



"He took the first right ... The street was filled with people, on one side shouting 5th! 5th! 5th! And on the other side shouting 4th district ! 4th! 4th!"



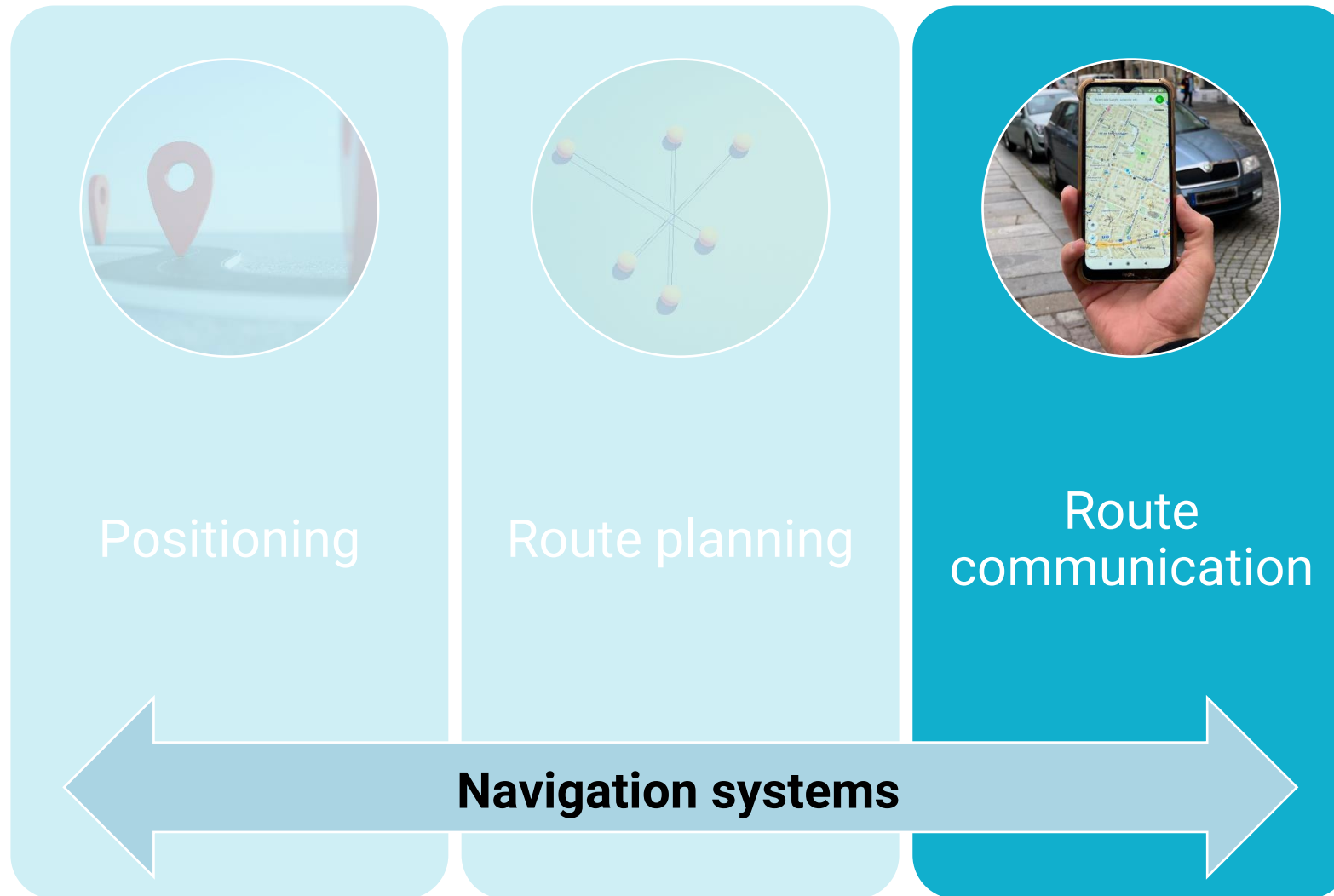
Cartography M.Sc.

Narrating the route: Route memorability in navigation instructions augmented with narrative

Lydia Youngblood

Supervisor: Univ.-Prof. Mag. Dr. Dr. h.c. Georg Gartner (TUW) | Reviewer: Dr.-Ing. Eva Hauthal (TUD)

Why?



(Huang & Gartner, 2009; Gartner et al., 2011)

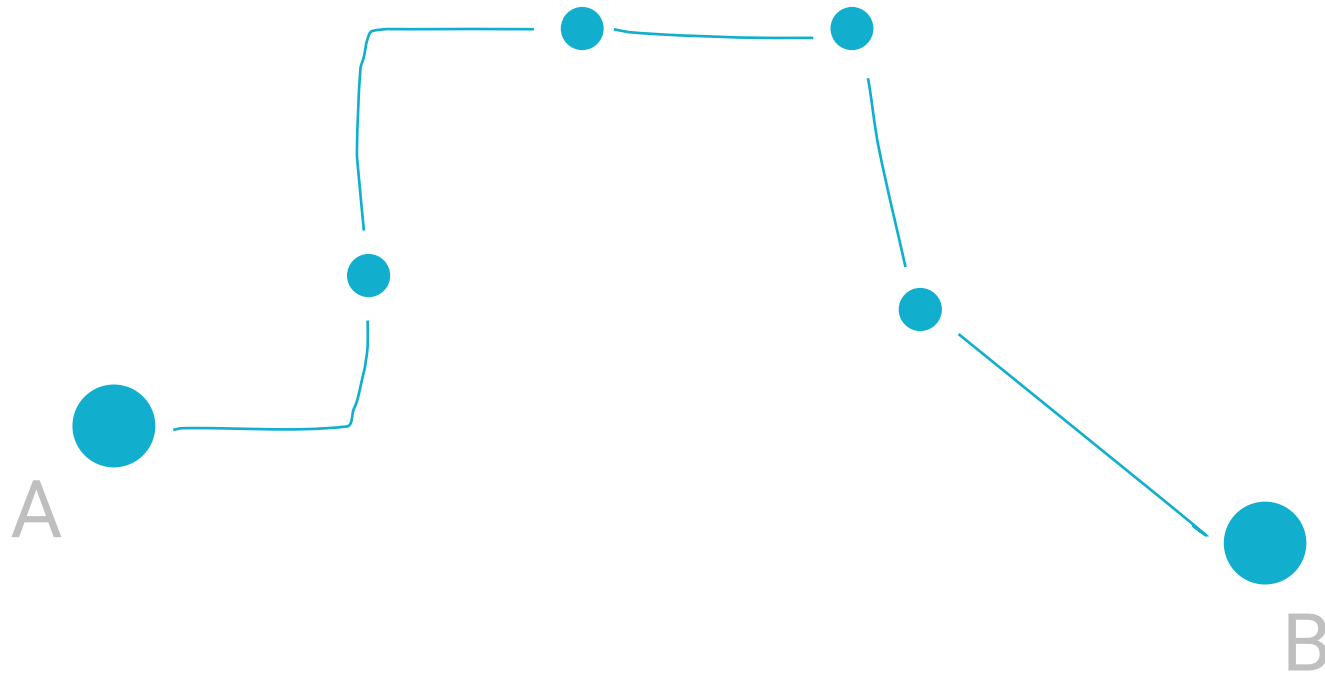


Why?



- State-of-the-art navigation aids harm spatial knowledge acquisition (Ishikawa et al., 2008; Ishikawa 2019; Krukar et al., 2020; Münzer et al., 2006)
- Alternative ways to communicate routes to pedestrians being developed (Anacta et al., 2018; Krukar et al., 2021; Löwen et al., 2019; Raubal & Winter, 2001; Tom & Denis 2004; Wunderlich & Gramann, 2021)

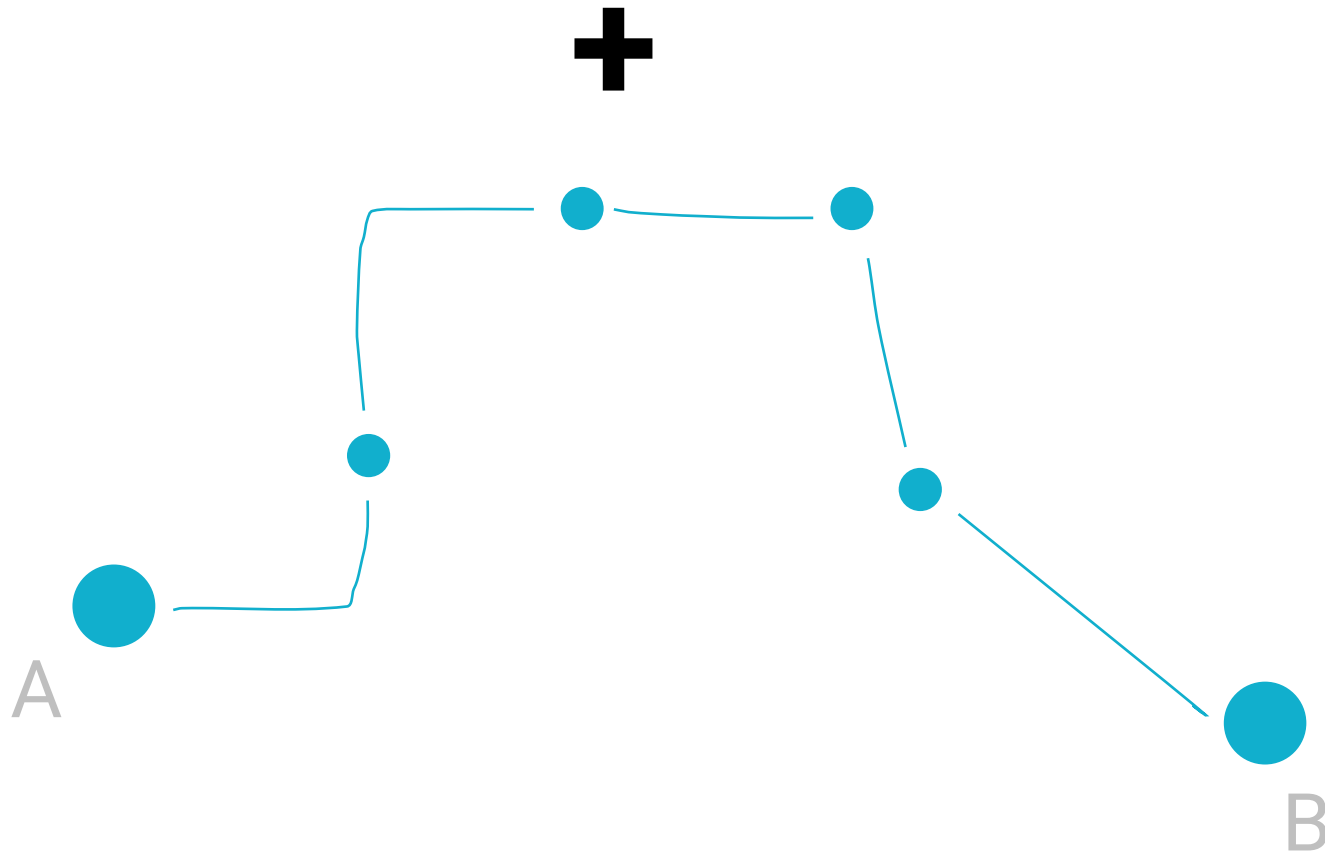
Why?



(Huang et al., 2012; Denis et al., 2014)



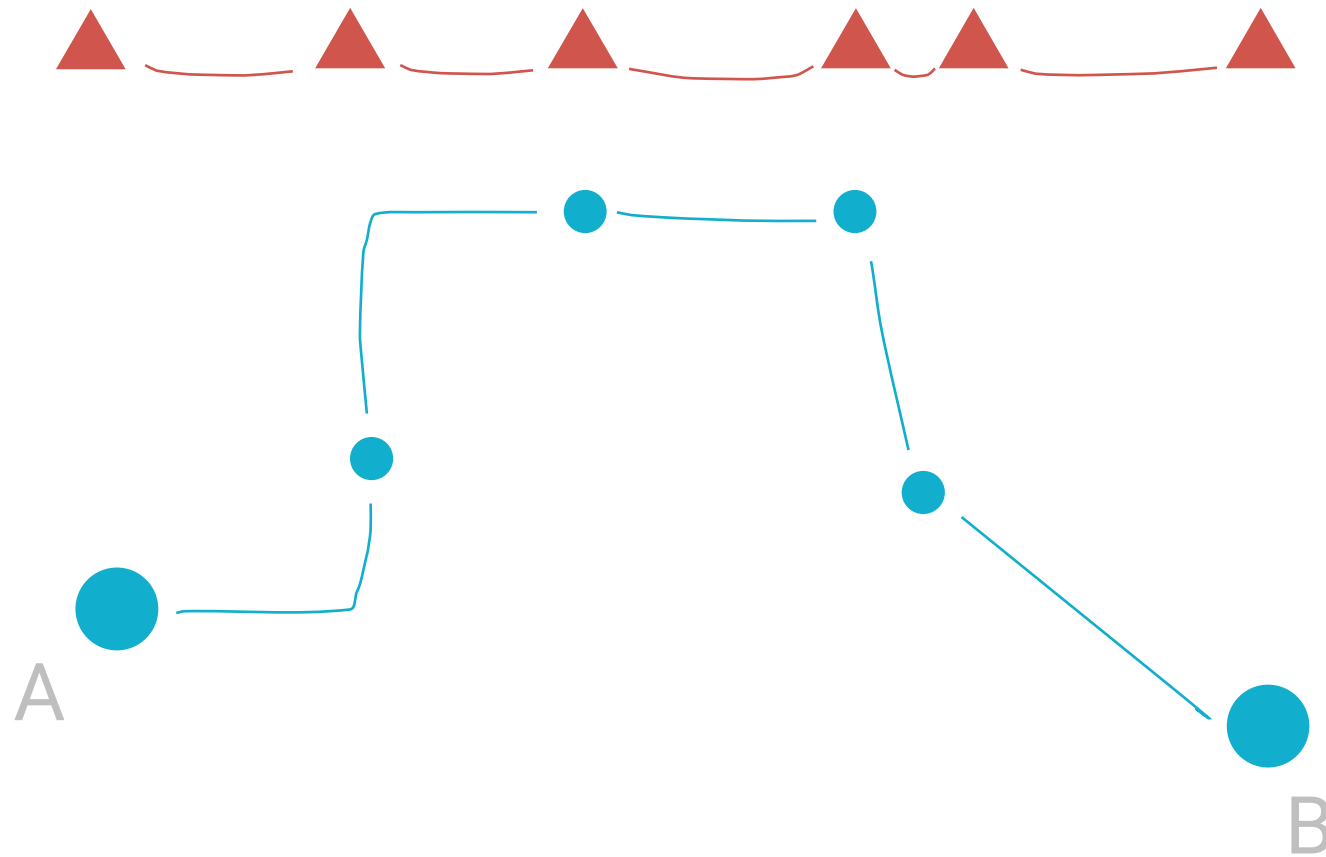
Why?



(Gramann et al., 2017; Anacta et al., 2017; Krukar et al., 2020)

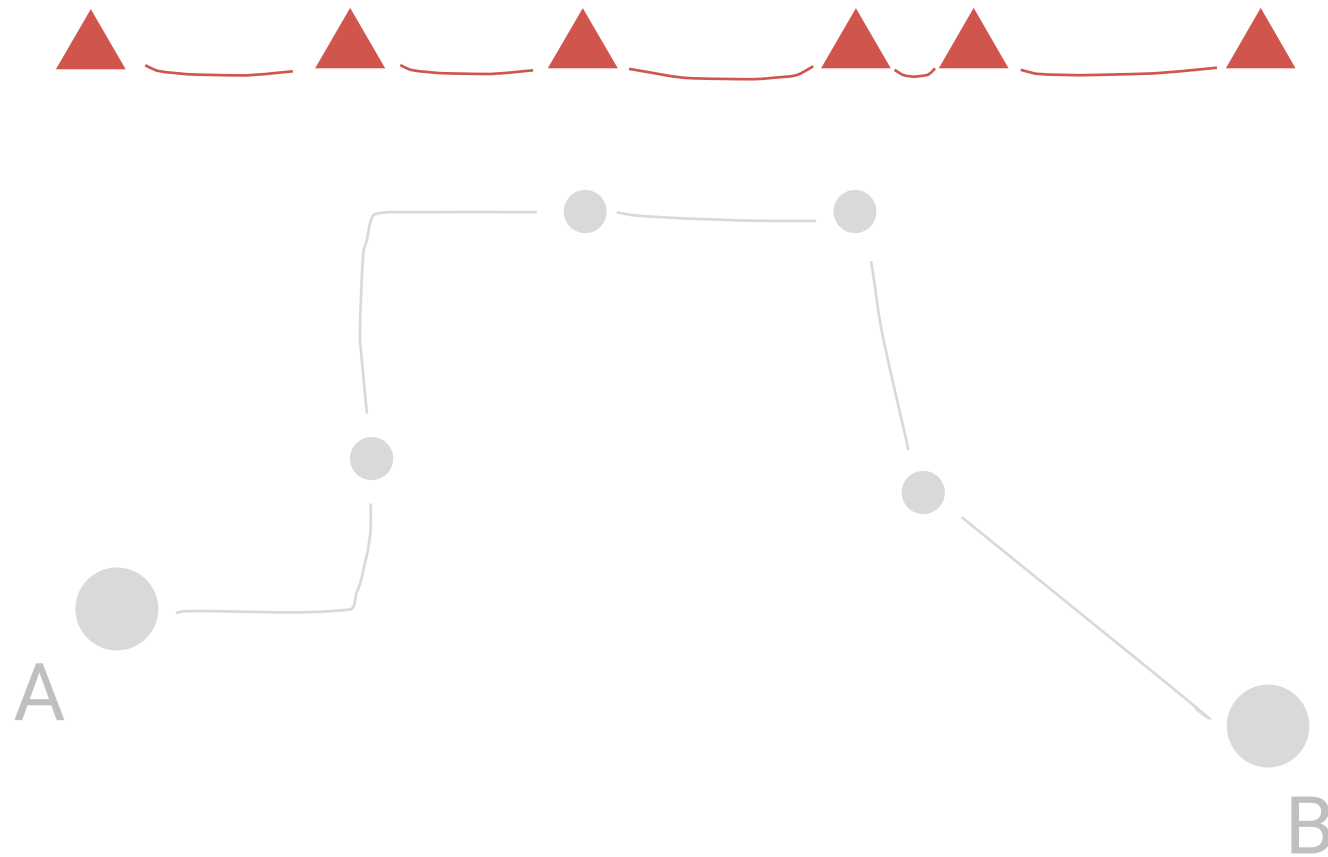


Research objective



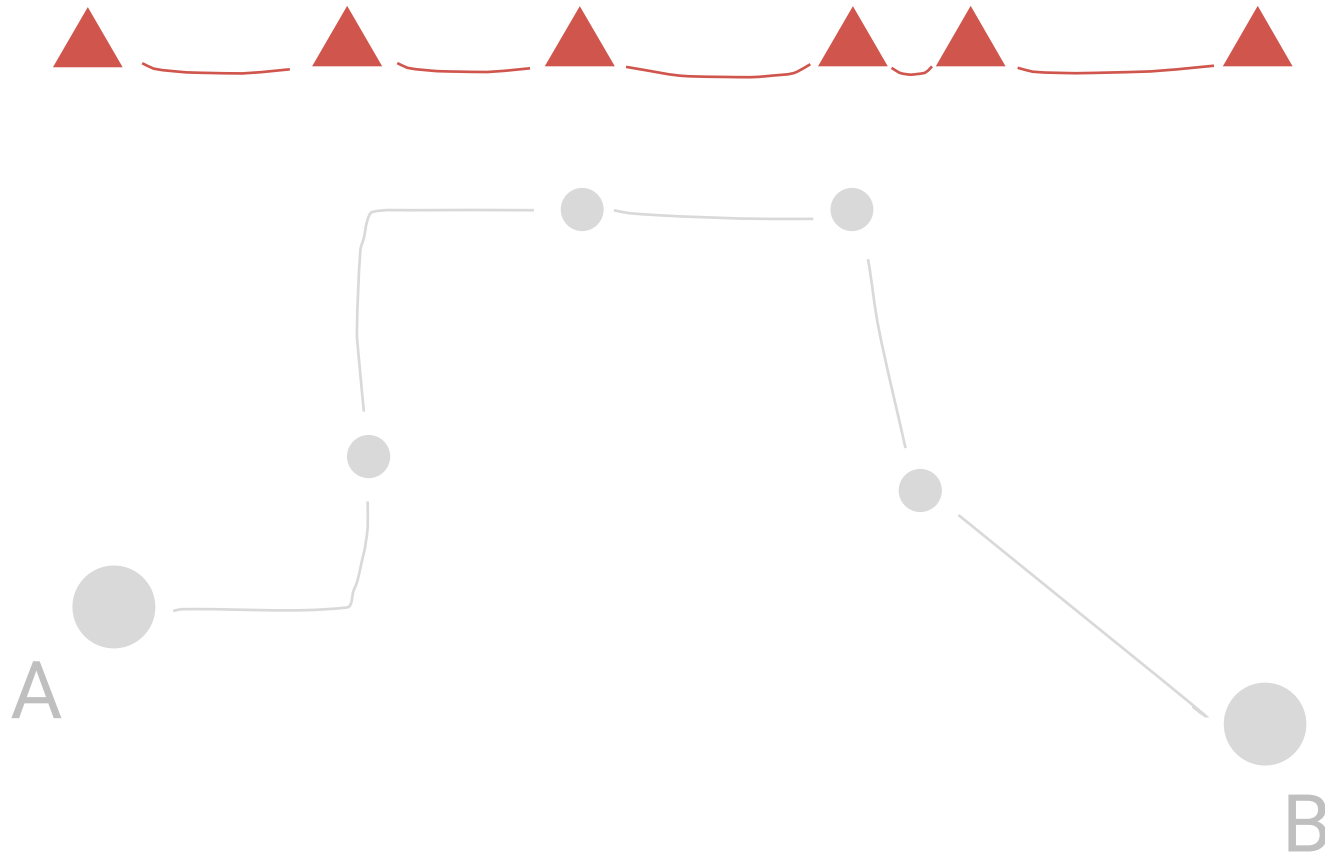
To identify whether the augmentation of verbal route instructions with a narrative can be used to increase the memorability of a route for pedestrians.

Why?



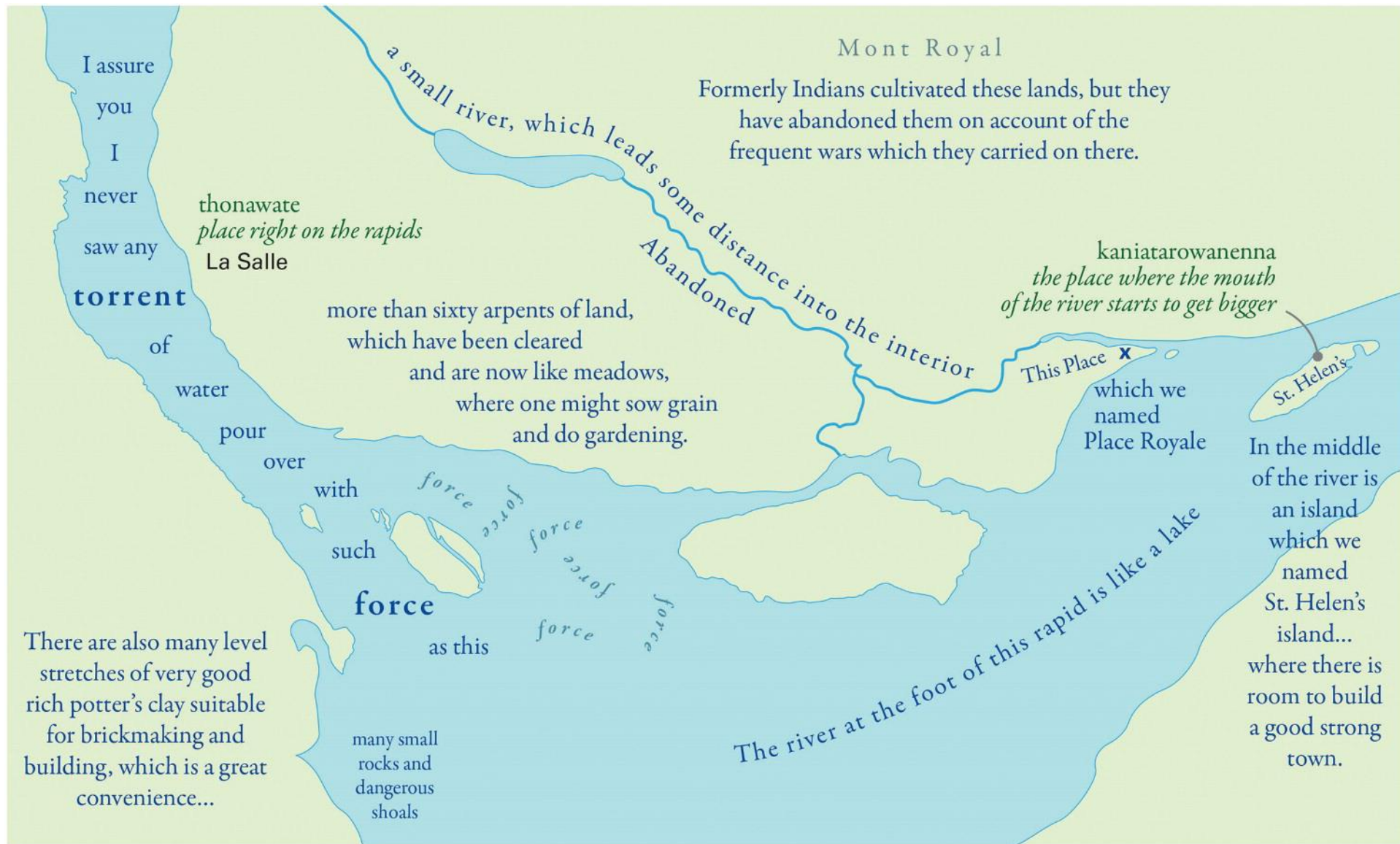
Human experience is deeply rooted
in narratives (Chatman, 1978; Herman et
al., 2005; Roth, 2021)

Why?



Human experience is deeply rooted in narratives (Chatman, 1978; Herman et al., 2005; Roth, 2021)

Stories have the power to help us remember objects in sequence and their relationships; they impose organized structure to information, schematic integration, vivid mental imagery (Baddeley, 1999; Negrete, 2021; Reisberg 2010)



(Pearce & Hermann, 2010. Image from Roth (2021) used with permission from the University of Maine Canadian-American Center)



RQ 1. What are the fundamental components of a narrative and how can they be implemented in navigation instructions?



How?



(Ryan, 2007; Toolan, 2001; Chatman, 1978)



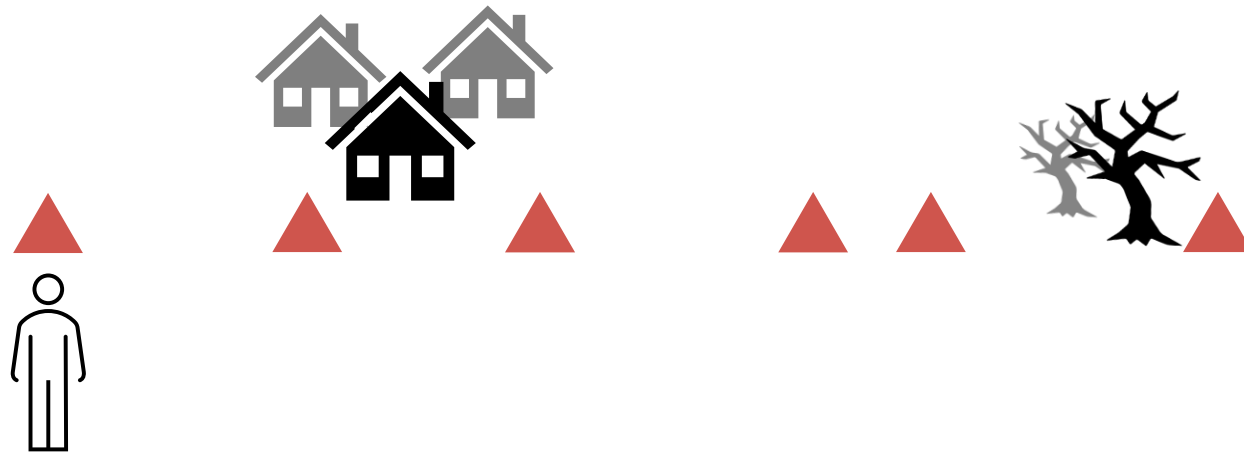
How?



(Ryan, 2007; Toolan, 2001; Chatman, 1978)



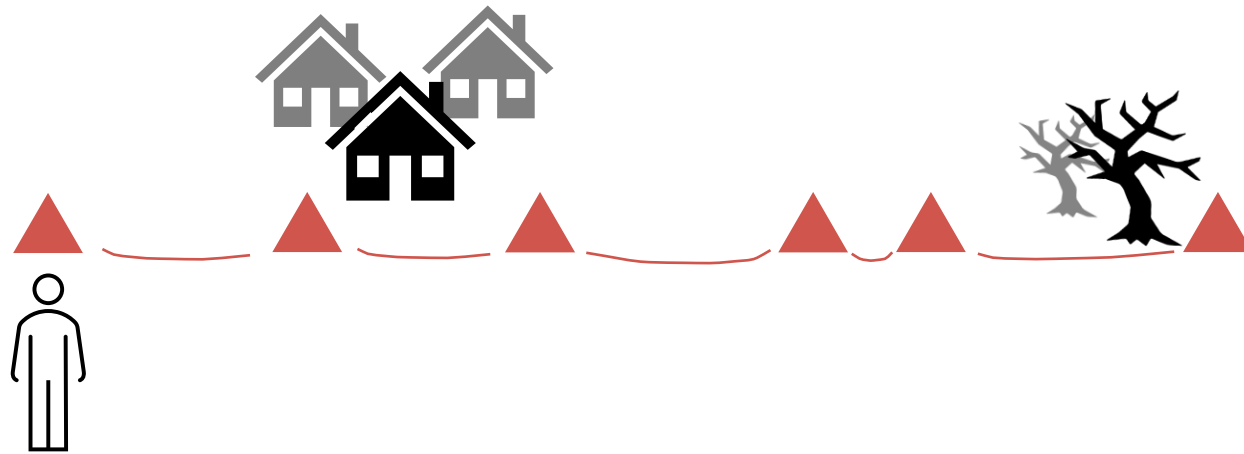
How?



(Ryan, 2007; Toolan, 2001; Chatman, 1978)



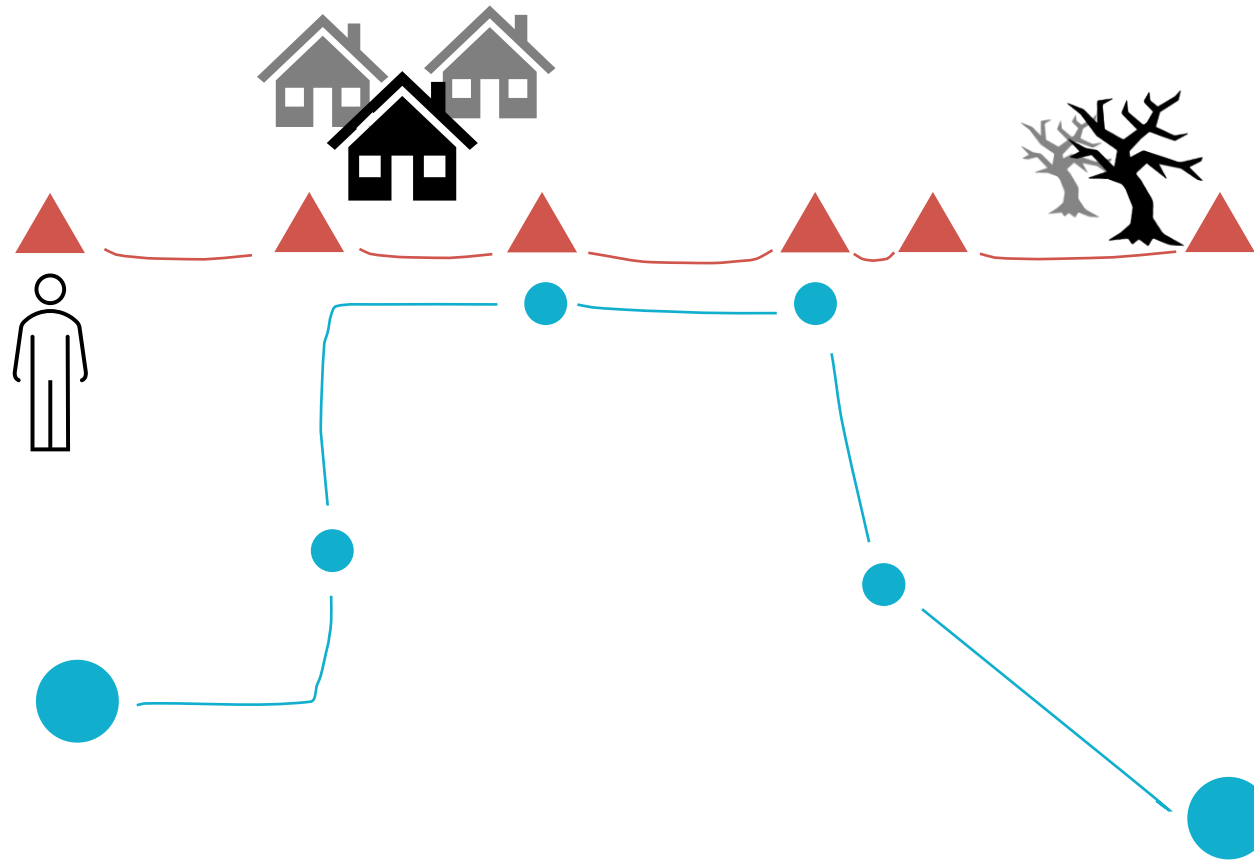
How?



(Ryan, 2007; Toolan, 2001; Chatman, 1978)



How?





- ▲ Johann Strauss needed to take his dog to the veterinarian. He left his white palace and turned left down the street (...)
- ▲ At this age, he couldn't make it far without a toilet, so he took a right at the sign for the toilet, the oldest public toilet in Vienna.
- ▲ When they turned left onto the tree-lined street, his dog had the same idea, stopping at every single tree to mark her territory.
- ▲ When they reached the pink houses, they turned right. Famously in 1855, a resident threw dozens of pink roses from the balcony in protest of the construction of the first public toilet. Oh, how Strauss missed politics.



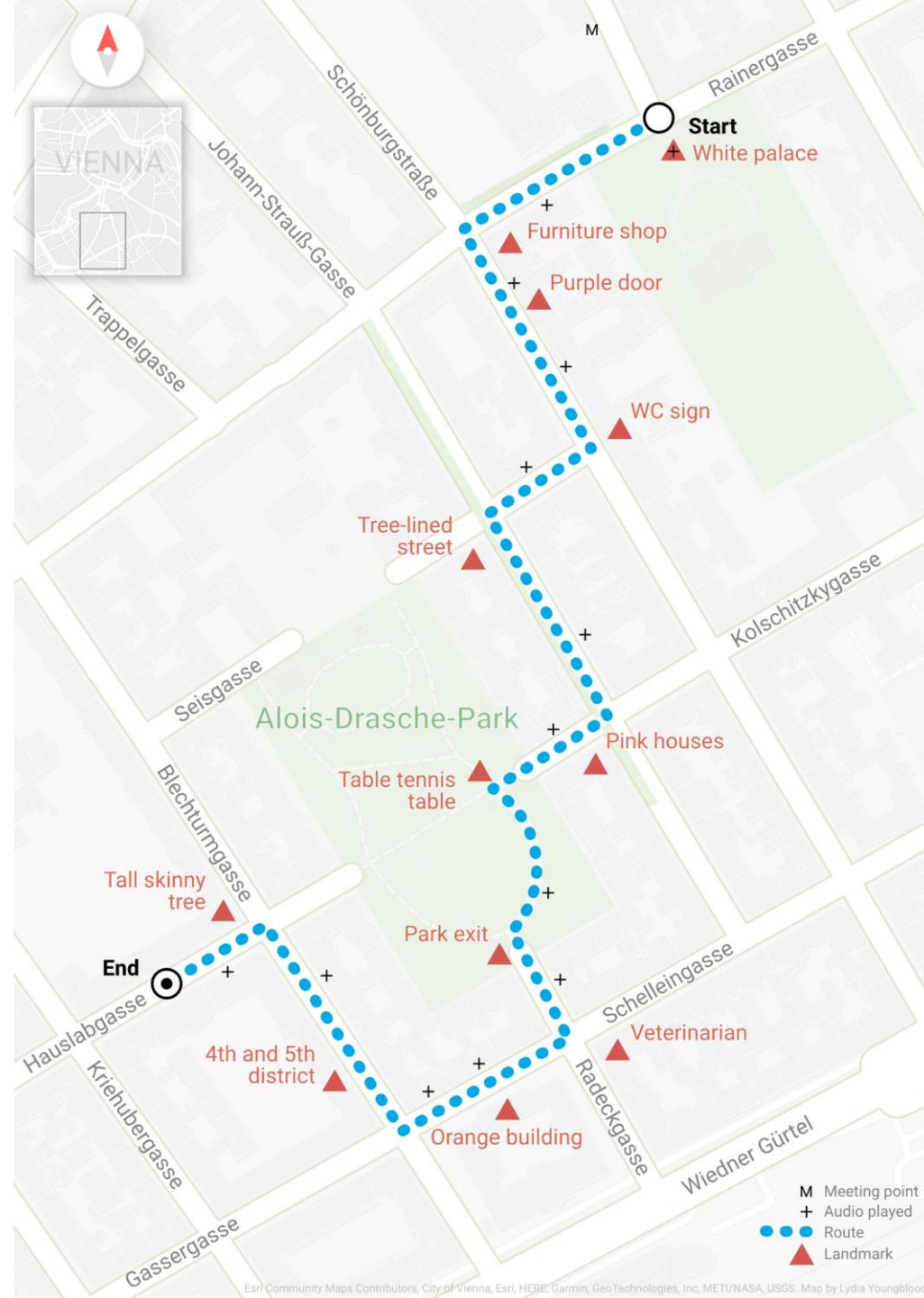


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- ▲ At this age, he couldn't make it far without a toilet, so he took a right at the sign for the toilet, the oldest public toilet in Vienna.
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How?

RQ 2. Does augmenting navigation instructions with a narrative increase the memorability of a route?



How?

- Audio-based
- Tested against simple landmark-based instructions (“turn right at the veterinarian”)
- Participants mostly well-balanced (N = 18)



How?



- Audio-based
- Tested against simple landmark-based instructions (“turn right at the veterinarian”)
- Participants mostly well-balanced (N = 18)
- **Mixed-method design:**
 - Verbal generation of route

(Daniel et al., 2007; Denis et al., 2007; Huang et al., 2012; Denis et al., 2014; Kim & Bock, 2021; Wunderlich & Gramann, 2021)



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 - Landmark sequencing tasks

Immediately after learning

(Daniel et al., 2007; Denis et al., 2007; Huang et al., 2012; Denis et al., 2014; Kim & Bock, 2021; Wunderlich & Gramann, 2021)



How?



One week after learning

- Audio-based
- Tested against simple landmark-based instructions (“turn right at the veterinarian”)
- Participants mostly well-balanced (N = 18)
- **Mixed-method design:**
 - Verbal generation of route
 - Landmark sequencing tasks
 - Route recognition

(Daniel et al., 2007; Denis et al., 2007; Huang et al., 2012; Denis et al., 2014; Kim & Bock, 2021; Wunderlich & Gramann, 2021)



How?



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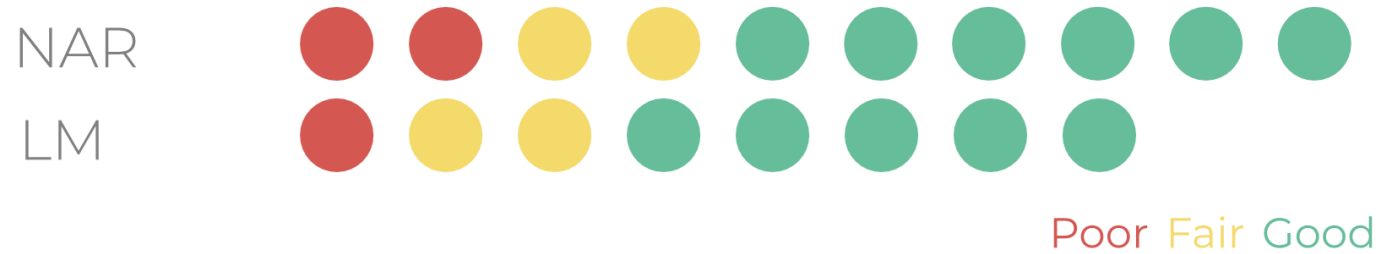
Novel: semi-structured interview following verbal generation of route and landmark sequencing tasks



Results



Ratings of route descriptions



Results



Ratings of route descriptions

NAR



60%

LM



62.5%

Poor Fair Good



Results



Percent correct (%):

Phase 2
landmark
sequencing

NAR **80**

LM **92**

Phase 3
landmark
sequencing

NAR **93**

LM **98**

Route
recognition

NAR **84**

LM **95**

$p = 0.0478$



Results



Percent correct (%):

Phase 2
landmark
sequencing

NAR **80**

LM **92**

Phase 3
landmark
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NAR **93**

LM **98**

Route
recognition

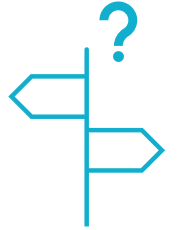
NAR **84**

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Results



Percent correct (%):

Phase 2
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NAR **80**

LM **92**

Phase 3
landmark
sequencing

NAR **93**

LM **98**

Route
recognition

NAR **84**

LM **95**

$p = 0.0478$



Confidence (Likert-scale, 1-5)

Phase 2
landmark
sequencing

NAR **4.25**
LM **4.10**

Phase 3
landmark
sequencing

NAR **4.0**
LM



Results



“Probably **because I feel like it had a lot of essence to the story**. It’s like... the people, the line... I think it also connects with the fact that he also came to this tree to join the other people. So I guess that’s probably why...**It also affected like his emotions while walking**. So I guess that’s why I also remember it.”



Passing the orange city council building, he could see lines of people voting. He grew outraged. “Separating our districts! And I didn’t even know! It cannot be.”



Results



“Is it not the same? **Ah! This is the street where the dog wants to pee** and these are **the houses with the flowers**. I think this was... this was first”



Results




"I think the fact of **having a story behind the instructions helped me a lot.** By remembering some important **facts of the story which I associate with images I saw**, it is easier to remember the order of facts even if there are some things that I don't remember."



Conclusions

- Excellent reception




“But **I really really like it.** I think it’s interesting. And I didn’t think it would work this good...but then going in... **I felt confident**”



Conclusions

- Excellent reception
- Development and implementation of narrative wayfinding instructions




“But I really really like it. I think it’s interesting. And I didn’t think it would work this good...but then going in... I felt confident”



Conclusions

- Excellent reception
- Development and implementation of narrative wayfinding instructions
- Good overall performance
- High confidence
- Little quantitative difference...




“But I really really like it. I think it’s interesting. And I didn’t think it would work this good...but then going in... I felt confident”



Conclusions

- Excellent reception
- Development and implementation of narrative wayfinding instructions
- Good overall performance
- High confidence
- Little quantitative difference...

But interviews suggest there is a mark

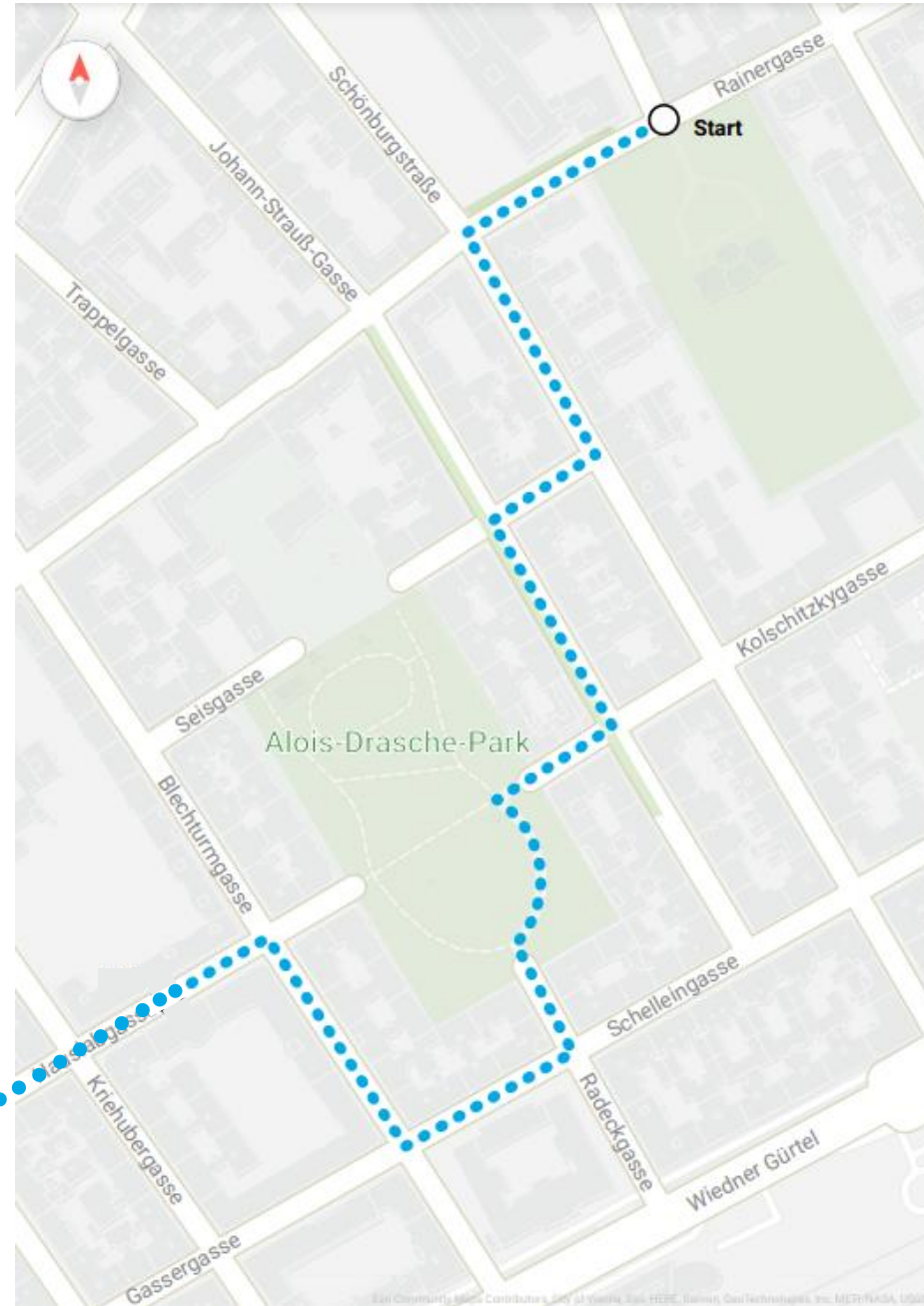


“It was a bit like a **two layers of a map**. One is the physical environment. One is the mental environment. So I have to switch between them. I was interested in the story...[switching] was easy. Because **the tree suddenly belongs to both layers**.”



- More insight from dataset
- Reconsider methods?
- Many ways to approach the topic!

Further
research



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- First image from Inspirama.io AI image generator, prompt: "Protest in 1800s Vienna."





Thank you!
Questions?



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