

(1998, appendix 5A), *LOT 2* would've been the perfect place for him to tell us why he now thinks that the arguments for atomism are best taken as arguments against analyticity, given that this constitutes a major shift in his thinking since *LOT 1*.

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The Origins of Meaning: Language in the Light of Evolution

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A bridge is needed for the daunting disciplinary gap that separates friends and foes of evolutionary accounts of the origins of language. Hurford's richly informative and thought-provoking work is an important step in that direction. Conceived as the first of a two-volume project, *The Origins of Meaning* purports to shed light on the evolution of language understood as "a bridge between meanings and vocal sounds or manual signs" (p. x). This first book discusses the origins of semantics and pragmatics; the second promises to deal with phonetics, phonology, and morphosyntax. Given the magnitude of such a project it wouldn't be surprising to

discover a few careless arguments and some truncated discussions here and there. Unfortunately, though, the reader will find that they tend to occur more often than they should. As it is, this is the major downfall of what otherwise is a phenomenal investigation. Perhaps these issues may be resolved in the second volume, in which case my misgivings will lose their footing. The good news, however, is that if they don't, Hurford's general picture of the evolutionary origins of language is clear and promising, even when some details don't appear to be so neatly crafted under closer inspection.

Although both part I on semantics and part II on pragmatics are equally intriguing, this review will focus more on the first one, as I find it more ambitious. Hurford begins chapter 1 with a few terminological clarifications, setting up the tone of the entire work. His first and fundamental move is to commit himself to a psychologized account of *semantics*, according to which meaning is an indirect relationship between language and world via the mind, and not (brace yourselves, philosophers) a direct one. The mind acts as intermediary insofar as it houses *mental representations* of things and events in the world, which in turn anchor their corresponding expressions in language. This makes all the more likely for *intentionality* to be prior to language, so that not only pre-linguistic children and some human ancestors but also non-human animals can have intentional states. After all, if intentionality is to be understood as a relation between private mental representations and the objects or events they are representations of, and if these mental representations are to be cashed out in terms of the information the organism can store, retrieve and attend to, then organisms with the right kind of memory and attention systems, as well as the right sorts of represented information, will entertain the sorts of intentional states that can be expressed with language. Thus, the question for the origin of semantics in language can be broken down into two subsidiary ones:

- (a) Can non-human animals, pre-verbal infants, and human ancestors entertain the sorts of mental representations expressible through language?
- (b) Do any of them possess the kind of memory and attention systems required to support linguistically expressible mental representations?

Hurford faces both questions in the remaining chapters of the first part. The second chapter, for instance, approaches question (a) with a critical examination of the literature on animal concepts, leaving us under the impression that many are actually capable of making inductions, generalizations, and abstractions, as well as entertaining concepts like *OPPOSITE* and *SAMENESS*. This doesn't mean, as Hurford rightly warns us, that animal and human concepts are identical. When it comes to claims about concept resemblance all we can do is rely on their apparent co-extensiveness in the world, while holding a minimal constraint on their neural implementation: "ROCK stands for whatever goes on in an animal's brain when it recognizes, or thinks about, things roughly coextensive with what we'd call a rock" (p. 15). Many theorists agree on this strategy, and suggest that whether animals have concepts is a matter of degree (Allen & Hauser, 1991). But degrees do matter,

especially when it comes to the astonishing variety of semantic shades constituting the spectrum of human language. Hurford's strategy is to espouse a perception-based view of concepts in order to make this conceptual diversity a simple consequence of the theory. He says, for instance, that given the empirical nature of our concepts, we can't expect other animals to have the same concepts as we do because they have different perceptual and proprioceptive systems (p. 24); moreover, this would explain why non-human animals lack concepts like UNICORN or 312: these just aren't "directly based on perception (or proprioception)" (p. 154).

This strategy is potentially problematic for two reasons. First, since his view piggybacks so heavily on a perception-based theory of concepts, the scope of the latter would determine the explanatory capacity of the former. However, despite their qualities, the truth is that even the best available theories in the market (e.g., Barsalou 1999) are still unable to provide the explanatory traction that Hurford's view requires. Second, even if we accept perception-based concepts, it doesn't follow that two organisms, sufficiently similar in their perceptual capabilities, entertain concepts in the same way. But Hurford seems to assume that it does. For instance, when arguing in support of the claim that some animals' calls are primitive denotations, he presupposes that the mental operation that goes on for these organisms is relevantly similar to what goes on when a human denotes: "I am prepared to say that vervet, chicken, and Diana monkey alarm calls and the like do *denote*, in the sense that they systematically bring to mind representations of quite specific categories of predators" (p. 230). The problem is that exhibiting a functionally similar behavior, even highly sophisticated conducts like systematic pointing and denoting, doesn't license the conclusion that what goes on for one organism is the same mental operation that goes on for the other. A case can be made to the effect that these organisms don't entertain such representations the way we do, and although it is possible that these differences make no difference for the purposes of language evolution, this remains an open question.

Hurford's answer to question (b) alleviates some of these preoccupations. In particular, I think his views on the roles that attention and memory played during the origin of language are illuminating—although they need to be taken with a grain of salt. Consider memory. One of the central ideas of Hurford's book is that semantic memory—understood as "the set of representations in an organism's brain corresponding to regularities experienced in external objects and situations" (p. 49)—was a condition of possibility for stabilizing unified cross-modal perceptual representations in the brains of our ancestors. Hurford thinks that such representations reside outside the language areas of the brain, in regions where environmental information gets codified, and which we happen to share with non-human primates. This much isn't that controversial. What I find potentially confusing is his argument against the received view, according to which episodic preceded semantic memory, by way of closely relating semantic and procedural memory, a cognitive system that surely preceded both. For instance, he re-describes Korsakoff's discovery of implicit classical-conditioning association in amnesiacs in terms of patients forming a connection in their *semantic* memory while keeping no

episodic recollection of the event that gave rise to such connection. Although I agree that semantic and procedural memory overlap much more than we currently admit, thinking of an association usually attributed to implicit memory as if it were semantic memory minus episodic memory, is to blur unnecessarily the distinction between implicit and *explicit* semantic memory. There is a substantial amount of evidence that makes more sense if we keep them apart; linking semantic and procedural memory the way Hurford suggests requires a lot more work.

Still, the main point holds: the content represented when one thinks about a non-present situation involves many of the same brain processes that would have been engaged had the situation actually been perceived. But thoughts and perceptions share more than contents: they share their limits. In one of the two most intriguing insights of this book, Hurford reviews literature on subitizing, attention, working memory, and perception, and finds that all of them limit the amount of information one can keep track of to about four items. This observation leads him to claim—in chapter 4—that the size of a “single thought” is equally limited by the amount of information tractable by our ancient visual-attentional system. In addition, he thinks that attentional limitations play a role when it comes to the way in which our thoughts are structured. In particular, he suggests that the propositional predicate-argument structure is the result of the distinctive activity of the brain’s dorsal and ventral pathways: while the “where” stream—related to pre-attentive global-attentional processes—picks out an arbitrary object and tells you that “there is something there,” the “what” stream—related to focal attention—delivers detailed information about its nature.

The other intriguing insight comes in the second part of the book, on pragmatics. After suggesting—in chapter 6—that the first communicative acts were probably dyadic (i.e., non-referring), Hurford goes on to hypothesize—in chapter 7—that the move to triadic (i.e., referential) acts was bolstered by hominids’ capacity to manipulate each other’s attention. The idea is that when a creature’s attention is drawn to an object, her brain’s dorsal stream makes it come into focal attention, which is when the ventral stream kicks in and attributes properties to this fleeting “bare-object.” The mere act of pointing only directs the addressee’s attention to the object, expressing nothing about it. But “if the pointing gesture is successful, the addressee also attends to the same object, and a similar fleeting bare-object representation is formed in her brain, as her dorsal stream locates the object. . . . All that is actually communicated by the pointing gesture is the presence, and relevance, of the object” (p. 224).

Joint attention was thus required for deictic communication to occur. But here comes the rub: a creature would only call someone else’s attention toward the object she’s attending to if she trusts the addressee, if she thinks she’ll cooperate. Joint attention in the void can’t give you referential communication, but joint attention inside a cooperative social environment can. That’s why—in chapter 8—Hurford examines different theories of evolution of cooperative and altruistic behavior, pointing to their advantages and disadvantages. He seems to suggest that a mix of these views may be the way to go. Finally, building upon these observations, Hurford

ends up (chapter 9) explaining the way in which a cooperative social environment may have been a condition of possibility for declarative information communicative exchanges to emerge. Once again, his conclusions are highly dependent upon the plausibility of the subsidiary theories he's relying upon, and thus leave many open-ended questions. This is risky, but it also creates many avenues for future research. We have to take Hurford's project for what it is—programmatically, not conclusively—and he clearly succeeds in delivering a very promising picture for a fruitful research plan.

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The Phenomenological Mind: An Introduction to Philosophy of Mind and Cognitive Science

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The Phenomenological Mind is part of a recent initiative to show that phenomenology contributes something important to cognitive science. (For other examples, see the reference list : Hutto & Ratcliffe, 2007; Petitot et al., 1999; Ratcliffe, 2007; Smith & Thomasson, 2005.) Phenomenology, of course, has been a part of cognitive science for a long time. It implicitly informs the works of Andy Clark (e.g., 1997) and John Haugeland (e.g., 1998), and Hubert Dreyfus explicitly uses it (e.g., 1992). But where the former use phenomenology in the background as broad context and Dreyfus uses it primarily (though not exclusively) as a critique of conventional artificial intelligence, Gallagher and Zahavi indicate a positive and constructive place for it. They do not recommend that we simply accept pronouncements of thinkers like Husserl, Heidegger, Sartre and Merleau-Ponty and apply them to questions of cognition, but that we use revised forms of phenomenology to illuminate dimensions of cognitive experience that are missing in current research.

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