

LING5702: Lecture Notes 23

Phylogeny: Is Language Learning Just Statistics?

We've looked at how language can be statistically learned. Is that all there is?

An alternative: a biologically evolved instinct for grammar (Chomsky, 1986; Pinker, 1994).

Contents

23.1 Evidence that much of language learning is statistics	1
23.2 Evidence that some of language learning isn't statistics	2

23.1 Evidence that much of language learning is statistics

1. Statistical models are fairly successful
 - (a) segmentation
 - (b) grammar induction
2. Language evolved recently (so it shouldn't be very different from what we had before)
 - (a) 5-8Mya: humans diverge from common ancestor of chimps/bonobos (Sarich & Wilson, 1967)
 - tool *use* inherited to humans, chimps, ..., but no language
 - 3.3M y.a.: stone tool *making* (Harmand et al., 2015)
 - (b) 2M y.a.: start of ice age, homo erectus
 - at least 1M y.a.: fire (Berna et al., 2012)
 - (c) 1M y.a.: homo heidelbergensis
 - branch (until 30,000 y.a.): neanderthal, tools, burials, communication?
 - (d) 200,000-100,000 y.a.: homo sapiens (Schlebusch et al., 2017)
 - humans nearly wiped out? (Behar et al., 2008) (DNA stats: population 2000)
 - innervation for breathing control, needed for language (MacLarnon & Hewitt, 1999)
 - (e) 40,000 y.a.: particularly cold ice age, 'upper paleolithic revolution' (Bar-Yosef, 2002)
 - organized settlements: campfire, storage pit, in narrow valley for hunting
 - tools – indicate specialization of skills
 - built boats/rafts to colonize New Guinea and Australia
 - cave paintings – indicate reference (it's paint, and it's a deer)
 - humans probably had language by this time

So language seems like less of a change than upright posture.

3. Animals can learn aspects of language, but don't see the value of it (Tomasello et al., 2005)
 - (a) Washoe the chimp (Gardner & Gardner, 1969) – taught signs to her adopted son Loulis
 - (b) Koko the gorilla (Patterson, 1978) – learned to sequence ASL signs
 - (c) Akeakamai the dolphin (Herman et al., 1984) – comprehended sequences of signs
 - with sibling, demonstrated 'creative' and 'synchronous' trick (Braslau-Schneck, 1994)
 - (d) Alex the parrot (Pepperberg, 2000) – name things (but wants to go back to cage)

23.2 Evidence that some of language learning isn't statistics

1. Gold (1967)'s theorem (but very strict assumptions)
2. double dissociation (but there are confounds)
 - (a) Williams Syndrome (Reilly et al., 1990),
 - (b) SLI from FOXP2 gene (Lai et al., 2001): assoc. w. morphology & other fast sequencing
3. critical period
 - (a) Genie: 13yrs (Curtiss, 1977) – deprived of speech during childhood, syntax deficits
 - (b) Jim: 1;6 & Glen: 3;9 (Sachs et al., 1981) – hearing of deaf parents: initially no syntax
 - (c) Nicaraguan Sign Language (Senghas, 1995) – kids learn pidgin as creole, w. morphology

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