Lecture Thirteen: Piantadosi et al. on the Value of Ambiguity

Philosophy 431
November 5, 2015

I. Administration
   A. Reading for next week – Wasow et al.
   B. Questions?

II. The Virtue of Ambiguity
   A. As Wasow noted, Chomsky argues that the prevalence of ambiguity is reason to think that language is not designed to be used for communication:
      P1. If language is for communication, then there would be no ambiguity
      P2. There is much ambiguity
      C. Language is not for communication
   B. Piantadosi et al. argue that this is to get things “exactly backwards” – they argue that “ambiguity is in fact a desirable property of communication systems, precisely because it allows for a communication system which is ‘short and simple’” (p. 2).
   C. Thus, contrary to the idea that ambiguity is a bad thing because it makes communication confusing, Piantadosi et al. argue that it is a good thing for reasons having to do with communicative efficiency.

III. Following Zipf
   A. Zipf argued that ambiguity was required to enable speakers and listeners to strike a balance between the work they had to do in successful communication, in conformity with the principle of least effort.
      1. Speakers want to unify language in communication, reducing the amount of work they have to do in order to convey their intended meaning.
      2. Listeners want language in communication to be diversified so that meanings are readily available from words that are univocal.
3. These are in tension with one another, and so a balance is struck in which both speaker and listener make trade-offs, leaving the communication system unavoidably ambiguous.

B. Piantadosi et al. embrace this idea, pointing to the informativity of context as a key part of the story.

1. Given that context is informative, the speaker can use an ambiguous language and the listener can recover the speaker’s intended meaning using disambiguating cues from the context

2. Instead of unification and diversification, they use ease and clarity as the variables that must be balanced by speakers and listeners who use a communication system.

IV. The View

A. Piantadosi et al. argue that when context is informative about meaning, ambiguity makes language more efficient

1. It is important to recognize the role that context plays here. If context is not emphasized – as it often isn’t in discussions of ambiguity – then language will look exceedingly and problematically ambiguous. However, with context, this is not so.

2. Efficiency is grounded in variables that correspond to ease of use, e.g., shorter word forms, more frequent word forms, and word forms that exhibit phonotactic probability

B. Argument 1: For the necessity of ambiguity in an optimally efficient communication system (from §2.1)

P1. An optimally efficient communication system will never convey unnecessary information

P2. Assume that language is used in contexts that provide disambiguating cues

3. From P1 and P2, an optimally efficient communication system will not disambiguate what context disambiguates

4. Given 3, an optimally efficient communication system will be unable to disambiguate elements in the system when they are considered out of context

C. An optimally efficient communication system will always be ambiguous.
C. **Argument 2: Ambiguity “can result from trading off ease of production and ease of comprehension”**

P1. Let $L_1$ be an unambiguous linguistic system in which each linguistic unit has one and only one meaning; thus, $m_1$ is mapped to $l_1$ and $m_2$ is mapped to $l_2$, where $l_1 \neq l_2$ if $m_1 \neq m_2$.

P2. Assume that context is informative and disambiguates between $m_1$ and $m_2$; i.e., it is a context in which only one of those meanings would be appropriate.

P3. Assume that $l_1$ is easier to process than $l_2$ (e.g., it is shorter, more frequent, or phonetically simpler).

P4. Assume that disambiguation in context is not prohibitively costly – i.e., that what is saved in P3 is not spent in P2.

5. Given P2 and P3, a language $L_2$ in which $m_1$ and $m_2$ are mapped on to $l_1$ (i.e., $l_1$ is ambiguous) would be easier overall to use than $L_1$ – it costs the same in effort when $m_1$ is communicated but is easier when $m_2$ is communicated given that $l_1$ is easier to use than $l_2$.

6. Thus, under “very weak conditions” (viz., P1 to P4), “an unambiguous linguistic system can always be made easier to use by preferentially re-using the ‘easy’ linguistic units” (p. 5).

C. Therefore, “a linguistic system can be improved by introducing ambiguity” (p. 5).

D. In §3, Piantadosi et al. provide empirical evidence for the second argument in §2. In particular, they look at three languages (English, Dutch, and German) and examine whether homophony, synonymy, and syllable ambiguity (i.e., three measures of ambiguity) vary in the way predicted when looking at word length, word frequency, and phonotactic probability (i.e., three factors that correspond to processing ease).

1. In almost every case, the easier, more frequent, and more phonetically probable a word/syllable is, the more ambiguous it is.

2. What does this empirical test presume about the nature of ambiguity?