

Psych56L/ Ling51

Winter 2014

Review Questions: Biological Bases of Language

(1) Terms/concepts to know: pidgin, creole, homesign, Nicaraguan Sign Language, Language Bioprogram Hypothesis, critical period, sensitive period, “less is more” hypothesis, functional architecture, neurolinguistics, lesion studies, contralateral brain connection, ipsilateral brain connection, dichotic listening task, ERP, PET, fMRI, MEG, optical topography, near-infrared spectroscopy, functional asymmetry, agrammatism, Broca’s aphasia, Wernicke’s aphasia, split brain patients, right-ear advantage, intentionality, reference, syntax, vervet monkey alarm calls, honeybee waggle dance, dolphin whistles, bird song, FLB, FLN, lexical layer, expression layer

(2) What is one way we know that language isn’t simply a “cultural” habit passed on from person to person? (Hint: Think about cases where there’s no person to learn it from.)

(3) Why are creoles informative about what prior knowledge children may have about language acquisition while pidgins generally are not?

(4) On the fictitious island of the Guins, suppose that several immigrants from different language and cultural backgrounds have come to live and work together. Suppose that you noticed that there was now a common language comprised of lots of other language parts, and this common language was spoken by all of the adult immigrants. Meanwhile, a different (though related) language was spoken by the children of the immigrants. Which language (that of the adults or that of the children) would be termed a pidgin and which would be termed a creole? Why? Whose language (that of the adults or that of the children) would you expect to be more grammatically complex?

(5) Does creolization necessarily indicate that there is domain-specific knowledge about language? Why or why not?

(6) What are some differences between the signs used by homesigners, compared with their caretakers? Why does this suggest that homesigners are adding something to the linguistic system that wasn’t present in their input? Could this evidence be compatible with the Language Bioprogram Hypothesis?

(7) What are some ways researchers measured the structural complexity of the language of signers learning Nicaraguan Sign Language?

(8) Is the Language Bioprogram Hypothesis more in line with a nativist or an empiricist viewpoint? What about a generativist vs. a constructionist viewpoint? How do you know?

(9) When Genie was tested with a dichotic listening task, it was found that language was a right-hemisphere activity for her. How does this compare with native speakers’ neural activity? How did Genie’s language ability compare to native speakers’?

- (10) What are deaf-of-hearing children? Why are they a better case study for language's critical period than Isabelle and Genie?
- (11) How do we know that language ability isn't just about how long you've known a language? What evidence do we have from deaf signers? What about from second-language learners?
- (12) How does testing second language speakers help us decide whether there is a critical or sensitive period for language development?
- (13) What evidence from fMRI and ERP studies is there to suggest a neurological basis for a critical/sensitive period?
- (14) What kind of performance trajectory do we expect from language learners if there is a critical period for language? What about if there is a sensitive period?
- (15) What is the "less is more" hypothesis, in relation to language-learning? Why might it be counterintuitive, given children's cognitive abilities and adults' cognitive abilities?
- (16) What are some pros and cons of the human speech apparatus?
- (17) What can lesion studies tell us about how language functions are implemented in the brain?
- (18) Which connections, contralateral or ipsilateral, are stronger from the ears to the brain?
- (19) Can ERP studies give us detailed information about the timing of neural events? Why or why not? What about detailed information on the exact location of neural activity?
- (20) Would MEG be easy to use for a young child? Why or why not?
- (21) Which of the following sentences would a Broca's aphasic likely have trouble comprehending? Why?
- (a) The penguin ate the fish in one gulp.
 - (b) The fish ate the penguin in one gulp.
- (22) Consider split brain patients and what they can tell us about where language is processed in the brain.
- (a) What is the defining feature of a split brain patient? (Hint: What part of the brain has been altered?)
 - (b) Suppose a split brain patient sees a cat in her right visual field.
 - (i) Will she be able to say "cat" out loud to identify what she saw?
 - (ii) Will she likely be able to pick up a stuffed cat from a set of objects on her righthand side?
 - (c) Suppose a split patient sees a cat in her left visual field.
 - (i) Will she be able to say "cat" out loud to identify what she saw?

(ii) Will she likely be able to pick up a stuffed cat from a set of objects on her lefthand side?

(d) Given the results from (b) and (c), what would we conclude about where language is located in the brain of this split brain patient? Why? Assuming the patient's language location is typical of most adults, where would we conclude that language is located in the brains of most adults?

(23) In which ear would you expect a normal right-handed subject with no brain damage to report hearing a language stimulus in a dichotic listening experiment? Why?

(24) Which side of the brain seems to control non-linguistic visual-spatial information processing? How do you know?

(25) Why might it be surprising to discover that ASL speakers who have right hemisphere damage do not show deficits in ASL? (Hint: Consider how ASL is communicated from speaker to speaker.)

(26) Give two examples of aspects of language that the right hemisphere seems to control.

(27) Where is a non-native language usually located in the brain for speakers who aren't as proficient with syntax? Does this fit with the general notion of what the right and left hemispheres are specialized for? Why or why not?

(28) Do vervet monkey calls show evidence of syntax? What about intentionality?

(29) Does human language have more or fewer "signs" than animal communication systems?

(30) Does a honeybee's waggle dance have the intentionality feature? Why or why not?

(31) How would you argue that dolphin communication differs from human language? (Hint: Think about the core features of intentionality, reference, and syntax.)

(32) How can birdsong be compared to human language, with respect to how it develops?

(33) Does birdsong seem to have reference at the level of notes, syllables, or motifs?

(34) In what way is birdsong similar to human language with respect to syntax (the combinatorial system)? In what way is it different?

(35) How does the number of symbols Alex the parrot learned compare with the number of symbols an average adult human knows?

(36) What is one reason that chimpanzees were more able to learn a signed human language than a spoken human language?

(37) How does the number of signs Washoe learned compare to the number of “signs” an average adult human knows?

(38) Nim Chimsky was able to create combinations of signs. Were these likely the result of a productive combinatorial system or were they likely just memorized chunks?

(39) What was the difference in Matata’s and Kanzi’s language training? Who succeeded better at learning language? Why was this the case, and how does this relate to the critical/sensitive period of language acquisition?

(40) What are two ideas why other primates like Kanzi may be unable to learn human languages as well as human children learn them?

(41) Which human Faculty of Language, broad (FLB) or narrow (FLN), is supposed to represent a qualitative difference between human and animal communication? Which is supposed to represent a quantitative difference? (Note: qualitative = not just about needing more brain power, but actually needing more specialized brain parts; quantitative = just need more brain power, but basic functional brain parts are the same)

(42) One idea about human language by Miyagawa et al. (2013) is that it combines two layers, the lexical and the expressive layer.

(a) Which layer is argued to correspond to primate alarm calls and honeybee waggle dance components? (Hint: Think about which piece corresponds to the basic “sign” level.)

(b) Which layer is argued to correspond somewhat to birdsong melodies? Why isn’t this layer argued to be exactly like what birdsong uses?

(c) Suppose we consider the utterance below:
“Jareth became irritated with Hoggle.”

(i) What are the components that would correspond to the lexical layer?

(ii) What are some alternate utterances that could be produced by the expressive layer?

(d) How do the two layers relate to the FLB and the FLN? (Hint: Think about what parts human communication shares with animal communication, and what’s different.)