Rules and similarity – a false dichotomy

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Abstract: Unless restricted to explicitly held, sharable beliefs that control and justify a person’s behavior, the notion of a rule has little value as an explanatory concept. Similarity-based processing is a general characteristic of the mind-world interface where internal processes (including explicitly represented rules) act on the external world. The distinction between rules and similarity is therefore misconceived.

In order to maintain a meaningful theoretical distinction between two explanatory notions such as rules and similarity, it is necessary to be clear about how the terms are to be used. As Pothos notes, there has been much discussion about whether “similarity” can be rendered as a useful theoretical notion (Goldstone 1994a; Goodman 1972). Similar issues arise in defining the notion of a rule.

The prototypical notion of a rule is an explicit code that governs how they relate to data. The proposed distinction in the target article does more to turn this relationship on its head, in that patterns of data are all that is to remain.

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data were of interest (only) because they were thought to inform this debate. This is true not only of the expert systems debate in Artificial Intelligence, but in particular of the debate in the context of language, from the longstanding controversy between rules and connectionism prompted by Rumelhart and McClelland’s (1986) model of the past tense to more recent contrasts between grammars and data-oriented parsing (e.g., Boul 1998). Past proposals of the rule/similarity distinction such as Hahn and Chater (1998) have (successfully or not) sought to characterise the representations and processes that might count as rules or similarity and how they relate to data. The proposed distinction in the target article does more than turn this relationship on its head, in that patterns of data are all that is to remain.

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Having restricted the meaning of “rule” narrowly enough for it to have some distinct explanatory value, we can then ask whether “similarity” is the best concept with which to describe other forms of behavior that are not directly controlled by explicit rules. Here again I find the notion problematic, and indeed the dichotomy between rules and similarity to be false. Consider how a rule is applied in a given situation. A rule generally has two parts: a condition that must be satisfied to trigger the rule, and an action that follows once the rule has been triggered. In deciding whether the triggering condition of a rule has been satisfied, it is inevitable that similarity will be involved. Some situations will trigger the rule in a clear prototypical fashion. Others will partially match the conditions, and will result in slow and uncertain application of the rule. A learner who has decided to follow the explicit rule of putting all red blocks in one pile and all orange blocks in another will need to use similarity judgments when faced with colors intermediate between red and orange. Generally speaking, with the exception of artificial microworlds such as chess or baseball, there will always be the potential for vagueness and uncertainty in how the rule applies to an individual case. All processes that involve the interface between internal processes and the external world will exhibit similarity-based effects, regardless of whether explicit rules are involved or not.

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