Notes on Bar-On: On the origins of meaning

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1 The question

Humans can express themselves through language; other animals cannot.

- How did that happen?

2 The linguistic view

Language = "a finite computational system yielding an infinity of expressions, each of which has a definite interpretation in semantic-pragmatic and sensorimotor systems (informally, thought and sound)" (Berwick & Chomsky 2015:1).[1]

This uniquely human computational system boils down to one thing: Merge.

- What is Merge? Glad you asked!

    - Merge is an operation that builds hierarchical structure via set formation. It takes two things and combines them to form an unordered set.

    (1) $\text{Merge(x,y)} \rightarrow \{x,y\}$

    - The resulting set gets a label from a labelling algorithm.

    - Merge can apply to atoms[2] from the lexicon or outputs of previous applications of Merge; this yields recursion.

- Merge is a very simple operation.

    - It could plausibly have arisen as the result of a minor mutation - a single evolutionary step.

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[1] Berwick, R. C., & Chomsky, N. (2015). *Why only us?* Cambridge, MA: MIT Press. Everything presented in this section is drawn from this work.

[2] Words or word-like units – bundles of syntactic, semantic, and phonological features (?)

- So all we needed to evolve was the capacity for Merge? Well, not quite:

  "Insofar as [the idea that the key to human language is Merge] is correct, the evolution of language will reduce to the emergence of Merge, the evolution of conceptual atoms of the lexicon, the linkage to conceptual systems, and the mode of externalization" (Chomsky & Berwick 2015:71-72).

What is the purpose of language?

- Language did not start out as a communicative tool; its primary function is as a tool for complex thought.

    - Most uses of language occur in our heads; externalization (and by extension communication) comes second.
    - This is not a new idea; it is present in the writings of neurologist Harry Jerison in the 1970s.

- Human language is very different from other animal communication systems. As animals ourselves we may share with other animals some non-linguistic ways of communicating, but these are crucially separate from our language faculty.

3   The neo-expressivist view

Starting point: Whatever animals are doing, it's not language in the human sense.

- Animals' expressive behaviour (e.g. yelps, growls, alarm calls, cowering gestures) lacks combinatorial structure, is affect-driven, and is keyed to environmental stimuli.

- This has led some people to say that animals' expressive behaviour is reflexive-responsive, composed of natural signs.

    - e.g. a dog's growl or tail-wagging is no different from a dog's panting, a rash, or a peacock's tail
    - Animals n-express; humans s-express.

- Assumption: Animal communication and human language have something in common (perhaps including a shared heritage?)

    - Darwin attempted to trace a gradual, sequential path for the emergence of language behaviours.[3] The work that Bar-On cites on language evolution is very much in the Darwinian spirit.

- Problem: This is a big and scary gap. How could language have arisen in nature?

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[3]Darwin, C. (1871). *The descent of man*. London: John Murray.

– Desideratum: A way to bridge this gap.

  ∗ The size and scariness of the gap seems to depend on a) what you think s-expressing entails and b) whether you think it should be related to animal communication. If you're a linguist, s-expression has nothing to do with animal communication, and simply requires Merge - a single, simple operation - plus atoms for it to operate on.

Solution: the a-expression/s-expression distinction

- We need to do justice to what animals are doing when they express. It's not true that everything animals do is just n-expression. They also a-express states of mind.

  – (What states of mind are they a-expressing? Could one a-express something other than a state of mind?)

  – When a dog licks your hand, it is a-expressing its affection for you.

  – Although animals lack a combinatorial symbolic system like human language (i.e. they do not s-express), they still express things through their behaviour: they show their states of mind.

    ∗ "Janus-faced": pointing inward (to mental state) and outward (toward whatever the state is directed at).

    ∗ These performances "also reveal the relevant behaviour's cause or motivation at the same time as they foretell the expresser's impending behaviour and move others to respond appropriately" (Bar-On, p. 8).

    ∗ (Is this a-expression? Bar-On notes that animals' communicative behaviours "exhibit a measure of *intentionality* or subjective directedness, even when not produced intention*ally* (p. 8).)

- Humans don't just s-express propositions; they a-express things too!

  – The act of laughing or uttering "This is so funny" both a-express amusement, but only the second one s-expresses anything.

  – This should make us feel better about the gap. Animals and humans share certain (a-)expressive behaviours.

  – Instead of trying to cross the Rubicon, we are left with "the more tractable task of identifying processes that could transform complex (though semantically inarticulate) expressive vehicles, used by social, nonlinguistic creatures to a-express their states of mind in communicating with others, into increasingly more articulate vehicles that eventually take on semantic life" (Bar-On, p. 9).

Showing and telling

- Jenny and Teddy:

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- A child sees a teddy bear, her face lights up, and she gasps.

- A child sees a teddy bear and reaches toward it, possibly while making inarticulate noises, or exclaiming "Teddy!"

- A child sees a teddy bear and says "Gimme Teddy!", perhaps without reaching.

- Regardless of the vehicle, expressive acts show the agent's state of mind.

  - (Showing vs. a-expressing?)

  - Expressive behaviour allows a "suitably endowed individual" to witness the expresser's state of mind (p. 4-5).

Integrating purely expressive forms into language

- *yuck* vs. *yucky* vs. *This is yucky*.

4 Taking stock

- What should we be trying to explain?

- How does adding a-expression, as distinct from both n-expression and s-expression, help the issue? Is the gap between a-/s- expression, or n-/a- expression, any more comfortable than the gap between n-/s- expression?

5 Fun facts about animal communication

Birdsong:

- Since at least Aristotle, people have thought about similarities between birdsong and human language

  - Darwin noted that, like humans, juvenile birds must learn their songs from mature birds before they themselves reach maturity, and that they go through babbling stages.

- Current state of the art:[4] birdsong shares certain features with the externalization system of human languages (namely, precedence-based dependencies), but it is not the same (crucially, it lacks hierarchical structure, and it does not combine meaningful atoms). Birds with vocal learning have similar neural connections in their brains, but this is a result of convergent evolution.

Non-human primate calls:

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[4]See Berwick & Chomsky (2015) for a more detailed summary.

- There has been an attempt to assign a formal semantics to the alarm calls of Campbell's monkeys.[5]

- Limited concatenation, or memorization of finite strings, vs. Merge

Teaching animals human language:

- Bar-On's footnote 13, p. 6: Gray parrots can apparently be taught to not only label items and actions but also to request them (i.e. to make *want* statements). What are these parrots doing?

- Nim the chimpanzee: able to acquire a sign for *apple*, but used it as a broad label for pretty much anything related to apples. This is radically unlike what human children do; they seem to start out with kind-denoting uses.[6]

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[5]Schlenker, P., Chemla, E., Arnold, K., Lemasson, A., Ouattara, K., Keenan, S., Stephan, C., Ryder, R., & K. Zuberbühler. (2014). Monkey semantics: Two 'dialects' of Campbell's monkey alarm calls. *Linguistics and Philosophy* 37(6), 439-501.

[6]Petitto, L. A. (2005). How the brain begets language. In J. McGilvray (ed.), *The Chomsky reader* (pp. 85-101). Cambridge: Cambridge University Press.