology* **42**(3):494–515. http://doi.org/10.1177/0022022110381120. [RAM]

Van Overwalle F. (2009) Social cognition and the brain: A meta-analysis. *Human Brain Mapping* **30**(3):829–58. [aCH]

van Turennout M., Ellmore T. & Martin A. (2000) Long lasting cortical plasticity in the object naming system. *Nature Neuroscience* **3**(12):1329–34. [GI]

Varela F. J., Thompson E. & Rosch E. (2017) *The embodied mind: Cognitive science and human experience*. MIT Press. [MF]

Veissière S. P. L., Constant A., Ramstead M. J. D., Friston K. J. & Kirmayer L. J. (2019) Thinking through other minds: A variational approach to cognition and culture. *Behavioral and Brain Sciences*. Advance online publication. doi:10.1017/S0140525X19001213. [PBB]

Vecera S. P. & Johnson M. H. (1995) Gaze detection and the cortical processing of faces: Evidence from infants and adults. *Visual Cognition* **2**(1):59–87. [aCH]

Verbeek P.–P. (2005) *What things do: Philosophical reflections on technology, agency, and design*. University Park: Penn State Press. [MF]

Verbruggen F. & Logan G. D. (2008) Automatic and controlled response inhibition: associative learning in the go/no-go and stop-signal paradigms. *Journal of Experimental Psychology: General* **137**(4):649. [SB]

Versace E., Martinho-Truswell A., Kacelnik A. & Vallortigara G. (2018) Priors in animal and artificial intelligence: Where does learning begin? *Trends in Cognitive Sciences* **22** (11):963–65. doi: 10.1016/j.tics.2018.07.005. [GI, MDG]

Versace E. & Vallortigara G. (2015) Origins of knowledge: Insights from precocial species. *Frontiers in Behavioral Neuroscience* **9**:338. doi: 10.3389/fnbeh.2015.00338. [GI]

Vinden P. G. (2001) Parenting attitudes and children's understanding of mind: A comparison of Korean American and Anglo-American families. *Cognitive Development* **16**(3):793–809. http://doi.org/10.1016/S0885-2014(01)00059-4. [RAM]

Vinkhuyzen A. A., Van der Sluis S., Posthuma D. & Boomsma D. I. (2009) The heritability of aptitude and exceptional talent across different domains in adolescents and young adults. *Behavior Genetics* **39**:380–92. [MDG]

Vogd W. (2013) Constructivism in Buddhism. In: *Encyclopedia of Sciences and Religions*, ed. A. L. C. Runehov & L. Oviedo, pp. 489–495. Springer. [MF]

Vouloumanos A. & Werker J. F. (2007) Listening to language at birth: Evidence for a bias for speech in neonates. *Developmental Science* **10**(2):159–64. [aCH]

Waddington C. H. (1942) Canalization of development and the inheritance of acquired characters. *Nature* **150**:563–65. [DS]

Walls M. (2019) The bow and arrow and early human sociality: An enactive perspective on communities and technical practice in the Middle Stone Age. *Philosophy and Technology.* **32** (2):265–81. Available at: https://doi.org/10.1007/s13347-017-0300-4. [MF]

Wang Q. (2004) The emergence of cultural self-constructs: Autobiographical memory and self-description in European American and Chinese Children. *Developmental Psychology* **40**(1):3–15. [PVB]

Wang Q. (2013) *The autobiographical self in time and culture*. Oxford University Press. [PVB]

Wang Q. (2018) Culture in collaborative remembering. In: *Collaborative remembering: Theories, research and applications*, ed. M. Meade, C. Harris, P. Van Bergen, J. Sutton & A. Barnier, pp. 297–314. Oxford University Press. [PVB]

Wannenburgh A., Johnson P. & Bannister A. (1979) *The Bushmen*. Methuen. [AW]

Wareham P. & Salmon K. (2006) Mother-child reminiscing about everyday experiences: Implications for clinical interventions in the preschool years. *Clinical Psychology Review* **26**(5):535–54. [PVB]

Warrier V., Grasby K. L., Uzefovsky F., Toro R., Smith P., Chakrabarti B., Khadake J., Mawbey-Adamson E., Litterman N., Hottenga J.-J., Lubke G., Boomsma D. I., Martin N. G., Hatemi P. K., Medland S. E., Hinds D. A., Bourgeron T. & Baron-Cohen S. (2018) Genome-wide meta-analysis of cognitive empathy: Heritability, and correlates with sex, neuropsychiatric conditions and cognition. *Molecular Psychiatry* **23**:1402–09. [MDG]

Washburn M. F. (1908) *The animal mind*. Macmillan. [aCH]

Waszak F., Hommel B. & Allport A. (2003) Task-switching and long-term priming: Role of episodic stimulus-task bindings in task-shift costs. *Cognitive Psychology* **46**:361–413. [SB]

Watson J. B. (1930) *Behaviorism*. Phoenix. [aCH]

Werker J. F. & Hensch T. K. (2015) Critical periods in speech perception: New directions. *Annual Review of Psychology* **66**:173–96. [aCH]

West-Eberhard M. J. (2003) *Developmental plasticity and evolution*. Oxford University Press. [aCH, EJ]

West-Eberhard M. J. (2005) Developmental plasticity and the origin of species differences. *Proceedings of the National Academy of Sciences* **102**(1):6543–49. [aCH]

Whitehead H. & Rendell L. (2015) *The cultural lives of whales and dolphins*. Chicago University Press. [AW]

Whiten A. (2005) The imitative correspondence problem: Solved or sidestepped? In: *Perspectives on imitation: From neuroscience to social science*, vol. 1: *Mechanisms of imitation and imitation in animals*, ed. S. Hurley & N. Chater, pp. 220–222. MIT Press. [AW]

Whiten A. (2017a) A second inheritance system: The extension of biology through culture. *Royal Society Interface Focus* **7**:20160142. [AW]

Whiten A. (2017b) Culture extends the scope of evolutionary biology in the great apes. *Proceedings of the National Academy of Sciences USA* **114**(30):7790–97. [AW]

Whiten A. (2019a) Conformity and over-imitation: An integrative review of variant forms of hyper-reliance on social learning. *Advances in the Study of Behavior* **51**:31–75. [AW]

Whiten A. (2019b) Cultural evolution in animals. *Annual Review of Ecology, Evolution and Systematics*. Available at: https://doi.org/10.1146/annurev-ecolsys-110218-025040. [AW]

Whiten A. & Erdal D. (2012) The human socio-cognitive niche and its evolutionary origins. *Pan. Philosophical Transactions of the Royal Society B: Biological Sciences* **367**(1599): 2119–129. [AW]

Whiten A. & Ham R. (1992) On the nature and evolution of imitation in the animal kingdom: Reappraisal of a century of research. *Advances in the Study of Behavior* **21**:239. [aCH]

Whiten A., Hinde R. A., Stringer C. B. & Laland K. N. (2011) Culture evolves. *Philosophical Transactions of the Royal Society B: Biological Sciences* **366**(1567):938–948. [AW]

Whiten A. & van de Waal E. (2018) The pervasive role of social learning in primate lifetime development. *Behavioral Ecology and Sociobiology* **72**:UNSP 80. [AW]

Wilkins A.S., Wrangham R. W. & Fitch W. T. (2014) The "domestication syndrome" in mammals: A unified explanation based on neural crest cell behavior and genetics. *Genetics* **197**(3):795–808. [aCH]

Wilkinson A., Kuenstner K., Mueller J. & Huber L. (2010) Social learning in a non-social reptile. *Biology Letters* **6**:614–16. [aCH]

Wilson B., Slater H., Kikuchi Y., Milne A. E., Marslen-Wilson W. D., Smith K. & Petkov C. I. (2013) Auditory artificial grammar learning in macaque and marmoset monkeys. *Journal of Neuroscience* **33**(48):18825–35. [aCH]

Wilson D. S. (2002) *Darwin's cathedral: Evolution, religion, and the nature of society*. University of Chicago Press. [PES]

Wilson E. O. (1975) *Sociobiology: The new synthesis*. Harvard University Press. [aCH]

Wilson R. A. (1994) Wide computationalism. *Mind* **103**(411):351–72. [MF]

Wimsatt W. C. (1974) Complexity and organization. In: *PSA 1972*, ed. K. Schaffner & R. S. Cohen, pp. 67–86. Philosophy of Science Association. [PES]

Wischniewski J., Windmann S., Juckel G. & Brüne M. (2009) Rules of social exchange: Game theory, individual differences and psychopathology. *Neuroscience & Biobehavioral Reviews*, **33**(3), 305–313. doi: 10.1016/j.neubiorev.2008.09.008. [PBB]

Woodward M. (2019) Metaplasticity rendered visible in paint: How matter 'matters' in the lifeworld of human action. *Phenomenology and the Cognitive Sciences* **18** (1):113–32. [MF]

Young J. M., Krantz P. J., McClannahan L. E. & Poulson C. L. (1994) Generalized imitation and response-class formation in children with autism. *Journal of Applied Behavior Analysis* **27**(4):685–97. [CH]

Zefferman M. R. & Mathew S. (2015) An evolutionary theory of large-scale human warfare: Group-structured cultural selection. *Evolutionary Anthropology* **24**(2):50–61. [PES]

Zentall T. R., Sutton J. E. & Sherburne L, M. (1996) True imitative learning in pigeons. *Psychological Science* **7**(6):343–46. [AW]

Zilles K. (2005) Evolution of the human brain and comparative cyto- and receptor architecture. In: *From monkey brain to human brain*, ed. S. Dehaene, J. R. Duhamel, M. D. Hauser & G. Rizzolatti, pp. 41–56. MIT Press. [aCH]

Zmigrod L., Rentfrow P. J., Zmigrod S. & Robbins T. W. (2018) Cognitive flexibility and religious disbelief. *Psychological Research*. Published online 11 June 2018. https://link.springer.com/content/pdf/10.1007%2Fs00426-018-1034-3.pdf [SB]

Zwaan R. A. & Radvansky G. A. (1998) Situation models in language comprehension and memory. *Psychological Bulletin*, **123**, 162–185. [IAA]

This article has been provided by Cambridge University Press, via the Cambridge Core platform. For information on our sharing po Feedback