



Wayfinding Styles

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Outline

- What are wayfinding styles
- How can we analyze wayfinding styles
- Conceptual Framework
- Relations
- Findings & Impact
- Future directions



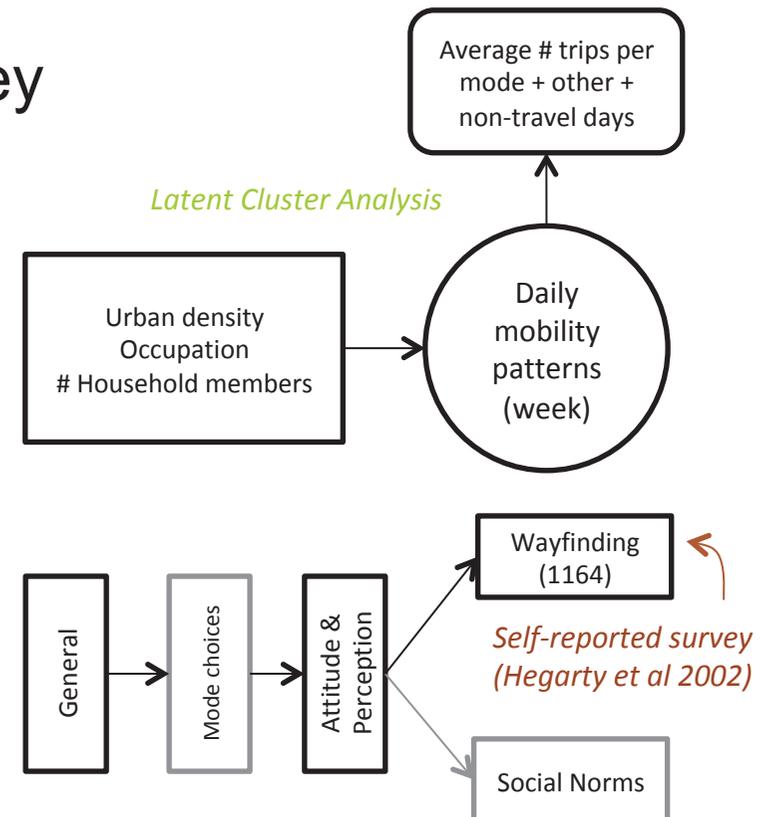
What are Wayfinding Styles

- The strategies that people use to decide how to move from one place to another within a city (Montello 1995).
 - preferences, selection and application of navigation strategies
 - attitude towards travelling
 - ability to reach the intended destination
- Clearly there are individual differences
- But what are the influences on/of mobility patterns, the built environment, navigational preferences, and socio-demographics?



How can we analyze Wayfinding Styles

- MPN Longitudinal Survey
 - 3 Day Travel diary 2016
 - Complementary surveys
 - Household level
 - Personal level
- Special Issue
 - PAW-AM survey
 - Preferences
 - Attitudes
 - Wayfinding
 - Active Modes





How can we analyze Wayfinding Styles

Latent Cluster Analysis (Explained during Danique Ton's Presentation)

Car Bike Other

Car Only & No Travel

No PT

PT & all

Bike Only





How can we analyze Wayfinding Styles

Factor analysis | Principal component extraction method & Varimax rotation method | KMO: 0.933 | 43.79% of the total variance is explained

23 self-reported questions relating to wayfinding behavior



1. Orientation Abilities

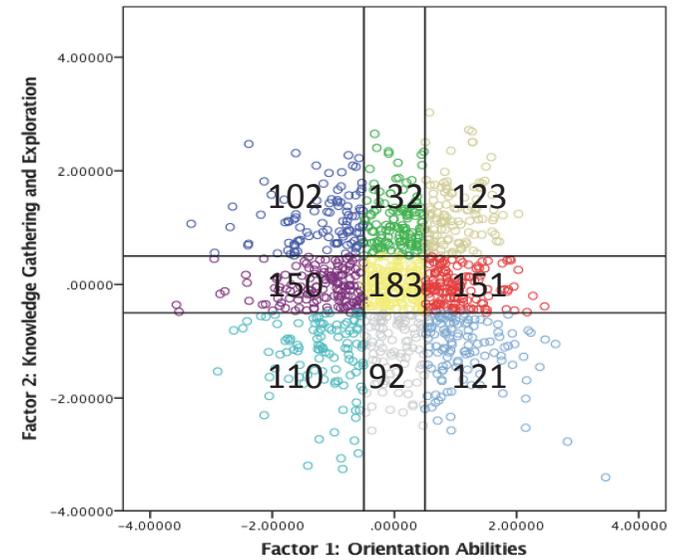
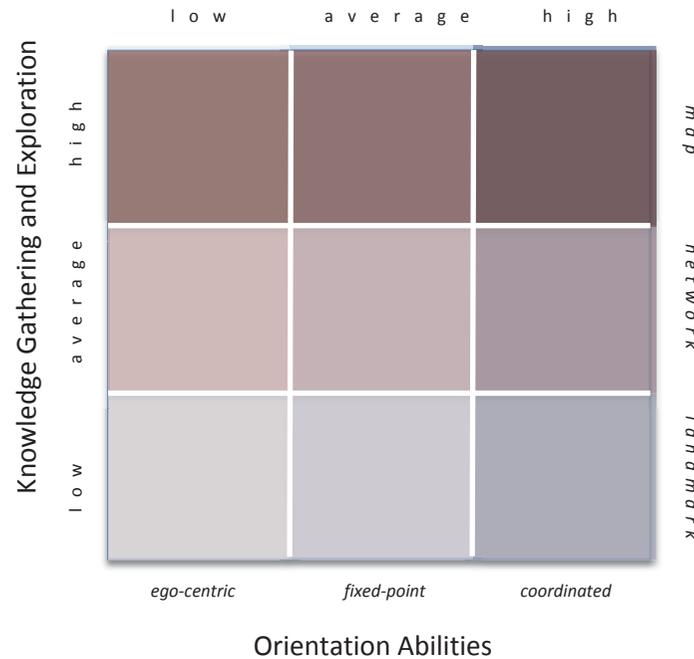
Ability to understand route directions | Sense of orientation | Ability to reach unfamiliar destination in a new city | *Ability to give route directions* | Memorize routes during passive navigation | Memorize route once taken | Responsible during travel with group | *Perception of distances* | Like to give route directions | Mental map | Memory to retrace things | *Like to read maps* | Travel time

2. Knowledge Gathering & Exploration

Like to take new routes | Exploration is important | Think in cardinal directions | *Like to read maps* | *Ability to give route directions* | Positive attitude towards travelling | *Perception of distances*

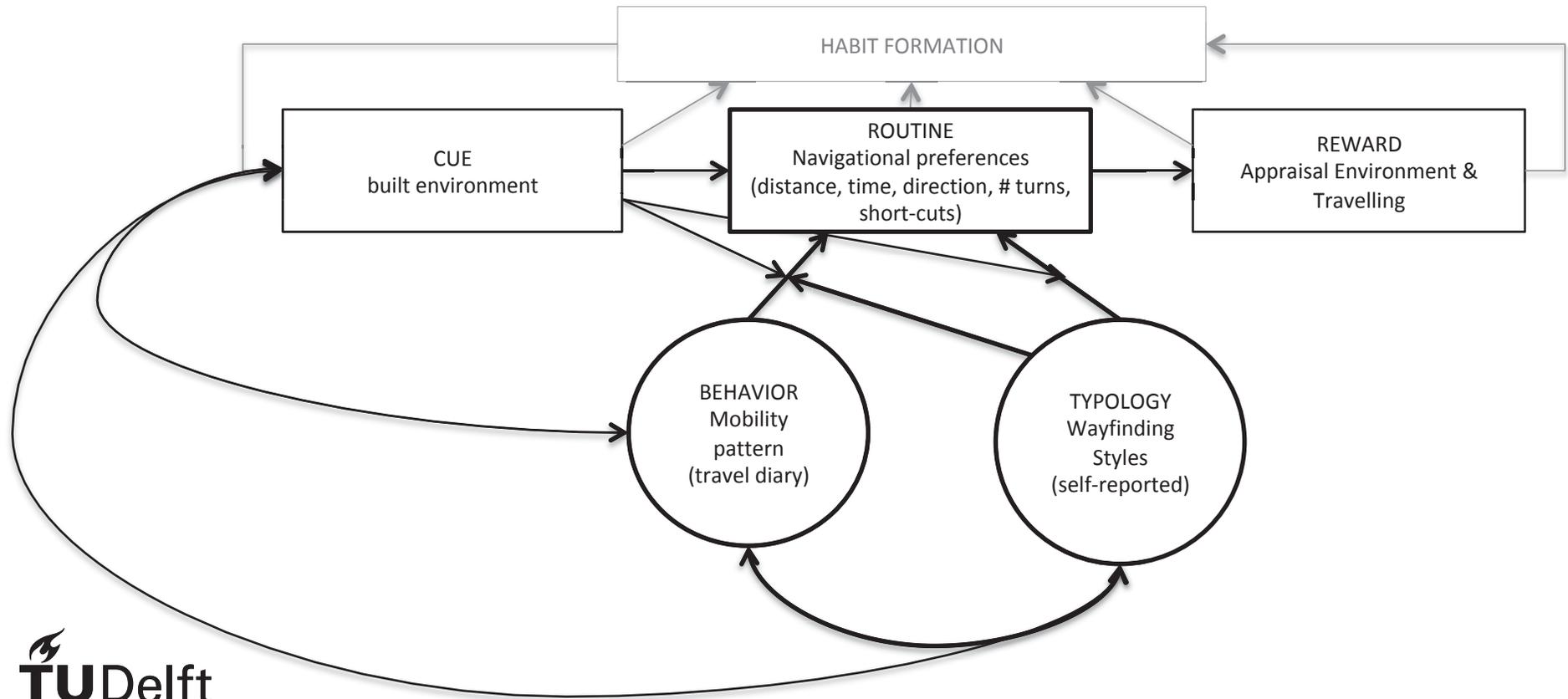


How can we analyze Wayfinding Styles





Conceptual Framework





Bike Only have more wayfinding abilities than Car Only

TRUE
 FALSE



Relations

	Low Orientation Ability	Average Orientation Ability	High Orientation Ability	
<i>Car Bike Other</i>	+	++*		High Knowledge Gathering
<i>Car No Travel</i>			++	
<i>No PT</i>	--	-		
<i>PT</i>	+	--	+	
<i>Bike</i>	++		--	
<i>Car Bike Other</i>			-	Average Knowledge Gathering
<i>Car No Travel</i>	---**	++*	+	
<i>No PT</i>	-			
<i>PT</i>	+++**	-	-	
<i>Bike</i>	+++**		--	
<i>Car Bike Other</i>			+	Low Knowledge Gathering
<i>Car No Travel</i>	--*			
<i>No PT</i>	++	+	+++**	
<i>PT</i>	--		--	
<i>Bike</i>	+++*	-	---**	

“+, - (++, +++)” Indicates that the people with this wayfinding style 10% (20%, 30%) more, or less, often belong to this latent mobility pattern cluster compared to the average of the total population. “*,**” Indicates the difference is significant at 90% (95%) confidence interval.



People living in highly urbanized areas explore and gather more knowledge compared to people living in rural areas.

TRUE
 FALSE



Relations

	Low Orientation Ability	Average Orientation Ability	High Orientation Ability	
<i>(Highly) urbanized</i>		+		High Knowledge Gathering
<i>Suburban</i>	-	-		
<i>Rural</i>	++*	-		
<i>(Highly) urbanized</i>	+*			Average Knowledge Gathering
<i>Suburban</i>	--**	++		
<i>Rural</i>				
<i>(Highly) urbanized</i>				Low Knowledge Gathering
<i>Suburban</i>	+++**			
<i>Rural</i>	-	+		

“+, - (++, +++)” Indicates that people with this wayfinding style 10% (20%, 30%) more, or less, often belong to people living in this urbanization level compared to the average of the total population. “*,**” Indicates the difference is significant at 90% (95%) confidence interval.



People with higher orientation abilities also have a (strong) preference for the short travel time

TRUE
 FALSE



Relations

<i>Preference for short travel time</i>	Low Orientation Ability	Average Orientation Ability	High Orientation Ability	
<i>strongly disagree</i>			+	High Knowledge Gathering
<i>disagree</i>			-*	
<i>neutral</i>			+++	
<i>agree</i>	---	---		
<i>strongly agree</i>				
<i>strongly disagree</i>				Average Knowledge Gathering
<i>disagree</i>		+*		
<i>neutral</i>	+++*	---**	---**	
<i>agree</i>		+**		
<i>strongly agree</i>	---	---	+++**	
<i>strongly disagree</i>				Low Knowledge Gathering
<i>disagree</i>	+			
<i>neutral</i>	++	--	---**	
<i>agree</i>	-*	+		
<i>strongly agree</i>	+++	--	+++**	

“+, - (++, +++)” Indicates that the people with this wayfinding style 10% (20%, 30%) more, or less, often (not) prefer short travel times compared to the average of the total population. “*,**” Indicates the difference is significant at 90% (95%) confidence interval.



Men have more
wayfinding abilities than
women

TRUE
 FALSE



Relations

	Low Orientation Ability	Average Orientation Ability	High Orientation Ability	
<i>female</i>		---**	---**	High Knowledge Gathering
<i>male</i>		+++**	+++**	
<i>female</i>	+++**	++**	---**	Average Knowledge Gathering
<i>male</i>	---**	--**	+++**	
<i>female</i>	+++**	+++*	---**	Low Knowledge Gathering
<i>male</i>	---**	---**	+++**	

“+, - (++, +++)” Indicates that the people with this wayfinding style 10% (20%, 30%) more, or less, often are male/female compared to the average of the total population. “*,**” Indicates the difference is significant at 90% (95%) confidence interval.



Findings & Impact

- Large study (1164 respondents)
 - Revealed data on 3 day mobility pattern with a representative population
 - Self-reported questions on wayfinding styles
- Operationalization of spatial knowledge and orientation styles into 9 wayfinding styles
 - Bike Only: low wayfinding abilities, most different from Car Only: not low wayfinding abilities
 - Knowledge gathering and exploration from low to high: suburban – (highly) urbanized – rural. But Chi-Square Test on wayfinding style is not significant.
 - Navigational preference for short travel time relates to higher orientation abilities, but lower knowledge gathering and exploration. What are the effective time savings of using travel information?
 - Strong effects on wayfinding styles for gender (and age), maybe we should control for the influence of gender.



Future directions

- Complete the conceptual framework
- Investigate behavioral adaptation of wayfinding styles based on (changes in) the urban environment
- Investigate relations with travel information preferences and desires
- Combine results with avoidance and attractions of urban elements
- Combine results with an index on the complexity of the tours on a day



Thank you

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