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Conceptual advances in the cognitive neuroscience of learning: Implications for relational frame theory

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Abstract

Cognitive neuroscience has developed many approaches to the study of learning that might be useful to functionally oriented researchers, including those from a relational frame theory (RFT) perspective. We focus here on two examples. First, cognitive neuroscience often distinguishes between habit and goal-directed reinforcement learning, in which only the latter is sensitive to proximal changes in behavior-environment contingencies. This distinction is relevant to RFT's original concerns about how rule-based processes can sometimes render an individual's behavior maladaptive to changing circumstances. Second, the discovery of neurophysiological structures associated with fear extinction and generalization can potentially yield new insights for derived relational responding research. In particular, we review how such work not only informs new ways of modifying the functions transformed in derived relational responding, but also new ways of measuring derived relational responding itself. Overall, therefore, existing conceptual and methodological advances in the cognitive neuroscience literature addressing learning appear to generate functionally interesting predictions related to RFT that might not have surfaced from a traditional functional analysis of behavior.

The goal of cognitive neuroscience is to understand how cognitive activities emerge from biological operations in neural tissue. At first, this field might seem far removed from functional psychology where behavioral events are explained relative to measurable regularities within the environment (De Houwer, Barnes-Holmes & Moors, 2013). Yet cognitive neuroscience can meaningfully contribute to the progression of functional psychological endeavors, including relational frame theory (RFT; Hayes, Barnes-Holmes & Roche, 2001; Vahey & Whelan, 2016). This is possible because cognitive neuroscience measures behavioral events as a proxy for cognitive activity (e.g. De Houwer, 2011; De Houwer, Gawronski, & Barnes-Holmes, 2013, p. 16). These behavioral events include brain activity, typically assayed non-invasively in humans using functional magnetic resonance imaging (fMRI) or electroencephalography (EEG). Here, we focus on two recent conceptual and methodological developments in the cognitive neuroscience literature. The first posits that it is possible to measure the relative contribution to learning of, broadly speaking, verbal behavior

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