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Spatiotemporal description of events in AD

the role of cognitive aspects and voice quality

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Spatiotemporal description of events in AD - the role of cognitive aspects and voice quality

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ARSAD 2023

LUND UNIVERSITY

Åbo Akademi University

FORTE

Forskningsrådet för hälsa, arbetsliv och välfärd

How the blind audience receive and experience audio descriptions of visual events

Ongoing project: Roger Johansson, Jana Holsanova, Viveka Lyberg-Åhlander

What?

- Identify **perceptual** and **cognitive** factors underlying successful communication between the sighted and the blind during **audio descriptions (AD)** of visual events.

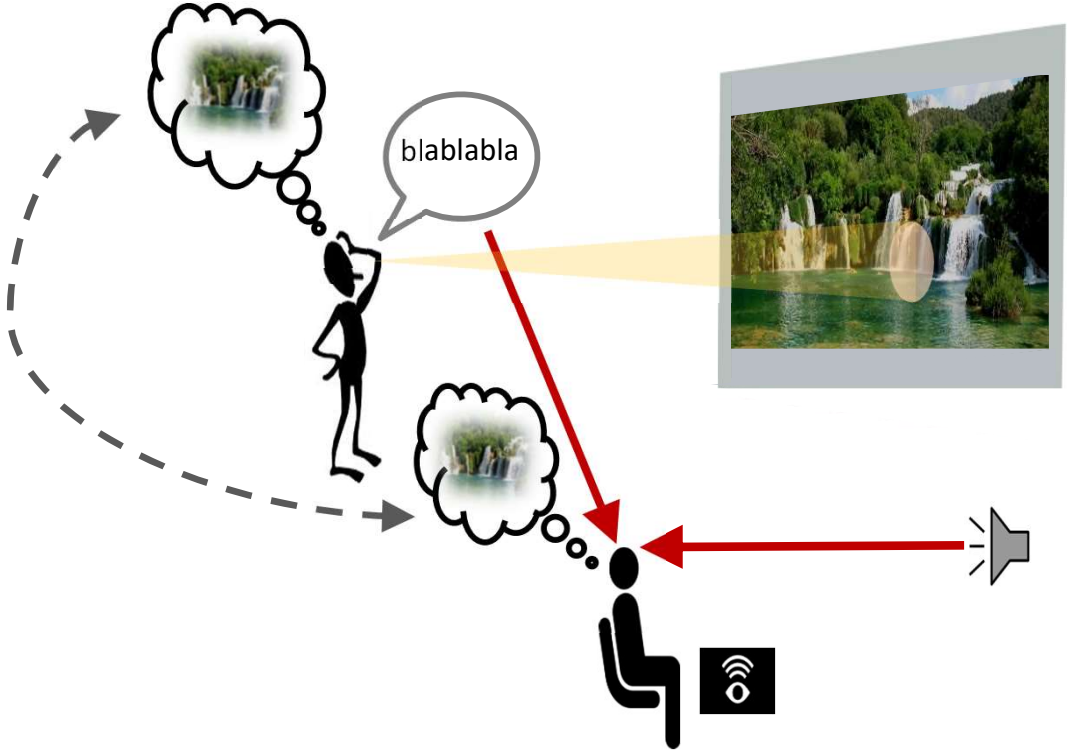
How?

- Experimental studies using methods from **cognitive science** and **experimental psychology**.

Why?

- Increase **knowledge** of how these factors affect communication between the sighted and the blind.

- Apply this knowledge to increase the **quality of AD** and **AD practices**, and ultimately facilitate the understanding and **accessibility of visual information** for the visually impaired.



The present study

- **Aim:** Systematically investigate how non-sighted people experience and understand **spatial relations** and **temporal change** of verbally described events - and to investigate what significance the describer's **voice quality** has in this interaction.

- Specific focus on how sighted vs non-sighted people **imagine** and **create mental models** of spatiotemporal content from verbal event descriptions. Similarities? Differences?

- Critical for the **experience** and **understanding** of how described state-of-affairs relate to each other over **time** and **space**.

The Experiment

- 40 participants
- 20 sighted and 20 non-sighted (congenitally blind or lost sight early in life)
- Groups matched for verbal working memory (Competing Language Processing Task – CLPT)
- Conducted over Zoom
- Each participant listened to 50 event descriptions
- 20 Event descriptions of spatial relations
- 30 Event descriptions of motion changes
- High and Low specificity

Description Specificity

Event descriptions of spatial relations

Low Specificity

On the train. Lisa is in a train compartment. Lisa's sister Maja is also there. Lisa sits **in front of** Maja.

High Specificity

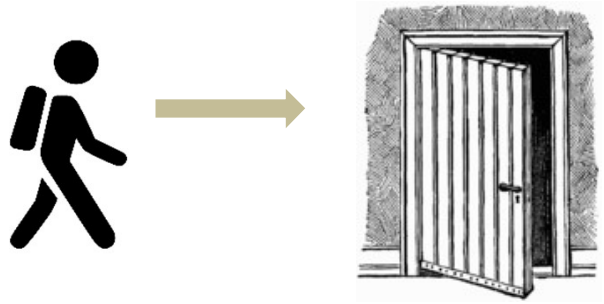
On the train. Lisa is in a train compartment. Lisa's sister Maja is also there. Lisa sits **opposite** Maja.

Description Specificity

Event descriptions of motion changes

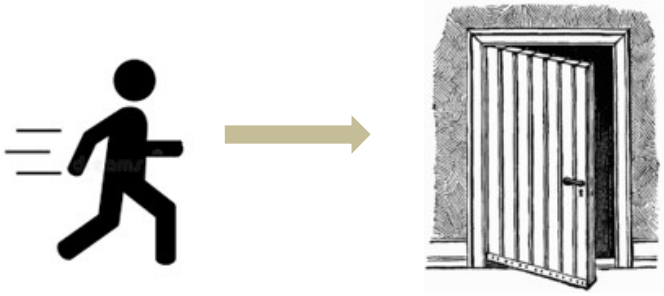
Low Specificity

In school. It's Monday morning. Frank **enters** the classroom door.



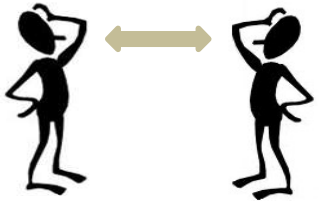
High Specificity

In school. It's Monday morning. Frank **rushes through** the classroom door.

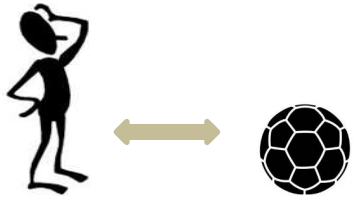


Types of Event Descriptions

Event descriptions of spatial relations



1. Person-Person

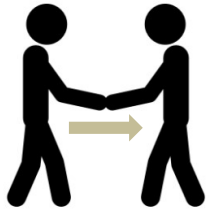


2. Person-Object

Event descriptions of motion changes

1. Person

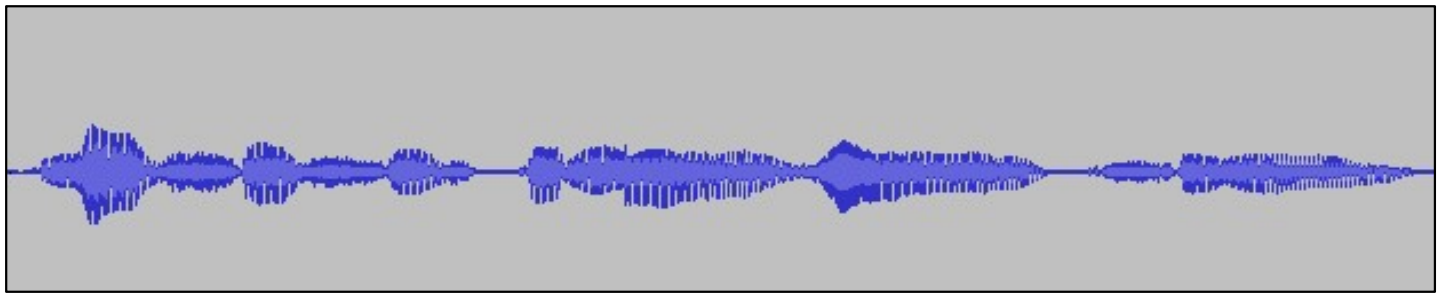
2. Person-Object



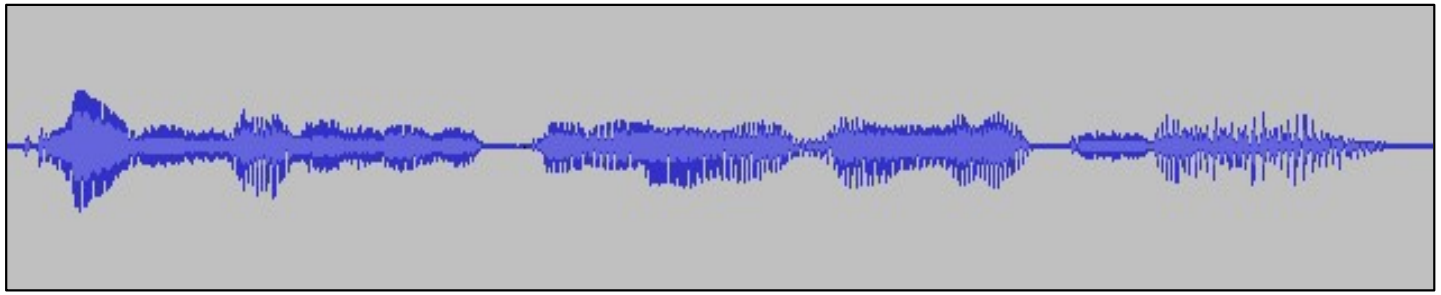
3. Person-Person

Voice Quality

Normal Voice



Dysphonic (hoarse) Voice



The Experiment

- Each participant listened to 50 event descriptions
- 20 Event descriptions of spatial relations
  - 10 Person-person, 10 Person-Object
- 30 Event descriptions of motion changes
  - 10 Person, 10 Person-Object, 10 Person-Person
- Equally distributed across high and low specificity
- Equally distributed across normal and dysphonic voice

- Data analysed with Generalised Mixed Effects Models

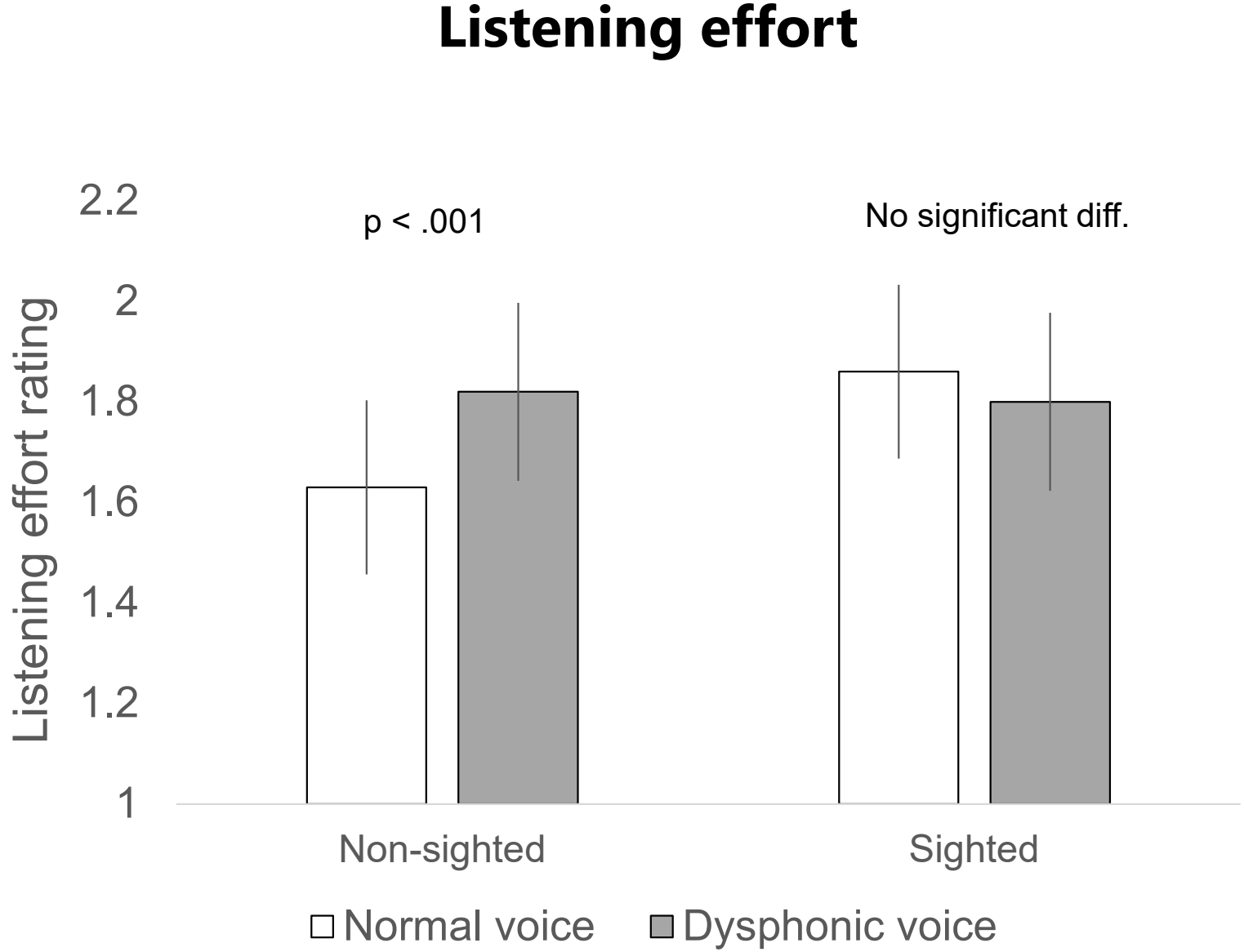
The Experiment

Task after listening to each event description

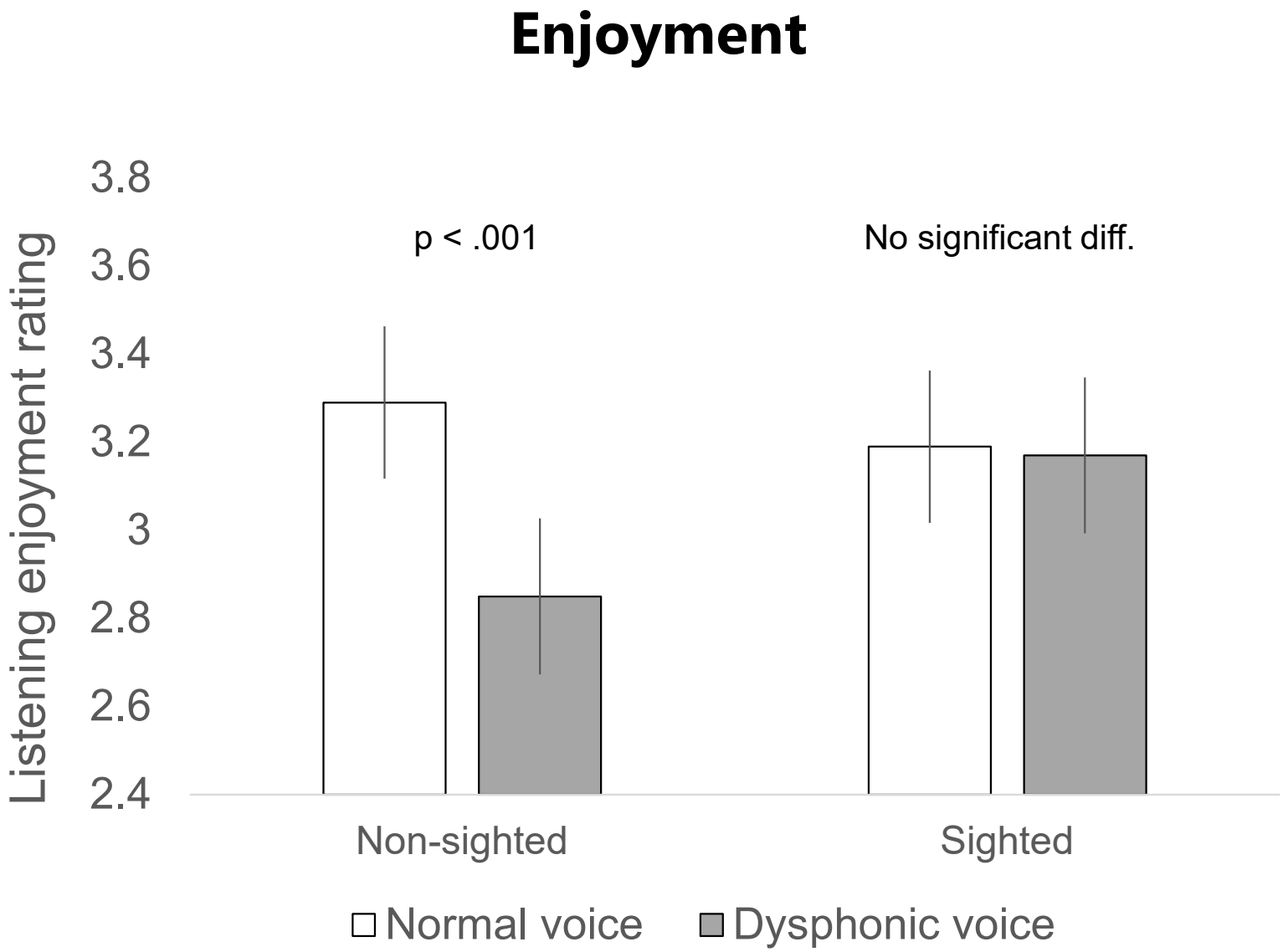
On a scale 1 to 6 rate:

1. How well you could **imagine** the content of the described scenario
2. How well you **understood** the described scenario
3. How **effortful** it was for you to listen to the described scenario
4. How **enjoyable** it was for you to listen to the described scenario

Results – Voice quality

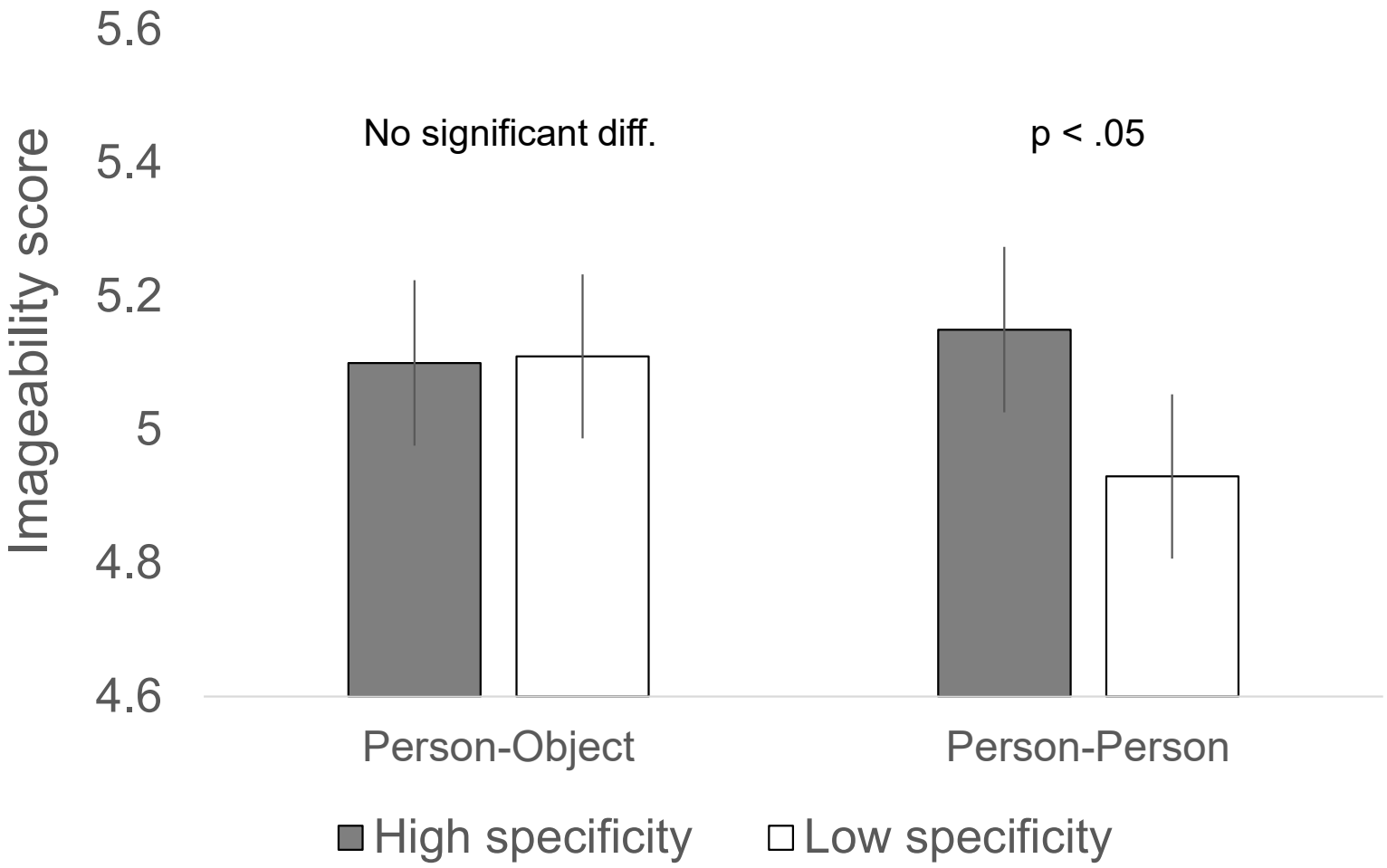


Results – Voice quality

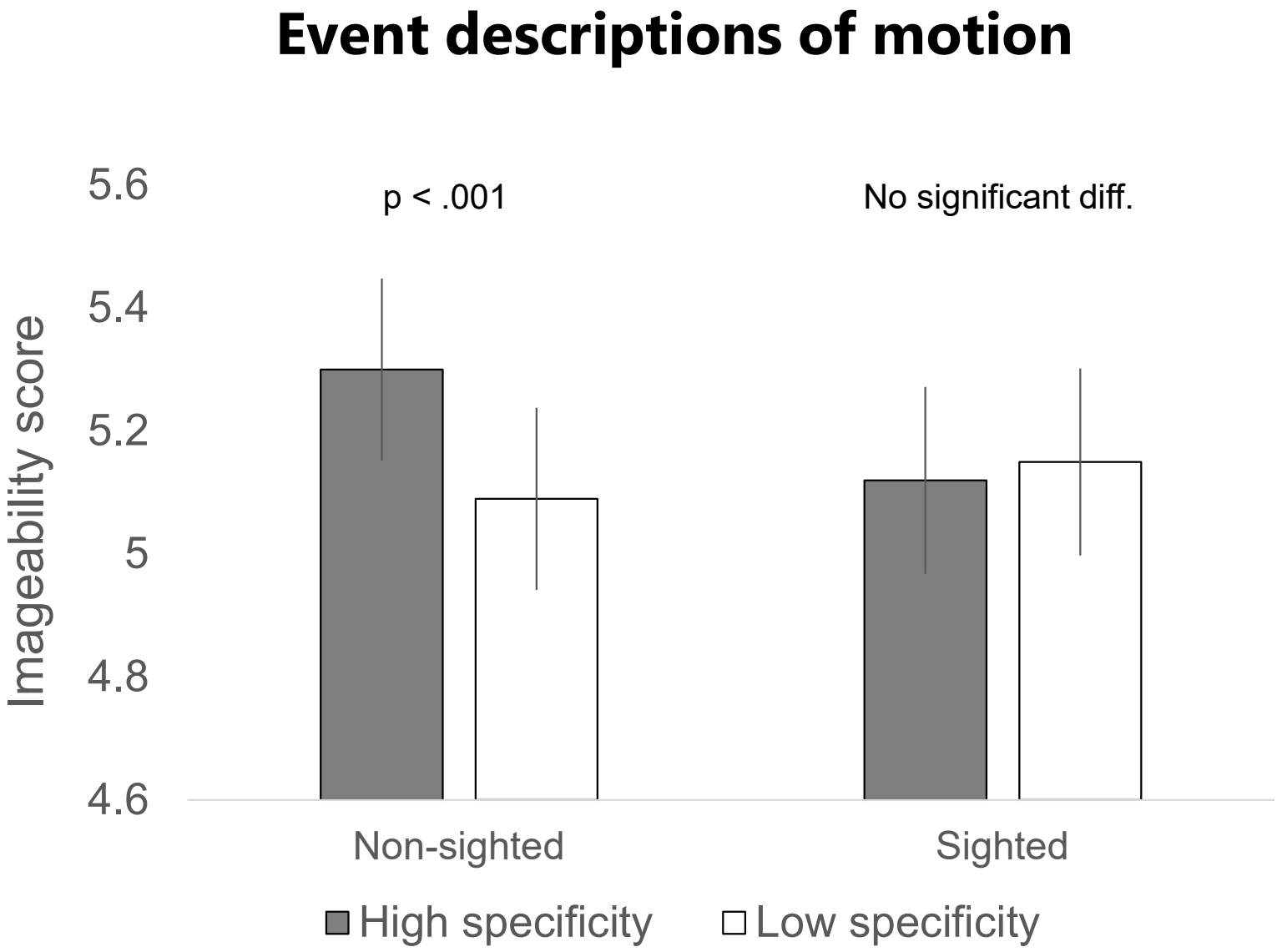


Results - imageability

Event descriptions of spatial relations



Results - imageability



Summary

- **Voice quality** in verbal narration of visual events play a major role in **listening effort** and **enjoyment** of listening.

  → Big difference for sighted and non-sighted listeners!

- **The specificity** in how **spatial relations** and **changes in motion** are described plays a **major role for the imageability** of the described content.

  → Primarily for the non-sighted group and especially prominent for motion changes!

- **Empirical evidence** that these factors are important for successful communication between the sighted and the blind.

- Important factors to consider in **audio descriptions** of visual events.

Thank you for your attention!