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COMMENT ON “O PERCEPTIVISMO NEUTRO E A FUNÇÃO BIOLÓGICA DE EXPERIÊNCIAS FENOMÊNICAS”

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The question of how brain function and consciousness ultimately relate remains a mystery, as no theory of consciousness has succeeded in closing the “explanatory gap” (LEVINE, 1983). Our (epistemic) lack of understanding of why certain brain processes are (or at least appear to be) accompanied by conscious experiences (CHALMERS, 1995), however, does not seem to properly justify jumping to (metaphysical) “solutions” such as reductive physicalism or any form of dualism (not to mention idealism). Stein (2023), on her turn, proposes what could be considered as a middle ground between these two ontologically-opposed commitments: Neutral Perspectivism (NP). This is a view that does not attempt to eliminate phenomenal states from the ontological realm, neither add miraculous substances or properties to it, but rather considers a possible inclusion of conscious states in the causal chain of brain processes (e.g., by connecting them to perception, cognition, emotions, and decision-making). NP does not aim to determine the ultimate nature of

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mental events, but instead focuses on establishing laws or principles that could be applied to them.

Consistent with the neutral part of NP, the scientific search for the “neural correlates of consciousness”, for example, has been relatively theory-neutral, providing a framework and common language for researchers with different metaphysical views (cf. SETH; BAYNE, 2022). And although the view that consciousness “has no function whatsoever” is logically plausible (cf. SETH, 2009), it could also be the case that conscious mental states are caused by and supervene on biological activity of the brain and yet are causally efficacious in a way that cannot be wholly reduced to their biological foundations (CLEEREMANS; TALLON-BAUDRY, 2022). In this sense, the inclusion of a more naturalistic view of consciousness in the scientific explanation of brain functions (as appears to be the case of NP) may be still insufficient to provide a definitive answer to the ultimate metaphysical questions that interests philosophers (just like all the alternatives), but yet seems a promising attempt to scientifically *reduce the gap* between the brain and its conscious outputs.

Predictive Processing (PP) (FRISTON, 2005, 2010; HOHWY, 2013, 2020; CLARK, 2013, 2015), for example, was not originally conceived as a theory *of* consciousness, as it is a general theory of brain function. However, it can be still considered as a theory *for* consciousness, as long as it provides a framework that systematically maps neural mechanisms to aspects of consciousness (cf. SETH; BAYNE, 2022; SETH; HOHWY, 2021).

Consistent with NP, PP includes phenomenal states in its framework (e.g., self-reports of perceptual shifts), and relates them with brain functions and activities (e.g., HOHWY *et al.*, 2008; CORCORAN *et al.*, 2023). At the same time, PP remains relatively neutral about the ultimate nature of consciousness. Throughout this comment, I will expose the PP mechanism and suggest that it seems to be the ideal framework for a neutral perspectivist.

PP is historically rooted on von Helmholtz’s (1860) view of perception as an unconscious inferential process that uses learned probabilistic models to guess the hidden causes of incoming sensory data. This process corresponds to Bayesian inference, in which sensory data (likelihoods) are combined with probabilistic predictions (priors) to infer the best explanations (posteriors) of their hidden causes. Bayesian inference provides the optimal way of balancing prior beliefs and likelihoods, given their relative uncertainties (quantified as

the informational entropy of their probability density functions), to generate posterior beliefs.

As a neural implementation of Bayesian inference (among others), PP assumes that a typically-functioning brain will update its beliefs (posteriors), given sensory information (likelihoods) and internal probabilistic models (priors), in an approximately Bayes-optimal fashion (FRISTON, 2010). Here the degrees of confidence attached to priors and sensory data corresponds to their precisions (the inverse of their variances). The long-term sum of prediction errors – the discrepancies between prior and likelihood means – is the quantity that brains need to minimize in order to reduce an (otherwise life-threatening) upper bound on surprise (FRISTON, 2010; HOHWY, 2013).

Prediction errors can be minimized either through perceptual inference (by providing better predictions of sensory inputs), or active inference (by selectively sampling sensory inputs that conform to predictions). Prediction Errors are weighted relatively to prior and likelihood precisions, resulting in precision-weighted Prediction Errors (pwPEs). The learning rate (likelihood precision / likelihood precision + prior precision) indicates how much we learn from data in updating our beliefs. Posteriors closer to likelihoods indicate that sensory inputs were weighted more relatively to priors (high learning rate), while posteriors closer to priors indicate that priors were weighted more relatively to sensory inputs (low learning rate).

PP considers that the winning perceptual hypothesis determines phenomenology by achieving the highest posterior (i.e., is considered as the “best guess” about the hidden cause of sensory data). Here the balance between the precisions (or degrees of reliability) of priors (perceptual beliefs) and likelihoods (sensory data) is key: a strong perceptual hypothesis being compared with imprecise sensory data would bias perception towards priors, while a weak perceptual hypothesis being compared with precise sensory data would bias perception toward likelihoods.

Determining how information processing in the brain and the content of conscious perception are typically connected could also provide a better understanding of atypical conscious phenomena like the occurrence of illusions (i.e., misperception of an external stimulus) and hallucinations (i.e., perception in the absence of an external stimulus). The mechanism of PP, for example, has the potential to explain how a given disturbance in a neural mechanism (e.g., an abnormal weighting of priors relatively to sensory inputs

together with high environmental uncertainty) could give rise to a specific abnormal phenomenology (e.g., perceiving meaning in noise).

Neutral Perspectivism, given its minimal metaphysical commitment, avoids the unnecessary hindrances that reductive physicalism and dualism impose to the scientific study of consciousness (either the elimination of phenomenal states from the scientific repertoire or the addition of mysterious substances or properties). By focusing on how mental states are causally related to processes in the brain and remaining neutral about the ultimate nature of consciousness, Neutral Perspectivism provides a better match between philosophical views about the mind and Predictive Processing approaches to brain function and consciousness. This our comment to Stein (2023)

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