

Kluge: The Haphazard Construction of the Human Mind

Gary Marcus

Boston, MA: Houghton Mifflin, 2008

224 pages, ISBN: 0618879641 (hbk); \$24.00

Gary Marcus provides an engaging argument for the two-part view that the mind is a kluge, and that it's therefore not created by an intelligent designer, a.k.a., God. This argument, while philosophical, is based on empirical evidence culled from psychology. We distill Marcus's argument, and briefly explain why it's derailed by at least two objections. In the course of our presentation we summarize the book.

What's a kluge? Two definitions, derived directly from Marcus's introductory chapter, constitute an answer. The first:

Def-1: x is a kluge if and only if (iff) (i) some of its properties are the result of what Marcus calls "evolutionary inertia" (p. 12); and (ii) these properties entail that x is sub-optimal.

When something is a product of evolutionary inertia, it's produced by adding atop earlier mechanisms without fully eliminating the older ones, where the continued presence of the older mechanisms hinder efficiency. Marcus writes: "the characteristics we hold most dear, the features that most distinctly define us as human beings — language, culture, explicit thought — must have been built on genetic bedrock originally adapted for very different purposes" (p. 14). But is it for something to be the product of evolutionary inertia? Consider our spines. This part of our physical bodies evolved for bipedal locomotion not from scratch specifically for this locomotion, but under constraints put in place by evolutionary precursors to our spines, which were "designed" for quadruped locomotion. Marcus's idea is more carefully captured by this definition:

Def-2: Properties F_1, F_2, \dots, F_n , possessed by x , are the product of evolutionary inertia iff (i) x 's having F_i is the product of evolution operating long ago on y , where y also was the product of evolution, and (ii) specifically, y 's capacities and powers did not arise in order to address the needs addressed by evolution operating on y to later produce x .

In the physical realm, the spines of bipeds have numerous evolution-produced properties, and these attributes arose as a result of mutations reinforced in the course of our spines evolving from those of quadrupeds. But Marcus is concerned not with bodies and parts thereof, but rather with things mental.

He thus presents the reader with a number of properties possessed by the human mind that entail that that mind is sub-optimal, and that are by his lights the product of evolutionary inertia. Each such property is featured in its own chapter; this five-chapter sequence forms the heart of the book. For example, in "Choice" (ch. 4), Marcus argues that the human mind makes sub-optimal decisions, and that this flaw is the result of evolutionary inertia. The other chapters serving the same purpose are: "Memory" (ch. 2), "Belief" (ch. 3), "Language" (ch. 5), and "Pleasure" (ch. 6).

To set out Marcus's overall argument, we denote each of the properties that imply sub-optimality by the first letter of the chapter in question. Then his argument has a premise

corresponding to each chapter in which a mental deficiency is described. We use the constant ‘ m ’ to denote some representative human mind, and write ‘ $X(m)$ ’ to say m has property X . Hence:

Marcus’ Overarching Argument

1. $M(m)$ [ch. 2]
2. $B(m)$ [ch. 3]
3. $C(m)$ [ch. 4]
4. $L(m)$ [ch. 5]
5. $P(m)$ [ch. 6]
6. For every x , if x has any of M , B , C , L , or P , then x is sub-optimal. [implicit definition of sub-optimality]
Therefore: 7. m is sub-optimal. [(1)–(6) by elementary logic]

8. m ’s having properties M , B , C , L , and P is the product of evolutionary inertia. [ch. 2–6 & background assumption to the effect that all organic systems are the product of evolution]
Therefore: 9. The human mind (m) is a kluge. [D1, (7), (8), by elementary deductive logic]

10. If the human mind was the product of an intelligent designer, then $\sim M(m)$ & $\sim B(m)$ & $\sim C(m)$ & $\sim L(m)$ & $\sim P(m)$. [This principle captures such assertions by Marcus as this one appearing on page 1: “If mankind were the product of some intelligent, compassionate designer, our thoughts would be rational, our logic impeccable. Our memory would be robust, our recollection reliable. ...”]

Therefore: 11. The human mind is not the product of an intelligent designer. [(9) and (10) by elementary logic]

Each of these chapters makes polymathic use of behavioral experiments confirming the sub-optimality in question (the aforementioned psychology part of *Kluge*), but space constraints preclude recounting these experiments.

1. “Memory”: Marcus here explains that humans have context-dependent memories (accessed by context/cues). Information stored in these memories, when used infrequently, is difficult to retrieve. Marcus writes: “Our memory is both spectacular and a constant source of disappointment: we can recognize photos from our high school yearbooks decades later — yet find it impossible to remember what we had for breakfast yesterday. Our memory is also prone to distortion, conflation, and simple failure” (p. 18). Humans, in general, have a difficult time remembering regular, menial events or constant routines, but have an easier time remembering the momentous.

2. “Belief”: Marcus explains that we fall victim to confirmation-bias, which occurs when a human does not look at a matter objectively, and exaggerates the importance of information that boosts their “intuitive” theory, while ignoring information casting doubt on this theory. Marcus points to the extensive literature showing that the vast majority of even college-educated humans are horrible context-independent reasoners. For example, very few of us can grasp, let alone prove, that the following argument is invalid (see p. 61):

All living things need water.
Roses need water.
Therefore: Roses are living things.

3. “Choice”: The human mind is often torn between two courses of action, one short-term and one long-term. There is tension between these two courses of action (“deliberative” and “reflexive,” as Marcus labels them). “If you ask people whether they’d rather have a certified check for \$100 that they can cash now, or a check for twice as much that they can’t cash for three years, more than half will take the \$100 now” (p. 70).

4. “Language”: Here Marcus says that we are linguistically sub-optimal because we mispronounce words, stutter, and so on. He writes: “In reality, language is filled with foibles, imperfections, and idiosyncrasies, from the way we pronounce words to the ways we put together sentences. We start, we stop, we stutter; we use *like* as a punctuation marker...” (p. 95).

5. “Pleasure”: Marcus points out that humans often perform leisure activities that “don’t actually do much for our genes” (p. 125). For example, “In the United States, the average adult spends nearly a third of his or her waking hours on leisure activities such as television, sports, drinking with friends — pursuits that may have little or no direct genetic benefit” (p. 125). Marcus admits that he will himself spend \$100 at his favorite Sushi restaurant.

Is Marcus’s argument sound? We believe the correct answer is a negative one, in light of a number of objections, two of which we summarize momentarily.

But first we present another example of sub-optimal reasoning, the famous king-ace problem from Johnson-Laird and Savary (1995). This problem is much more difficult than judging whether syllogisms (such as the simple one about roses reproduced above) are valid. Here’s the problem: Given the premises

If there is a king in the hand, then there’s an ace in the hand; and if there isn’t a king in the hand, there is an ace in the hand. But, not both of these if-then statements are true.

what can you infer? Nearly all college-educated subjects (and indeed, as Johnson-Laird has declared, “professors from Seattle to Stockholm”) confidently respond by saying: “That there is an ace in the hand.” This is incorrect, for it can be proved in the propositional calculus that the premises entail that there *isn’t* an ace in the hand (Bringsjord & Yang 2003a).

In this context, our first objection is that Marcus’s argument is logically compatible with the possibility of what we call a *partial kluge*, or a *p-kluge* for short. A p-kluge we define to be a kluge (perfectly in keeping with Def-1 and Def-2), *but* with the added property that it nonetheless enjoys outright optimality in one or more domains. For example, it’s well-known that there exists an algorithm *A* for achieving *absolute perfection* in the search for a proof or disproof of any formula *p* in the propositional calculus. Furthermore, it’s well known that some humans can themselves internalize *A* and deploy it in order to decide whether a formula *p* is a theorem or not. Such a human—Jones, say—is a p-kluge. And Jones will be able to easily answer the king-ace puzzle correctly. The problem for Marcus is that he doesn’t consider the possibility that while he establishes (8), the proposition that we are kluges *simpliciter*, it is nonetheless true that some of us are p-kluges for not only theoremhood in the propositional

calculus, but for many domains. Worse, Marcus doesn't consider the possibility of a *p!-kluge*: a p-kluge with respect to many *substantive* domains. And even worse, he doesn't consider the possibility of what might be called *self-made* p!-kluges: p-kluges which, through their study, reasoning, training, education, etc., become p!-kluges.

Our second objection targets premise (10). There are many reasons for God to create kluges with the ability to become self-made p!-kluges. One reason would be to cultivate, first, the presumed value arising from the virtuous admission that one is a kluge, and then, second, the hard work required to raise oneself up to cognitive excellence in one or more significant domains. While Marcus baldly asserts that there is a "manifest lack of direct evidence" for God's existence, a number of philosophers and logicians who are prime candidates for p!-kluges in the area of formal reasoning (e.g., Descartes and Leibniz, and more recently, Gödel and Swinburne), presented what they took to be not only direct evidence for God's existence, but outright proofs.

Two final points and a concluding remark: First, it seems that p-kluges are found outside our species. We know that dogs can be trained to recognize an owner's actions leading up to being fed, and so on. Since presumably Marcus is willing to concede that the human intellect exceeds the canine one, it follows that the human mind must be at least a p-kluge. Secondly, it was Darwin (1871, ch. 3) himself who repeatedly cited canine problem-solving in his own attempt to show that human reasoning is a kluge.

In sum, Marcus's book is an argument which, with economy and elegance, conveys a wealth of evidence from psychology for the sub-optimality of human cognition, but from the standpoint of philosophy, the argument fails.

Reference

- Bringsjord, S. & Yang, Y. (2003a) "Logical Illusions and the Welcome Psychologism of Logicist Artificial Intelligence" in *Philosophy, Psychology, and Psychologism: Critical and Historical Essays on the Psychological Turn in Philosophy*, edited by D. Jacquette (Dordrecht, The Netherlands: Kluwer), pp. 289–312.
- Bringsjord, S. & Yang, Y. (2003b) "The Problems that Generate the Rationality Debate are Too Easy, Given What our Economy Now Demands" *Behavioral and Brain Sciences* **26.4**: 528–530.
- Darwin, C. (Originally published in 1871; 2004) *Descent of Man: And Selection in Relation to Sex* (New York, NY: Barnes and Noble).
- Dore, C. (1984) *Theism* (Dordrecht, The Netherlands: D. Reidel).
- Leibniz, G. (1709) *New Essay Concerning Human Understanding*. Translated by A. Langley to produce an 1896 version from Macmillan (New York, NY).
- Marcus, G. (2008) *Kluge: The Haphazard Construction of the Human Mind* (New York, NY: Houghton Mifflin).
- Swinburne, R. (1991) *The Existence of God* (Oxford, UK: Oxford University Press).
- Johnson-Laird, P. & Savary, (1995) "How to Make the Impossible Seem Probable" in *Proceedings of the 17th Annual Conference of the Cognitive Science Society*, edited by M. Gaskell and W. Marslen-Wilson (Hillsdale, NJ: Lawrence Erlbaum Associates), pp. 381–384.

Selmer Bringsjord & Alexander Bringsjord
Department of Cognitive Science
Rensselaer Polytechnic Institute (RPI)
Troy, NY 12180, USA
Email: selmer@rpi.edu; bringa@rpi.edu