INTRODUCTION
Sentence formulation (e.g., production of descriptions like *The horse is kicking the cow*) unfolds incrementally.

But what controls the timecourse of formulation?

**Radical incrementality** (Gleitman et al., 2007):
- formulation starts with encoding of one character (*horse*).
- speakers add information about the action (*kick*) and the second character (*cow*) only after encoding the sentence subject (*horse*).

**Broad-scope planning** (Griffin & Bock, 2000):
- formulation starts with encoding of information about the whole event (relational information: *X kicking Y*).
- the first increment of the sentence includes information about the first character (*horse*) and the main action (*kick*) of the event.

HYPOTHESES
Can we predict the timecourse of sentence formulation from the speed of retrieving NOUNS (*horse*) and VERBS (*kick*)?

**Radical incrementality** predicts that formulation will be sensitive to the ease of encoding the first character (the agent in active sentences: *horse*).

**Broad-scope planning** predicts that formulation will be sensitive to the ease of encoding the first character (the agent: *horse*) as well as the verb (*kick*).

METHOD
Participants
22 eye-tracked native speakers of Dutch.

Tasks
1. **Sentence production:**
   - 33 target pictures of transitive, two-character events eliciting active sentences, embedded in a list of 66 filler pictures
   - modal description: *Het paard schopt de koe.*
   - [The horse is kicking the cow.]

2. **Object and action naming:**
   - 30 target object pictures and 33 target action pictures, embedded in a list of 106 filler object pictures and a list of 70 filler action pictures

RESULTS
1. **Do action and object naming latencies (RTs) predict sentence onsets?**
   - Pearson’s *r* correlations:
     - sentence onsets & action naming, *r* = .55 *
     - sentence onsets & object1 (agent) naming, *r* = .28
   - Hierarchical multiple regression analyses:

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Beta</th>
<th>p</th>
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<tbody>
<tr>
<td>Object1 (agent) naming RT</td>
<td>.00</td>
<td>.99</td>
</tr>
<tr>
<td>Action naming RT</td>
<td>.55</td>
<td>.02</td>
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<tr>
<td>R² change with Obj. naming removed</td>
<td>.00</td>
<td>.99</td>
</tr>
<tr>
<td>R² change with Act. naming removed</td>
<td>.30</td>
<td>.03</td>
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   * entering Object2 (patient) naming latencies into the model does not change model fit

2. **Do action and object naming latencies (RTs) predict the timecourse of sentence formulation?**

   Results of by-participant quasi-logistic regressions performed on agent-directed fixations (0-400 ms, 400-1600 ms):

   - No interaction between Time and Object naming speed

CONCLUSIONS
- **Action naming speed, but not object naming speed, predicted sentence onsets.**
- **Action naming speed, but not object naming speed, predicted the timing of gaze shifts from one character to another before speech onset.**

The results suggest that the timecourse of sentence formulation is strongly influenced by processes responsible for encoding relational information, rather than only information about individual characters. Modulation of the formulation process by encoding of relational information is consistent with broad-scope planning.