**Structure-sensitive Noise Inference:**

**Comprehenders Expect Exchange Errors**

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**Background**

- Comprehenders consider **non-literal** interpretations
- Evidence from garden-paths: readers retain initial misinterpretations (Christianson et al., 2001)
- Also in non-garden paths (Ferreira, 2003)
- **Key finding:** the tendency to adopt non-literal interpretations is affected by **semantic plausibility** and **syntactic canonicality**

- **Thematic role assignment**
- **Syntactic frequency**

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**Assumptions**

1. **Effect of the prior:** % of noise inferences should be inversely related to plausibility and canonicality
2. **# of string edits:** noise operations with fewer string edits should permit more noise inferences
3. **Exchange errors:** % of noise inference should be higher for exchanges than active/passive constructions

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**Non-literal questions?**

- Comprehenders consider non-literal interpretations
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**Predictions**

- **Listeners consider exchange errors:**
  - Comprehenders’ noise model is structure-sensitive

- **Open questions:**
  - Noise model vs. speaker model: are listeners’ inferences attuned to error frequencies? (cf. spoonerisms; e.g. Dell et al., 2000)
  - Exchange what?

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**Discussion**

- Results
  - Experiment 1: Active/Passive
  - Experiment 2: Transitive/Intransitive
  - Experiment 3: DO/PO
  - Experiment 4: Non-categorical

- **Model prediction:** % literal interpretations

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**Method**

- **2x2 design:** plausibility x canonicality (estimated in separate corpus analysis)
- **Dependent measure:** % of literally correct answers

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**Results**

- **Novel**
  - 2x2 design: plausibility x canonicality (estimated in separate corpus analysis)
  - Dependent measure: % of literally correct answers

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**References**


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**Noise Inference**

- **Gibson et al. (2013): Noisy-channel approach**

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**噪声概率**

- Speaker error
- Listener error
- Environmental noise

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**環境**

- Noise Probability
- Prior probability

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**Replication**

- Experiment 1: Active/Passive
- Experiment 2: Transitive/Intransitive
- Experiment 3: DO/PO
- Experiment 4: Non-categorical

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**Novel**

- 2x2 design: plausibility x canonicality (estimated in separate corpus analysis)
- Dependent measure: % of literally correct answers

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**Xpect**

- 2x2 design: plausibility x canonicality (estimated in separate corpus analysis)
- Dependent measure: % of literally correct answers

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**Xchanges**

- 2x2 design: plausibility x canonicality (estimated in separate corpus analysis)
- Dependent measure: % of literally correct answers

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**Read Sentence (5)**

- **Speaker error**
- **Listener error**
- **Environmental noise**

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**Infer Intention (5)**

- From the floor to the table. (Goal)

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**Did something fall to the floor?**

- "No" (literal interpretation)
- "Yes" (noise inference)

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**Environment noise**

- Speaker error
- Listener error
- Environmental noise

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**Experimental 1:**

- Active/Passive
- The ball kicked the girl.
- (2 deletions)

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**Experimental 2:**

- Transitive/Intransitive
- The CEO benefitted the tax law.
- (1 deletion)

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**Experimental 3:**

- DO/PO
- The cook baked Lucy for a cake.
- (1 insertion)

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**Experimental 4:**

- Non-categorical
- The package fell from the floor to the table.
- (4 edits?!)