

# Embodied Language Comprehension and Sentence Mood

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# *Representing Described Situations*

Representation of described situation → tokens standing for the entities that make up the described situations → Representation of non-linguistic entities

- How are representations of described situations related to representations that are constructed during perception and interaction with the world?

*A girl cut her finger when slicing lemons*

## *Two Possibilities*

**One** → Representations of described situations are of a **different** kind than representations that are constructed during direct experience  
→ **Traditional View**

**Two** → Representations of described situations and representations constructed in action and perception are build in the **same** mental subsystems  
→ **Embodied View**

# *Embodied View of Language Comprehension*

**Embodied view** (aka Simulation view aka Modal view)

Language comprehension involves embodied mental representations that are grounded in perception and action

→ Understanding a sentence/text through a **mentally simulation** of experiencing the described situation

Kurt Vonnegut (1969): “*to turn print into exciting situations in their skulls*”

e.g., comprehending the sentence about the girl who cut her finger by mentally simulating the perception of the described situation

# Embodied View: Empirical Evidence

## Neuroscientific studies

González et al. (2006): Reading odor-related words (e.g., *cinnamon*) evokes activation in the olfactory cortex

Hauk et al. (2004): Reading action verbs (e.g., *kick*) activates areas in motor cortex that overlap with the areas that are activated when actually doing the actions

## Behavioural studies

Interaction of described and to be performed actions

e.g., Zwaan & Taylor (2006): Processing sentences describing a clockwise manual rotation, e.g., *John closed the water bottle*, facilitates turning a knob in clockwise compared with counter clockwise direction and processing and processing sentences describing a counter-clockwise manual rotation, e.g., *John opened the water bottle*, facilitates turning a knob in counter-clockwise compared with clockwise direction

# *Embodied View and Sentence Mood*

Most of the evidence for the embodied view:  
from studies investigating the comprehension of content words  
referring to concrete situations

**Present Study: Can the embodied view also handle abstract  
linguistic devices like sentence mood?**

**Simple start**

**desiderative sentence mood**

expressed by non-factual mood markers like  
*want, wish, would like to*

Example *Antoine wants to marry a hairdresser.*

# *Approach and Avoidance*

**Starting point: Distinction between two systems in accounts of the regulation of behaviour**

**Approach** → associated with desirable events

**Avoidance** → associated with undesirable events

→ **Processing sentences in desiderative mood activates the approach system and facilitates approach actions compared with avoidance actions**

## **Approach/Avoidance Related Actions**

**Approach** → e.g., pulling something toward you

**Avoidance** → e.g., pushing something away from you

# Experiment

**Does processing sentences in desiderative mood facilitate an approach action (like pulling a joystick) compared with an avoidance action (like pushing a joystick)?**

## Methodological Approach

Participants listened to sentences

They had to judge whether the sentences were sensible

Response via moving a joystick, two conditions:

**yes-is-pulling (approach)** / yes-is-pushing (avoidance)

## Material

sensible and non-sensical sentences

**Experimental sentences** (all sensible)

two versions → **'desired'** / 'factual' (control)

***Lea wants to rest in a hammock.*** [***Lea will in einer Hängematte liegen.***]

*Lea has rested in a hammock.* [*Lea hat in einer Hängematte gelegen.*]

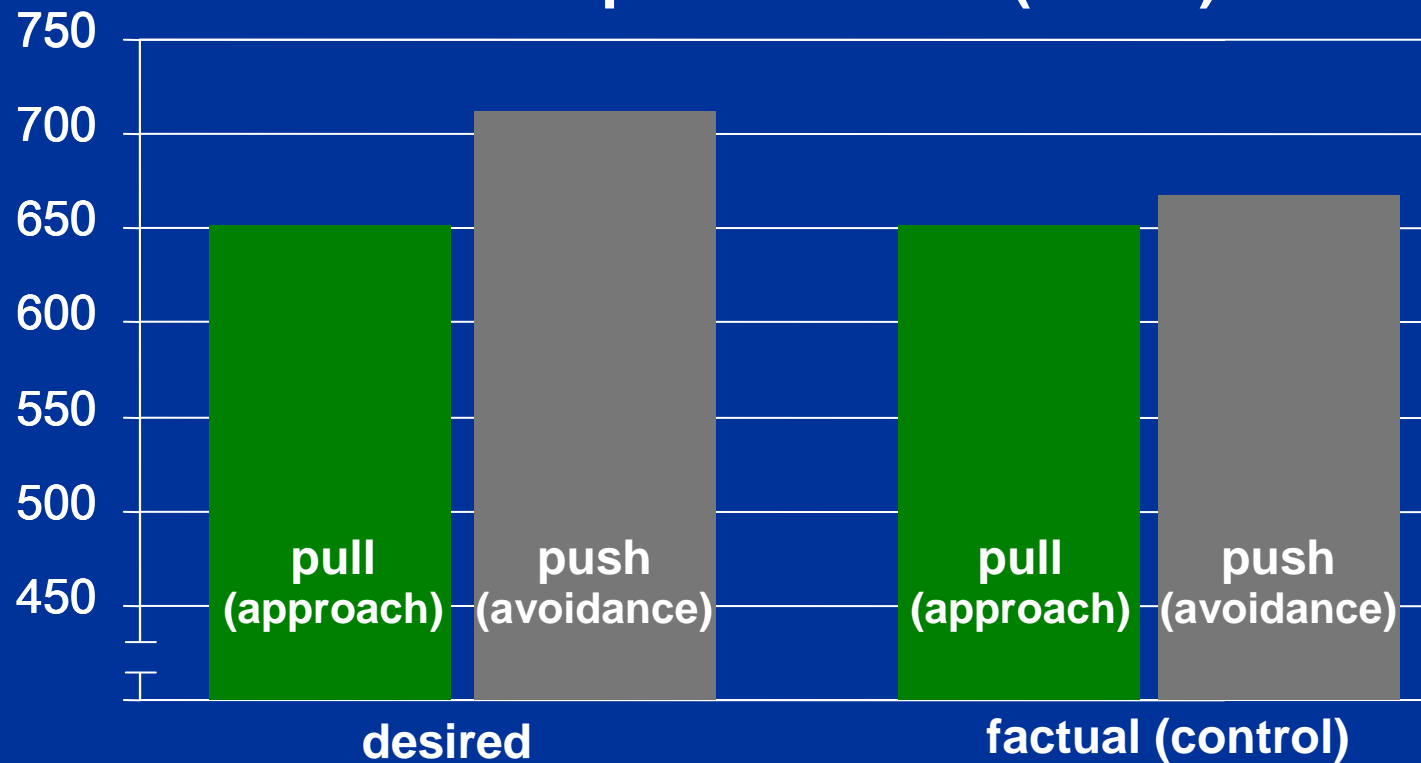
# Result: Expected and Actual

## Expected

'desired': Response Time<sub>pulling</sub> < Response Time<sub>pushing</sub>

'factual': No effect of joystick direction on response times

## Mean Response Times (in ms)



## *Findings from additional experiments*

Effect of processing sentences in desiderative mood on approach vs. avoidance actions could be replicated for a different desiderative mood marker: *möchte* (*would like to*)

Evidence for the reversed effect (Action → Comprehending):  
Performing an approach action was found to facilitate processing desiderative mood sentences compared with performing an avoidance action

**→ Preliminary evidence that the embodied view can handle even abstract information like desiderative sentence mood**