Motivating the Use of Real-time Multimodal Travel Planners: the Role of Users Value, Technophile and Community Resilience

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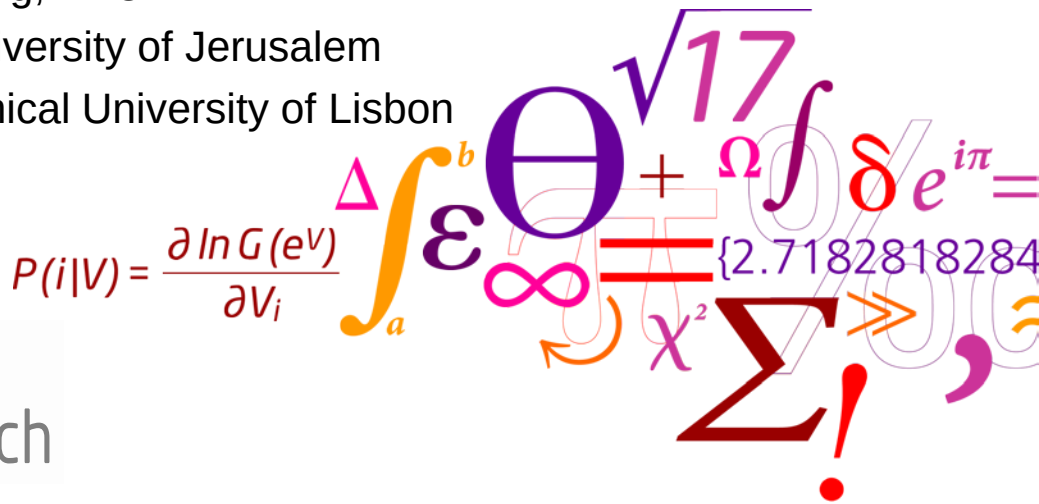
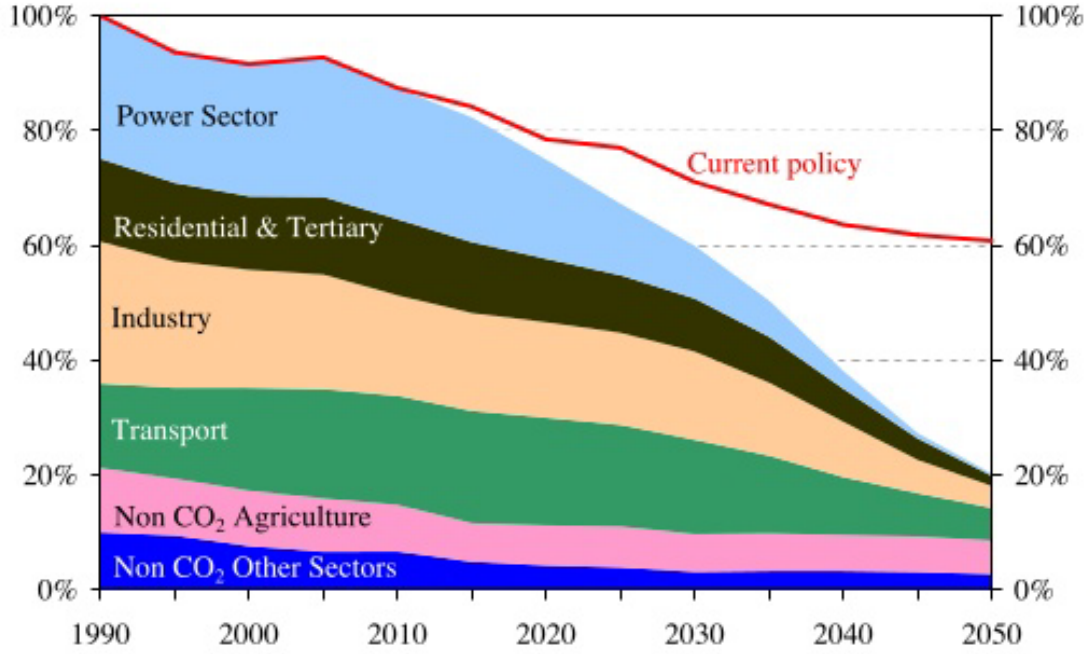


Transport DTU

Centre for Transport Research

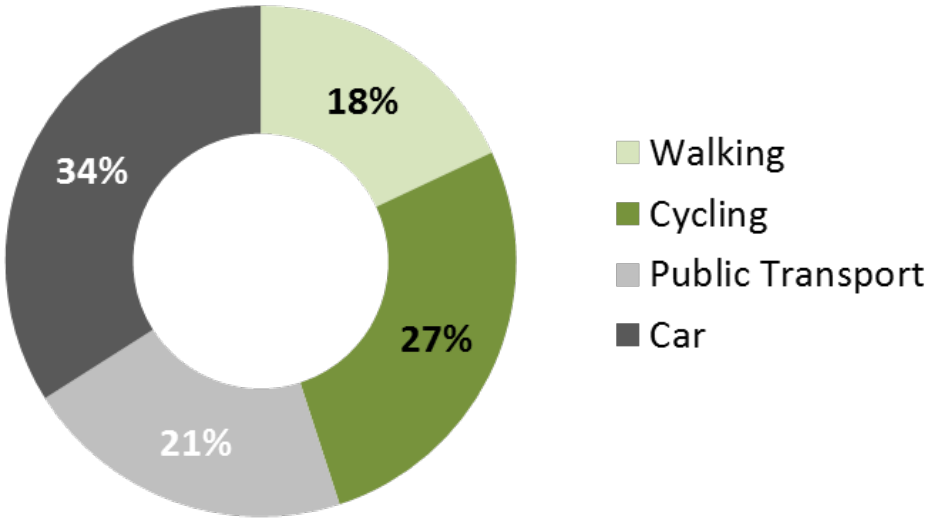
EU Roadmap for moving to a low carbon economy in 2050



- The transport sector: 60% reduction
- Towards means of travel that use less energy
- Establish a framework for multimodal transport information system
- Promote awareness of more environmental friendly modes
- Great expectation from the system to influence travel choices

Case study: Copenhagen

- CPH 2025 Climate Plan: the First CO2 Neutral City by 2025
- A number of major goals for mobility in 2025 are:
  - 75% of all trips are by active modes or public transport
  - 50% of all trips to work or education are by active modes
  - 20% more passengers use public transport
- **Better Travel information system!**

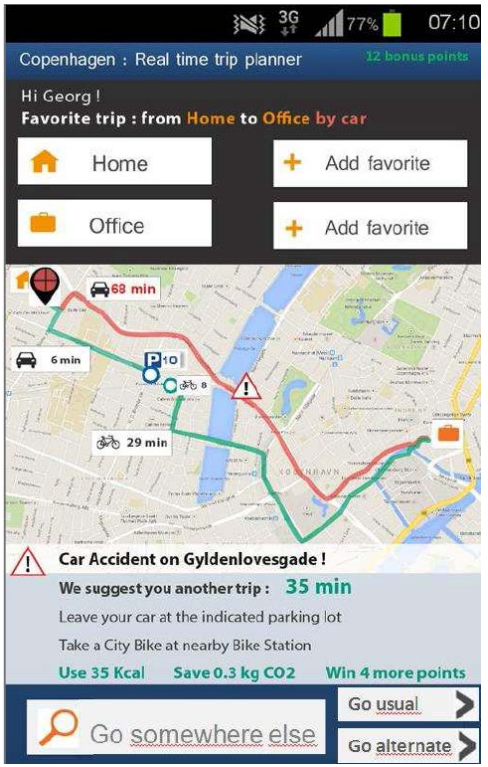


Research Question

- How information influences travel behavior?
  - Weak effect of information on individual travel behavior
  - Strong habitual mobility behavior
  - Biased search in favor of existing habits
  - Limited search for information on alternative options
- How to make information more effective?
  - Persuasive strategies
    - Self-monitoring
    - Challenges & goal setting
    - Social comparison
    - Personalized messages
    - Gamification
    - Rewards

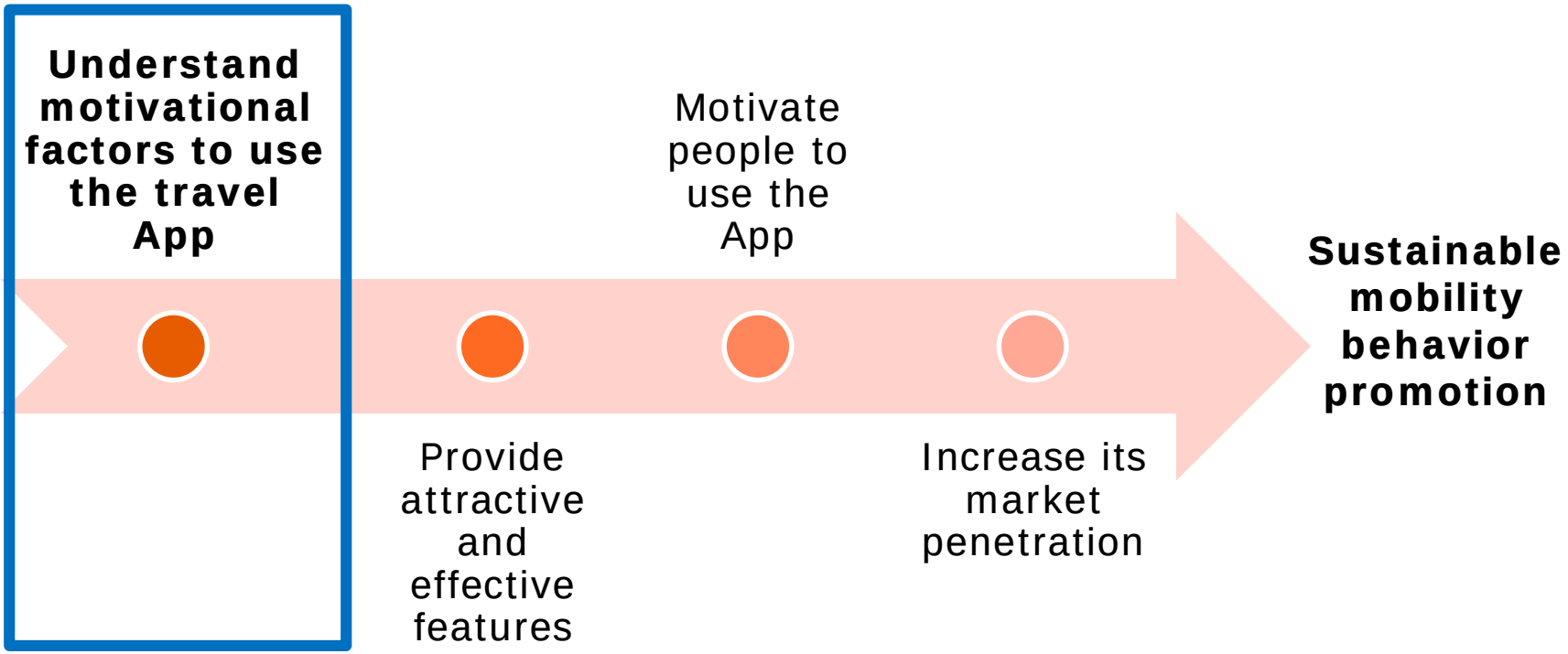
Advanced Real-time Multi Modal Information System

- It is under investigation
- Multi-modal information system
- Travel App
- General functionalities:
  - Travel time and cost of travel options
  - Navigation app
  - Traffic disruption alerts and proposed alternative routes
  - CO2 emissions information
  - Parking space, availability, booking and payment
  - Shared E/normal bike availability, booking and payment
  - Carpooling opportunities
- Persuasive features:
  - Tracking CO2 emission saved/produced over time
  - Tracking calories burnt by using active modes over time
  - Eco-points collection
  - Sharing trip information on social media



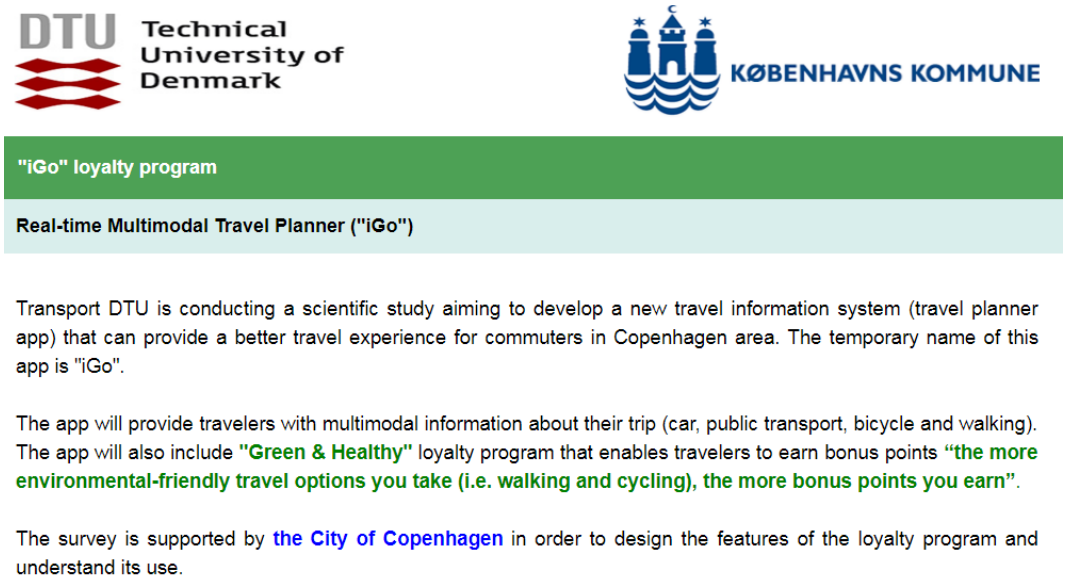
Research objectives

Seek first to understand, then to be understood



Data collection and analysis method

- Web-based survey among commuters in the Greater Copenhagen Area
- Attitudinal variables plus Individual attributes (e.g. gender, age, family status,income, travel habit etc.)
- 987 participants in total
- 822 completed responses (83%)
- Structural Equation Model (SEM)



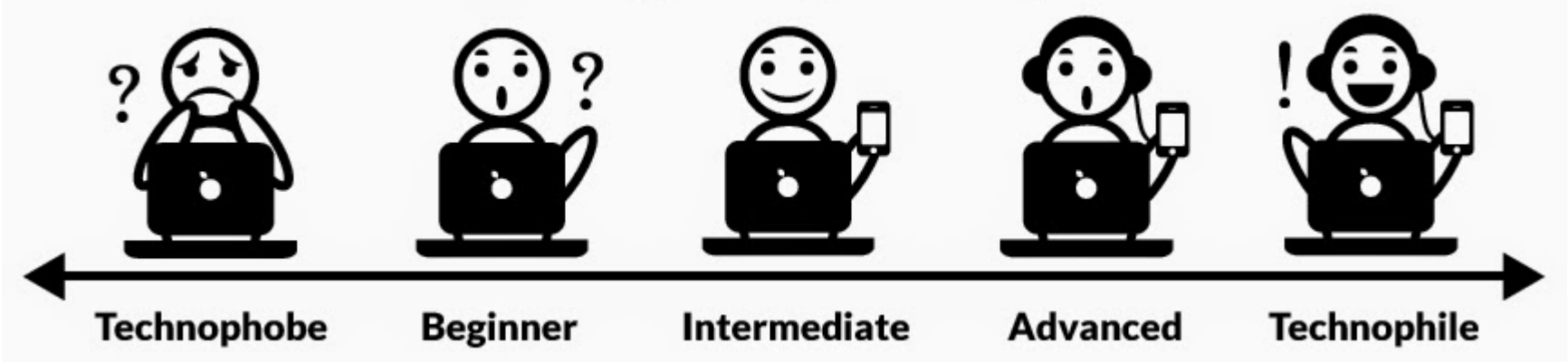
Conceptual framework:
First group of independant variables

- Goal-frame theory
- Functional motives:
  - Time savings for traveling & searching
  - Effort savings for searching information
  - Travel cost savings
- Hedonic motives:
  - Enjoyment
  - Gaining social acceptance by sharing information
- Normative motive:
  - Eco-friendly travel behavior
  - Healthy travel
  - Contribution to the city CO2 reduction

Conceptual framework:
Second group of independant variables

- Thechnophile attitude

Technophilia refers to “a person’s openness, interest in and competence with (innovative) technologies”



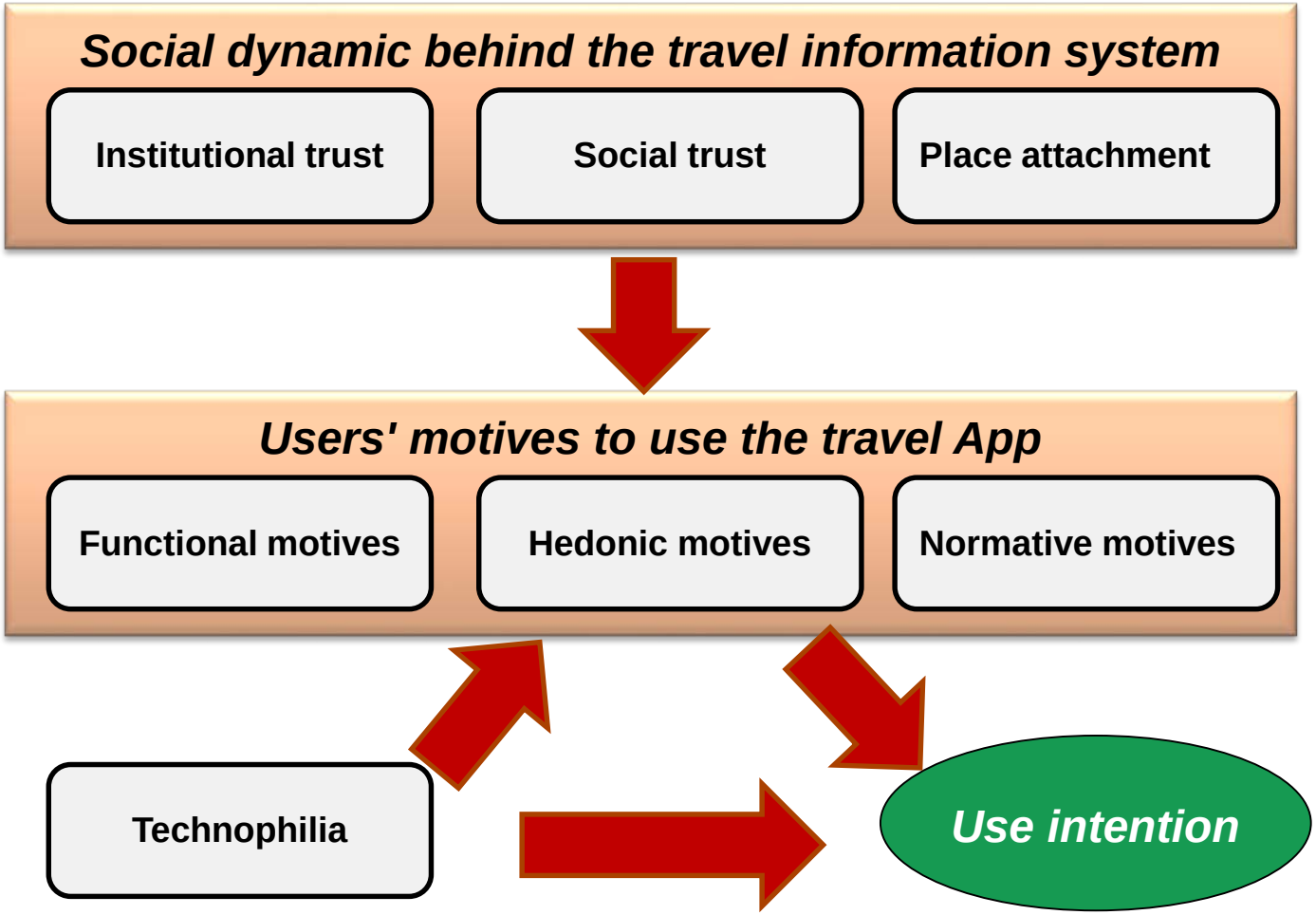
Conceptual framework:
Third group of independant variables

- There is a social dynamic behind the information system.
- Community Resilience
- Institutional trust :
  - Trust in institutions and organizations operating transport systems in a sustainable manner
- Social trust:
  - Trust in other members of the community to pursue the common goal of the city
- Place attachment:
  - Individuals willingness and support to engage in transport related projects and local issues

Conceptual framework:
Dependant variable

- Use intention which is the intention to use the new travel app in 4 different situations
  - For daily use/adoption intention
  - Active trip making (e.g. Spontanious trip making, Trips to unfamiliar places)
  - Proactive trip making (e.g. Receiving short notice/info about traffic disruptions, Long-distance trips (over 100 km), Wayfinding at night)
  - Multi modal trip (e.g. Looking for public transport schedule, Having efficient multiple trips when switching transport mode or connection)

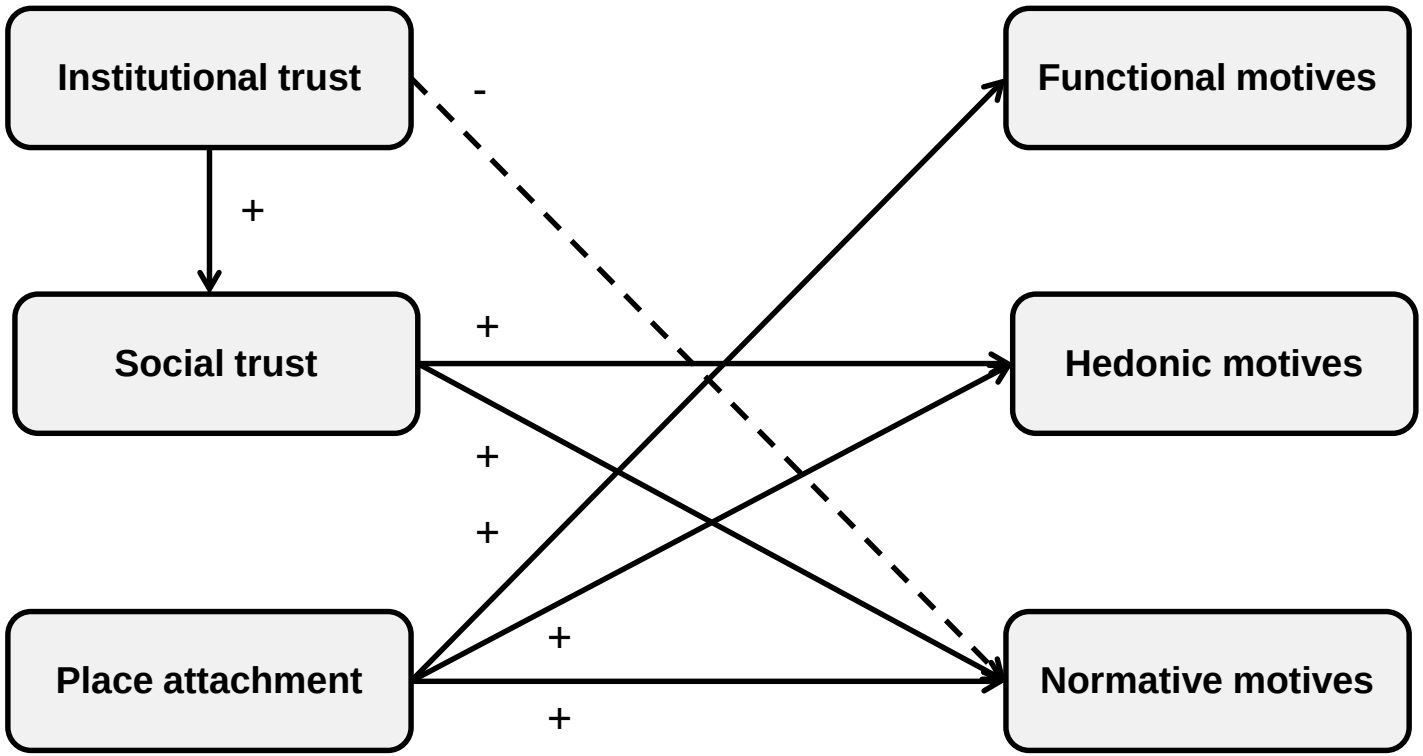
Conceptual framework



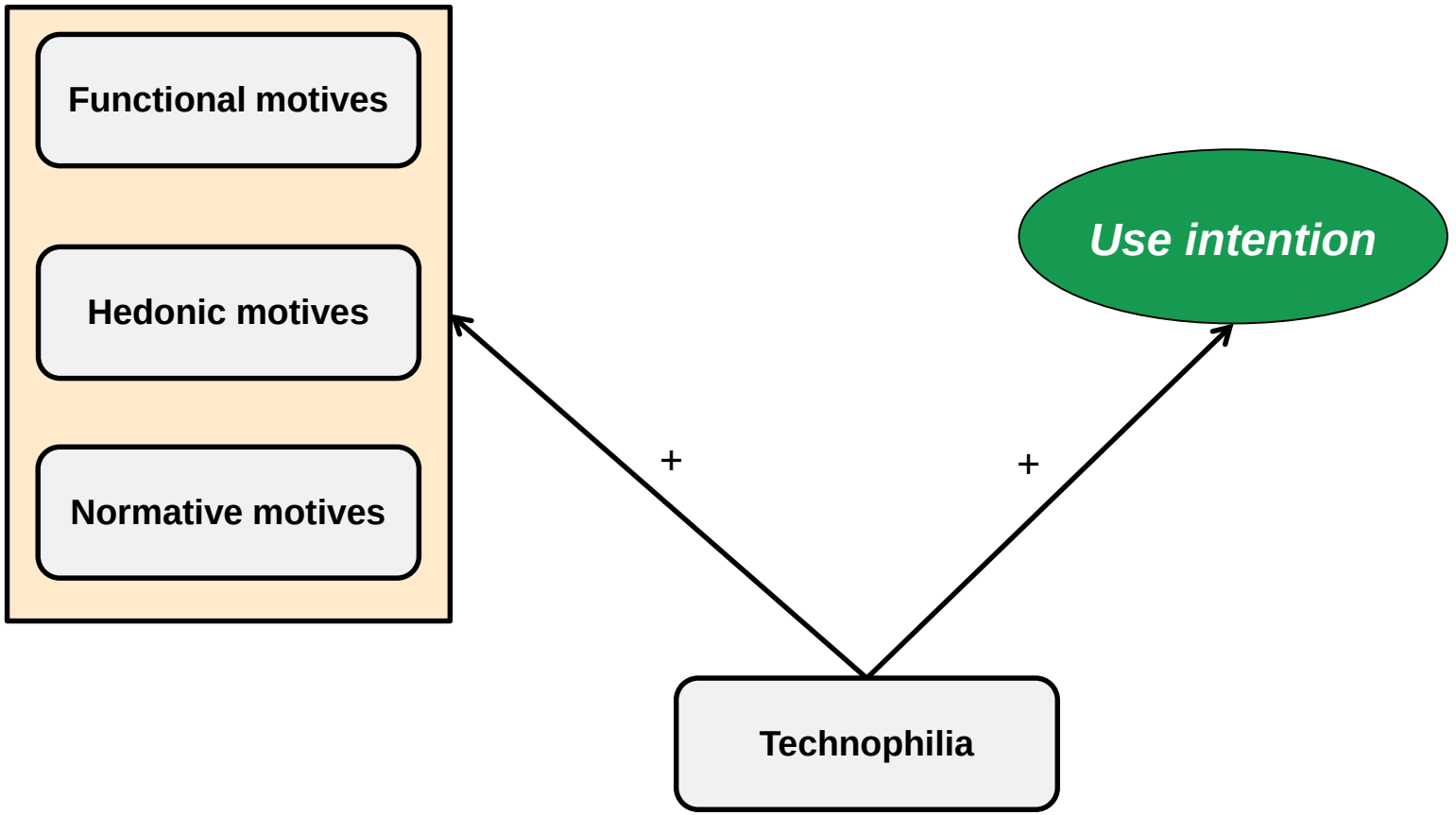
Results

Goodness of fit indices:

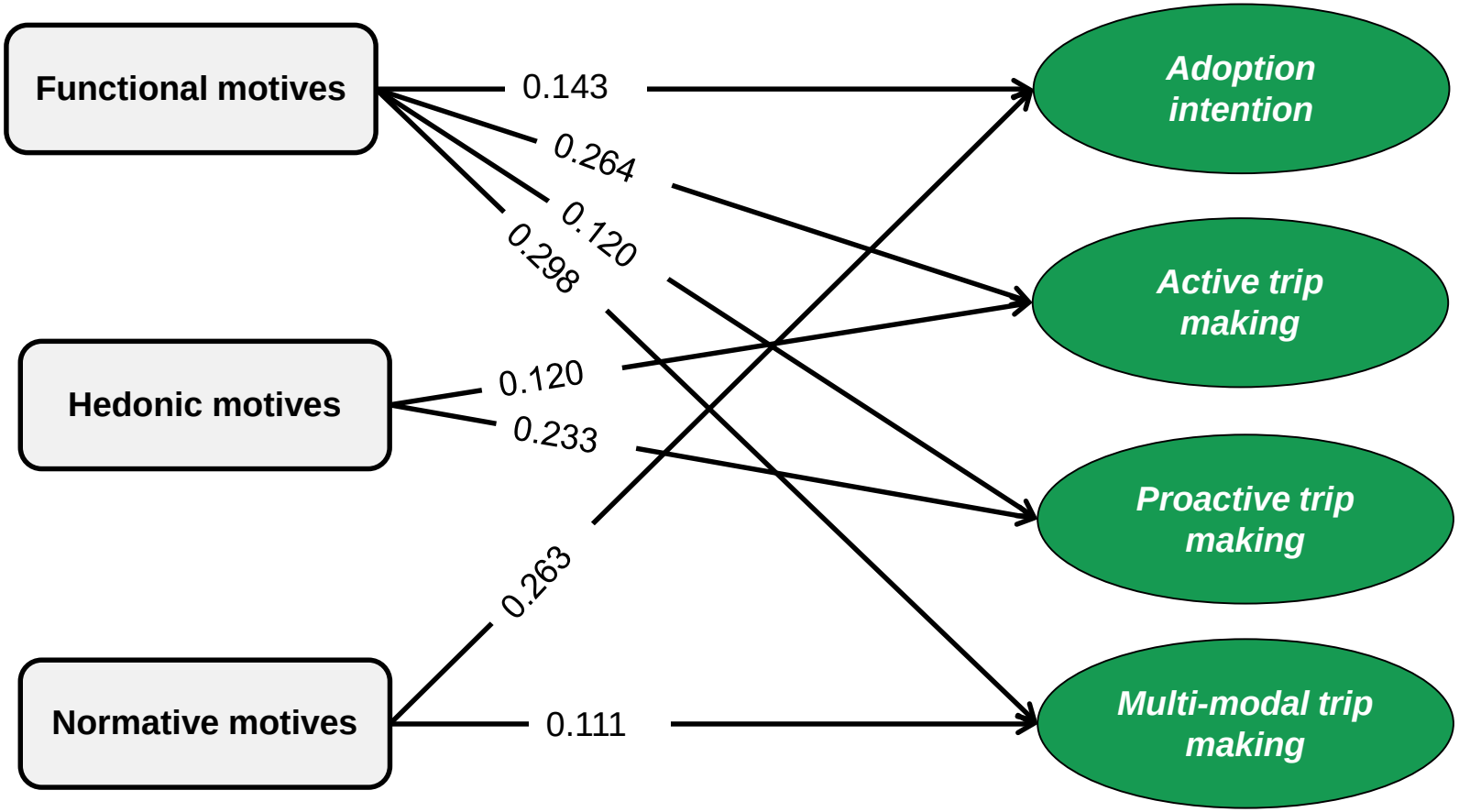
No.of cases	*822*
CFI	*0.926*
RMSEA	*0.044*
SRMR	*0.076*



Results

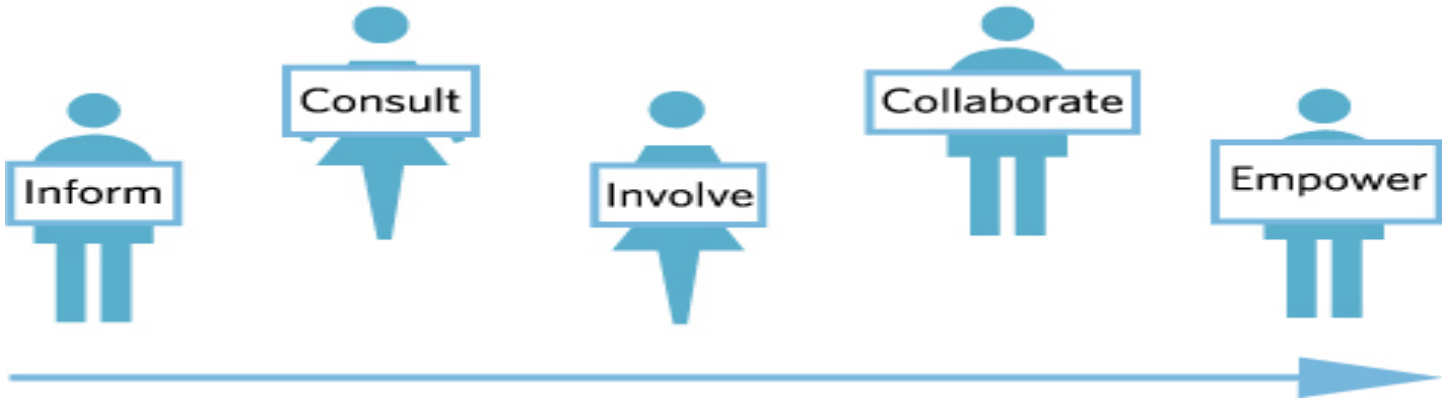

Functional motives
Hedonic motives
Normative motives
Use intention
+
+
Technophilia

Results


Functional motives
Hedonic motives
Normative motives
0.143
0.264
0.120
0.298
0.120
0.233
0.263
0.111
Adoption intention
Active trip making
Proactive trip making
Multi-modal trip making

Conclusion

- Functional usefulness as the fundamental value in adopting the travel app
- Addressing the needs of both Technophiles and Technophobes
- Public engagement as the key to achieve the goals of the system implementation



Thank you!
We appreciate your comments and questions

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Somehow I don't think we're doing this right...

Appendix

- With respect to goal-framing theory, respondents were asked the question how using the new travel app can help/enable them to achieve different travel-related goals. (5-point Likert scale ranging from strongly disagree to strongly agree)

Factor name	Item
Functional motives (F1)	reduce my travel time
	be on time
	pay less for daily transport
	choose my travel mode according to the departure/ arrival time
	be faster and more efficient trip
	get customized information about my preferred trips
	get cost information for each suggested trip
	get pop-ups with alternative travel modes/ routes, when there is disruption
	reduce time spend and difficulty for travel information search
	arrive on-time
Hedonic motives (F2)	be rewarded with bonus points for eco-friendly behavior
	monitor amount of calories burnt while travelling
	share information with other users
	share my saved CO2 emissions due to my eco-friendly behavior on social media
Normative motives (F3)	use more public transport
	cycle more
	make healthier choices
	reduce the CO2 level and air pollution in Copenhagen area

Appendix

- Technophilia and community resilience were measured using the 5-point Likert scale ranging from strongly disagree to strongly agree.

Factor name	Item
Technophilia (F4)	I usually like to install interesting new apps
	I regularly use apps for payments, reservations, errands etc.
	I am enthusiastic about GPS and travel apps
	I think it is exciting to try new apps
Institutional trust (F5)	I have trust in information provided by the public transport authority
	I have faith in the authorities to lead a sustainable transport vision for my city
	In Copenhagen area, appropriate attention is given to traveler's needs
	The residents are informed about the future vision of the city
	The transport system of my city is well-organized to be sustainable
	The current transport infrastructure and policy support a sustainable future
Social trust (F6)	I can count on people in my city to travel in an environmentally sustainable manner
	I trust that Copenhageners are willing to contribute to assure a sustainable future
	I believe that environmental concerns are shared among all the residents in my city
Place attachment (F7)	Participating in transport-related test projects in my city is important to me
	Knowing more about new travel apps in my city is important to me
	Knowing more about how to make my city sustainable is important to me