Origins of Mind: Lecture 07

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1. Core Knowledge

For someone to have *core knowledge of a particular principle or fact* is for her to have a core system where either the core system includes a representation of that principle or else the principle plays a special role in describing the core system.

1.1. The idea

'We hypothesize that uniquely human cognitive achievements build on systems that humans share with other animals: core systems that evolved before the emergence of our species. The internal functioning of these systems depends on principles and processes that are distinctly non-intuitive. Nevertheless, human intuitions about space, number, morality and other abstract concepts emerge from the use of symbols, especially language, to combine productively the representations that core systems deliver' (Spelke & Lee 2012, pp. 2784-5).

1.2. Two-part definition

'Just as humans are endowed with multiple, specialized perceptual systems, so we are endowed with multiple systems for representing and reasoning about entities of different kinds.' (Carey & Spelke 1996, p. 517)

'core systems are largely innate, encapsulated, and unchanging, arising from phylogenetically old systems built upon the output of innate perceptual analyzers' (Carey & Spelke 1996, p. 520).

Note There are other, slightly different statements (e.g. Carey 2009).

1.3. Compare modularity

Modules are 'the psychological systems whose operations present the world to thought'; they 'constitute a natural kind'; and there is 'a cluster of properties that they have in common' (Fodor 1983, p. 101).

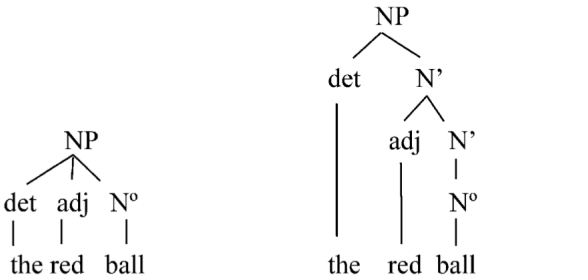
These properties include:

- domain specificity (modules deal with 'eccentric' bodies of knowledge)
- limited accessibility (representations in modules are not usually inferentially integrated with knowledge)
- information encapsulation (modules are unaffected by general knowledge or representations in other modules)
- innateness (roughly, the information and operations of a module not straightforwardly consequences of learning; but see Samuels (2004)).

2. Syntax / Innateness

Is the syntactic structure of 'the red ball' (a) flat or (b) hierachical?

a. Flat structure hypothesis b. Nested structure hypothesis



from Lidz et al. 2003

1. 'red ball' is a constituent on (b) but not on (a)
2. anaphoric pronouns can only refer to constituents
3. In the sentence 'I'll play with this red ball and you can play with that one.', the

word ‘one’ is an anaphoric prononun that refers to ‘red ball’ (not just ball). (Lidz et al. 2003; Lidz & Waxman 2004).

‘The assumption in the preferential looking task is that infants prefer to look at an image that matches the linguistic stimulus, if one is available’ (Lidz et al. 2003).

2.1. Poverty of stimulus arguments

How do poverty of stimulus arguments work? See Pullum & Scholz (2002).

1. Human infants acquire X.
2. To acquire X by data-driven learning you’d need this Crucial Evidence.
3. But infants lack this Crucial Evidence for X.
4. So human infants do not acquire X by data-driven learning.
5. But all acquisition is either data-driven or innately-primed learning.
6. So human infants acquire X by innately-primed learning .

‘the APS [argument from the poverty of stimulus] still awaits even a single good supporting example’ (Pullum & Scholz 2002, p. 47)

3. Pointing

From around 11 or 12 months of age infants spontaneously point to request, inform and initiate joint engagement (Liszkowski 2007).

‘infant pointing is best understood—on many levels and in many ways—as depending on uniquely human skills and motivations for cooperation and shared intentionality, which enable such things as joint intentions and joint attention in truly collaborative interactions with others (Bratman, 1992; Searle, 1995).’ (Tomasello et al. 2007, p. 706)

3.1. Why don’t ape’s point?

‘there is not a single reliable observation, by any scientist anywhere, of one ape pointing for another’. (Tomasello 2006, p. 507)

‘Although some apes, especially those with extensive human contact, sometimes point imperatively for humans […],

no apes point declaratively ever.’ (Tomasello 2006, p. 510)

‘to understand pointing, the subject needs to understand more than the individual goal-directed behaviour. She needs to understand that by pointing towards a location, the other attempts to communicate to her where a desired object is located; that the other tries to inform her about something that is relevant for her’ (Moll & Tomasello 2007, p. 6).

’the specific behavioral form—distinctive hand shape with extended index finger—actually emerges reliably in infants as young as 3 months of age (Hannan & Fogel, 1987). [...] why do infants not learn to use the extended index finger for these social functions at 3 – 6 months of age, but only at 12 months of age?’ (Tomasello et al. 2007, p. 716)

Comprehending pointing is not just a matter of locking onto the thing pointed to; it also involves some sensitivity to context (see Liebal et al. 2009).

3.2. Pointing: referent and context

‘Already by age 14 months, then, infants interpret communication cooperatively, from a shared rather than an egocentric perspective’ (Liebal et al. 2009, p. 269).

‘The fact that infants rely on shared experience even to interpret others’ nonverbal pointing gestures suggests that this ability is not specific to language but rather reflects a more general social-cognitive, pragmatic understanding of human cooperative communication’ (Liebal et al. 2009, p. 270).

3.3. pointing vs linguistic communication

'the most fundamental aspects of language that make it such a uniquely powerful form of human cognition and communication—joint attention, reference via perspectives, reference to absent entities, cooperative motives to help and to share, and other embodiments of shared intentionality—are already present in the humble act of infant pointing.' (Tomasello et al. 2007, p. 719)

'cooperative communication does not depend on language, […] language depends on it.' (Tomasello et al. 2007, p. 720)

'Pointing may […] represent a key transition, both phylogenetically and ontogenetically, from nonlinguistic to linguistic forms of human communication.' (Tomasello et al. 2007, p. 720)

4. What is a communicative action?

Theory of communicative action (compare Tomasello et al. 2007):

1. Producing and understanding declarative pointing gestures constitutively involves embodying (?) shared intentionality.

2. Embodying shared intentionality involves having knowledge about knowledge of your intentions about my intentions.

4.1. A Gricean view

First approximation: To communicate is to provide someone with evidence of an intention with the further intention of thereby fulfilling that intention (compare Grice 1989, chapter 14).

4.2. First alternative view

'No speaker needs to form any express intention … in order to mean by a word what it means in the language' (Dummett 1986, p. 473)

'Interpreting speech does not require making any inferences or having any beliefs about words, let alone about speaker intentions' (Millikan 1984, p. 62)

4.3. Davidsonian view

'meaning of whatever sort ultimately rests on intention' (Davidson 1992, p. 298)

ulterior intentions: 'intentions which lie as it were beyond the production of words … [such as] the intention of being elected mayor, of amusing a child, of warning a pilot of ice on the wings' (Davidson 1992, p. 298).

semantic intentions: intentions concerning the meaning of one's utterance.

'The intention to be taken to mean what one wants to be taken to mean is, it seems to me, so clearly the only aim that is common to all verbal behaviour that it is hard for me to see how anyone can deny it.' (Davidson 1994, p. 11)

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