

Degrees of metaphoricity: a quantitative gesture analysis

Greg Woodin, English Language & Linguistics, University of Birmingham

1. Introduction

English speakers commonly talk about **emotional valence** in terms of **vertical space**.

Proponents of **Conceptual Metaphor Theory** (e.g., Lakoff & Johnson, 1980) argue that these **linguistic metaphors** reflect a **conceptual association** between emotional valence and vertical space.

This **space-valence** association has been demonstrated **experimentally** (e.g., Meier & Robinson, 2004).

By looking at a speaker's gestures, we can determine whether a speaker is **'thinking metaphorically'** (e.g., Müller, 2008).

If a speaker gestures **upwards** when saying that they are 'on a **high**', this would be classed as a **metaphoric gesture** (e.g., McNeill, 1992).

Hostetter and Alibali's (2008) **Gesture as Simulated Action (GSA)** framework argues that gestures are the outward manifestations of **mentally simulated actions**.

Thus, metaphoric gestures may result from **mental simulation** of a linguistic metaphor's **source domain** (e.g., vertical space).

The GSA framework predicts that the more **actively** this source domain is **simulated**, the more likely that the speaker will **gesture**.

The **form** of the resultant gesture should reflect the **form** of the speaker's mental simulation.

Based on this, I suggest **three criteria** for determining the **degree** to which a metaphor is being actively simulated:

- Gesture co-occurrence:** whether or not speakers gesture at all when using the linguistic metaphor.
- Gestural fit:** whether or not speakers produce gestures that reflect the meaning of the linguistic metaphor.
- Gestural effort:** how effortful speakers' gestures are (e.g., gesturing with two hands tends to involve more effort than gesturing with one hand).

top form
high bar

low point
rock bottom

vertical
space

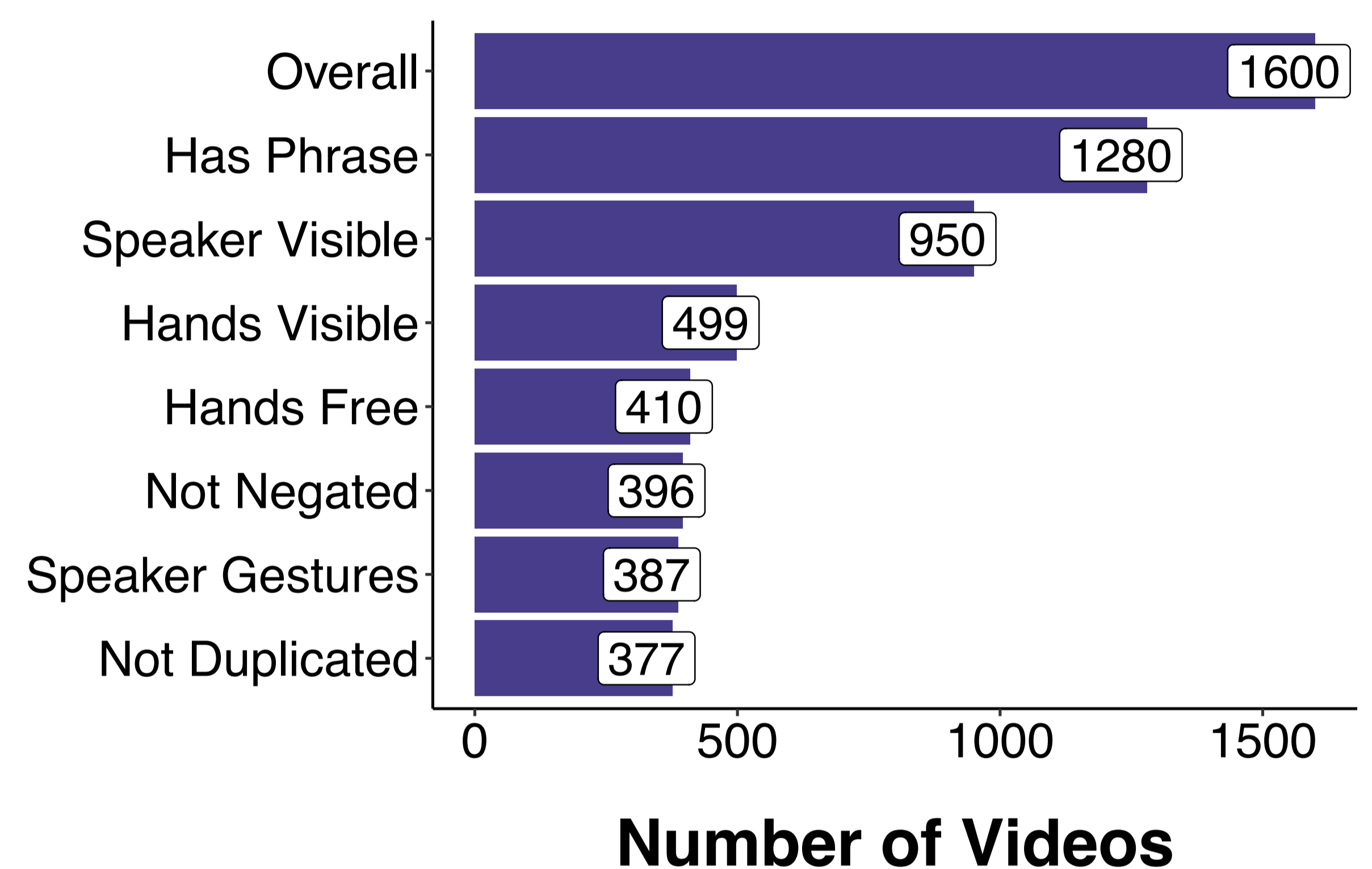
raise the
standards

2. Methodology

I investigate how speakers gesture when they use the linguistic metaphors **'low standard'**, **'high standard'**, **'lower the standard'** and **'raise the standard'**.

I do this using the **TV News Archive**, an **online, open-access** database of over **1.7 million** English news broadcasts.

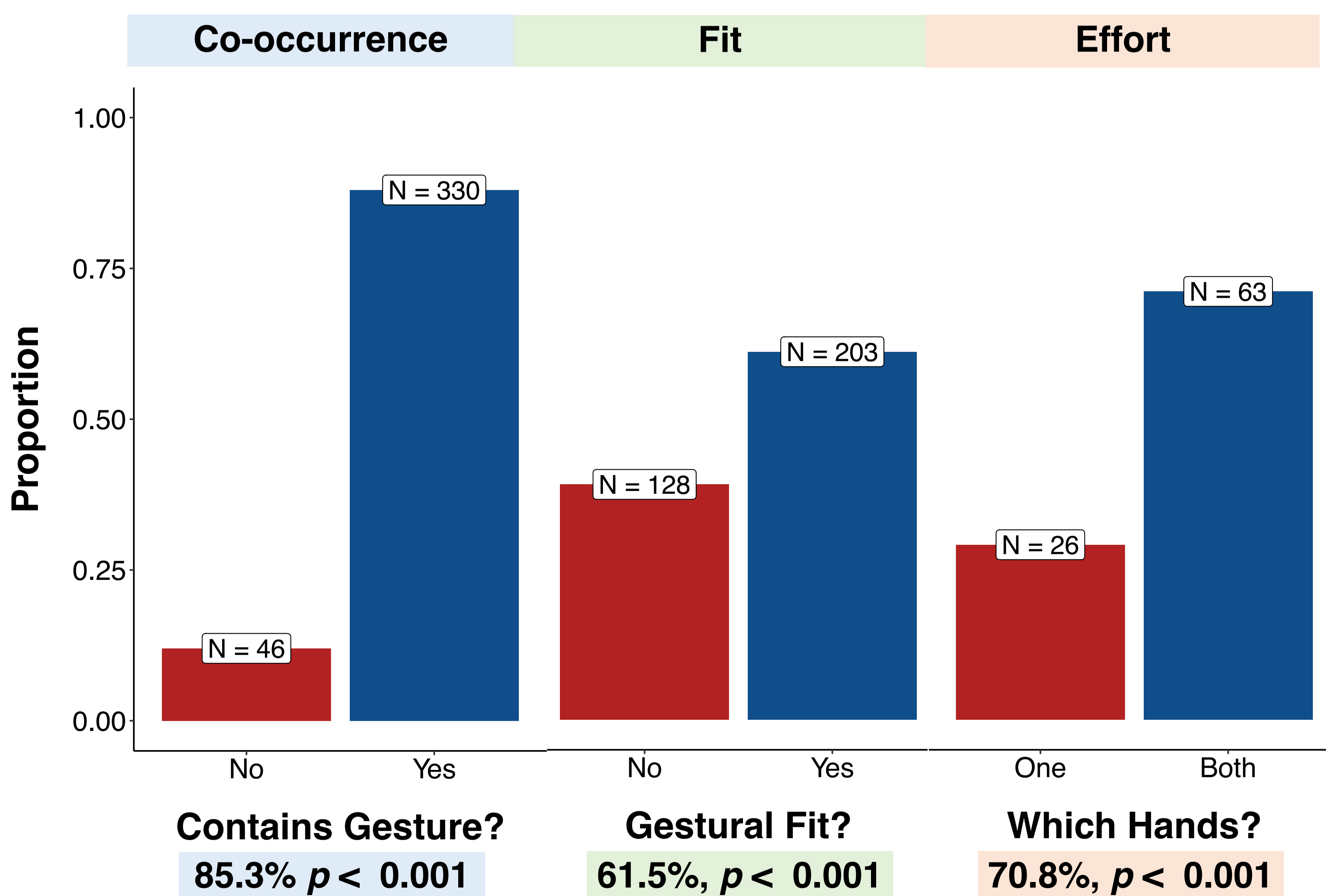
400 videos per phrase (**1600** in total). Dataset reduced to **377 videos** with **257 unique speakers** once all inclusion criteria are applied.



Videos manually coded for (1) **gesture co-occurrence** (gesture vs. no gesture), (2) **gestural fit** (fit vs. no fit) and (3) **gestural effort** (of those gestures that fit: one hand vs. two hands).



3. Results



1. High rates of gesture co-occurrence, gestural fit and gestural effort. Striking result considering that the GSA framework does predict that abstract concepts will be linked to simulated action unless **grounded** metaphorically in **real-world** attributes such as vertical space.

2. Speakers more likely to gesture when using the verbs as opposed to the adjectives. Perhaps because the verbs 'lower' and 'raise' explicitly encode vertical movement (**motor** information), whereas the adjectives 'low' and 'high' only specify vertical position (**visuospatial** information).

3. Results build upon experimental evidence for space-valence associations. By looking at gestures produced **'in the wild'**, this study extends the **ecological validity** of such research.

4. Criteria provide a novel way of quantifying metaphoricity across many different speakers and contexts. Using a large corpus constructed using the TV News Archive, I have shown that gesture is a **lens** through which we can observe **trends** in the way the human **mind** works.

Hostetter, A. B. & Alibali, M. W. (2008). Visible embodiment: gestures as simulated action. *Psychonomic Bulletin & Review*, 15(3): 495-514.

Lakoff, G. & Johnson, M. (1980). *Metaphors We Live By*. London: Chicago University Press.

McNeill, D. (1992). *Hand and Mind: What Gestures Reveal about Thought*. Chicago: University of Chicago Press.

Meier, B. P. & Robinson, M. D. (2004). Why the sunny side is up: associations between affect and vertical position. *Psychological Science*, 15(4): 243-7.

Müller, C. (2008). *Metaphors Dead and Alive, Sleeping and Waking: A Dynamic View*. London: University of Chicago Press.

osf.io/3mpc7/
gregwoodin.co.uk
gawoodin@gmail.com
[@greg_woodin](https://twitter.com/greg_woodin)