

Discussion summary: Alegre & Gordon (1999), exp 2-5

Goal today: To examine (the rest of) the experiments in Alegre & Gordon (1999)

- (a) What is the task?
- (b) What is the experiment design like?
- (c) What are the results?
- (d) What are the implications?

(1) Review: Experiment 1

- (a) Task = lexical decision, visual (as opposed to auditory)
- (b) Factors held constant or otherwise controlled for:
 - Inflection = regular
 - Similar stem-cluster frequencies; range was 99-122
 - Word length and syntactic category were evenly distributed among the items
- (c) Crucial comparison:
 - Whole-word frequency spanned a continuum from low to high (0-101)
 - > Question being addressed here: Does whole-word frequency have an effect on the speed of lexical decision for regularly inflected forms?
- (d) Results: Higher whole-word frequency showed a weak relationship to response time (higher whole-word frequency corresponded to a slightly faster RT)
- (e) Implications: The existence of frequency effects is believed to be evidence for storage in the lexicon, so **at least some regularly inflected forms may be lexically stored**

(2) Experiment 2

- (a) Task = lexical decision, visual
- (b) Factors held constant or otherwise controlled for:
 - Inflection = regular
 - Similar stem-cluster frequencies; range was 49-60 this time
 - Word length and syntactic category were evenly distributed among the items
- (c) Crucial comparison:
 - Whole-word frequency spanned a continuum from low to high (0-44)
 - > Question being addressed here: Does whole-word frequency have an effect on the speed of lexical decision for regularly inflected forms with *lower* cluster-frequency values than were tested in Exp 1?
- (d) Results: Higher whole-word frequency had an effect on response time (higher whole-word frequency corresponded to a faster RT); significant by subjects and items
- (e) Implications: Bolsters the weaker result from Exp 1; indicates that **at least some regularly inflected forms are lexically stored**

- (3) Follow-ups to Experiment 2
- (a) Claim for dual-access models is that for low-frequency inflected forms, access should be via morphological decomposition
 - Predicts: Lower-frequency inflected forms should actually not show whole-word frequency effects
 - Results: Dividing items at median frequency found no effect in low-freq group; significant effect in high-freq group
 - (b) If this effect is real, it should turn up in Exp 1 results also
 - Exp 1 results reanalyzed for words in same (whole-word) freq range as Exp 2=lower; effect of freq stronger this way
 - Suggests floor effect — increasing whole-word freq only helps RT up to a point
 - Exp 1 results then examined for up to ww freq=6; no sig. effect (so, like Exp 2)
- (4) Conceptual background for Experiment 3
- (a) The reanalysis of Exp 1 and 2 results above suggested that low-frequency inflected forms do not show whole-word frequency effects, even though higher-frequency inflected forms do
 - (b) This result seems to have important implications for models of the lexicon
 - (c) BUT — Possible alternative explanation: It's not something special about inflected forms; instead, whole-word frequency effects simply can't be found (don't exist? can't be easily measured?) at the very low-frequency end of the scale even for simple words
- (5) Experiment 3
- (a) Task = lexical decision, visual
 - (b) Factors held constant or otherwise controlled for:
 - Similar stem-cluster frequencies for the inflected forms; range was 49-60
 - All words (N, V, A) had whole-word frequencies in the 0-6 range
 - (c) Crucial comparison:
 - Inflected N/V vs. uninflected A with same whole-word freq range (0-6)
 - > Question being addressed here: Is there a difference between inflected and uninflected forms in the same low-frequency range with respect to being able to find a whole-word frequency effect on RT?
 - (d) Results:
 - Lack of ww-freq effects for the inflected forms was replicated
 - But, the uninflected A did show ww-freq effects
 - (e) Implications: Confirms that low-frequency inflected items specifically are failing to show ww-freq effects; supports a few in which **low-frequency inflected items are accessed only by morphological decomposition**
 - What does this mean for lexical *storage*? Can we tell for certain?

- (6) Conceptual background for Experiments 4 and 5
- (a) Try a different (larger) low-frequency range
 - (b) Compare A vs inflected N/V across experiments and with larger numbers of items of each type
 - (c) Try a different (lower) cluster-freq range
- (7) Experiment 4
- (a) Task = lexical decision, visual
 - (b) Factors held constant or otherwise controlled for:
 - Inflected words (N/V); cluster freq 25-31
 - Whole-word frequencies in the 0-24 range
- (8) Experiment 5
- (a) Task = lexical decision, visual
 - (b) Factors held constant or otherwise controlled for:
 - Uninflected words (A); cluster freq 25-31
 - Whole-word frequencies in the 0-24 range
- (9) Experiments 4 and 5
- (c) Crucial comparisons:
 - Effect of ww-freq on RT within inflected and A conditions
 - Inflected N/V vs. uninflected A with same whole-word freq range (0-24)
 —> Questions being addressed here:
 - >> Is the 0-24 range low enough not to find ww-freq effects for inflected forms?
 - >> Do N/V and A still behave differently?
 - (d) Results:
 - Got ww-freq effects in the 0-24 range, so the threshold is somewhere between 6-24
- (10) Follow-up comparison: Effect of cluster frequency
- (a) If there is an effect of cluster frequency, this implies that the base is also accessed when a morphologically complex form is accessed
 - (b) Analysis: Items chosen from across experiments to compare in this way: ww-freq similar but cluster freq different
 - (c) Results:
 - Higher cluster freq leads to lower RT in Exp 1 vs Exp 2, and in 1 vs 2 vs 4
 - Inflected forms have overall faster RT than uninflected A (in Exp 3 but not in Exp 4&5, where the cluster freq was lower and the ww-freq was higher)
 - (d) Implications: Cluster frequency does have an effect if it is high enough and ww-freq is low enough, suggesting that under these conditions the base is activated (=morphological decomposition)

- (11) Follow-up comparison: Success of connectionist (rule-free) models
- (a) Bybee predicts effect of number of word-forms in cluster; this was not found
 - (b) Likewise, no support for a similar model where cluster frequency and ww-freq compete directly [although A&G warn us that the experiments were not set up to test this directly]
- (12) General implications: What do these results mean for the **architecture of the grammar**?
- Regular inflected forms show ww-freq effects
 - But, not when ww-freq goes below 6 tokens per million (in Kučera & Francis corpus)
- (a) This supports:
- Dual-route access model, where whole-word and decomposition routes compete (for all forms) and frequency affects which is faster
 - Weak version of Pinker model (allows for storage of *some* regular inflected forms)
- (b) What are the implications for associative networks among stored items?
- Seem to occur only for irregular inflection (even if regular inflected forms are stored, as seen through process of lexical access)
- (c) A&G's position:
- We can distinguish the **access system** from the more abstract **mental lexicon**
 - Frequency effects come from storage of items in the access system [regular inflection here]
 - Associative connections among items are restricted to the lexicon itself [no regular inflection here]