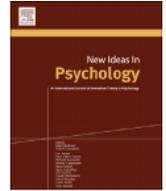




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To feel is to know relations: James' concept of stream of thought and contemporary studies on procedural knowledge



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ABSTRACT

The theory of William James concerning the temporal and dynamic nature of mind is analyzed as implying that thought is a flow of subjective experience that belongs to the material flow of living beings, and therefore, that knowledge is *primarily* affective and practical rather than declarative and contemplative. In this context, we will discuss contemporary theory and research relevant to the discussion about declarative and procedural knowledge, with the focus on a literature review in the neurosciences of knowledge. Then we reconstruct James' theory of mind as flow, in terms of relatedness, feeling, and temporality of experience. The *Principles* suggest that declarative knowledge is not independent, but derived and supported by a more basic knowledge that is both procedural and affective in nature. Finally, we discuss possible lesson for nowadays efforts to develop a dynamic account of the procedural nature of knowledge.

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On those who enter the same rivers, ever different waters flow

-Heraclitus, Fragment B12

1. Knowledge, mind, and cognition

What is knowledge? This question has been approached in different ways, depending on the discipline and the interest at hand. Cognitive science deals with this query, traditionally, from the point of view of the information processing in a system regarding its relation to its world. In this tradition, it is often assumed that there are two distinct kinds of knowledge, whose information-processing underpinnings are different: declarative and procedural knowledge. To 'know that something' is assumed to be essentially different from 'knowing how to do something.'

This declarative/procedural distinction can be traced back to Ryle's differentiation between propositional knowledge, which can be true or false, and the kind of knowledge needed to ride a bicycle (Ryle, 1945). This basic distinction is correlated with a set of other conceptual dichotomies, such as cognitive content/structure

(Piaget, 1971), associative/rule-based memory systems (Wilson & Rolls, 2005), explicit/implicit cognition (Bowles, 2011; Ellis, 2005; Evans, 2008; Reber, 1989; Rebuschat & Williams, 2012), fast/slow learning (McClelland, 2013). Overall in current psychological theory, it is assumed that, on the one hand, the notion of declarative knowledge refers to a representation of an object, and this semantic link is the content of (declarative) knowledge, which may be employed consciously by controlled information processing and put in language. On the other hand, the idea of procedural knowledge refers to cognitive dispositions (or skills) that have been formed as a consequence of training, constrain behavioral sequences in a particular domain of action, and are relatively automatic, not conscious, and hardly put in language. Consistently, some authors have posited that there are different memory systems, one supporting each of the kinds of knowledge, and each based on a different modality of learning.

This set of conceptual dichotomies also reminds the classical distinction, made by William James (James, 1890) from Chapter VIII, between two forms of knowledge, tapping common-sense language uses of 'knowing about something' and 'knowing something by acquaintance.' We can have information *about* something we have never met, but we are *familiar-with* something only when our knowledge of it is based on a continuous and proximal existence in the flow of experience. However, according to James, these are relative terms, as he does not postulate them as an essential

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