



# Prosodic Focus Strengthens Semantic Persistence

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# Misinterpretations in the Garden-Path

Prosodic Focus Strengthens Semantic Persistence  
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### Misinterpretations of Garden-Path Sentences

Previous research on misinterpretation of garden-path sentences has found that readers access an incorrect interpretation despite evidence of ambiguity (1).  
*Ashton's friend had been and had not had the flu.*

- Q: Did they have the flu? (No/Yes)  
 At the same time, comprehension is accurate when asked about material outside the region of ambiguity.  
 - Q: Did he read his book? (No/Yes)  
 - Q: Did he read his book? (No/Yes)

Suggests that comprehenders are not failing to make any use of these cues; instead, misinterpretations occur by preference and systematicity.

### The Locus of Misinterpretations

Some proposed explanations:

- The initial semantic commitment made in the garden path can persist in working memory without undergoing necessary revision (2).
- The *incremental head strategy* can linger in the syntactic representation, leading to misinterpretation (3).
- Engelhardt's *hierarchy* can be activated as a compensatory "good enough" strategy when syntactic reanalysis becomes too costly (4).

More recent studies find evidence that the parser actually actively attempts to interpret the global semantic structure in real-time (5) – *likely that the misinterpretation arises from the persistence of the initial misanalysis* to account as opposed to failure to bind to the correct structure-building process.

### Research Question

Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?

- in an auditory comprehension experiment, we test on how better effects of pitch accent on semantic processing.
- In American English, a highlighting pitch accent is often associated with semantic focus and facilitates reanalysis and retrieval of referent (6).
- This interpretation of focus is sensitive to the position of the accented word in the phrase (8):  
 Do: *Ashton* *had* the flu? (no pitch accent)  
 Do: *Ashton* *had* the flu? (pitch accent)  
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 Do: *Ashton* *had* the flu? (pitch accent)
- This interpretation of focus is sensitive to the position of the accented word in the phrase (9):  
 Do: *Ashton* *had* the flu? (no pitch accent)  
 Do: *Ashton* *had* the flu? (pitch accent)  
 Do: *Ashton* *had* the flu? (pitch accent)  
 Do: *Ashton* *had* the flu? (pitch accent)

Participants were assigned to four conditions:  
 - *Ashton* *had* the flu? (no pitch accent)  
 - *Ashton* *had* the flu? (pitch accent)  
 - *Ashton* *had* the flu? (pitch accent)  
 - *Ashton* *had* the flu? (pitch accent)

Participants were assigned to four conditions:  
 - *Ashton* *had* the flu? (no pitch accent)  
 - *Ashton* *had* the flu? (pitch accent)  
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 - *Ashton* *had* the flu? (pitch accent)

Participants were assigned to four conditions:  
 - *Ashton* *had* the flu? (no pitch accent)  
 - *Ashton* *had* the flu? (pitch accent)  
 - *Ashton* *had* the flu? (pitch accent)  
 - *Ashton* *had* the flu? (pitch accent)

- Initial pitch accents produced the early and late closure effects at each sentence. Pitch accents directed the path of the parser.
- The direction of pitch accent correlated with the direction of the misinterpretation. Pitch accents directed the path of the parser.
- Disambiguating regions were critical from the initial misinterpretation. The misinterpretation was the same as the misinterpretation in the initial misparse and the 40 correct responses across the three conditions and 40 correct responses across the three conditions.

### Discussion

Evidence for semantic nature of the persistence effect:

- Longer response times in the initial trials compared to misinterpretations. More evidence that listeners were garden-pathed in both conditions as intended.
- Negative effect of pitch accent on accuracy suggests that the processing of focus semantic resulting in the garden path increased the probability of the incorrect interpretation.
- No response time differences between conditions suggests that global semantic processing is not necessarily tied to correct structure building.
- The effect of pitch accent on accuracy performance is significant after controlling for local coherence effects (fluently/less fluently items).

### Additional Implications

- Results on prosodic focus "semantic processing" as discussed by previous and semantic processing research may be more closely linked than previously thought.
- English as a second language is a non-explicit problem of accuracy might arise in an incremental semantic processing being independently in reality.

## Misinterpretations of Garden-Path Sentences

Previous research on non-lexical representations of garden-path sentences has found that readers access an interpretative depth (extent of ambiguity) [1].

Authors: [David Reber and his colleagues](#) led the way.

- Q: Did they show the task? (Yes/No)

At the same time, comprehension was accurate when asked about content words (the subject of ambiguity).

- Q: Did he read left to the floor? (Yes/No)

## The Locus of Misinterpretations

Some previous experiments:

1. The initial semantic commitment track in the garden path can persist in working memory without undergoing necessary revision [2].
2. The moment head structure can figure in the semantic representation (knowledge) adopted for the correct structure, forcing the misinterpretation [3].
3. Superficial knowledge can be activated as a compensatory "good enough" strategy when syntactic reanalysis becomes too costly [4].

More recent studies find evidence that the parser actually actively attempts to minimize the global semantic structure in working [5] - likely that the misinterpretation error from the persistence of the initial misanalysis is assessed as optimal to failure related to the correct structure-building process.

## Research Question

Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?

1. In an auditory comprehension experiment, we test on how focus effects of pitch accent on semantic processing.
2. In American English, a highlighting pitch accent is often associated with semantic focus and facilitates reanalysis and retrieval of content [6].
3. This interpretation of focus is sensitive to the position of the accented word in the phrase (stress [6]).

For garden-path sentences, the accent is more challenging as the focus is an interpretative interpretation of focus on the region of ambiguity between alternative parses.

What does this mean for the comprehension process?

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What does this mean for the comprehension process?

Q: Was the study successful? (Yes/No)

## Materials

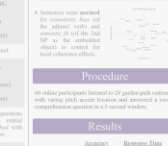
Twenty-five garden-path sentences were recorded in three different accent conditions and reworded to create twelve pitch-accented sentences to manipulate the locus for garden-path effects.

## Results

1. Initial pitch accent predicted the early and late choice accuracy of each sentence. Pitch accent showed the best fit for data.

2. The location of pitch-accent condition (1<sup>st</sup> vs. 2<sup>nd</sup>) was more influential than the strength of the focus, with early-focus condition in the center.

3. Disambiguating region was critical from the subject-accent condition and the verb-accent condition and the 10 content were interpreted across the three conditions and differentiated the three cases.



## Procedure

All online participants listened to 24 garden-path sentences with varying pitch accent locations and answered a yes/no comprehension question in a 4-second window.

Results

|           | Accuracy  | Response Time |
|-----------|-----------|---------------|
| F (1, 10) | F (1, 10) | F (1, 10)     |
| p < .001  | p < .001  | p < .001      |
| η² = .94  | η² = .94  | η² = .94      |

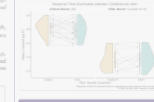
## Discussion

Evidence for semantic focus of the performance effect:

1. Longer response times in the initial trials compared to misinterpretations. This indicates that listeners were garden-pathed in both conditions as intended.
2. Negative effect of focus pitch accent on accuracy suggests that the processing of focus accent resulting in the garden path increased the accuracy of the sentence comprehension.
3. No response time differences between conditions suggest that focus semantic processing is not necessarily tied to content structure building.
4. This effect of pitch accent on accuracy performance is significant after controlling for local coherence effects (fluency) for each sentence [6].

Additional implications:

- English as a second language "semantic processing" as measured by priming and semantic processing research may be more closely linked than previously thought.
- English as a second language as a non-explicit process of semantic processing being independently in reality.



## Discussion

Evidence for semantic focus of the performance effect:

1. Longer response times in the initial trials compared to misinterpretations. This indicates that listeners were garden-pathed in both conditions as intended.
2. Negative effect of focus pitch accent on accuracy suggests that the processing of focus accent resulting in the garden path increased the accuracy of the sentence comprehension.
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Additional implications:

- English as a second language "semantic processing" as measured by priming and semantic processing research may be more closely linked than previously thought.
- English as a second language as a non-explicit process of semantic processing being independently in reality.

# Misinterpretations in the Garden-Path

As Harry chewed the brown and juicy steak fell to the floor.

# Misinterpretations in the Garden-Path

As Harry chewed the brown and juicy steak fell to the floor.

**X** Did Harry chew the steak?

Yes No

**Misinterpretations of Garden-Path Sentences**  
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**Research Question**  
Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?

**Methodology**  
1. In American English, a lightening bolt struck a tree attached with lightning rods and lightning rods and returned to the ground [1].  
2. This interpretation of focus is sensitive to the position of the second word in the phrase: lightning [2].  
3. In garden-path sentences, the second focus (highlighted in red) is an ungrammatical interpretation of focus on the region of ambiguity between disambiguating phrases: Harry chewed the brown and juicy steak fell to the floor [3].

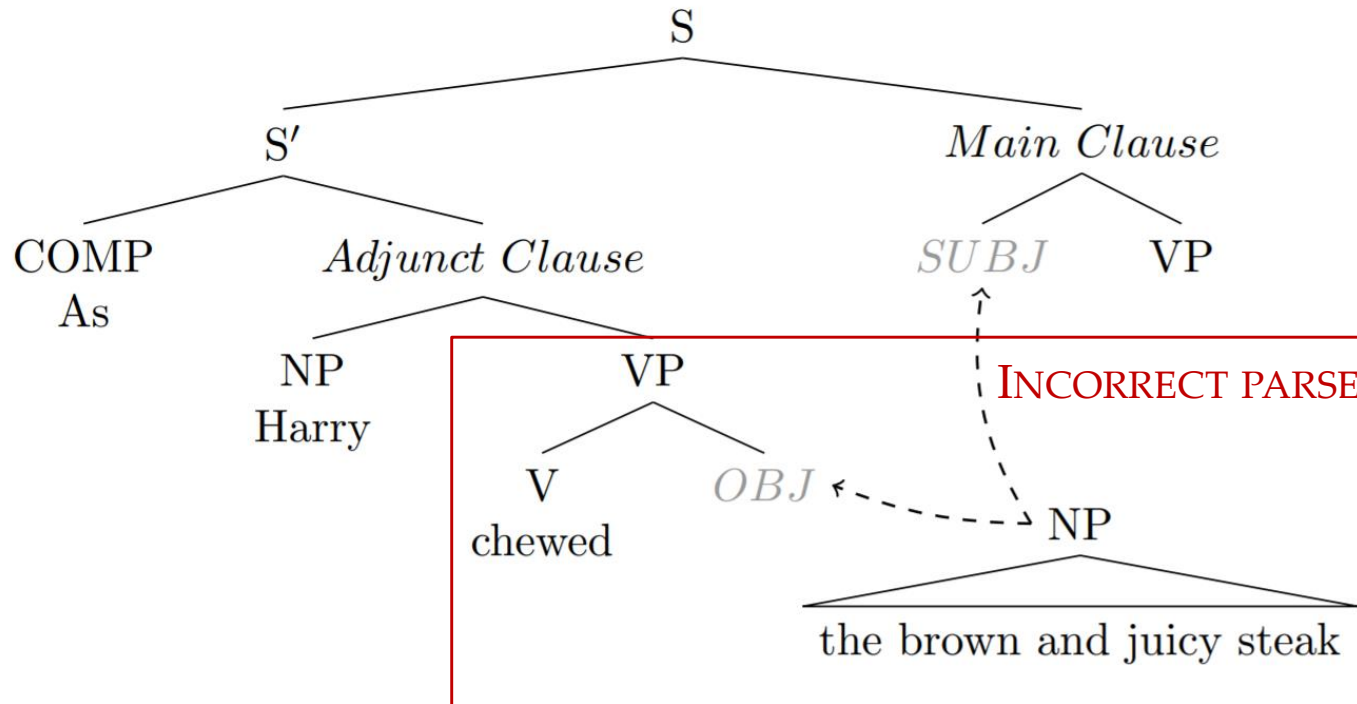
**Results**

| Condition                    | Accuracy | Response Time |
|------------------------------|----------|---------------|
| Lightning                    | 0.95     | 1.20          |
| Lightning Rods               | 0.90     | 1.30          |
| Lightning Rods and           | 0.85     | 1.40          |
| Lightning Rods and Lightning | 0.80     | 1.50          |

**Discussion**  
1. Longer response times in the initial trials compared to misinterpretations. This indicates that learners were garden-pathed in both conditions as intended.  
2. Negative effect of garden-path accuracy on accuracy suggests that the processing of focus occurred regardless of the garden-path accuracy of the sentence interpretation.  
3. No response time differences between conditions suggest that focus semantic processing is necessary but not sufficient for correct focus building.  
4. The effect of path accuracy on accuracy performance is significant after controlling for local coherence effects (fluency) but not semantic fluency.

# Misinterpretations in the Garden-Path

As Harry chewed the brown and juicy steak fell to the floor.



**Misinterpretations of Garden-Path Sentences**

Previous research on misinterpretations of garden-path sentences has found that readers use an interpretative strategy (referred to as *misinterpretation*) to resolve ambiguity (1).  
 Authors: *David Reber and Keith Stanfield*

**Research Question**

Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?  
 In an earlier comprehension experiment, we found that the location of the misparse affected the likelihood of misinterpretation.

**The Locus of Misinterpretation**

Some previous experiments:

- The initial semantic commitment made in the garden path can persist in working memory without undergoing necessary revision (2).
- The *recovery* level of attention can trigger in the correct representation (misinterpretation) accepting the correct structure, forcing the misinterpretation (3).
- Superficial knowledge can be assumed as a compensatory "good enough" strategy when syntactic knowledge becomes too costly (4).

More recent studies find evidence that the parser actually actively attempts to minimize the global semantic structure in ambiguity (5) - *finds* that the misinterpretation error (in the presence of the initial misanalysis) is assumed as optimal to facilitate re-visit to the correct structure-building process.

**Discussion**

Evidence for overall nature of the persistence effect:

- Longer response times in the initial trials compared to misinterpretation trials indicate that learners were garden-pathed in both conditions as intended.
- Negative effect of garden path across an accuracy suggests that the processing of these sentences involving the garden path increased the accuracy of the sentence interpretation.
- The response time difference between conditions suggests that global semantic processing is necessarily tied to correct structure building.
- The effect of path accuracy on accuracy performance is significant after controlling for local coherence effects (readability) and sentence length.

**Procedure**

All online participants (N=24) garden-path sentences with using path accuracy location and answered a revised comprehension question to a 4 second window.

**Results**

| Accuracy        | Response Time   |
|-----------------|-----------------|
| F(1,23) = 10.15 | F(1,23) = 10.15 |
| p < .001        | p < .001        |
| d = 0.45        | d = 0.45        |

**Materials**

Twenty-four garden-path sentences were constructed in which the misparse location and the misinterpretation were manipulated to create the garden-path effect.

# Syntactic or Semantic in Nature?

**Hypothesis:** The erroneous semantic interpretation independently lingers despite the success of syntactic reanalysis.

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**Misinterpretations of Garden-Path Sentences**  
Previous research on misinterpretation representations of garden-path sentences has found that semantic access is not a prerequisite for syntactic reanalysis [1].  
Although several researchers have argued that the brain does not reanalyze garden-path sentences, we show in this research that syntactic reanalysis is not a prerequisite for semantic access [2].

**Research Question**  
**Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?**  
Is an earlier comprehension reparse, or does not have an effect on final accept or semantic processing?

1. In American English, a highlighting pitch accent is often associated with semantic focus, and facilitates reanalysis and retrieval of referent [3].  
2. This interpretation of focus is sensitive to the position of the accented word in the prosodic phrase [3].  
3. Accents attract the EARLY (left) path account.  
4. Accents attract the LATE (right) path account.  
5. Accents attract the EARLY path account.  
6. Accents attract the LATE path account.  
7. Accents attract the EARLY path account.  
8. Accents attract the LATE path account.

**The Locus of Misinterpretation**  
1. The initial semantic commitment made in the garden path can persist in working memory without subsequent reanalysis [4].  
2. The reanalysis itself is sensitive to the position of the accented word, favoring the misinterpretation [5].  
3. Misinterpretation is sensitive to the position of the accented word, favoring the misinterpretation [5].  
4. Misinterpretation is sensitive to the position of the accented word, favoring the misinterpretation [5].  
5. Misinterpretation is sensitive to the position of the accented word, favoring the misinterpretation [5].

**Procedure**  
All online participants listened to 24 garden-path sentences, with varying pitch accent locations and attempted a second comprehension question in a second window.

**Results**  
Accuracy: Higher than chance.  
Response Time: Shorter than chance.

**Discussion**  
1. Longer response times in the initial window compared to reanalysis. This indicates that semantic access is not a prerequisite for syntactic reanalysis.  
2. Negative effect of pitch accent on accuracy suggests that the processing of focus accent is not a prerequisite for semantic access.  
3. The response time differences between conditions suggest that semantic processing is not a prerequisite for syntactic reanalysis.  
4. The effect of pitch accent on accuracy is not significant after controlling for local coherence effects (fluency) and semantic focus.

# Syntactic or Semantic in Nature?

**Hypothesis:** The erroneous semantic interpretation *independently lingers* despite the success of *syntactic* reanalysis.

To disentangle the two, we draw on a well-known relationship between *pitch accent* and *semantic processing*:

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**Misinterpretations of Garden-Path Sentences**  
Previous research on garden-path sentences has found that semantic access is independent of syntactic reanalysis (Ferreol, 2017).  
However, several researchers have argued that the two are related (Ferreol, 2017).

**Research Question**  
Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?  
Is an auditory comprehension experiment, or does it only become effective if pitch accent or semantic processing is manipulated?

**The Locus of Misinterpretations**

**Materials**

**Procedure**

**Results**

**Discussion**

**Additional Information**

**References**

# Syntactic or Semantic in Nature?

**Hypothesis:** The erroneous semantic interpretation *independently lingers* despite the success of *syntactic* reanalysis.

To disentangle the two, we draw on a well-known relationship between *pitch accent* and *semantic processing*:

A rising pitch accent (H\*) is a strong cue for FOCUS in phrase-medial positions but not so much in phrase-final positions.

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**Misinterpretations of Garden-Path Sentences**  
Previous research on garden-path sentences has found that semantic access is interrupted by syntactic reanalysis (Ferreol & McClelland, 2017). However, it is unclear how semantic persistence is affected by the focus of the sentence.

**Research Question**  
Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?  
Is an auditory comprehension advantage, or does it only become evident if pitch accent or semantic processing is manipulated?

**The Locus of Misinterpretation**  
1. The initial semantic commitment made in the garden path can persist in working memory without subsequent reanalysis (Ferreol & McClelland, 2017).  
2. The attentional load advantage can trigger the semantic representation (Kern, 2019) associated with the correct analysis, leading to misinterpretation (Ferreol & McClelland, 2017).  
3. Syntactic reanalysis can be triggered by a pitch accent (Ferreol & McClelland, 2017) or a semantic processing advantage (Ferreol & McClelland, 2017).

**Materials**  
Twenty-four garden-path sentences were recorded in which the focus of the sentence was manipulated to occur in phrase-medial or phrase-final positions.

**Procedure**  
All online participants listened to 24 garden-path sentences with rising pitch accents located at the end of a phrase, in the middle of a phrase, or at the beginning of a phrase. Participants were asked to select the best interpretation of the sentence.

**Results**  
Accuracy: Higher than chance  
Reaction time: Faster for phrase-medial focus

**Discussion**  
Larger response times in the initial misparse suggest that semantic processing is interrupted by syntactic reanalysis. However, faster response times in the final misparse suggest that the processing of focus occurred despite the syntactic reanalysis.



# Syntactic or Semantic in Nature?

**Hypothesis:** The erroneous semantic interpretation *independently lingers* despite the success of *syntactic* reanalysis.

To disentangle the two, we draw on a well-known relationship between *pitch accent* and *semantic processing*:

A rising pitch accent (H\*) is a strong cue for FOCUS in phrase-medial positions but not so much in phrase-final positions.

If prosodic focus facilitates deeper semantic processing in the incorrect local parse, we should observe a stronger lingering effect.

The thumbnail shows a research paper with the following sections:

- Misinterpretations of Garden-Path Sentences:** Discusses how pitch accent affects semantic processing in garden-path sentences.
- Research Question:** "Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?"
- The Locus of Misinterpretation:** Explores whether misinterpretations occur at the syntactic or semantic level.
- Procedure:** Describes the experimental design with 24 participants.
- Results:** Includes a table showing accuracy and response times for different conditions.
- Discussion:** Concludes that semantic processing is more persistent than syntactic processing.

| Condition | Accuracy | Response Time (ms) |
|-----------|----------|--------------------|
| Control   | 0.95     | 1200               |
| Local     | 0.85     | 1500               |
| Global    | 0.90     | 1400               |

# Auditory Comprehension Experiment

**Design:** Manipulate location of pitch accent to induce an asymmetrical interpretation of FOCUS between local parses.

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**Misinterpretations of Garden-Path Sentences**

Previous research on garden-path representations of path-path sentences has found that sentence focus is an important factor in the interpretation of ambiguity [1].

Interpretations of the focus and focus shift in the focus.

~ Q: Did they bark at the cat? (No/Yes)  
In the same time, comprehensions are accurate when initial alternative parses are ambiguous at all points.

~ Q: Did they bark at the dog? (No/Yes)  
Beginners find comprehensions are not being to make any sense out of these sentences initially - misinterpretations occur in the beginning and eventually.

**The Locus of Misinterpretation**

- The initial semantic commitment made in the garden path can persist in working memory without subsequent re-evaluation [2].
- The incorrect final structure can trigger the semantic representation/interpretation associated with the correct structure, leading to misinterpretation [3].
- Redundant information can be retained as a complementary "good enough" strategy when syntactic reanalysis becomes necessary [4].

More recent studies that evidence that the parser actually stores multiple or alternative semantic representations in memory [5] -> imply that the comprehension error comes from the persistence of the initial misinterpretation in memory as opposed to failure related to the semantic structure-building process.

**Research Question**

**Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial parse?**

**Is an auditory comprehension experiment, we show the influence of pitch accent on semantic processing?**

- In American English, a high-pitch pitch accent is often associated with semantic focus, and facilitates encoding and retrieval of relevant [7].
- This interpretation of focus is sensitive to the position of the accented word in the prosodic phrase [8].  
E: Anna stressed the BAIT.  
F: Anna stressed the BAIT. (high pitch accent)  
G: Anna stressed the BAIT. (intentional focus)

In garden-path sentences, the location of the accented word influences an asymmetrical interpretation of focus over the region of ambiguity between alternative parses.

**While Anna stressed the bait, several people...**  
While Anna stressed the bait,  
While Anna stressed the bait,  
While Anna stressed the bait,  
While Anna stressed the bait,  
While Anna stressed the bait,  
While Anna stressed the bait,

This yields better accuracy on comprehension questions in the **verb-accent condition**, where the initial misinterpretation in the first parse step is overlaid with focus-accent meaning that later supports re-eval.

~ Q: Was the bait stressed? (Yes/No)

**Materials**

Twenty-five garden-path sentences were recorded in subject-to-subject conditions and reorganized to equal prosodic pitch-accent cues (ambiguity or focus) for the path-path effect.

- Initial pitch accent produced the early and late focus accents in each sentence: While Anna stressed the bait, the dog...
- The location of prosodic boundaries (17 total, 27% were used) varied the strength of the focus accents, with early focus occurring in the center.
- Disambiguating regions were added from the subject-accent recordings and the verb-accent recordings and the 40 sentences were reorganized across the classic boundaries and distributions of the main clause.

**Discussion**

Evidence for semantic focus in the initial which component in misinterpretation. When initial and later focus were placed in both conditions an increase in accuracy was observed.

Negative effect of prosodic pitch accent on accuracy suggests that the processing of focus accents resulting in the garden path increased the accuracy of the sentence interpretation.

No response time differences between conditions suggest that semantic processing is not necessarily tied to sentence structure building.

The effect of pitch-accent on semantic processing is significant after controlling for local coherence effects (boundary bias and semantic fit).

**Additional Implications**

- English as a second language "semantic processing" as measured by prosodic and semantic processing strength may be more closely linked than previously thought.
- English as a second language is a non-explicit problem of semantic strength used in an incremental semantic processing using independently in natural contexts.

**Procedure**

All online participants listened to 25 garden-path sentences with varying pitch accent location and answered a seven-comprehension question in a 4 second window.

**Results**

|             | Accuracy  | Response Time                                   |
|-------------|---|---|
|             | F 100 % F 100 % F                               |   |
| Path-Accent | 0.71 (0.05) 0.85 (0.03) 0.81 (0.04) 0.75 (0.04) | 1.88 (0.02) 1.86 (0.02) 1.87 (0.02) 1.86 (0.02) |
| Verb-Accent | 0.71 (0.05) 0.85 (0.03) 0.81 (0.04) 0.75 (0.04) | 1.88 (0.02) 1.86 (0.02) 1.87 (0.02) 1.86 (0.02) |

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# Auditory Comprehension Experiment

**Design:** Manipulate location of pitch accent to induce an asymmetrical interpretation of FOCUS between local parses.

While Anna dressed the baby stopped crying.

**Prosodic Focus Strengthens Semantic Persistence**  
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**Misinterpretations of Garden-Path Sentences**  
Previous research on garden-path sentences has found that readers access an interpretation despite retention of disambiguation [1].  
Interpretations of the sentence below are influenced by the focus.

**Research Question**  
**Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial parse?**  
Is an auditory comprehension experiment, we show an asymmetrical effect of pitch accent on semantic processing.

**The Locus of Misinterpretation**

**Procedure**

**Results**

**Discussion**

# Auditory Comprehension Experiment

**Design:** Manipulate location of pitch accent to induce an asymmetrical interpretation of FOCUS between local parses.

While Anna dressed the baby stopped crying.

## VERB ACCENT CONDITION:

While Anna *DRESSED* the baby stopped crying.

- While Anna [dressed]<sub>FOCUS</sub> the baby, ... (late closure) ✗
- While Anna dressed, the baby ... (early closure)

**Prosodic Focus Strengthens Semantic Persistence**  
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 Department of Linguistics, Northumbria University

**Misinterpretations of Garden-Path Sentences**  
 Previous research on garden-path sentences has found that sentence accent is an important factor in determining the interpretation of ambiguous sentences (1).  
 Accents affect the focus and focus shift in the discourse.  
 - Q: Did they close the window? (Yes/No)  
 - Q: Did they close the window? (No/Yes)  
 - Q: Did they close the window? (No/No)

**Research Question**  
 Is the likelihood of misinterpretation affected by the depth of semantic processing in the initial misparse?  
 Is an auditory comprehension experiment, we show an asymmetrical effect of pitch accent on semantic processing.

**The Locus of Misinterpretation**  
 The initial semantic commitment made in the garden path can persist in working memory without subsequent reanalysis (2).  
 The incorrect local structure can trigger the semantic representation (3).  
 Misinterpretation can be induced as a consequence of 'good enough' parsing when syntactic reanalysis is not required (4).  
 More recent studies that indicate that the parser actually revises its structure (5).  
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 The misinterpretation can be induced as a consequence of 'good enough' parsing when syntactic reanalysis is not required (4).  
 More recent studies that indicate that the parser actually revises its structure (5).

**Materials**  
 Twenty-four garden-path sentences were recorded in subject-verb conditions and reworded to equal overall pitch contour. Auditory cues manipulate the pitch-path effect.

**Procedure**  
 All online participants listened to 24 garden-path sentences with rising pitch accent location and answered a yes/no comprehension question in a 4 second window.

**Results**  
 Accuracy: Human, 100%; Machine, 100%.  
 F(1, 1) = 0.00, p = 1.00, d = 0.00.  
 F(1, 1) = 0.00, p = 1.00, d = 0.00.  
 F(1, 1) = 0.00, p = 1.00, d = 0.00.  
 F(1, 1) = 0.00, p = 1.00, d = 0.00.

**Discussion**  
 Evidence for semantic focus of the persistence effect.  
 Longer response times in the initial trials compared to misinterpretations. This indicates that longer response times in both conditions are needed.  
 Negative effect of pitch accent on accuracy suggests that the processing of focus accent is required for the garden path to be resolved.  
 No response time differences between conditions suggest that focus accent processing is necessary for correct structure building.  
 The effect of pitch accent on accuracy performance is significant after controlling for local coherence effects (6).  
 Additional implications:  
 - English is predominantly "semantic processing" as opposed to primarily "syntax processing" (7).  
 - English is "social" language as a non-representational production of meaning might lead to an incremental semantic processing being independently necessary.

# Auditory Comprehension Experiment

**Design:** Manipulate location of pitch accent to induce an asymmetrical interpretation of FOCUS between local parses.

While Anna dressed the baby stopped crying.

## SUBJECT ACCENT Condition:

While ANNA dressed the baby stopped crying.

- While [Anna]<sub>FOCUS</sub> dressed the baby, ... (late closure) ✘
- While [Anna]<sub>FOCUS</sub> dressed, the baby ... (early closure)

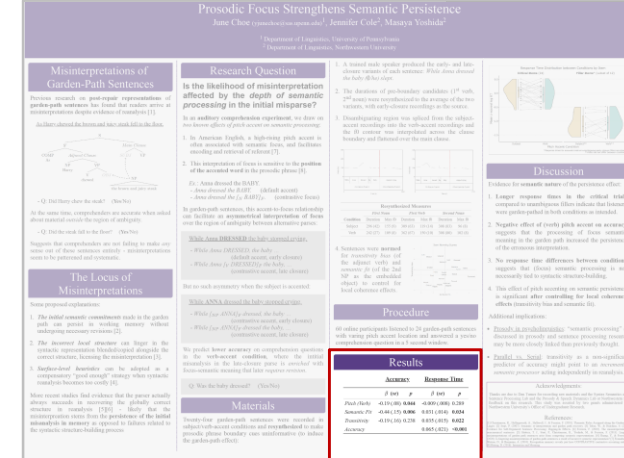
The collage features several research papers. The central paper, 'Misinterpretations of Garden-Path Sentences', discusses how pitch accents affect the interpretation of ambiguous sentences like 'While Anna dressed the baby stopped crying'. It details the experimental design, which manipulates the location of the pitch accent to induce different focus structures. Other papers in the collage explore related topics such as the locus of misinterpretation, the effects of pitch accents on semantic processing, and the results of the experiment, showing that late closure is more likely when the pitch accent is on the subject.



# Results

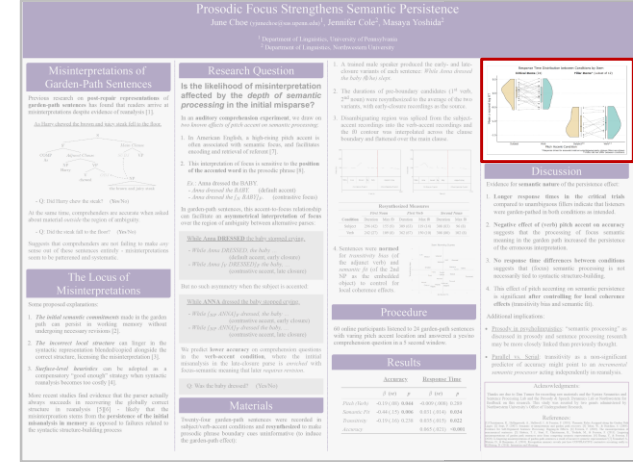
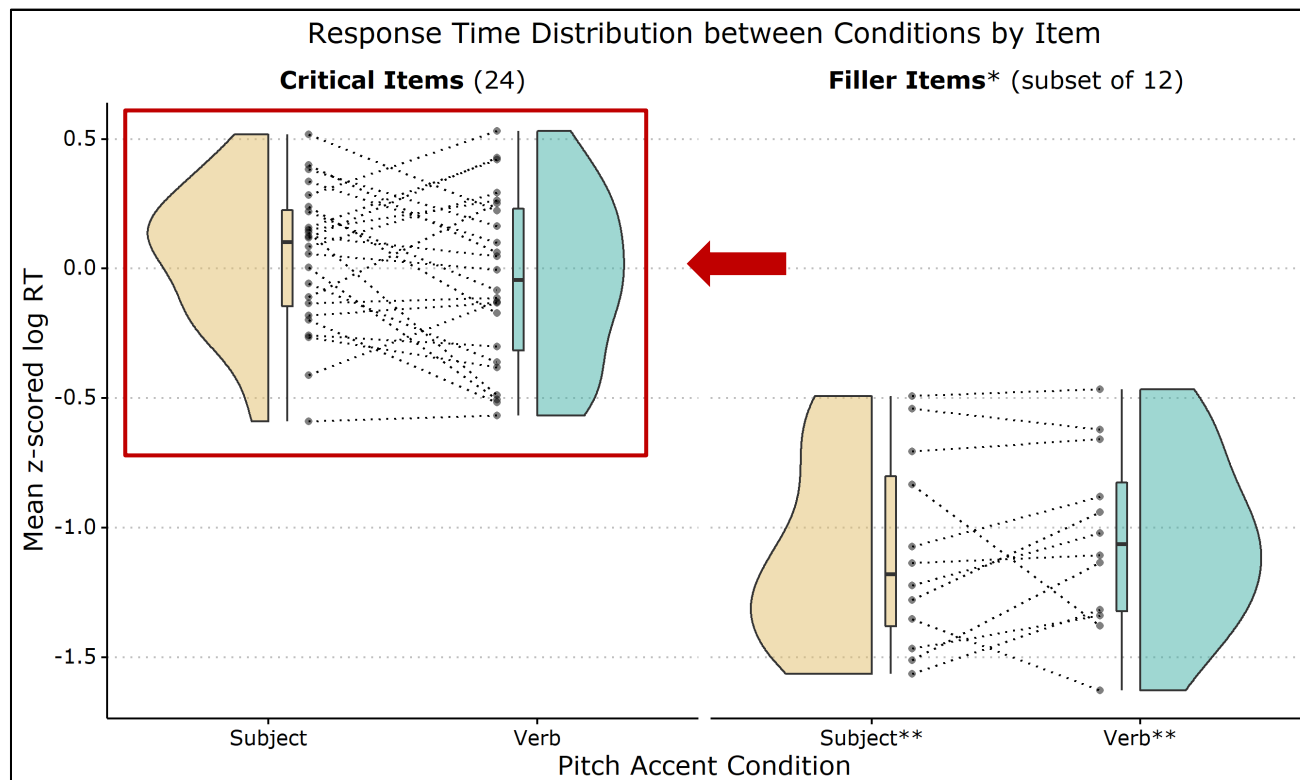
## 1. Significant negative effect of VERB ACCENT on accuracy:

|              | Estimate (SE) | $\chi^2$ | p            |
|--------------|---------------|----------|--------------|
| Pitch (Verb) | -0.19 (0.08)  | 6.23     | <b>0.044</b> |
| Semantic Fit | -0.44 (0.15)  | 7.45     | <b>0.006</b> |
| Transitivity | -0.19 (0.16)  | 1.39     | 0.238        |



# Results

## 2. No differences in response time between accent conditions:





# Conclusion

## Evidence for the semantic nature of the lingering effect & a model of an independent semantic processor

- ❖ Initial semantic commitments may fail to be revised, especially when it contains focused information.
- ❖ But syntactic reanalysis always succeeds, and the parser never builds an ungrammatical structure

... and more to discuss!

