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Processing Tenses for the Living and the Dead:

Evidence from Self-Paced Reading

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Introduction

Lifetime Effects: Past tense for the dead, present tense for the living

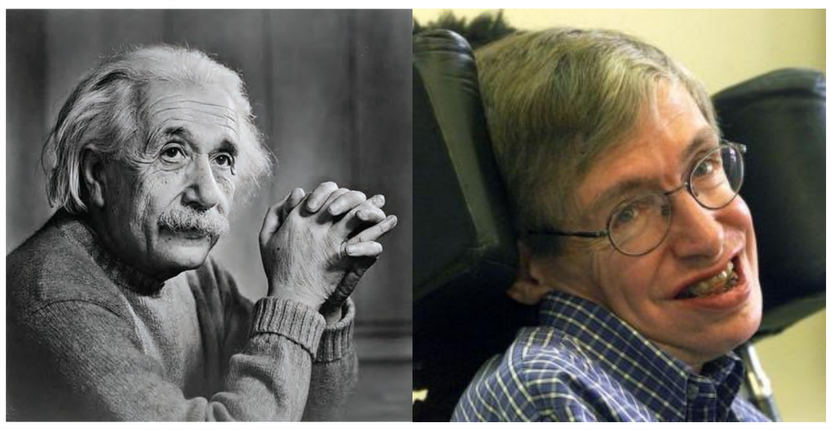
- Albert Einstein was/*is a physicist.
- Stephen Hawking *was/is a physicist.

Individual-level predicate (ILP) denotes a property that holds over the lifetime of its subject

- In an out-of-the-blue context, ILP in past or present tense triggers lifetime inferences:
- John Doe was a physicist. —> John Doe is dead.
- John Doe is a physicist. —> John Doe is alive.

Conjoined subjects with contradictory lifetime inferences are "ineffable" (Mittwoch, 2008)

- Due to obligatory tense marking in English
- Albert Einstein and Stephen Hawking *??are/??were* physicists.



Research Questions

- Establishing the issue of lifetime effects from linguistic literature in a quantitative manner
- Are English speakers able to detect lifetime effects during online processing?
- Are lifetime inferences from past tense and present tense on a par?

Experimental Design

3×2 Factorial Design:

- Match: Living + Present, Dead + Past
- *Mismatch: Dead + Present, Living + Past
- ??Conjoin: Conjoin + Present, Conjoin + Past

Norming Study: Questionnaire

- Participants (N=60) were asked to answer multiple-choice questions with single or conjoined subjects. For example:

  Albert Einstein and Stephen Hawking _____ physicists.
  (a). are (b). were (c). Neither

- This study is to ensure:
  - that the items were appropriate for assessing lifetime effects: speakers do have access to world knowledge about these particular individuals
  - that English speakers are indeed much more likely to respond "Neither" to Conjoin Condition (A total of 1200 observations for each condition; $\chi^2(1) = 188.03$, $p < .001$, odds ratio = 238.96)

	Dead	Living	Conjoin
neither	1	4	188

Experiment 1: Acceptability Judgment

- 24 participants were recruited on Amazon MTurk. They were asked to read the sentences and rate them on a scale of 1-7 (with 1 as 'bad' and 7 as 'good')
- At the end of the task, they answered a questionnaire about the life/death of the subjects. For example:

  Albert Einstein _____ a physicist.
  (a). is (b). was

Experiment 2: Self-Paced Reading

- 33 participants were recruited on Amazon MTurk. They were asked to read the sentences, one phrase at a time, at their own pace.
- Each sentence was accompanied by a multiple-choice comprehension question
- The same questionnaire from Experiment 1 was used

Hypotheses and Predictions

Contradictory lifetime inferences arise in the Conjoin Condition:

- In principle, neither tense is appropriate. Lifetime inferences from past tense and present tense are both presuppositions (Kratzer, 1995; Mittwoch, 2008) or scalar implicatures (Magri, 2009; Musan, 1997)
- However, lifetime inferences from past tense are more defeasible
  - Contextual dependency of the English past tense (Mittwoch, 2008): "John *said* Albert Einstein and Stephen Hawking *were/??are* physicists."
  - ILPs in past tense can be coerced into stage-level (Jäger, 2001; Kratzer, 1995; Magri, 2009): "He was a physicist. Years ago, he left the academia."

In Acceptability Judgment:

- Both Conjoin condition and Mismatch condition should receive lower ratings than Match condition

In Self-Paced Reading:

- Both Conjoin condition and Mismatch condition should elicit longer RTs than Match condition
- Given the out-of-the-blue context, effects are likely to be immediate and may arise at ILP region

Results

Experiment 1: Acceptability Judgment

- No outliers
- Trials whose RTs were shorter than 1000 ms or more than 2.5 standard deviations above the mean value were removed
- Conjoin condition patterns with Mismatch condition:
  - Significant difference from Match condition
  - Main effect of tense

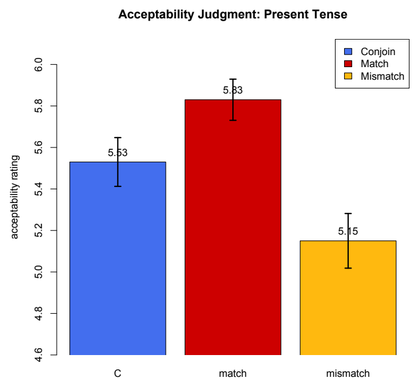


Fig. 1: Acceptability ratings for present tense

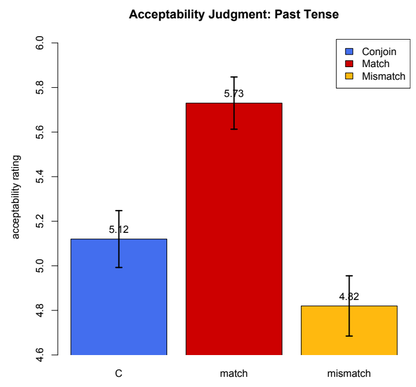


Fig. 2: Acceptability ratings for past tense

Experiment 2: Self-Paced Reading

- 2 participants were removed due to excessive RTs
- Trials that didn't match up with assigned lifetime information in the questionnaire were filtered out
- Data analysis was carried out by using lmer() in R. At ILP region, Conjoin Condition patterns with Mismatch Condition only in present tense; no effect of subject type was found in past tense

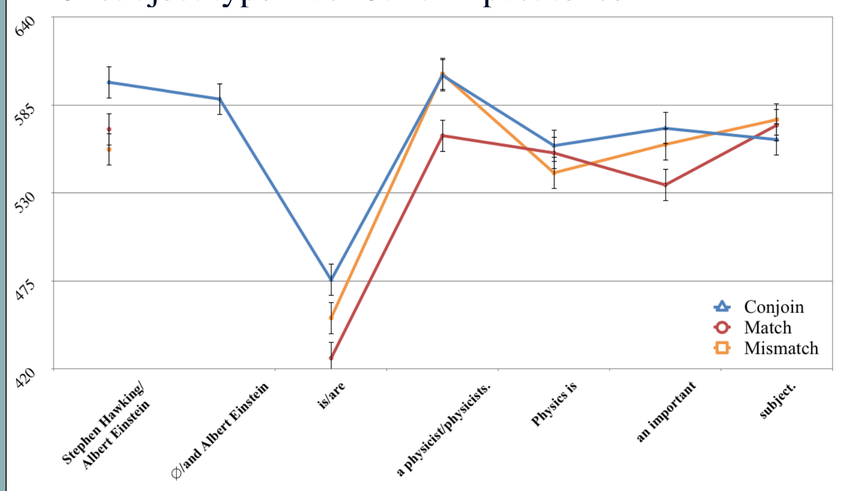


Fig. 3: RTs for present tense

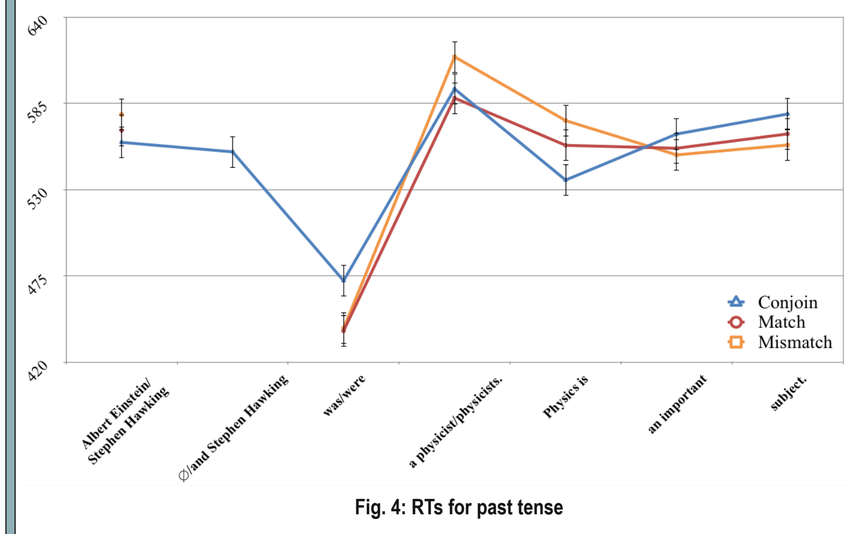


Fig. 4: RTs for past tense

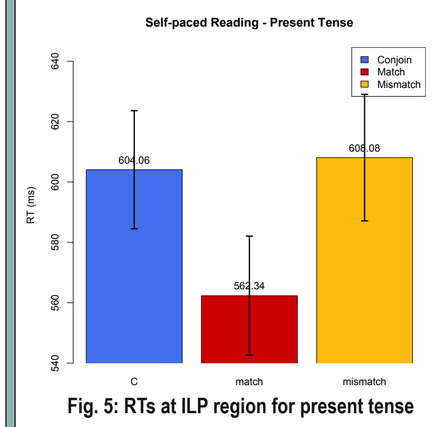


Fig. 5: RTs at ILP region for present tense

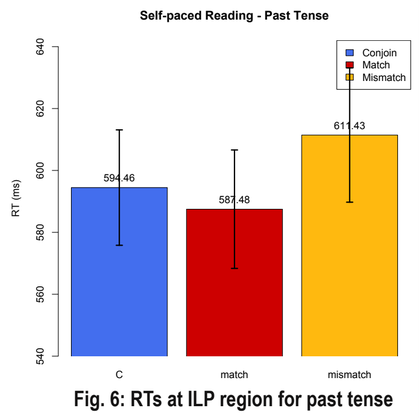


Fig. 6: RTs at ILP region for past tense

Discussion

Findings:

- Lifetime inferences from past tense and present tense are on a par in the sense that speakers are sensitive to both when asked explicitly
- However, results from online processing show that lifetime inferences from past tense are indeed more defeasible than those from present tense

Limitations:

- Dependent on the participants' world knowledge
- Conjoin Condition might have been more salient

Follow-up studies:

- Discourse approach: construct a context for living and dead information
- What about "tenseless" languages like Mandarin Chinese (Lin 2006, 2010)?
- "Forward lifetime effect": future vs. non-future contrast (Arche, 2006)

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