

Intro to Cognitive & Information Sciences, Homework 4
Due in Class on May 12

Note: Handwritten answers take substantially longer to read and mark than typed ones. It's fine to turn in handwritten equations and other mathematical portions of the problems, but we would very much appreciate it if you could type up the longer stretches of prose.

1. Pinker and Ullman claim “that speakers should apply regular inflection whenever memory fails to supply a form for that category,” and then go on to cite low frequency as one reason memory might fail to supply a form. This implies that frequency of occurrence and irregular inflection should be statistically correlated. Now look at tables of the most frequent nouns and verbs in English, available at

<http://www.askoxford.com/worldofwords/wordfrom/revisedcoed11/>

- a) How many of the top 25 nouns have irregular plurals?
 - b) How many of the top 25 verbs have irregular past tenses?
 - c) Pick 5 regular and 5 irregular nouns not on this list of the 25 most frequent nouns and check their frequency in the Corpus of Contemporary American English
 - d) Pick 5 regular and 5 irregular verbs not on this list of the 25 most frequent verbs and check their frequency in the Corpus of Contemporary American English
 - e) Are your findings in (a)-(d) a problem for Pinker and Ullman? Why or why not? (maximum 200 words)
 - f) A connectionist model like that of Rumelhart and McClelland predicts that another factor besides frequency would play an extremely important role in determining whether a word would have an irregular inflection. What is that other factor?
2. a) Explain what it is about the structure of yes-no questions in English that Chomsky claims provides evidence for innate knowledge. (200 word maximum)

Bruno Estigarribia's 2007 Stanford Linguistics PhD dissertation studied yes-no questions in the speech of several American children, and in the speech directed to them by adults. It documented that a great many of the adult questions were in the form of fragments, rather than full sentences. For example, instead of *Do you want milk?* an adult might say one of the following to a child:

Milk?

Want milk? or

You want milk?

The children's questions frequently took the form of such fragments as well, with the fragments getting longer (on average) as the children got older. Estigarribia also noticed that the fragments tended to be final substrings of full yes-no questions – that is, they look like full sentences with some words lopped off the beginning.

- b) What is the obvious explanation for the similarity between children's questions and the questions that adults direct to them? In your opinion, do Estigarribia's observations weaken Chomsky's argument that you summarized in part a)? Why or why not? (200 words maximum)