Does sentence processing show domain-general primacy and recency effects?

Morton Ann Gernsbacher & David Hargreaves ’88:

► **stimuli:** written sentences:
   
   (a) ‘Tina beat Lisa in the state tennis match.’
   (b) ‘Tina was beaten by Lisa in the state tennis match.’
   (c) ‘Tina and Lisa beat Susan and Marsha in the state tennis match.’

followed by query: did ‘Tina’ appear in the sentence?

► **measure:** time to answer query

► **results:** facilitation for first mention, indep. of argument or conjunct.

Consistent with domain-general primacy effect.
Structure Building Framework

Build structured events (signs) up from foundation

- mapping: connecting observations to expectations
- shifting: start working on a new substructure

Caplan ’72:

- **stimuli**: written sentences:
  
  (a) ‘Now that artists are working fewer hours, oil prints are rare.’
  (b) ‘Now that artists are working in oil, prints are rare.’

  followed by query: did ‘oil’ appear in the sentence?

- **measure**: time to answer query

- **results**: response time is longer when ‘oil’ in earlier clause.

Similar inhibition across ‘clause’ bounds w. picture stimuli (Gernsbacher’85).
Structure Building Framework

Structure building supported by processes of enhancement and suppression:
- **enhancement**: automatically infer propositions related to text-base
- **suppression**: eliminate propositions that are not relevant

**Duffy, Henderson and Morris ’89:**
- **stimuli**: written sentences:
  ‘The teacher has a lot of patience.’
  followed by query: is ‘hospital’ related to the sentence?
- **measure**: time to answer query
- **results**: response time is longer when query related by alternate sense.
Event Indexing Model

Is comprehension primarily about identifying goals of protagonists?

Rolf Zwaan, Narj Langston, Arthur Graesser ’95: Event Indexing Model

Eventualities (propositions) are indexed/tagged according to features:

1. time - connect to other contemporary eventualities
2. protagonists - connect to other eventualities done by same
3. causation - connect to antecedent or consequent eventualities
4. space - connect to other co-located eventualities
5. motivation - connect to other events with same purpose
Evelyn Ferstl, Mike Rinck and D. Yves von Cramon’05:

- **stimuli**: spoken stories contradicting global context in various ways:
  ‘Today, Markus and Claudia would finally meet again. Markus’s train arrived at the station 20 minutes after/before Claudia’s train. . . . Claudia was already waiting for him when he got off the train with his huge bag.’

- **measure**: fMRI voxel activations

- **results**: different brain regions lower/higher for each contradiction type
CI (Kintsch) model advocates usually assume ‘leading edge’ strategy:
- retain most recent main verb propositions, then children, ...

Maybe recall of propositions depends on causal chains:
- retain most recent eventualities (propositions) with no consequence

Charles Fletcher ’86:
- **stimuli**: several story texts:
  ‘Once there was a tortoise and a crow who were best friends. The tortoise was having a birthday party and the crow had no present to give him. While all the other animals played games, the crow just sat under a tree and watched. Then everyone had ice cream and cake, but the crow barely touched his. . . . ’

followed by request: write down all you can remember of the story
- **measure**: reading time and recall results
- **results**: ‘current state’ strategy gives better fit than ‘leading edge’
We can measure the effect of filling in propositions.

Janice Keenan, Susan Baillet & Polly Brown ’84:

- **stimuli**: written paragraphs with variable 1st sentence:
  1. ‘Joey’s big brother punched him again and again.’
  2. ‘Racing down the hill, Joey fell off his bike.’
  3. ‘Joey’s crazy mother became furiously angry with him.’
  4. ‘Joey went to a neighbor’s house to play.’

followed by 2nd sent. describing directly/indirectly related consequence:

- ‘The next day his body was covered with bruises.’

followed by question: how related were these two sentences

- **measure**: reading time and survey result

- **results**: more directly related consequences were read faster.
Bridging Inferences

Chin Lung Yang, Charles Perfetti & Franz Schmalhofer ’07: ERP effects

- **stimuli:** written paragraphs presented one word at a time:
  - (a) (explicit) ‘After being dropped from the plane, the bomb hit the ground and exploded.’
  - (b) (paraphr) ‘After being dropped from the plane, the bomb hit the ground and blew up.’
  - (c) (inferenc) ‘After being dropped from the plane, the bomb hit the ground.’
  - (d) (baseline) ‘Once the bomb was stored safely on the ground, the plane dropped off its passengers and left.’

followed by 2nd sent. describing directly/indirectly related consequence:
- ‘The explosion was quickly reported to the commander.’

- **measure:** scalp electrode readings over time
- **results:** N200,P300,N400 spike for explicit,paraphrase,inference/baseline

Suggests reader tries surface match≺text-base co-ref≺situational bridging