Modern Language Models Refute Nothing

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Piantadosi's MLM* manifesto conjures a hypothetical physicist *ingénu* to assert "there is no bright line between 'just' fitting parameters and advancing theory" (1). In physics, geocentric models predicted planetary trajectories with incredible quantitative accuracy, by fitting ever more epicycle-deferent parameters that could generate arbitrary paths, even squares or triangles. Heliocentric theory with circular (elliptical) orbits predicted far worse, yet explained far more. Which one was true? Explanatory power, not predictive adequacy, forms the core of physics and ultimately all modern science (2). Even for understood parameterizations, pretending "the theory is certainly in there" leads away from real principles and understanding to overgenerating nonsense. MLMs are no exception. Ironically, Piantadosi's *ingénu* uses inverse-square-law gravitation, the canonical success story of rejecting geocentric parameter-fitting for a fundamental theory of motion. Changing the interpretation of a theory, like Einstein replacing gravitational force with curved spacetime, is not the same as refuting it. General relativity endorsed, explained, and extended Newtonian mechanics, even reducing to it in a certain limit. All without including unattested phenomena, unlike Piantadosi's obsession with weak-constraint domain-general models. In falsificationist terms, "we do not seek highly probable theories but explanations; that is, powerful and highly improbable theories"(3).

More generally, consider Guest & Martin's argument about the validity of cognitive modeling (4)

P: MLMs are a theory/model of human linguistic capacities, or "do what humans do"
Q: MLMs correlate with/predict human behavioral and/or neuroimaging data

Assuming P implies Q, Piantadosi's assertion Q *therefore* P fallaciously affirms the consequent. Pretending induction problems don't exist and assuming Q implies P just replaces fallacy with "inappropriate causality" under a falsifiability view (4). Only model misbehavior can appropriately refute anything, by inferring $\neg Q$ *therefore* $\neg P$ (3). If anything, the laughably numerous MLM misbehaviors undermine Piantadosi's own argument and his revanchist behaviorism (5).

Ergo, MLMs refute nothing. Bandwagoning in the face of psychology's dual replication and theory crises is, as Piantadosi says, "a humiliation for everyone". Psychologists might instead reconsider "what is it that I study?" (6) via observation and no-go results, standard practice in linguistics, physics, math, and AI (7). Like epicycles, MLMs may still be useful to predict horoscopes.

References

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*we enjoy the unintended abbreviation coincidence with Multi-Level Marketing scams