LING440: Predictive vs. Conservative Parsing

- In many cases, as we are parsing through a sentence incrementally, there is some uncertainty about how the structure will turn out. A standard example is filler-gap dependencies.
  - I want to buy [the book], that you wrote …
    - I want to buy [the book], that you wrote __ i last year.
    - I want to buy [the book], that you wrote an article about __ i

- This raises a research question: in comprehension do humans (conservatively) wait to find out how the sentence is going to go, so that we never make a mistake? Or do we (predictively) make a guess so that we can process faster, but risk being wrong?

- Stowe (1986) tested this question for filler-gap dependencies. The specific hypotheses she tested were
  - **Predictive hypothesis**: in a filler-gap dependency like the relative clause above, readers predict that the gap will be the object of the verb.
  - **Conservative hypothesis**: readers don’t make any prediction, they just wait to see what happens. They don’t assume there is a gap until they get clear evidence that an argument is missing (e.g. at ‘last year’ above).

Stowe used the ‘filled-gap’ paradigm. This refers to the case where the object of the verb is ‘filled’ by something else (e.g. ‘an article’) so that the gap cannot be in the object position. According to the predictive hypothesis, this violates the reader’s expectations, so their reading time should be disrupted. According to the conservative hypothesis, no prediction is made and either gap position is equally acceptable, so no disruption should be observed. Stowe found evidence for reading time disruption.

- Traxler & Pickering (1996) tested these same hypotheses for filler-gap dependencies using a different design. They used the ‘plausibility mismatch effect’ paradigm.
  - The big city was a fascinating subject for the new book.
    - (Match condition) We like the book that the author wrote …
    - (Mismatch condition) We like the city that the author wrote …

The idea behind this design is to insert a verb that would make the filler an implausible object (e.g. ‘writing the city’). On the predictive hypothesis, this is going to cause a problem: readers were predicting that the filler would be the object of the verb, but the verb makes this implausible, so disruption should be observed. On the conservative hypothesis, this is no problem: at the verb readers are waiting for more evidence before deciding where the filler goes, so they’re not going to be checking whether it is a plausible fit with the verb. T&P found evidence for disruption.
This work suggests that readers make predictions about the structure of the sentence for filler-gap dependencies. Now we can ask a follow-up question: do these predictions follow the constraints of the grammar?

- Remember island constraints? Some filler-gap dependencies are not allowed by the grammar.

  *I bought [the book], that the author who wrote __ lives in Canada.

- So what happens to reader predictions now? Do they still predict that the filler will be the object of the first verb, which would be ungrammatical? Or are their predictions constrained by their grammar? Traxler and Pickering (1996) addressed this question with the plausibility mismatch paradigm using island sentences.

- The big city was a fascinating subject for the new book.
  - (Match condition) We like the book that the author who wrote …
  - (Mismatch condition) We like the city that the author who wrote …

T&P found no plausibility mismatch effect in the island condition. That is consistent with the hypothesis that filler-gap predictions are constrained by the grammar—readers don’t predict a gap after the first verb if it would be ungrammatical.