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What Domain Integration Could Not Be

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Abstract

Carruthers (2002) argues that natural language is the medium of non-domain-specific thought in humans. The general idea is that a certain type of thinking is conducted in natural language. It's not exactly clear, however, what type of thinking this is. I suggest two different ways of interpreting Carruthers's thesis on this point, and argue that neither of them squares well with central-process modularism.

According to central-process modularism, the bulk of post-perceptual cognitive processing is accomplished by a plurality of special-purpose mechanisms, each dedicated to a particular task domain, such as mindreading, causal inference, or biological classification. Few if any advocates of this theory of cognitive architecture endorse the radical view that all central cognition is like this. Indeed, most are careful to leave space at the table for central processes which are not proprietary to any particular cognitive module, hence not domain-specific. No doubt this is a good thing (Fodor 2000). But at this point it becomes natural and important to ask: What features of our cognitive architecture explain those instances of cognition which transcend the modularist framework? Are these higher flights of thinking special to humans, and if so, what is it about us that underwrites this fact?

An increasingly popular view in contemporary cognitive science, especially among developmentalists, suggests that the key to answering these questions may be found in the domain of language. This is the view Carruthers seeks to promote. Buoyed by recent empirical findings of Elizabeth Spelke and her colleagues (Hermer & Spelke 1996, Hermer-Vazquez, Spelke & Katsnelson 1999, Spelke & Tsivkin 2001a, 2001b), he argues that natural language is the medium of non-domain-specific thought in humans. The general idea is clear enough: a certain type of thinking, not proprietary to any particular central module, is conducted in natural language. What's less clear — indeed, what stands in need of clarification — is exactly what type of thinking this is. In this note I will suggest two different ways of interpreting Carruthers's thesis on this point, and argue that neither of them squares well with central-process modularism.

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The resulting dilemma threatens to undermine this particular variant of the cognitive conception of language.

The principal feature of the type of thought at issue is that it involves "integrating information" from distinct domains. But there are at least two ways to think about what such integration comes to. The first is that it is simply a matter of the representational content of a thought, where thoughts are structures figuring in certain computational processes (reasoning, problem-solving, decision-making, and the like). Thoughts have constituent structure, and their constituents — that is, concepts — may be drawn from one or another domain. On this view, then, a non-domain-specific thought is a thought that combines concepts from distinct cognitive domains. A paradigm case, drawn from Spelke et al.'s studies of spatial orientation, would be the thought

(1) THE TOY IS TO THE LEFT OF THE BLUE WALL

which combines geometric concepts (left of) with color concepts (blue). Carruthers says that "our hypothesis is that such a thought cannot be entertained independently of being framed in natural language" (§6.1; see also §6.4, *passim*). The capacity for domain integration in this sense, then, is just the capacity to host thoughts built up from domain-heterogeneous components.

If this is how the notion of domain integration is cashed out, however, it becomes hard to believe that language is necessary for domain-integrative thought. To see why, recall the background thesis of central-process modularism. The idea is that most cognitive capacities are realized by a special-purpose conceptual mechanism: mindreading is accomplished by a folk psychology module, reasoning about physical objects by a folk physics module, spatial navigation by a folk geometry module, and so on. But when we look into the representational contents of these various modules, we are sure to find representations at least some of whose components are not proprietary to the module in question. For instance, Carruthers suggests that the geometrical module might construct the thought

(2) THE TOY IS IN THE CORNER WITH A LONG WALL ON THE LEFT AND A SHORT WALL ON THE RIGHT

and the object-property system might build a thought like

(3) THE TOY IS BY THE BLUE WALL.

Notice, however, that both thoughts implicate exogenous concepts (hence, exogenous information). The thought in (2) includes the non-geometric concepts TOY and WALL, and the thought in (3) includes both those concepts, neither of which is plausibly in the domain of object-properties, as well as the spatial concept BY. And examples like this can be multiplied.

Consider the case of mindreading. A key component of mindreading is the capacity to attribute propositional attitudes to other agents. Such states are specified in two dimensions: by attitude type (belief, desire, intention, etc.), and by intentional content (*that snow is white*, *that lunch be served*, etc.). And

representing the latter typically requires non-psychological concepts (e.g., SNOW, WHITE, LUNCH). So here too, domain integration in the weak sense sketched above seems inevitable even in cases of intra-domain thinking. Since Carruthers insists that language is probably not necessary for this sort of cognition, the present notion of integration doesn't fit the bill.

Here is a second proposal. Let's say that a thought is domain-integrative just in case it combines information in the weak sense above and is an output of an inference whose inputs span two or more central modules. This stronger notion locates the property of informational integration at the level of processes, rather than states. For example, the thought

(4) THE TOY IS IN THE CORNER WITH A LONG BLUE WALL ON THE LEFT

is domain-integrative — hence, non-domain-specific — because it is computed from (2) and (3). On this view, the claim that non-domain-specific thought in humans depends on language amounts to the idea that without language, certain kinds of transitions in thought would be impossible for us. Carruthers suggests that this is because the very process of making such transitions causally implicates the language faculty in an essential way. But how?

The answer on offer goes as follows (§6.1). The geometry module and the object-property module, respectively, output (2) and (3), and both thoughts are taken up as inputs by the language faculty. Each is then translated into a natural-language expression, viz.

(5) [$_S$ The toy is in the corner with a long wall on the left and a short wall on the right]

and

(6) [$_S$ The toy is by the blue wall]

and the results are combined into

(7) [$_S$ The toy is in the corner with a long blue wall on the left].

This is just a tentative sketch of how speech production might proceed in the case of non-domain-specific thought. But it does show how one might sidestep the standard supposition that thought invariably precedes its linguistic expression.

Unfortunately, the story sketched above hasn't much to recommend it beyond that. For it is doubtful that the language faculty could carry out the sorts of extra-linguistic computations ascribed to it here. Speaking of the transition from (5) and (6) to (7), Carruthers notes "it would not be too complex a matter for the language production system to take two sentences sharing a number of references like this and combine them into one sentence by inserting adjectives from one into open adjective-slots in the other." But complexity is beside the point. The question is whether or not the language faculty itself should be thought to contain a general-purpose inference engine. And the likely answer — surely the answer one would expect from a central-process modularist, as well

as the answer given by most linguists (Larson & Segal 1995) — is no. Language is one thing, reasoning is another.

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