Simon's Legacy on Bounded Rationality: Opportunities for a Neuroscience-Based Shared Research Agenda.

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Until the past few decades, research on human behavior in decision-making was governed by economic theories, mainly those of rational choice and revealed preferences. The main rationale behind this scholarship is grounded on the rationality axioms – a limited set of consistent properties are imposed on choices or preferences and as long as these are followed a utility function can be computed (see e.g., Bossaerts and Murawski, 2015).

Yet, axiomatic theories often fail to capture important regularities of decision-making (e.g., paradoxes) and as a reaction have historically promoted alternative conceptualizations on rationality (e.g., Kahneman and Tversky, 1979; Chase, Hertwig, and Gigerenzer, 1998). Importantly, most of these works find their roots in Herbert Simon's concept of 'bounded rationality' (1982). That is, cognitive abilities of human decision-makers are not always sufficient to find optimal solutions to real-life problems, leading individuals to find 'satisficing' outcomes.

Nowadays, with the emergence of non-invasive neuroimaging and neurophysiological techniques – such as functional magnetic resonance imaging (fMRI), electroencephalography (EEG), skin conductance level (SCL) and heart rate variability (HRV) – there has been an unprecedented opportunity to advance knowledge on the neural and physiological foundations of rational (and not) decision-making. In turn, there has been a rapid rise of novel research fields such as neuroeconomics (Glimcher and Rustichini 2004), neurofinance (Lo and Repin, 2002), organizational neuroscience (Becker, Cropanzano, and Sanfey, 2011), and so forth.

While these research fields share the underlying call to provide novel, biologically grounded, explanations of decision making, they have also evolved in different directions, each with its own literature, its own approach and proponents, thus far. The main aim of this work is to review the recent development and contributions of these various perspectives along the underlying common narrative of bounded rationality.

By doing so we seek to highlight that shared aims of emerging 'neuro' scholarly perspectives are to explain how decision-making is implemented biologically, which biological circuits are recruited, and what computation is used. Further, we argue that by encompassing such a comprehensive view, and understanding the related limitations, we can better identify research questions still unexplored and in need of further attention, such as what the role of emotions or of context are in shaping bounded rationality. Answers to these inquiries may in turn provide fresh opportunities to inform public policy and practice.

Key References:

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