Review of: "Necessity Was the Mother of Human Cultural Invention"

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Potential competing interests: No potential competing interests to declare.

General comments.

This is a thoughtful, ambitious, detailed argument for the author's thesis that suppression of instincts plays a significant role in explaining human uniqueness. When I say ambitious, I mean it: everything from from armpits to parental leave are considered among a range of social and anatomical facts enlisted in support of the author's hypothesis; sources cited include such diverse works as the *Code of Hammurabi* and *I Am Curious (Yellow)*.

While I find the central claim interesting and worthy of study, I don't find the specific points particularly persuasive. The connection between (for example) the prevalence of food content on social media and the suppression of instincts in the hominin lineage seems to me extraordinarily tenuous. If cooking shows and pornography can be explained by suppression of instincts, what can't? Instead, to my mind the value of this article lies in its documentation of the differences between instinctual behaviour in animals and corresponding non-instinctual behaviour in humans. I would restrict the claims made to a smaller class of behaviours, especially those already cited in contemporary work on human uniqueness.

Suggestions.

1. The introduction could have a summary paragraph describing how the rest of the paper will argue for the central claim. (I take the central claim to be that “cultural evolution requires not just the enlargement of brain capacity for invention but also the suppression of instinctive behaviors that would otherwise constrain those inventions.”)
2. The final two paragraphs of the “Suppressed Neural Circuits” section (beginning with “More subtle, layered interactions occur among the subsystems involved in emotions and desires…”) are a little rushed. These paragraphs provide some examples of genetically specified instincts, as in the rest of this section, but they also seem to be trying to establish two wider points: first the difficulty of establishing new instincts given the learning abilities of the mammalian brain, second the difficulty of modifying instincts that are highly polygenic. If these points are important for the argument later on in the paper, I would distinguish them and perhaps give them a paragraph each.
3. “Many of the most distinctive changes during the evolution of Homo sapiens appear to reduce the salience of olfactory cues, probably because they would otherwise drive the instinctive behaviors that humans must suppress to develop large, multi-ethnic societies.” This is a big claim that requires a great deal more support and argumentation than you give it. After all, it's not too difficult to think up alternative hypotheses. Here are two: (1) Bipedalism diminished the

importance of olfaction because it's a lot harder to smell things when your nose isn't pressed to the ground. (You mention this yourself later on.) (2) Increasing general intelligence enabled the tracking of both prey and predators via visual cues without resorting to sniffing for them.

4. Typo: “The unique thing about humans is that we can **chose** to ignore our instincts…”
5. In the *Mating Behavior* subsection, it seems like the argument is that widespread use of pornography throughout history can be explained in part by suppression of instincts. It would be good to say this explicitly here. You say something related in the introductory paragraph of the overall section: “A curiosity drive seems to motivate all humans when young and many throughout life. It is particularly likely to manifest itself in those activities that are important for survival and procreation but for which the genetically defined instincts available to other animals have been suppressed.” I think each subsection should contain a precisified version of this claim, if only to help the reader understand the role of the subsection in the overall narrative.
6. “What we call foods are the bodies of other animals (meat) and the aspirational progeny of plants (seeds and fruits), all of which evolved to resist the disaster of being eaten.” Some seeds and fruits are evolved to be spread via ingestion by animals, a process known as **endozoochory**.
7. Are “polygenic” and “multigenic” synonymous? If so you might want to consider using just one of them rather than both.