Meaning (Mis-)Match in the Directionality of German Particle Verbs

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1. Motivation

Spatial Meaning of German Particle Verbs

- **German particle verbs** (PVs): highly productive compositions of particle prefixes and base verbs (BVs)

  schieben ('push something') ▷ **an** + schieben ('push something forward')
  ▷ **auf** + schieben ('postpone')
  ▷ **nach** + schieben ('continue pushing')

- Focus: investigate the **spatial meaning** of particles:
  - AN: horizontal directionality (↔)
  - AUF: vertical directionality (↕)
- PVs often trigger (regular) **meaning shifts** with respect to their BVs

Hypothesis

- **Match** between particle direction (*an* ↔) and base verb direction (*schieben* →): **literal PV meaning** ('push something forward')
- **Mismatch** between particle direction (*auf* ↕) and base verb direction (*schieben* →): **meaning shift** ('postpone')

Prediction

Mismatches may be reflected in **longer reaction times** (inhibition process) during language comprehension

2. Item Generation

Classification of Base Verbs

- **Human annotators** (15 per BV) selected one or more directions that best represent the meaning(s) described by the BV

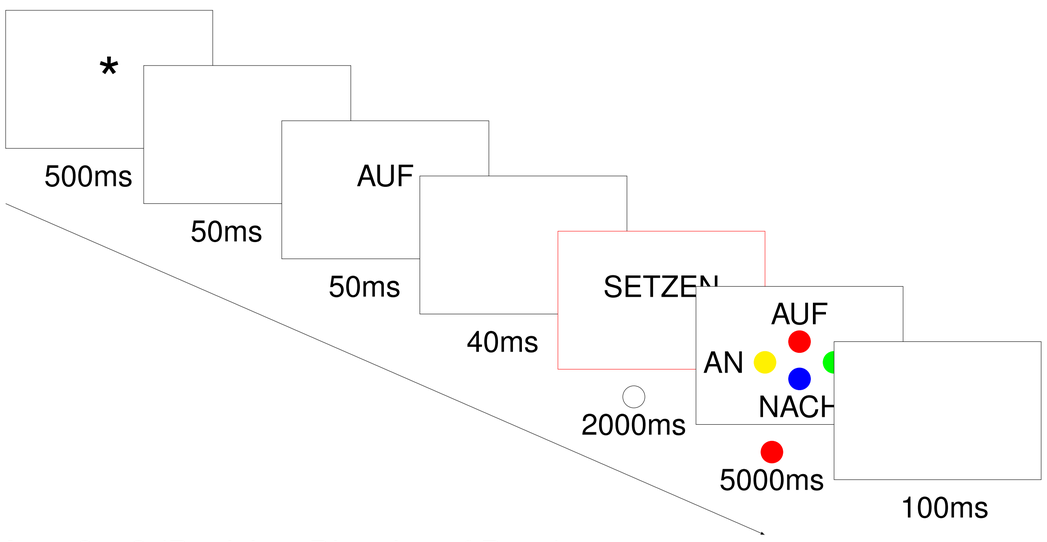
	⇑	⇓	⇐	⇒
schieben				✓
setzen		✓		

Selection of Experimental Items

- **22 German BVs** with a strongly preferred direction
  - 11 with **horizontal** preference (e.g., *schieben*)
  - 11 with **vertical** preference (e.g., *setzen* 'put')

3. Experimental Design: Go/No-Go Priming Study

- Task: **go/no-go lexical decision** (press a button if the target is a word)
  - Prime: particle (*an*, *auf*, other)
  - Target: base verb



- **Design: 2 x 2** (Particle x Direction of Base)

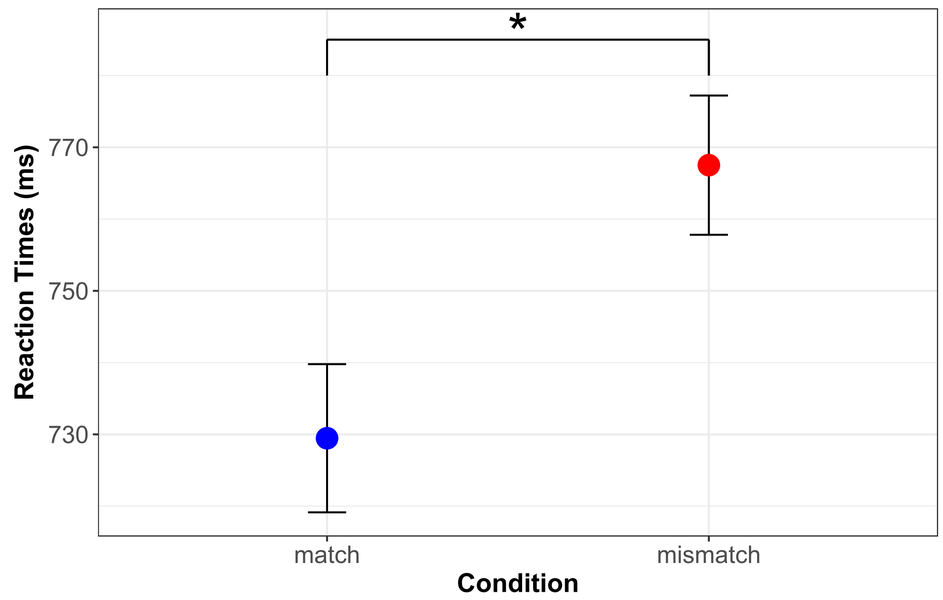
	Horizontal	**Vertical**
an	**MATCH**	**MISMATCH**
auf	**MISMATCH**	**MATCH**

- **Items (22 targets, 78% fillers):** words/non-words controlled for **frequency** and **distributional semantic similarity**
- **Participants: 66** (12 females, 23yo ± 3)

4. Analysis

Regression Model

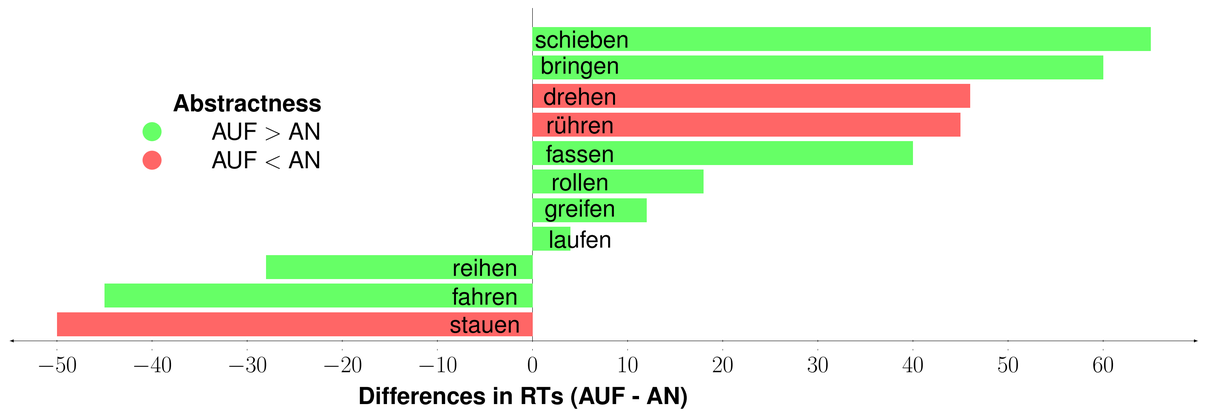
logRT ∼ **Condition +**
Frequency + Semantic Similarity
(1 + Condition | Subject) + (1 + Condition | Item)



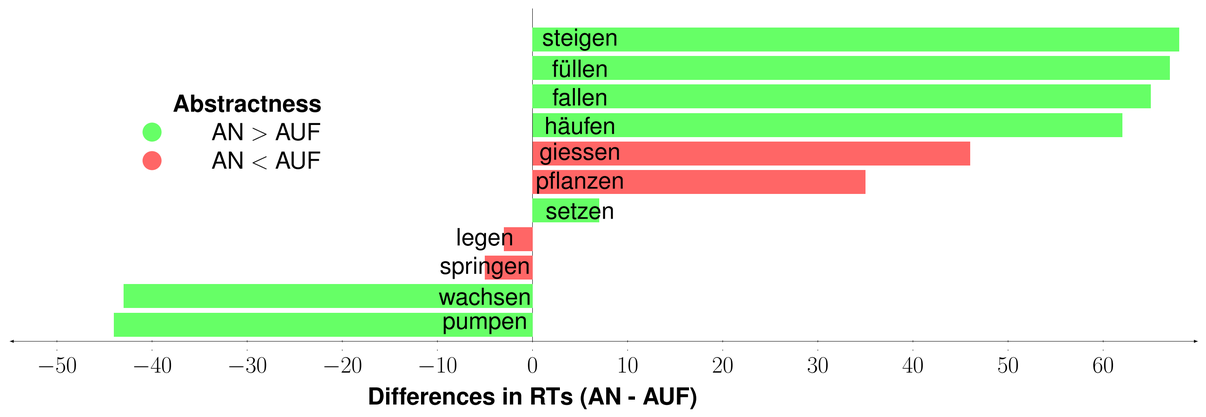
Matching condition (*an* ↔ + *schieben* →) processed **significantly faster** (β_{mismatch} = 0.05, p < 0.001) than **mismatching** condition (*auf* ↕ + *schieben* →)

5. Qualitative Analysis by Item

Horizontal Base Verbs



Vertical Base Verbs



6. Discussion

Finding

- **Mismatch** in the directionality of particles and base verbs results in longer processing time (**inhibition process**) with respect to the **matching** condition (**facilitation process**)

Conclusions

MATCH literal	**MISMATCH** meaning-shifted
AN+SCHIEBEN 'push something forward'	AUF+SCHIEBEN 'postpone'
AUF+SETZEN 'put on'	AN+SETZEN 'begin'

- The particles *an* and *auf* show a **predominant direction**
- Typically, the inhibition effect can be attributed to **meaning-shifted senses** of PVs