Can viewpoint and gesture prime spatiotemporal metaphor use?: The function of gestural metaphor iconicity in resolving linguistic ambiguity

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Metaphorical relationship between space and time
- Ego-based perspective (we’re approaching the deadline)
- Time-based perspective (the deadline is approaching)

Conceptual metaphors are grounded in physical experience

The now-famous ambiguous question

Next Wednesday’s meeting has been moved forward two days. What day is the meeting on now?

**Friday: Ego-based**
- Being on a plane
- Reading the sentence “The road goes all the way to NY”
- (Thinking about) moving across a room

**Monday: Time-based**
- Waiting for a plane
- Reading the sentence “The road comes all the way from NY”
- (Thinking about) moving an object toward you
Metaphoric gestures
- Complement to speech content
- Ambiguous speech can be resolved by gestural content

Are gestures similar to other motion stimuli?
- Within the conversational setting
- Listeners rarely consciously attend to gesture
- Not all gestures are not iconic (in the narrow sense)

How does viewpoint affect mental representation?
- Most conversations are face-to-face
- How do listeners interpret gestural motions?
  - Maintain own viewpoint, or
  - Take their interlocutor’s viewpoint

Two questions:
- Does gesture influence spatiotemporal metaphor use?
- Do listeners simulate experience from their interlocutor’s viewpoint?
Study Design

- 120 participants in Baltimore, MD (M=51; F=69)
- Elicited answer to the ambiguous test question
  Next Wednesday’s meeting has been moved forward two days. What day is the meeting on now?
  - Gesture away from speaker: Friday
  - Gesture towards speaker: Monday
  - No gesture (control): more Fridays

- Current physical experience
  - Half in motion condition (e.g., on campus shuttle)
  - Half in stationary condition (seated in offices)

- Conversational viewpoint
  - Half in shared viewpoint (side by side)
  - Half in opposing viewpoint (face to face)
Results

- Helmert-coded multiple logistic regression
- No significant effect of motion condition

Motion condition

<table>
<thead>
<tr>
<th>Motion condition</th>
<th>Monday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stationary</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Moving</td>
<td>40</td>
<td>20</td>
</tr>
</tbody>
</table>

#Responses
Results

- Helmert-coded multiple logistic regression
- No significant effect of viewpoint condition

![Viewpoint condition chart](chart.png)
Results

- Helmert-coded multiple logistic regression
- “Towards” gesture more likely to elicit Monday
  - less likely to elicit Friday, odds ratio = -1.61
- Gesture sig. improved fit of model ($p = 0.01$) due to gesture direction and presence/absence
  - No gesture more likely to elicit Friday, odds ratio = 1.32
- Overall prediction accuracy 77.5%
Discussion

- Current physical experience
  - Doesn’t effect spatiotemporal metaphor use (when not actively attended to)

- Listener viewpoint or speaker viewpoint?
  - Maintained same viewpoint in both conditions
  - Monday responses in “towards” condition
    - Time motion metaphor from speaker’s viewpoint
    - Simulating speaker’s experience

- What about the “away” gesture?
  - Resembles common pragmatic gesture

- What does this tell us about the effect of gesture?
Conclusion

- Listeners maintain their interlocutor’s viewpoint
  - Mentally simulating speaker’s experience

- Gestures...
  - are a semantically meaningful part of the conversation
  - can influence metaphor use
    - Motion in conversational space can influence experiential simulation

Friday: Ego-based
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Monday: Time-based
- Waiting for a plane
- Reading the sentence “The road comes all the way from NY”
- (Thinking about) moving an object toward you
- Seeing a gesture towards the speaker
Future Directions

- Follow-up on the “away” gesture
- Conflicting metaphors in speech and gesture
- Cross-metaphor and cross-linguistic studies
  - Other spatial metaphors in speech and gesture
  - Other languages with different gestural styles
    - Restricted to English discourse, or a broader cognitive phenomenon?
Thank you!

- **References**


- **Acknowledgements**: Berkeley Gesture Group, EMCL 2012 Gesture Group, and the participants of the 2013 Stanford-Berkeley Talks