

Assessing the role of human factors in the willingness to use a shared automated service

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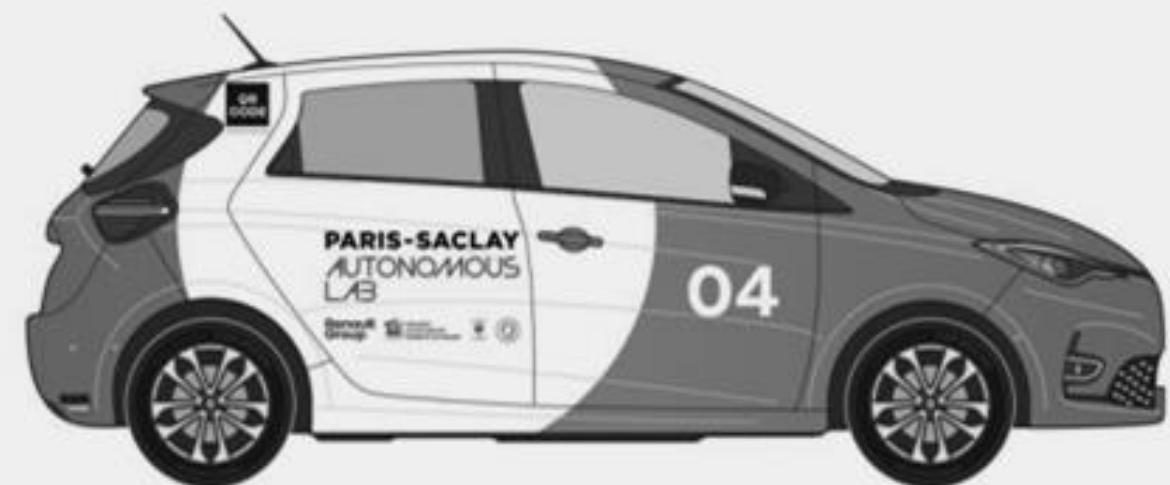
Introduction

- Importance of understanding the determinants that shape individuals' **willingness to use shared automated vehicles (SAV)**
- Considering **psychological constructs** from classical **Technology Acceptance Model (TAM)**
- Previous studies focus **only on direct effects**, and none have accounted the **effect of intention to explain the effect of the latent construct in the actual behavior** (see model framework below), as implied in the TAM.

→ **What are the psychological determinants of SAV adoption?**

Methodology

- March 2023: Online **Discrete Choice Experiment**
- Sample = **759** potential users of a **shared automated light vehicle on demand**



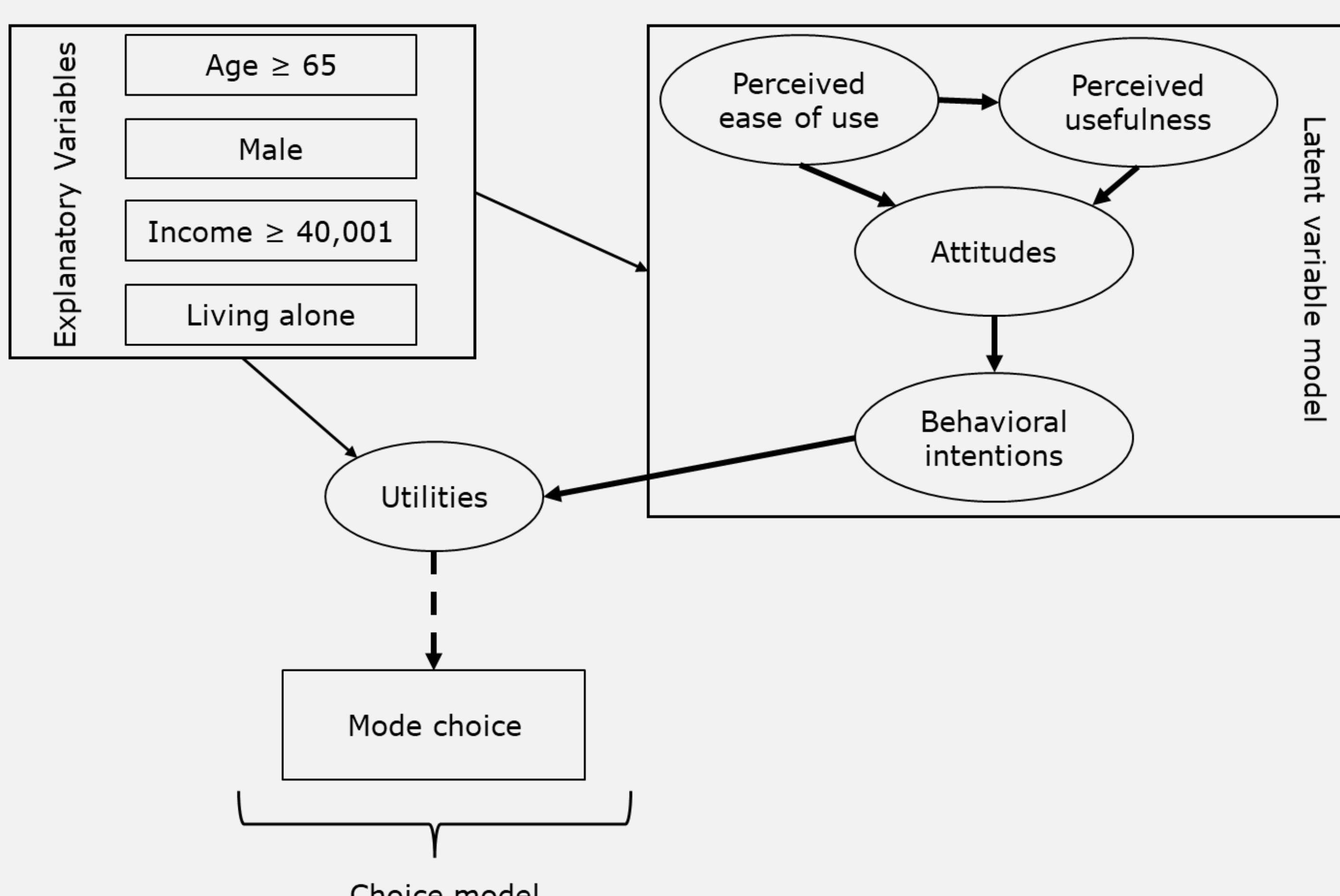
- Scenario:** commuting trip, located on **Paris-Saclay** plateau (15 kilometers)

- 4 modes** available described using **5 attributes**

Which of the following options do you choose to make this trip?

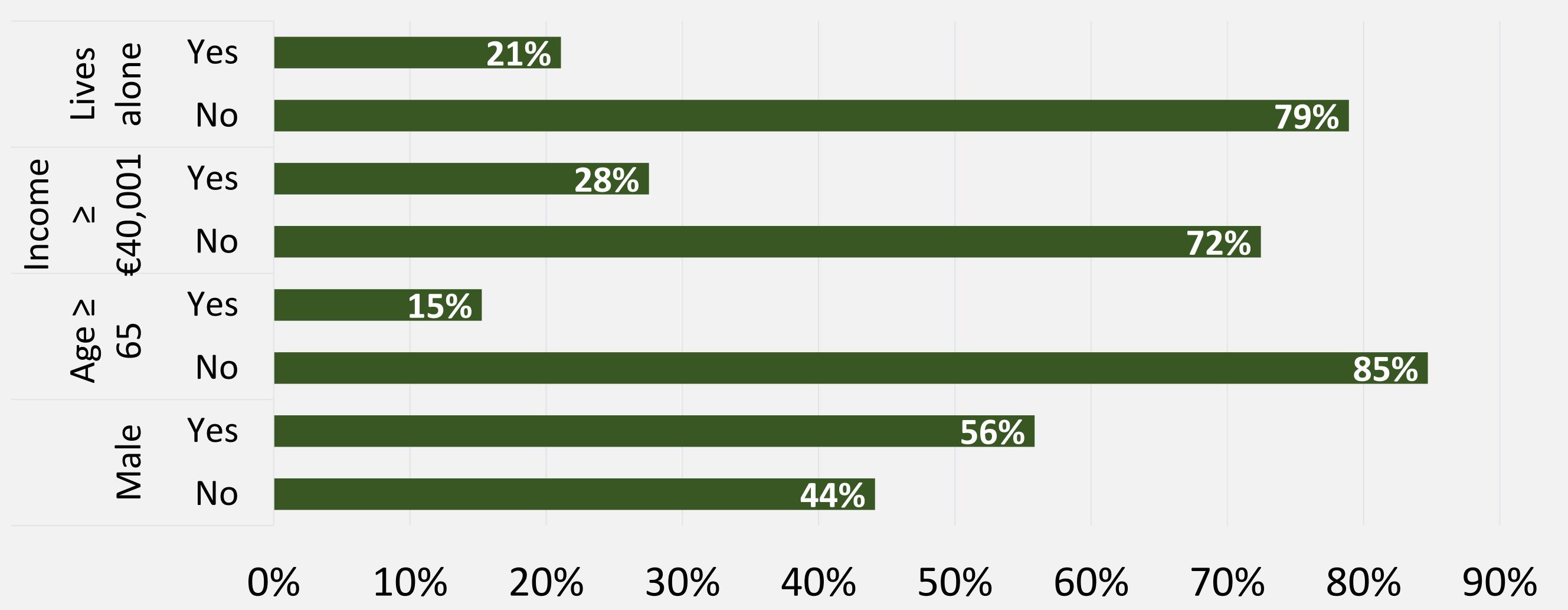
	Personal car	Automated light vehicle on demand	Bus	Bike
Shared	--	No	Yes	--
Steward	--	No	Driver	--
Waiting time	--	3 min	15 min	--
Travel time	30 min	18 min	1h15	35 min
Travel cost	7 €	10 €	4 €	0 €
Your choice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Model framework:** Hybrid choice model explaining mode choice
- Psychological indicators: Likert scales ranging from 1 (strongly disagree) to 6 (strongly agree)
- Behavioral intentions:** "I intend to use an automated vehicle."
- Perceived ease of use:** "I'll quickly learn to operate an automated vehicle."
- Perceived usefulness:** "An automated vehicle will enable me to get around safely."
- Attitudes:** "An automated vehicle will make my commute more enjoyable."

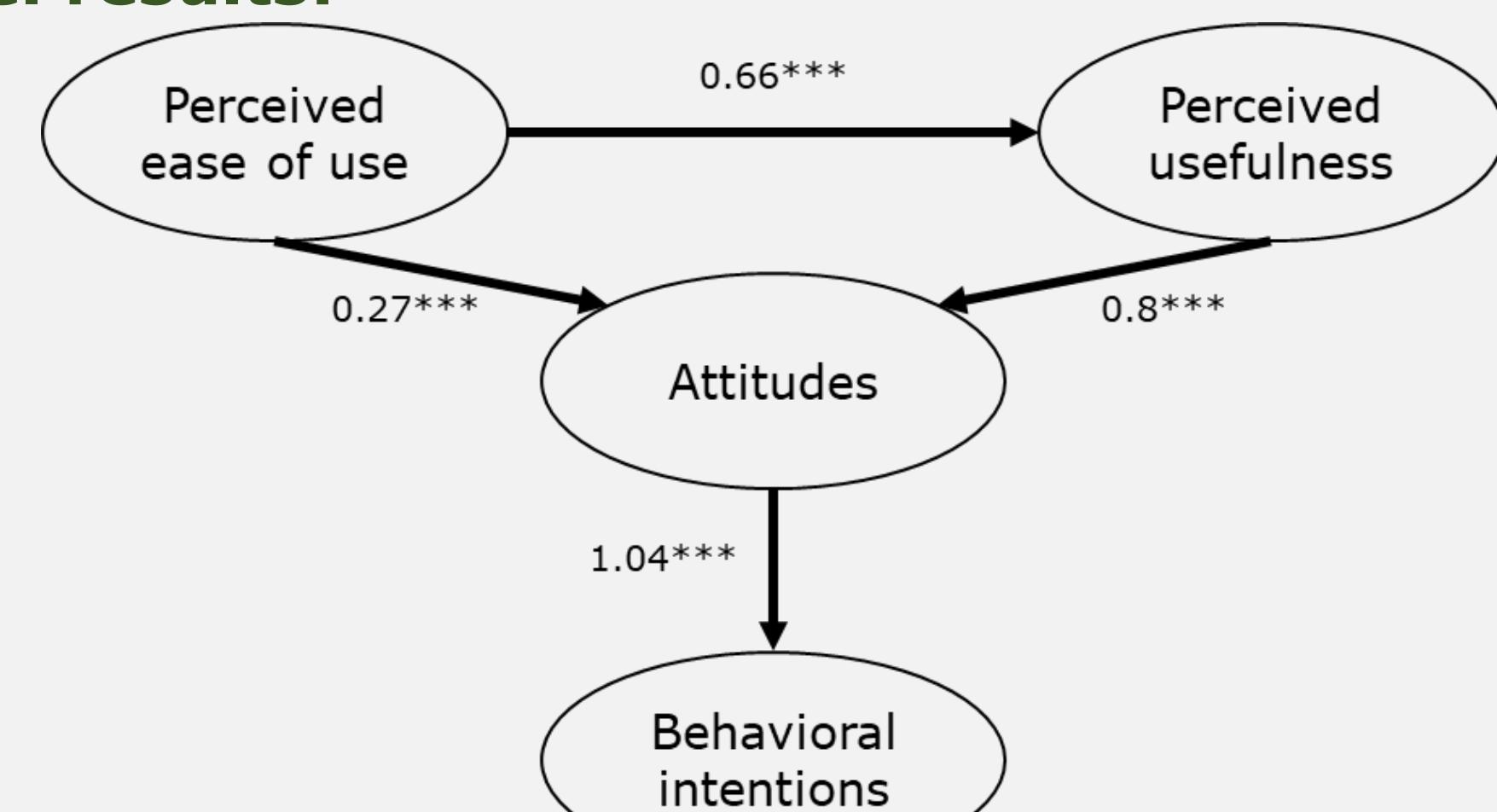


Results

Descriptive statistics



Latent model results:



Choice model results:

Intentions → SAV choice	↑ intention to use SAV ↑ likelihood of choosing SAV vs. E-Bike (0.22***)
Cost sensitivity	All modes ↓ preference with higher cost (***) SAV most cost-sensitive : Bus = -0.21, Car = -0.3, SAV = -0.46 Income ↓ cost-sensitivity for SAV only
Time sensitivity	All modes ↓ preference with longer time. SAV most time-sensitive : E-Bike = -0.07, Bus = -0.04, Car = -0.04, SAV = -0.09
Waiting time	Bus waiting time ↓ preference (-0.03**) SAV waiting time not significant
Socio-demographics	Income : prefer E-biking (less likely to pick other modes) ↑Age (65+) : prefer motorized modes over biking

Willingness to pay

Value Of Time (€/hour)	
Bus	12.3
Car	8.1
SAV	12.3
Value of Waiting Time (€/hour)	
Bus	7.3
SAV	0.5 (not significant)

Notes: Electric bike as a reference mode, *p-value < 0.05 ; **p-value < 0.01 ; ***p-value < 0.001

Conclusion

- Importance of **accounting for unobservable psychological factors** when dealing with SAV adoption
- Promote positive attitudes and perceptions** to have stronger behavioral intentions/acceptability to use SAV (e.g., campaigns highlighting safety, reliability, and convenience)
- Reduce price/time sensitivity for SAV** : Flexible pricing, combined SAV-bus tickets, promoting SAVs as productive (e.g., "work while you ride"), enhance multimodal integration (Bus and save have similar Value of Time)
- Future studies** should extend mode choice analyses by integrating more comprehensive technology acceptance frameworks and collecting larger, more representative samples.