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FACTORS AFFECTING THE INTENTION TOWARDS ACTIVE MOBILITY IN COMMUTING:
A DUAL STUDY FOR THE CAPITAL REGION OF DENMARK

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Abstract

Purpose

Transportation greatly impacts the environment and cities' livability. To tackle the consequences, many cities have embarked on active mobility strategies, by promoting cycling and walking as a transport mode also in combination with public transport to facilitate longer distances. Nonetheless, a wide adoption of active mobility has not been achieved yet, even in mature active mobility cultures. This research aimed to identify the factors affecting citizens' intention to adopt active mobility in commuting.

Method

The Capital Region of Denmark constituted the study context due to its mature active mobility culture alongside its rising population and passenger cars' stock. Based on an extended theory of planned behavior, a dual study was implemented. Firstly, interviews with five mobility experts were conducted to get their views and forecasts on the factors derived from the literature, but also identify new potentially influential factors. Secondly, after assimilating the interviews' results into a final research model, this was tested via an online survey among 151 citizens living in the Capital Region of Denmark whose commuting purpose was either working or studying.

Findings

During interviews, experts acknowledged the theory's original three variables, that is, attitude, subjective norms, and perceived behavioral control, as predictors of intention, and generally agreed on the predictability of the initial research model. Additionally, they contributed to it with four new variables. In the survey followed, the theory's three original variables were also confirmed as determinants of intention. Also, the perception of availability and quality of infrastructure and climate change knowledge were acknowledged as predictors of attitude and cycling culture of subjective norms. All other variables leading to the three original ones as well as habit leading to intention, were rejected.

Conclusion

An alignment between available literature and this research's findings is observed as for the predictability of attitude, subjective norms and perceived behavioral control, with that underscoring the suitability of the theory of planned behavior in behavioral transport studies. Additionally, the acknowledgement of the three other factors as determinants of attitude and subjective norms underlines the importance of beliefs. Practically, communication strategies run by municipalities should consider the environment and cycling culture as communication angles, while investment in infrastructure could be important. Follow up research could test the research model in other mature and less mature active mobility contexts to identify commonalities and differences, while the addition of behavior could shed light on the factors' effect on people's actual behavior. Further research on climate change knowledge's and cycling culture's influence would be valuable.

Keywords: active mobility, commuting, Denmark, theory of planned behavior

Contents

1. Introduction

Transportation constitutes an integral element of cities' development and liveability. Transport systems offer necessary mobility choices for individuals and goods, but also affect development and economic activity levels of cities (Aljoufie et al., 2011). The last century's focus on motorized transport (Hrelja & Rye, 2022), magnified the road infrastructure's dominance within the cities, at times reaching over 50% of public space (EIT Urban Mobility, 2021). As for pollution, transport is categorized among the most polluting industries (Jain & Tiwari, 2016; Koszowski et al., 2019; Mat Yazid et al., 2011). The European Commission, (n.d.) reports that passenger cars and light commercial vehicles are jointly responsible for the 14.5% of total European Union's (EU) emissions of carbon dioxide (CO2) in road transport. That consequently detains climate neutrality in EU by 2050 (European Commission, n.d.) and raises climate change and health problems related to air pollution as emerging concerns (Advancing Public Transport, 2020). On top of that, future cities are threatened by urbanization and population growth, with that consequently bringing more private motorized vehicles within them. Two out of every three people will likely be living in cities or other metropolitan areas by 2050 (Advancing Public Transport, 2020; UN News, 2018), increasing the demand on mobility (Advancing Public Transport, 2020).

In response to these problems, various initiatives and actions have been taken. Noteworthy is the "White Paper in Transport" of 2011 regarding EU's transport policies which aims to 60% reduction of transport emissions by 2050 via 40 tangible goals (European Commission Directorate General for Mobility and Transport, 2011). Additionally, the European Commission set a no less than 55% net decrease in greenhouse gas emissions by 2030, including law-making for the use of transport (European Commission, n.d.). On top of these, the most recent commitment of 100 EU cities to target carbon neutrality by 2030 (Krogh Andersen & Jordan, 2020), seems unachievable without addressing transportation issues. Notwithstanding these initiatives, a substantial margin for higher active mobility levels is observed, even in counties with a mature "cycling culture" (Pisoni et al., 2022). Active mobility is defined as "utilizing walking and cycling for single trips or within a trip in combination with public transport" (De Vos, 2018, p.2; Koszowski et al., 2019, p.150; Müller & Meyer, 2018, p.2) if necessary, with 400 meters constituting a reasonable minimum walking distance to be considered as active mobility (Wigan, 1995). When combined with public transport, it can meet practically all mobility needs and therefore increased active mobility can reduce the negative consequences private motorized vehicles convey, particularly in cities (Müller & Meyer, 2018). Considering the several mobility plans having already been made and the growing focus on the need of sustainable transport modes, such as active mobility, to tackle air pollution and urbanization, the research question of this study is formulated as follows:

"What are the factors affecting citizens to adopt the use of active mobility in commuting?"

In light of the research question, the Capital Region of Denmark was selected for the study context. Denmark is one of the countries confronting urbanization, with the Capital Region needing to cope with a significant population increase, which will evoke transport demand and traffic congestion via 20% more journeys by 2035 (Region Hovedstaden et al., 2019). Although motorists have been proved more hesitant to shift to sustainable transport means over the years compared to cyclists and public transport users in Denmark, investment in cycling infrastructure and public transport alongside grassroots policy making should continue (Rich, 2022). Next to the population growth, Capital Region is confronted with a gradual rise of the passenger cars' stock (Statistics Denmark, n.d.). Nonetheless, Copenhagen possesses high walking (Kodukula et al., 2018) and cycling levels (Kodukula et al., 2018; Pisoni et al., 2022), and aspires to have reached 50% cycling shares in commuting by 2050 (City of Copenhagen,

2011). Considering its mobility challenge, Capital Region was considered the suitable study context to investigate the adoption of active mobility in commuting. Copenhagen's cycling culture (Pisoni et al., 2022) strengthened further the scientific interest to detect the factors affecting citizens to use active mobility in commuting in a region, where the infrastructure needed is available. From a practical standpoint, the findings can be especially helpful to future cities since more and more of them will need to tackle the surge in individual car use by encouraging inhabitants to make the shift. Lastly, to answer the research question two studies were conducted. Based on literature-based factors, an initial research model was developed and discussed with mobility experts as part of study 1. Study 1 aimed to gather experts' feedback and predictions on the level of influence of the literature-based factors as well as views on potential new ones. Data gathered in study 1 were used for a final research model used in study 2 among citizens of the Capital Region.

2. Theoretical framework

In this research, an extended version of the theory of planned behavior (TPB) was used. Based on a research in the available literature, next to the three original variables of TPB explained below, seven more were added to the initial research model presented in this section. The rationale for their selection and hypotheses' development are presented below.

2.1 Theory of planned behavior

TPB was introduced by Ajzen (1991) and states that intention towards a certain behavior can be explained by attitude toward the behavior, subjective norms, and perceived behavioral control (PBC). More specifically, attitude is defined as a personal "favorable or unfavorable evaluation or appraisal of the behavior in question" (Ajzen, 1991, p.21), a tendency to react positively or negatively "to an object, person, institution, or event" (D'Souza et al., 2022, p.2). Subjective norms are defined as "the perceived social pressure to perform or not perform the behavior" (Ajzen, 1991, p.10). PBC is defined as "the perceived ease or difficulty of performing the behavior" (p.10), while intention is defined as "an individual's intention to perform a given behavior" (Ajzen, 1991, p.3). These intentions, along with PBC, explain a significant variance in real behavior (see Figure 1). In addition, TPB encompasses the role of salient beliefs in human behaviors, which are named behavioral, normative, and control ones and influence attitudes, subjective norms, and PBC, respectively (Ajzen, 1991). TPB is one of the most commonly employed theoretical frameworks within social and behavioral sciences (Zhao & Gao, 2022) and has been particularly applied in transport studies (Neto et al., 2020; Nguyen-Phuoc et al., 2022; Zhao & Gao, 2022). Therefore, it was also selected as this study's theoretical framework.

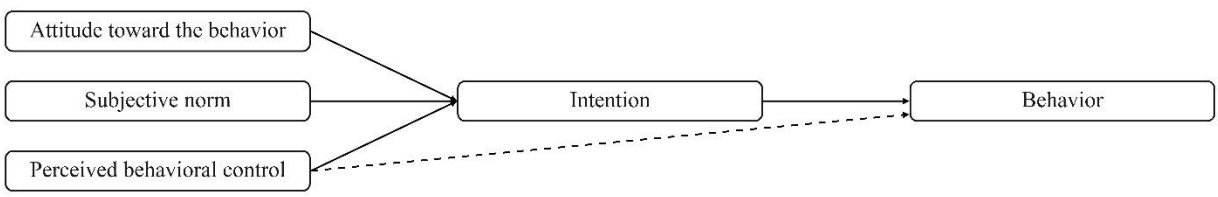

Figure 1

Theory of planned behavior

By focusing on intention and determining the "intention to adopt active mobility in commuting" as this study's dependent variable (DV), the hypotheses for the TPB original variables are formulated below.

To begin with, attitude can play an influential role in people's intention to use active mobility as it is widely acknowledged that attitude has an impact on decision-making (Atasoy et al., 2012). Specifically, by combining the three-stage version of the transtheoretical model of change and TPB, Warner et al. (2021) found that attitudes can adequately affect people's choices of transport means. The construct was measured towards all transport modes on a seven-point scale (1 = bad to 7 = good) by the item *"for me to travel all or part of the journey to work or school by bicycle/public transport/car at least twice a week over the next 3 months would be"*. Similarly, Bird et al. (2018) indicated an attitude's favorable effect on the amount of time spent for walking as a transport mode in the municipalities of Cardiff, Kenilworth and Southampton in the United Kingdom (UK). Moreover, Chen and Chao (2011) found that attitudes positively influenced private vehicle users in Kaohsiung City in Taiwan regarding switching intentions to public transit. Following the aforementioned, the first hypothesis of the research was developed.

H1: Attitude positively influences citizens' intentions towards active mobility in commuting.

Additionally, Donald et al. (2014) found that commuters' subjective norms were a contributing factor to the prediction of intentions of owned car and public transportation use in the South and North England, by directly measuring the construct's influence with two items for each transport mode (e.g., *most people think it's OK for me to drive to work*). Similarly, Nguyen-Phuoc et al. (2022) showed that this construct positively influences passengers' intention to employ on demand shared ride-hailing services in Vietnam. In line with these findings, subjective norms were demonstrated to positively influence citizens' intention towards public transit travel in Beijing in the post-pandemic era (Zhao & Gao, 2022). In the context of reinforcing sustainable mobility in China, Si et al. (2020) found subjective norms as a strong predictor towards users' intention on using dockless bike sharing (DBS) sustainably. In view of the aforementioned, the second hypothesis was proposed.
H2: Subjective norms positively influence citizens' intentions towards active mobility in commuting.

Dütschke et al. (2022) found that PBC constitutes a significant factor influencing individuals' owning a driver license future intentions on personal use of more or less sustainable transportation means for everyday and long-distance leisure transport, in Germany. Likewise, PBC was indicated as an influential factor regarding people's willingness to cycle in four municipalities of three Swedish counties (Forward, 2014). For habit's measurement, Forward (2014) used the item *"my choice of transport during this part of the year is more or less automatic"* from the Self-Report Habit Index in an uneven 7-point Likert scale (1 = strongly agree to 7 = strongly disagree). Additionally, habit was demonstrated as a stronger predictor of public transport compared to private car use in North and South England (Donald et al., 2014). In the same vein, Shukri et al. (2022) found that PBC significantly predicts Malaysian drivers' intention to avoid traffic violations when commuting to/from work. Considering these, the third hypothesis was formed.

H3: Perceived behavioral control positively influences citizens' intentions towards active mobility in commuting.

2.2 The role of beliefs and habit

Based on literature research, six independent variables in the form of behavioral beliefs and habit were added to the research model. As for the former six it was aimed to identify whether these affect

people's attitudes on active mobility in commuting and thus were assumed to influence attitude. As for habit, this was assumed to directly influence intention. The rationale behind the selection of every variable is being discussed below.

As a first belief, perceived time was added and refers to the time an individual perceives commuting with the use of a specific transport mode takes and differs from the actual time spent. As cited by Miura and Nishinari (2017), a study on public transportation indicated that car drivers perceive time spent on public transportation longer than the actual time it takes, with that underlining the difficulty of shifting to public transport mode. In another sustainable behavior context, Bruno et al. (2022) measured perceived time risks regarding time and effort spent needed for an individual to learn and perform recycling tasks. In the mobility context, people might perceive different time risks for different transport modes in commuting by ignoring the actual time they take with that impacting their attitudes on the mobility choices available. Therefore, the fourth hypothesis was formulated.

H4: Perceived time negatively influences citizens' attitudes.

As a second belief, in consumer behavior subjective price differs from the actual cost, as it is the personally meaningful value consumers ascribe to a service via contrasting their experience with it and its cost, with the result of contrast indicating the possibility of repurchasing (Nguyen-Phuoc et al., 2022). That is in line with the literature indicating price as the economic dimension of perceived value (Yuen et al., 2018). In active mobility, subjective price refers to the extent people perceive that the cost of active mobility is worth and consequently their attitude towards such transportation is affected. Therefore, the fifth hypothesis was formed, while for higher convenience the variable was named perceived cost.

H5: Perceived cost negatively influences citizens' attitudes.

What is more, comfort is described as a multidimensional concept taking into account "the availability and/or quality of infrastructure, such as seats or cleanliness" (Bouscasse & de Lapparent, 2019, p.2), with weather being assumed as an exemplary factor related to cleanliness. As also stated by the authors, absence of comfort in trains in the Rhône-Alpes region in France contributed to increased cars' market share (Bouscasse & de Lapparent, 2019). Moreover, Lyu and Forsyth (2021) indicated that individuals with favorable attitudes towards transportation conditions, such as perceiving walking around the city as generally convenient, walked more. Additionally, by studying people's comfort in urban settings in Adelaide, South Australia, Bennetts et al. (2017), found that participants did not feel comfortable when connectivity between pedestrian routes was not sufficient. Thus, their perceived comfort towards walking was low. Therefore, the sixth hypothesis was proposed.

H6: Perceived comfort positively influences citizens' attitudes.

Active mobility also constitutes a proper way to contribute to physical activity (Gerike et al., 2016), as it can convey diverse positive health results (Clark & Stigell, 2017), with people walking or cycling at least once per week being aligned with physical activity recommendations (Bopp et al., 2013). Additionally, as cited by Cornet et al. (2021) cycling and walking are rated high in physical and mental health compared to private cars or public transport and can provide various health benefits even when performed within transit time. More specifically, noncommunicable diseases (NCDs), such as diabetes and cancer, as well as their risk factors like obesity, can be prevented by active mobility (World Health Organization, 2021). Notably, the pharmaceutical company Novo Nordisk acknowledged the association of urbanization and peoples' way of commuting within cities with diabetes type 2 and developed the "Cities changing diabetes" programme aiming to tackle urban diabetes (Novo Nordisk, n.d.). Furthermore, health benefits for pedestrians and cyclists are extended to lower exposures to motorised

vehicle emissions, as they are in a longer distance from emissions compared to the motorised vehicle drivers (De Vos, 2018). Considering the aforementioned, the seventh hypothesis was developed.

H7: Perceived health benefits positively influence citizens' attitudes.

Furthermore, Lyu and Forsyth (2021) found that perceived safety regarding the streets was resulting in longer walking times as a transport mode for a weekday in the Chinese city, Chengdu. In addition to this, Basu et al. (2022) observed differences in perceived safety among genders and age ranges, depending on residential, commercial, recreational, mixed land use, and vacant areas. Moreover, Müggenburg et al. (2022) indicated that less cars in the roads may contribute to increased perceived safety in the German city, Offenbach am Main. Additionally, as cited by De Vos (2018), although walking and cycling are considered riskier than driving a motorized vehicle per kilometer, cycling seems significantly safer in countries with a high number of cyclists, such as the Netherlands, in comparison to countries where cycling is not as common. Based on the aforementioned and considering that Denmark possesses equally important cycling shares with the Netherlands (Pisoni et al., 2022), the eighth hypothesis was proposed.

H8: Perceived safety positively influences citizens' attitudes.

As a last belief, climate change knowledge can be described as people's awareness on climate change's existence and its consequences on different aspects of human lives, namely natural, social, territorial and threats to business (European Commission, n.d.-b). Particularly in the active mobility context, Ali et al. (2018) found that as climate change understanding was increasing among participants in Great Britain, their attitude towards changing their travel behavior was positivizing. In the same vein, and particularly as for commuting, users of bike sharing in China feel that they commute sustainably when using the service (Si et al., 2020). Nonetheless, the majority pay little attention on individual attitudes and norms on bike sharing and underestimate the significance of sustainable use (Si et al., 2020). Therefore, the ninth hypothesis was developed.

H9: Climate change knowledge positively influences citizens' attitudes.

Finally, habit is defined as the result of the repeated performance of a behavior Ajzen (1991, p.25) and has been encompassed in different studies to predict various behaviors and travel behaviors as well (Forward, 2014). It constitutes an automatic connection between an objective and a certain behavior and contributes significantly to forecast future behavior (Chen & Chao, 2011). Specifically, the authors found that habit positively influenced car and motorcycle users' intention toward public transit in Taiwan. Furthermore, Forward (2014) based his study on a combination of TPB and the six stages people undergo to form a cycling behavior, and found that across all stages people's transport mode selection was generally habitual. Remarkably, people who had recently shifted to the new behavior, the risk of shifting back to the old one was still high. Considering these, the fourth hypothesis was formulated.

H10: Habit negatively influences citizens' intentions towards active mobility in commuting.

Based on the literature discussed above and hypotheses formulated, this study's initial research model is presented in Figure 2.

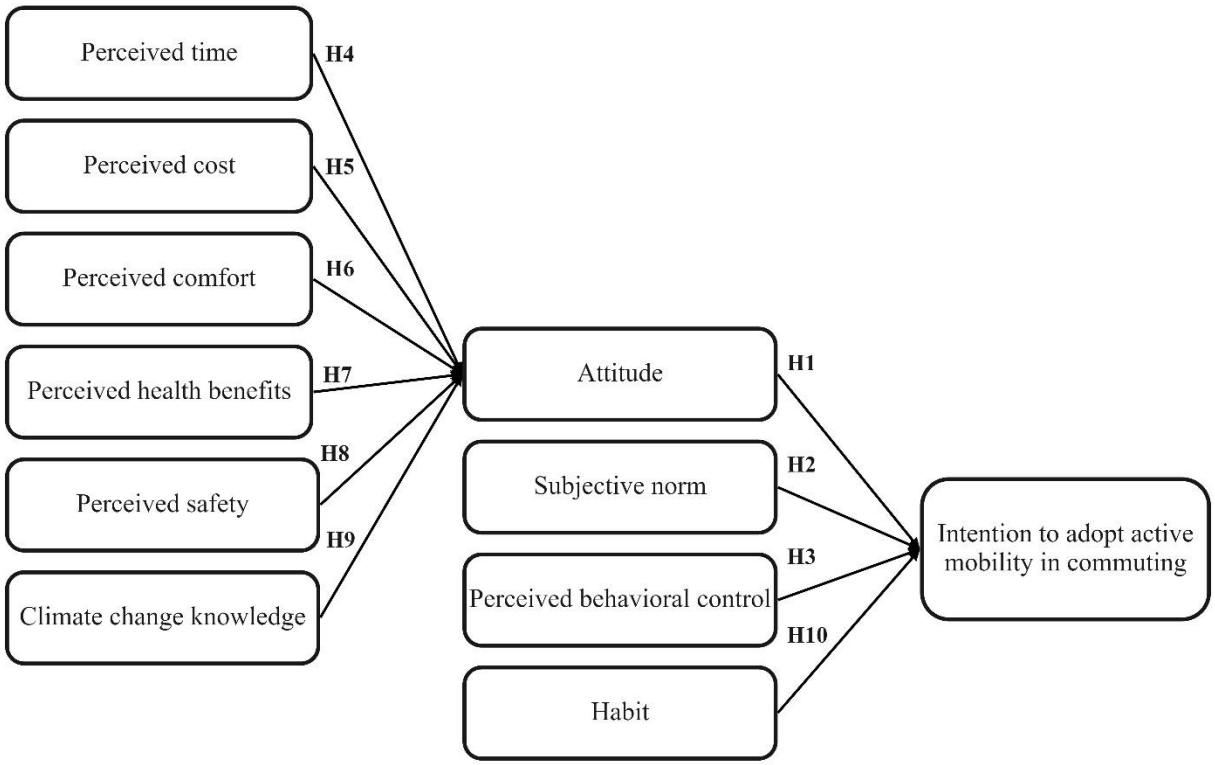

Figure 2

Initial research model

3. Study 1: Interviews with mobility experts

To confirm and possibly expand the initial research model, a qualitative study (study 1) was conducted with mobility experts aiming to get their (1) feedback on the literature-based factors, (2) views on new factors, and (3) prediction on the literature-based ones. Considering their professional experience, expertise, and knowledge, their input was deemed important before proceeding with testing a final research model to the citizens of the study context.

3.1 Method

3.1.1 Research design

A targeted search occurred to identify interesting experts' profiles within the mobility, architecture, and urban planning industries, considering the role they play in city design. The study was approved by the Ethics Committee of the Faculty of Behavioral, Management and Social Sciences of the University of Twente before implementation (no 221151).

3.1.2 Procedure and instrument

Four interviews were conducted physically and one was conducted online, via Microsoft Teams, due to the expert's inability to meet in person. A semi-structured approach was used and an interview guide (see Appendix A) was developed accordingly with open questions so for the experts to express

freely, share their input on the initial research model and feel encouraged to forecast the outcomes of it. The guide was not shared with the experts and the order of the items was neither strict nor necessary to be followed.

The interviews started with the experts receiving information on the study's goals and scope, the pseudonymization of their names and their right to quit at any time. Additionally, permission to record the session was asked and experts were guaranteed that all their data will be deleted after the thesis' submission, defense and grading announcement.

After experts consented and introduced themselves, interviews proceeded with the part one. The first part of the interviews aimed to contribute to the research aims one and two, that is, getting experts' feedback on the literature-based factors and views on potential new ones. For that, questions focused on the three topics: (a) Copenhagen's active mobility goals, (b) factors playing a role in achieving active mobility, and (c) characteristics of Copenhagen, such as population growth and multicultural element. Through the first topic, the researcher aimed to get experts' opinion on how ambitious and feasible these goals are and what the Capital Region should do to achieve them. The second topic aimed to motivate them mention factors affecting the adoption of active mobility in commuting by inspiring the discussion with current challenges such as the cars' use increase. As for the third topic, this focused on urbanization and the role of international citizens in connection to the adoption of active mobility commuting. Ultimately, the first part aimed to encourage experts to name influential factors considering the active mobility goals of the study context, the challenge of private vehicles' increase and social aspects of the city.

The second part of the interviews aimed to contribute to the research aims one and three, that is, getting experts' feedback and predictions on the literature-based factors. Experts were introduced to the theory of planned behavior and description of the variables included. Afterwards, a copy of the initial research model (see Appendix B) and definitions of the variables (see Appendix C) was shared with them and they were encouraged to go through the documents again to familiarize themselves with the context of part two. Furthermore, part two was introduced to them as an exercise aiming to get their feedback on the literature-based factors and their predictions on the model's results. Particularly, they were asked to think aloud as they were thinking of the factors and as a first step indicate the level of influence of the variables by using three pluses, two pluses, one plus or a minus to indicate a strong, a moderate, a low or no influence. As a second step, if they thought of other factors, they were encouraged to write them on the paper, place them wherever they think the best in the model and indicate the level of influence in the same way.

Throughout the interviews, the researcher used follow-up questions and encouraged experts to elaborate on their statements. In the end, they were thanked for their time and input.

3.1.3 Background of experts

LinkedIn and Google were used for identifying possible experts. To ensure they are familiar with active mobility in the Capital Region and can provide with relevant input, they needed to have worked or currently work in the Capital Region of Denmark within the sectors defined. Moreover, experts needed to relate to active mobility. Years of experience were not deemed a condition, as different views were desired. Totally, nine experts were contacted and five answered positively.

Table 1

Information about interviews conducted

Experts' pseudonymized names	Scope of experts' positions	Interview recorded time
Noah	Innovation in urban mobility	45 minutes, 49 seconds
Logan	Urban mobility	32 minutes, 1 second
Robin	Urban and mobility planning	44 minutes, 47 seconds
Andy	Future mobility	43 minutes, 23 seconds
Riley	Active mobility	1 hour, 7 minutes, 38 seconds

3.1.4 Data analysis

Interviews were transcribed manually (see Appendix D) and a codebook (see Appendix E) was developed based on the following three categories: (a) feedback on factors, (b) new factors, and (c) predictions. At the first category, transcripts were coded based on the experts' views on the literature-based factors as determinants. Additionally, new possible factors mentioned by the experts were coded as new factors and the four levels of influence were coded as predictions. The Atlas.ti software for qualitative data analysis was used for coding.

3.2 Results

Regarding the experts' views on existing factors, identification of new ones and their overall predictions on the existing variables' outcomes, results derived from interview analysis are presented below.

3.2.1 Assessment of literature-based factors by the experts

Attitude

As for attitude, most experts did not produce specific feedback other than the majority of them agreed on the major effect attitude has on intention. Nonetheless, as for how genuinely citizens will respond to the survey for attitude, Andy underlined that *"they will respond that they are pretty sure about the shift towards active mobility in their commuting, although their actual shift depends on other factors too."*

Subjective norms

Regarding subjective norms, all experts claimed the moderate influence it has on people's intention with Noah commenting that they *"are influenced by their social circle (family, friends), the values of their circle, and the stories they are listening to by them. They are affected by the environment they live in."* In the same vein, Andy underlined that *"it depends on your friends and family. What is normal within that subculture makes a big difference about whether you're going to take a bike or not."* For example, Andy mentioned that *"right wing people might think that active mobility is used by*

conscious people who vote for the Green Party, and they have to own a car because this is connected to their status."

Perceived behavioral control

With regards to perceived behavioral control, experts agreed on the factor's significant influence on people's intentions. Noah commented that *"some people do not feel comfortable in biking because they never did it. Maybe they are not in shape for it and therefore, experience plays a big role, because people may not be familiar with."* Noah elaborated by exemplifying that people *"maybe do not have a cargo bike before and do not really know how to bike it or they have not tried biking long distances, and thus they do not feel confident in doing it, with not being aware of the rules also playing a role."* Similarly, Logan claimed that *"some people do not feel capable of using active mobility because they have not done this before, do not do this often or do not know how to cycle or behave when cycling and thus they are afraid of doing it."*

On top of that, the easiness or difficulty of performing active mobility was also mentioned as a dependent on how differently cyclists behave in the cycle lanes in terms of speed depending for example on their age or shape. Andy underlined the challenge of different user segments as *"there are a lot of user segments and it is not easy for everyone to coexist with all these."* Beyond that, Andy commented that *"people tend to become homogeneous to coexist and thus whoever cannot follow, prefer not to use active mobility and hence if it is not easy for someone, then a lot of incentive is being lost,"* which is aligned with Riley's view on the importance of easiness.

Habit

As for habit, most experts acknowledged the variable's influence. Robin mentioned that "*the strongest way to predict a behavior is what an individual did yesterday and the individual most likely would do the same tomorrow"*, by highlighting that habit *"influences car commuters not to shift to active mobility."* In connection to the difficulty to break that behavior, Riley mentioned that "*the best time to change behavior in transport is when you move or your workplace moves, so you are forced to do something that you were not used to do in the past"*, by highlighting that *"this is the chance to be open for alternatives to the way you commute."* Nonetheless, Andy mentioned that *"people do not want to admit their habits, because they do not like to think of themselves that they are stuck to something."*

Perceived time

Concerning perceived time, all experts strongly agreed on the factor's effect. Noah elaborated on the importance of good connection of cycling and walking with public transport for the *"user to perceive the time taking for active mobility positively."* Andy underlined that connectivity with public transport is good in Copenhagen, but this is not the case in the city's outskirts, where also the infrastructure is of bad quality with "*bicycle lanes disappearing and potholes being frequent at the streets."* Lastly, despite the level of connectivity with public transport, Riley supported that *"car drivers tend to overestimate journey by public transport by often claiming the unpunctuality of train routes, which is not confirmed by statistics, and comfort in terms of seats' availability, although they do not use the train to know that."*

Perceived cost

The majority of experts claimed that cost does not impact citizens' intention towards active mobility in commuting. Specifically, Logan mentioned that *"since they can afford buying a car, they can also afford to park it"*, with Andy and Riley respectively claiming that *"it is not that expensive to own and run a car in Denmark and people can afford it"* and *"people know that cycle and walk are next to*

free." Contrarily, Noah supported that *"parking a car in the city is expensive"* with that playing a role in their intention, while Robin more neutrally declared that their financial situation plays a role.

Perceived comfort

As for perceived comfort, good connectivity and infrastructure's quality and availability were highlighted as major elements when it comes to how comfortable people will perceive active mobility in commuting. Particularly, Logan pointed out the importance of *"available cycle tracks, footrests, traffic signalized intersection, bridges and sidewalks"*, with the latter also being pointed out by Stephan.

However, all these are mainly visible in the city of Copenhagen but not in the rest municipalities of the Capital Region. *"The Capital Region still facilitates the car more,"* Andy said and added that *"since the car is a luxury product, but also weather and hilly areas can discourage people from active mobility, the latter should compete car by being of high class and designed in way that is faster to commute with."*

Beyond that, Robin underlined how pivotal network coherence is, with Riley furthering that and elaborating on the significance of good connectivity of transport modes, e.g., *"walking with train"*. With regards specifically to the Capital Region, Andy positively mentioned the development of cycle superhighways and claimed the importance of quality infrastructure across the Region so for *"commuting trips by bike from other communes to increase, as at this point cycle superhighways cannot accommodate everyone."*

Perceived health benefits

With regards to perceived health benefits, opposite views were expressed. On the one hand, Logan and Riley claimed that *"there is not a big awareness on how much active mobility can benefit people's health"* and that *"it has no influence on car drivers"* respectively. Concerning the latter, Riley elicited that *"car drivers will justify the no use of active mobility in commuting as they go to the gym instead."*

Nevertheless, Robin and Andy aligned on people's awareness on health benefits active mobility conveys, with the former mentioning that "*when citizens are being interviewed for the cycle superhighways, they say that they commute with active transport modes as they also get something out of it. It is part of their exercise and thus they do not need to exercise when they are home."*

Perceived safety

Regarding perceived safety, all experts agreed on the significance of safety by focusing on infrastructure's safety. Noah supported that *"it should be designed safely and maintained well to also afford bigger crowds."* On top of that, Robin mentioned that *"perception of safety is especially important for people who may not have some many experiences or did not learn how to bike as kids."* The latter is aligned with Riley's views on foreigners coming from a car-oriented country who *"probably have not actually adopted active mobility as a transport mode because it looks unsafe to them."* That links to Robin's statement on *"how separated bike lanes from the cars play a big role for people to feel safe to cycle,"* while Riley also added that "*availability of pavements also raises the feeling of safety instead of having to walk on the streets."*

Climate change knowledge

As for climate change knowledge, the majority of experts claimed that it has a low impact on people's attitude towards active mobility in commuting. Riley mentioned that it has no influence and

"although there will always be some that would be driven by their own mindset, a few people would say they ride for the environment." However, Riley acknowledged that *"there is a growing focus on climate change realizing the need not to just polluting and eating too much eat, for example, with that possibly going also to transport."*

Furthermore, Noah and Logan claimed the lack of awareness with the latter underlining that *"choosing active mobility is an added benefit against climate change but this is not the main reason people change their behaviors."* Robin mentioned that awareness exists however *"there is an intention gap as other factors, such as infrastructure, are more important in assisting you to make the shift."* Lastly, Andy also agreed that people are aware of climate change and contrarily furthered that it influences their intention towards active mobility in commuting.

3.2.2 New factors identified by the experts

Attractiveness of the surrounding environment

Robin mentioned the importance of a motivating context when people use active mobility. Specifically, the expert elicited that *"the experience and urban environment are important especially for walking. Density, interesting things to see, and open facades make a good urban environment and people want to have the eyes on the streets."* Therefore, it was considered of utmost interest to include "attractiveness of the surrounding environment" in the research model and was defined as *"how attractive the individuals perceive the surrounding environment they cross when they commute."* The variable was added in the form of a behavioral belief, as it is assumed that attitude is influenced by that. Based on these, the eleventh hypothesis of this research was developed.

H11: Attractiveness of the surrounding environment positively influences citizens' attitudes.

Perception of authorities' signals on active mobility

Derived by the discussion on perceived cost, the majority of the experts elaborated on the need of policies which will regulate the use of car as car ownership has been cheaper the last years in Denmark, while *"pricing for public transport has not"*, Robin said. As for regulation, Robin, Riley and Logan agreed on the lack of congestion pricing, with the latter forecasting that *"this will not come before 2025 and consequently car keeps being attractive"*.

In the same vein, Andy underlined the need of a governmental-level decision regarding the improvement of infrastructure by stating that *"if you want to increase cycling you cannot just making it better. You also need to make driving by car worse."* In connection to the infrastructure, Robin mentioned the level of investments the Netherlands proceeds with to replace car by active transport modes. However, in Denmark infrastructure remains focused on car with Logan having underlined that *"the building of new metro and extension of car highways respectively, disfavor active mobility."*

Therefore, it is considered scientifically interesting to research whether the authorities' signals on active mobility influences citizens' intention towards it in commuting. The new variable was named "perception of authorities' signals on active mobility" and was defined as *"how the individuals perceive the authorities' signals on active mobility in commuting"*. The variable was added in the form of a normative belief, as it was assumed that people's subjective norms are influenced by what the Danish

government and the municipal authorities of the Capital Region signal on the use of active mobility in commuting. Considering the aforementioned, the twelfth hypothesis was formed.

H12: Perception of authorities' signals on active mobility positively influences subjective norms.

Cycling culture

Moreover, Copenhagen's cycling culture was referred as an influential one with Logan stating that *"the culture of the city really matters"* and continuously recalling a study having showed that *"newcomers cycled 37% before moving to the city and 70%-80% more after moving to the city."* In the same vein, Robin commented that cycling *"is part of the DNA. You need to cycle, especially if you are a younger person."* Similarly, at another point Andy claimed that *"Copenhagen has a strong cycling culture and as you bring in people with different cultural norms, then they will act like it is normalized in the new setting. They will become part of where they will end up."*

Furthermore, as for the culture's relation with non-Danish, Riley said that *"internationals coming to Denmark are attracted by the culture and the intention of being part of it will come up soon."* Specifically, he mentioned the Dutch bicycle subscription service "Swapfiets" to indicate how internationals join the culture as *"they do not know how long they are going to stay so renting a bike via a monthly subscription, is a fast and easy way to join the culture."*

Last but not least, Andy pointed out the difference between Copenhagen and the Capital Region as *"cycling culture is not necessarily the same outside the city center."* Hence, cycling culture was defined as *"the mature culture a city possesses in cycling"* and added in the form of a normative belief as it is assumed that people's subjective norms are affected by the region's cycling culture. Considering these, the thirteenth hypothesis was proposed.

H13: Cycling culture positively influences subjective norms.

Perceived support from employer/university

As a last factor, Noah and Andy similarly expressed the influence employers have on employees' intention towards active mobility in commuting, with the former mentioning the importance of *"safe parking and shower facilities to prevent employees from bringing changes with them."* Regarding the latter, Andy agreed by adding that this way *"employees are encouraged to do long distances even without an electric bike."* On top of that, Andy elaborated on the significance of maintenance programs as part of the employment contracts *"in case a bike needs to be repaired."* Lastly, Noah mentioned the scenario of employers supporting financially employees to afford a bike, considering that *"cargo bikes, for example, are expensive."*

Consequently, for the variable to include both workers and students, it was named as "perceived support from employer/university" and was defined as "*how the individuals perceive that their employers or universities support them in commuting by active mobility."* Last but not least, it was added in the form of a control belief, as it was assumed that perceived behavioral control is influenced by that. Therefore, employers and universities facilitate or obstruct the adoption of active mobility in commuting by the employees and students. Thus, the fourteenth hypothesis was formulated

H14: Perceived support from employer/university positively influences perceived behavioral control.

3.2.3 Predictions overview

Overall, attitude is claimed as a variable with a strong influence, with Robin though highlighting that *"it has the least influence compared to subjective norms, perceived behavioral control and habit."*

As for subjective norms and perceived time, all experts agreed on the moderate and strong influence the former and the latter have respectively. Moreover, PBC's influence was indicated as moderate by the most, with Riley stating a strong one. Furthermore, habit's influence was deemed strong by four out of five experts with Noah mentioning that it is *"one of the hardest to break"*, while Robin indicated a low influence. Additionally, perceived cost fluctuated between no influence and a strong one, which is confirmed by the different views above. Perceived comfort also fluctuated between low and strong influence, with the majority stating a moderate one. Perceived health benefits constituted the only factor with equally distributed indications of influence, from low to strong. What is more, most experts stated a moderate influence of perceived safety on attitude, except for Robin who claimed a strong one. Lastly, a range of predictions was expressed by the experts regarding climate change knowledge, with the majority indicating a low influence, while Andy underlined a moderate one. Based on the average of experts' predictions gathered (see Appendix G), the level of influence per factor as forecasted by them is presented in Figure 3.

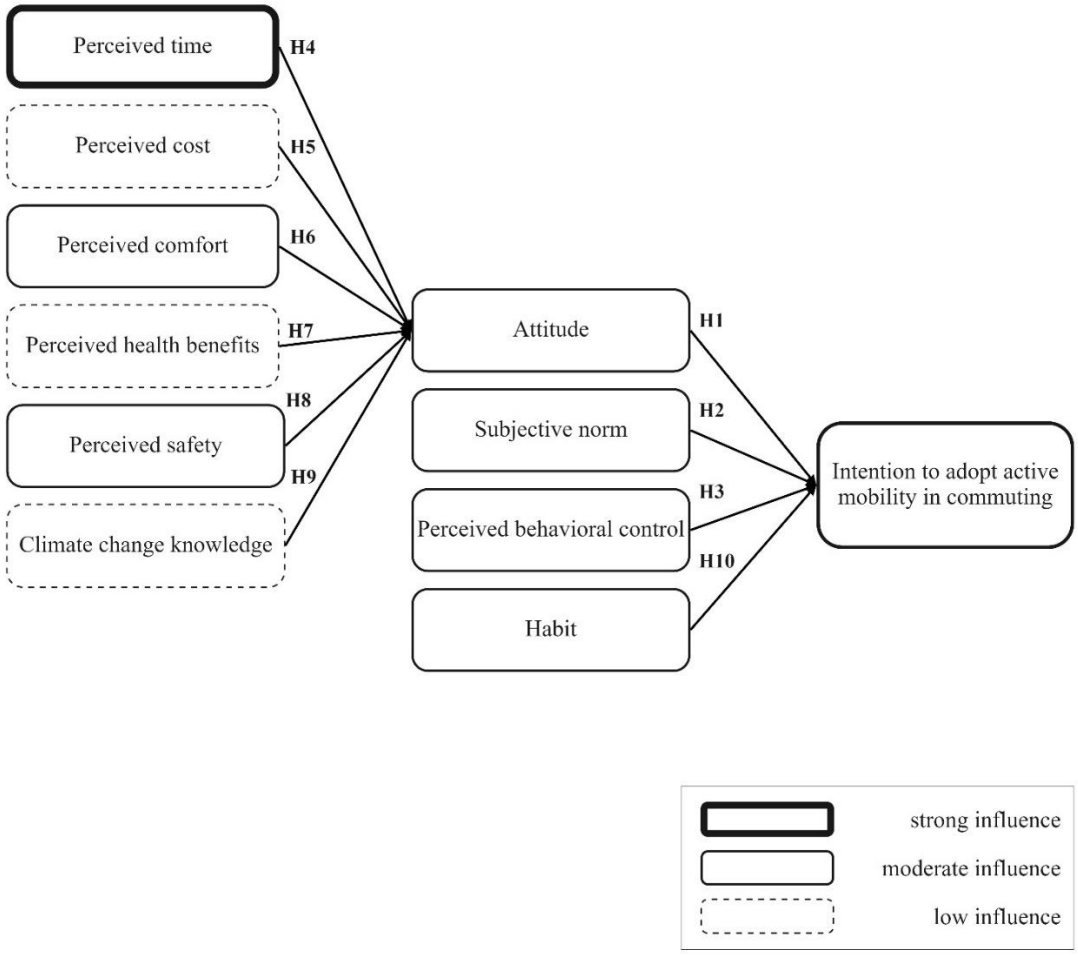

Figure 3

Initial research model

3.3 Conclusion

Ultimately, regarding the considerations and predictions expressed for the literature-based factors, commonalities were identified among experts as the outcomes were forecasted similarly by the majority.

Different views were expressed on perceived cost with most highlighting how affordable is to own a car in Copenhagen and generally in Denmark, with one expert disagreeing. Similarly, various opinions were formulated for perceived health benefits with the distribution being equal between those who claim people take these benefits into account and those who support health benefits are not a major factor towards citizens' intention towards active mobility in commuting.

As for the new factors, interestingly four new ones were identified by the experts with that enriching the research model, while most of them were not identified in the available literature. Noteworthy is that for attractiveness of the surrounding environment, one source was found which supports that "attractive local environments make active mobility more enjoyable and viable and additionally create places of high quality and a sense of space (Müggenburg et al., 2022, p.2)." Additionally, green and water elements contribute to the attractiveness of streets (Müggenburg et al., 2022).

Based on the results discussed above the adjusted research model is presented in Figure 4. New factors were assimilated into this. Considering also that perceived comfort was mainly discussed in connection to the availability and quality of infrastructure, it was renamed to "perception of availability and quality of infrastructure" to ensure intuitiveness. Similarly, perceived safety was renamed to "perceived safety of infrastructure".

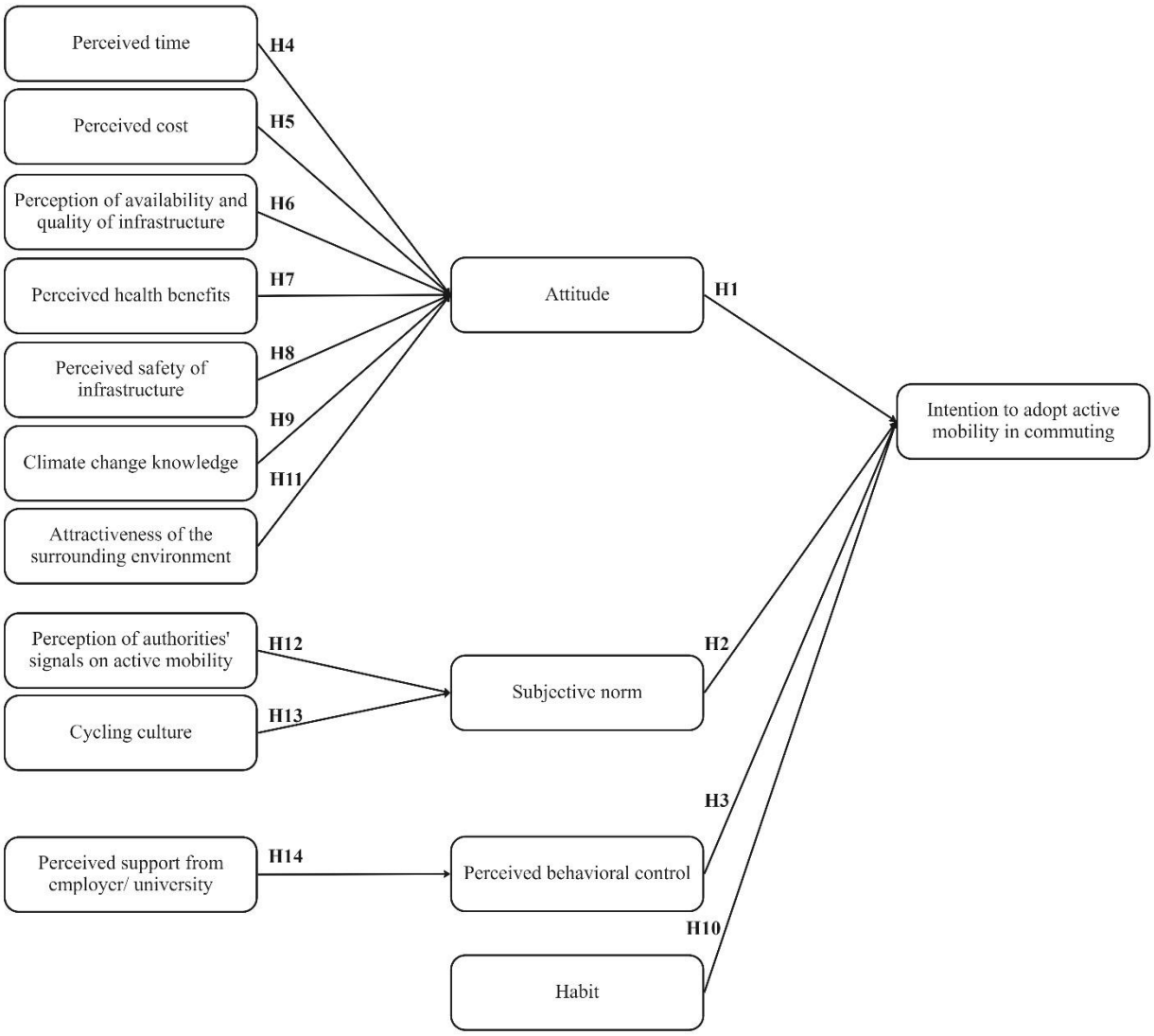

Figure 4

Adjusted research model

4. Study 2: Survey among citizens

Following the data gathered from study 1 and based on the final research model designed, a survey was developed and ran among citizens of the Capital Region of Denmark (study 2) to measure the constructs of the final research model.

4.1 Method

4.1.1 Research design

The goal of study 2 was to measure whether the factors mentioned by the experts and the literature-based ones have an influence on people's intention towards active mobility in commuting, but

also the level of influence they have. The survey was conducted in English as Denmark is ranked among the top English-speaking countries globally (Breene, 2019), while the survey pertained to all research context's citizens regardless of their nationality. Study 2 was also approved by the Ethics Committee of the Faculty of Behavioral, Management and Social Sciences of the University of Twente before implementation (no 221151).

4.1.2 Instrument

A questionnaire was designed online in the survey software Qualtrics. A combination of literature and experts' input was used to develop the survey's question items (see Appendix H). Background and demographic questions were included to get a better understanding of commuters' profiles and identify possible relations with the research model's factors. Specifically, commuting purpose, destination within the Capital Region, commuting distance, commuting time, transport mode(s) used as well as gender, age, nationality, education and income were asked respectively, with the latter being optional due to its private nature.

As for the scale construction, two to five statements were developed per construct and measured by an uneven 5-point Likert scale (1 = Totally disagree; 5 = Totally agree), to ensure that participants can respond neutrally. Regarding intention, it was measured by five items adapted by the available literature. For instance, the item *"I am willing to use active mobility over a private motorized vehicle"* was inspired by Beldad and Hegner (2018) and the item *"I will continue or make an effort to use active mobility when commuting next time"* was adapted by Chen and Chao (2011).

As for attitude, it was consisted of three items adapted by Nguyen-Phuoc et al. (2022). One of them is the following: "*I think that using active mobility in commuting is a positive behavior"*. Similarly, three out of four items of subjective norms were adapted by Nguyen-Phuoc et al. (2022), with the *"most people who are important to me support the use of active mobility in commuting"* constituting an example, while the last one was adapted by Beldad and Hegner (2018). That was formulated as follows: *"I believe that most people who influence my behavior expect me to use active mobility in commuting"*.

With regards to PBC, it was consisted of four items. The first two were adapted by Chen and Chao (2011) and Nguyen-Phuoc et al. (2022), and were the "*For me, using active mobility to commute is easy"* and *"I have enough time and energy to use active mobility in commuting"* respectively. Contrarily, the last two were developed by the researcher and are the following ones: *"I am capable to use active mobility in commuting"* and *"Active mobility fits my daily routine"*.

Concerning habit, it was measured by two items, developed by the researcher. These were developed as follows: *"My commuting is a habit to me"* and *"I do not think consciously what is the best way for commuting"*.

Regarding the constructs perceived time and perceived cost, these were inspired by Peng et al. (2019). Both were one-item questions, were formulated as *"Using active mobility in commuting"* and measured by the scales "1 = Cost me extra time; 5 = Save me extra time" and "1 = Cost me extra money; 5 = Save me extra money", respectively.

As for perception of availability and quality of infrastructure, four items were developed by the researcher. The items "*I think that there is an adequate infrastructure for active mobility in the Capital Region"* and "*The quality of cycle lanes and pavements within the Capital Region is good"* constitute two of the items used.

With regards to perceived safety of infrastructure, four items were used. The three of them, such as *"Using active mobility in commuting makes me feel vulnerable"* and *"When using active mobility in commuting, I feel more exposed to a crash compared to the use of a private motorized vehicle"* were developed by the researcher. Contrarily the item *"Using active mobility in commuting is safe"* was adapted by Liu et al. (2022).

Perceived health benefits were measured by four items, from which the first two were adapted by Bopp et al. (2013), with the "Using active mobility in commuting can help me to control my weight" constituting an example. On the other hand, two items, such as *"Using active mobility in commuting can help me to maintain a good physical condition"*, were developed by the researcher.

For climate change knowledge four items were used, with the *"Motorized traffic is a huge problem for environmental protection"* being adapted by Müggenburg et al. (2022). On the contrary, the rest three were adapted by Gatersleben et al. (2002). *"I worry about environmental problems caused by transportation"* is one of them.

As for attractiveness of the surrounding environment, all four items were formulated by the researcher, with *"When using active mobility there is always something interesting to discover"* and *"When using active mobility, I enjoy the built environment"* constituting two of them.

Regarding perception of authorities' signals on active mobility, three items were used. Two of them, such as *"I believe that the political support in Denmark leans towards active mobility as a transport mode in commuting"* were inspired by Jensen et al. (2020). As for the third item, *"I believe that the government recommends the use of active mobility in commuting"*, that was inspired by Beldad and Hegner (2018).

Concerning cycling culture, all four items used were developed by the researcher. *"I feel that Copenhagen has a cycling culture"* and "*I feel that using cycling in commuting makes you feel integrated in the city's culture"* were two of them. Similarly, for the perceived support from employer or university four items formulated by the researcher were used. "*I feel that my employer/university supports me in the use of active mobility in commuting"* and *"I feel that my employer/university motivates me towards the use of active mobility in commuting"* constituted two of them.

Furthermore, factor analyses occurred to ensure the validity of the research model. For that, IBM SPSS Statistics statistical software platform was used. Given that the research model was hierarchical and consisted of four dependent variables, that is, intention, attitude, subjective norms and PBC, factor analyses occurred towards all apart from PBC. As for PBC, since there was only one construct (perceived support from employer/university) influencing the DV based on the research model, Cronbach's alpha was considered sufficient. For all factor analyses, SPSS was requested to appear all absolute values above .40.

As for the factor analysis towards intention to adopt active mobility in commuting (see table 2), the item "Attitude_3_ I think that using active mobility in commuting is pleasant" and "Habit_1_My commuting is a habit to me" were removed due to not loading in the right dimensions.

As for the reliability of each construct, all constructs were internally consistent. However, Cronbach's alpha was not calculated for habit, as after factor analysis it was a one-item construct.

Table 2

Factor analysis for variables towards intention

Factor analysis for variables towards intention

	Factor			
Statements	**1**	**2**	**3**	**4**
Perceived behavioral control_2_I have enough time and energy to use active mobility in commuting.	0.9			
Perceived behavioral control_1_For me, using active mobility to commute is easy.	0.9			
Perceived behavioral control_4_Active mobility fits my daily routine.	0.8			
Perceived behavioral control_3_I am capable to use active mobility in commuting.	0.8			
Subjective norms_3_Most people who are important to me recommend the use of active mobility in commuting.		0.8		
Subjective norms_1_Most people who are important to me support the use of active mobility in commuting.		0.8		
Subjective norms_2_Most people who are important to me agree with the use of active mobility in commuting.		0.8		
Subjective norms_4_I believe that most people who influence my behavior expect me to use active mobility in commuting.		0.7		
Attitude_1_I think that using active mobility in commuting is a positive behavior.			0.9	
Attitude_2_I think that using active mobility in commuting is a good idea.			0.9	
Habit_2_I do not think consciously what is the best way for commuting.				0.9
Cronbach's alpha	0.9	0.8	0.7	
Explained variance (%)	30.8	24.8	17.3	9.2
Cumulative variance (%)	30.8	55.6	72.9	82.2
Eigenvalue	3.3	2.7	1.9	1.0

Note:

All factors were above 0.4 and thus none was suppressed.

Regarding the factor analysis towards attitude (see table 3), the item "Climate change knowledge_4_ A better environment starts with myself" was removed as it could not load at the same dimension with the rest of the items. Moreover, the item "Climate change knowledge_3_Using private motorized vehicles in commuting is unnecessary luxury" loaded in two factors. Considering that it loaded at the correct factor with a value above .6 (0.67) it was considered acceptable to be kept. Also, for this factor the Composite Reliability (CR) and the Average Variance Extracted (AVE) were calculated with values 0.82 and 0.61 respectively, which both indicated that the item could safely be considered in this factor.

Additionally, perceived time and perceived cost were merged as they correlated well together and loaded in the same dimension. Considering that time also indicates cost, both variables were renamed into

"perceived cost". Consequently, hypothesis 4 and 5, were merged into the following one and therefore the final research model was adjusted as presented in Figure 5.

H4: Perceived cost negatively influences citizens' attitudes.

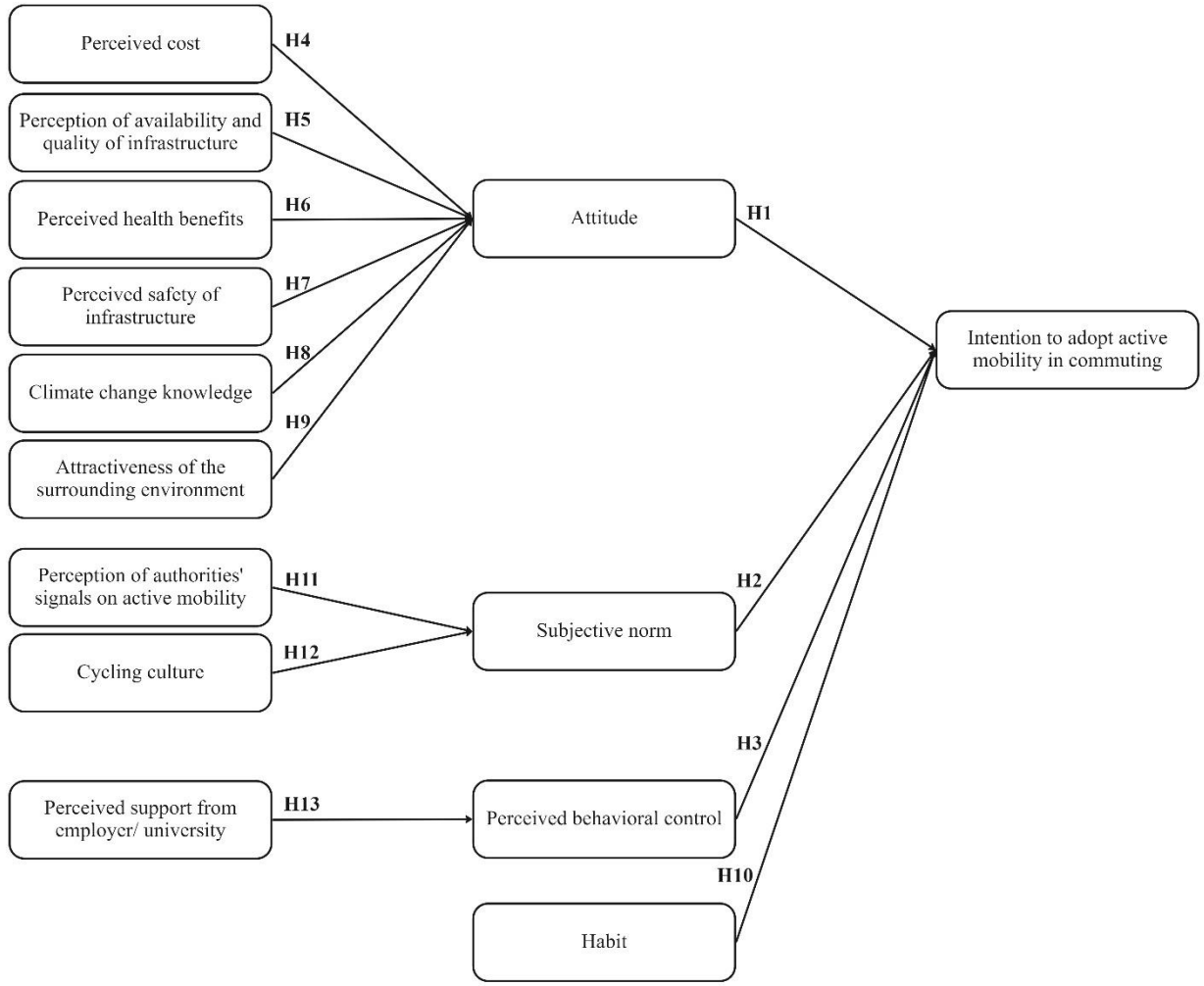

Figure 5

Final research model

Ultimately, reliability was sufficient for all constructs with Cronbach's alpha being higher than 0.7 for all of them, apart from perceived cost, which showed though an acceptable level of reliability (0.62).

Table 3

Factor analysis for variables towards attitude

Factor analysis for variables towards attitude

	Factor					
Statements	**1**	**2**	**3**	**4**	**5**	**6**
Perception of availability and quality of infrastructure_3_The quality of cycle lanes and pavements within the Capital Region is good.	0.8					
Perception of availability and quality of infrastructure_2_I feel that the infrastructure for active mobility within the Capital Region is of good quality.	0.8					
Perception of availability and quality of infrastructure_1_I think that there is an adequate infrastructure for active mobility in the Capital Region.	0.7					
Perception of availability and quality of infrastructure_4_I think that street furniture (footrests, benches, bins) within the Capital Region is sufficient.	0.6					
Attractiveness of the surrounding environement_3_When using active mobility, I enjoy the water elements (e.g., canals, lakes) around me.		0.8				
Attractiveness of the surrounding environement_2_When using active mobility, I enjoy the built environment.		0.8				
Attractiveness of the surrounding environement_4_When using active mobility, I enjoy the green elements (e.g. trees) around me.		0.7				
Attractiveness of the surrounding environement_1_When using active mobility there is always something interesting to discover.		0.7				
Perceived health benefits_3_Using active mobility in commuting can help me to prevent chronic diseases, such as diabetes.			0.7			
Perceived health benefits_1_Using active mobility in commuting can help me to control my weight.			0.7			
Perceived health benefits_4_Using active mobility in commuting can help me to maintain a good physical condition.			0.7			
Perceived health benefits_2_Using active mobility in commuting can help me to relieve stress.			0.6			
Perceived safety of infrastructure_3_When using active mobility in commuting, I feel more exposed to a crash compared to the use of a private motorized vehicle.				0.8		
Perceived safety of infrastructure_2_Using active mobility in commuting makes me feel vulnerable.				0.8		
Perceived safety of infrastructure_1_Using active mobility in commuting is safe.				0.7		

Perceived safety of infrastructure_4_Using active mobility in commuting requires higher focus on staying safe compared to the use of a private motorized vehicle.				0.6		
Climate change knowledge_2_Motorized traffic is a huge problem for environmental protection.					0.8	
Climate change knowledge_1_I worry about environmental problems caused by transportation.					0.8	
Climate change knowledge_3_Using private motorized vehicles in commuting is unnecessary luxury.					0.6	0.4
Perceived cost_1_Using active mobility in commuting						0.7
Perceived cost_2_Using active mobility in commuting						0.7
Cronbach's alpha	0.8	0.8	0.7	0.8	0.7	0.6
Explained variance (%)	13.7	13.3	12.6	12.0	9.6	8.4
Cumulative variance (%)	13.7	27.1	39.7	51.7	61.4	69.8
Eigenvalue	2.8	2.8	2.6	2.5	2.0	1.7

Note:

All factors were above 0.4 and thus none was suppressed.

The item "Perceived safety of infrastructure_1_Using active mobility in commuting is safe" was firstly reversed.

In the factor analysis towards subjective norms (see table 4), all variables loaded in two dimensions without excluding any items. Concerning the reliability of each construct, Cronbach's alpha was higher than 0.7 for both of them.

Table 4

Factor analysis for variables towards subjective norms

Factor analysis for variables towards subjective norms

	Factor	
Statements	**1**	**2**
Cycling culture_2_I feel that cycling is ingrained in the city for many years.	0.8	
Cycling culture_3_I feel that using cycling in commuting is part of Copenhagen's culture.	0.8	
Cycling culture_1_I feel that Copenhagen has a cycling culture.	0.8	
Cycling culture_4_I feel that using cycling in commuting makes you feel integrated in the city's culture.	0.6	
Perception of authorities' signals on active mobility_1_I believe that the political support in Denmark leans towards active mobility as a transport mode in commuting.		0.8
Perception of authorities' signals on active mobility_2_I believe that the government recommends the use of active mobility in commuting.		0.8
Perception of authorities' signals on active mobility_3_I believe that there are policies that promote active mobility in commuting in Denmark.		0.8
Cronbach's alpha	0.8	0.8
Explained variance (%)	39.5	33.9
Cumulative variance (%)	39.5	73.4
Eigenvalue	2.7	2.3

Note:

All factors were above 0.4 and thus none was suppressed.

4.1.4 Procedure

Once opening the survey, participants were greeted and informed by an introductory message about the study's goals and scope, while the researcher's contact details were given in case the participants wanted to clarify and/or ask anything they needed to. The approximate time (10 minutes) needed was given. Additionally, participants were ensured about the safe data collection, storage and handling and inability to be traced back, while they were informed about their right to quit at any time. Lastly, they were asked to consent to proceed with the survey (see Appendix I).

After, they proceeded to the background and demographic questions mentioned in Appendix H. During the survey, they were allowed to navigate back and forward in case they wanted to check the active mobility's definition and/or modify any of their answers. A progress bar had been placed on top for them to be aware of the time left. Finally, they were thanked for their time and devotion to the study, while the researcher's contact details were provided again.

4.1.5 Sample

Ultimately, 152 answers were collected, while only one answer was removed as the participant did not consent to the survey. Therefore, the total valid answers were 151, with that having helped in achieving a greater precision in drawing results.

Recruitment of participants

Snowball sampling was considered the best way to distribute the survey to various contexts and obtain the most diverse sample feasible based on the participants' characteristics. Specifically, a systematic multi-channel approach followed through the use of anonymous link and QR codes to reach the widest possible audience and get useful data. Social media (Facebook groups and researcher's LinkedIn account), social and professional context (friends and companies accessible to the researcher), educational institutes (University of Copenhagen, Denmark's Technical University), and central metro stations and streets around, constituted the distribution points. For participants' recruitment, an online message (see Appendix J), also in the form of a poster/flyer (see Appendix K) was used.

Background of respondents

Concerning the background characteristics of the sample (see table 5), the majority are between 26 and 30 years old, while the groups 18-25 and 31-44 are equally represented in the sample. Furthermore, a gender balance is observed, with the great majority being workers mainly working within the Capital Region. Additionally, most of the participants earn 30.000 to 50.000 DKK gross on a monthly basis while nearly half of the participants are Danes. Lastly, the vast majority holds or is currently pursuing a master's degree.

Table 5

Sample's characteristics

Sample's characteristics

		n.	%
Age	18-25	38	25
	26-30	60	40
	31-44	36	24
	45+	17	11
	Total	151	
Gender	Male	73	48
	Female	78	52
	Non-binary	0	0
	Total	151	
Country	Denmark	66	44
	Greece	19	13
	Germany	10	7
	Italy	5	3
	Other countries	51	34
	Total	151	
Education	High school diploma	5	3
	Bachelor's degree	25	17
	Master's degree	117	77
	PhD	1	1
	Other	3	2
	Total	151	
Worker/student	Worker	101	67
	Student	50	33
	Total	151	
Income	0 to 10.000 DKK	40	26
	10.000 – 30.000 DKK	31	21
	30.000 – 50.000 DKK	43	28
	50.000 – 70.000 DKK	21	14
	Above 70.000 DKK	11	7
	Prefer not to answer	5	3
	Total	151	
Work or study within the Capital Region	Yes	141	93
	No	10	7
	Total	151	

As for the commuting characteristics (see table 7), the great majority of the sample commute up to 10 kilometers, with the commuting time being up to 30 minutes for most of them. Cycling and public transport constitute the main commuting transport modes, with walking 400 meters or more and car having a lower but equal between them representation.

Table 6

Sample's commuting characteristics

		n.	%
Commuting distance (km)	0 - 5	44	29
	5 - 10	40	27
	10 - 20	34	23
	>20	33	22
	Total	151	
Commuting time (minutes)	0 - 5	4	3
	5 - 10	8	5
	10 - 20	50	33
	20 - 30	35	23
	≥30	54	36
	Total	151	
Main commuting transport modes	Car	24	16
	Motorcycle	0	0
	Bike	94	62
	Pedal-assisted e-bike	5	3
	Electric bike with no pedal-assist	1	1
	Electric scooter	1	1
	Kick-scooter	2	1
	Public transport	68	45
	I walk 400 meters or more	30	20
	I walk less than 400 meters	8	5

4.1.6 Data analysis

To analyze the data, different analyses were implemented. Firstly, Pearson correlation was employed to understand how the different variables correlate with each other. Based on the correlation results. After multiple linear regressions were employed towards the intention, attitude, subjective norms and PBC to model the data. Towards all dependent variables, regression firstly occurred with the background variables and then with the intrinsic ones from the research model.

4.2 Results

4.2.1 Descriptive statistics

The mean scores of the independent and dependent variables are shown in table 7 below. To determine whether the variables are important and relevant to the questionnaire's objectives, the scores should be far from neutrality. Thus, an overview is gained regarding the participants' views and perceptions towards the research model's factors.

Table 7

Descriptive Statistics

	n.	Mean	SD
Attitude	151	4.52	0.67
Subjective norms	151	3.64	0.73
Perceived behavioral control	151	3.81	1.10
Perceived cost	151	3.49	1.02
Perception of availability and quality of infrastructure	151	3.92	0.76
Perceived health benefits	151	3.85	0.69
Perceived safety	151	2.56	0.85
Climate change knowledge	151	3.78	0.80
Habit	151	2.70	1.13
Attractiveness of the surrounding environment	151	3.68	0.76
Perception of policies	151	3.49	0.83
Cycling culture	151	4.46	0.52
Perceived support from employer or university	151	3.15	0.79
Intention	151	3.99	0.98

Specifically, there is a strong agreement that active mobility is a positive behavior and a good idea, while Copenhagen's cycling culture is also highly acknowledged by the participants, with both achieving the two highest scores. Participants feel that the city's cycling culture is inherited in the city's general culture for many years and that pursuing active mobility in commuting make them feel integrated.

Furthermore, eight factors scored around 3.8 with that indicating a slight agreement among the sample towards these factors. Particularly, the availability and quality of infrastructure within the Capital Region is perceived as slightly good and similarly health benefits are acknowledged as moderate take aways from active mobility in commuting. Additionally, they agreed on the time and cost savings of active mobility as well as relatively recognized the importance and gains of an attractive environment offered when commuting with active mobility. Moreover, participants feel their social surroundings and governmental policies in Denmark lean towards active mobility in commuting. As for climate change, they recognize the environmental impact motorized transportation convey.

On top of these, participants feel that they have the capacity and energy to perform active mobility, while safety is not a very high concern, with the sample feeling relatively safe. As for the employers' or university's support, participants feel that none of them has a view on this with the score

going close to neutrality. Lastly, as for habit, their commuting transport mode seems to be a slightly conscious decision.

4.2.2 Correlations among variables

At table 8 the correlation of independent variables as well as the demographic variables, "gender", "age", "Danish nationality" and "income" is illustrated. Pearson correlation was implemented, with the gender not correlating with any variable. On the contrary, age correlates with income, while it has a significant correlation at the 0.01 level with perceived cost and a significant one at the 0.05 level with intention and perception of policies. Noteworthy is that age correlates negatively with perception of policies, with people perceiving or interpreting the policies differently. As for the nationality, internationals perceive authorities' signals on active mobility as well as the availability and quality of infrastructure in a more positive way compared to Danes. On top of these, Danes' attitudes seem to be more positive than the internationals' attitudes towards active mobility. Regarding the income, it seems that when higher, the perceived cost derived by active mobility and perception of availability and quality of infrastructure decrease, as both correlate negatively at 0.05 level of significance.

Moreover, as for the dependent variables of the model, attitude correlates significantly at 0.01 level with perception of availability and quality of infrastructure, perceived health benefits, climate change knowledge and attractiveness of the surrounding environment, while it correlates at 0.05 level with perceived cost. Nonetheless, attitude does not correlate significantly with perceived safety of infrastructure. Regarding subjective norms, it correlates significantly with cycling culture and perception of authorities' signals on active mobility at 0.01 and 0.05 levels respectively. Concerning PBC, that does not correlate significantly with perceived support from employer/university. Lastly, as for intention, it significantly correlates significantly at 0.01 level with attitude, subjective norms and PBC, while habit does not correlate with any variables apart from income and perception of authorities' signals on active mobility.

Table 8

Correlation matrix

Correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Gender	1.00																	
2	Age	-0.01	1.00																
3	DK	-0.08	.27**	1.00															
4	Income	-0.01	.64**	.22**	1.00														
5	Att	-0.07	0.06	.20*	0.11	1.00													
6	SN	0.09	-0.10	0.12	-0.11	.28**	1.00												
7	PBC	-0.03	-.17*	-0.11	-0.10	.32**	.38**	1.00											
8	PC	-0.06	-.29**	-0.11	-.18*	.20*	.36**	.63**	1.00										
9	Infr	0.00	-0.13	-.21**	-.19*	.23**	.27**	.52**	.37**	1.00									
10	PHB	-0.13	0.09	0.10	0.01	.30**	0.13	0.11	0.15	.20*	1.00								
11	PS	0.13	-0.06	0.06	-0.08	-0.07	-0.10	-.21**	0.04	-.36**	-0.09	1.00							
12	CCK	0.02	-0.08	0.07	-0.08	.41**	.40**	.29**	.27**	0.14	.29**	0.00	1.00						
13	H	0.07	-0.09	-0.02	-.18*	-0.04	0.07	0.13	.18*	0.12	0.00	0.00	-0.06	1.00					
14	Attr	0.10	-0.04	-0.10	-0.02	.24**	.16*	.27**	.24**	.28**	.46**	-0.16	.34**	0.12	1.00				
15	PAS	0.07	-.19*	-.24**	-.16*	0.10	.20*	.25**	.21**	.45**	0.13	-0.14	0.06	0.14	.26**	1.00			
16	CC	0.00	-0.04	-0.08	-0.10	.30**	.36**	.26**	0.11	.41**	.23**	-.31**	.26**	0.08	.42**	.31**	1.00		
17	Empl	0.09	-0.15	-.18*	-0.01	0.03	0.14	0.10	0.06	.24**	.21**	-0.13	0.15	0.00	.32**	.32**	.31**	1.00	
18	I	-0.01	-.17*	-0.05	-0.11	.54**	.44**	.75**	.48**	.38**	.25**	-.18*	.48**	0.09	.43**	.23**	.37**	0.11	1.00

Note:

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). Below you will find the meaning of abbreviations. DK was used for " Danish nationality" , Att for " Attitude" , PC for " perceived cost" , Infr for " Perception of availability and quality of infrastructure" , PHB for " perceived health benefits" , PS for " perceived safety of infrastructure" , CCK for " climate change knowledge" , H for " habit, Attr for " attractiveness of the surrounding environment, PAS for " perception of authorities' signals on active mobility" , CC for " cycling culture, Empl for " perceived support from employer/university and I for " intention" .

4.2.3 Predictors of intention, attitude, subjective norms and perceived behavioral control

As for predictors of intention, intention towards active mobility was firstly modeled with four background variables (see table 9). On top of that, the model was extended with the constructs of the research model. Therefore, it can be seen that based on the adjusted R-squared values the second model fits better the data. Attitude and PBC are significant at the 0.01 level and therefore constitute important predictors of intention. Similarly, subjective norms is also a predictor with significance at the 0.05 level. The rest of demographics and commuting characteristics seem not to contribute significantly to the intention in both models and that is also true for habit.

Table 9

Multiple linear regression analysis towards intention

Multiple linear regression analysis towards intention

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.122	0.299		13.789	0.000
	Age	-0.001	0.010	-0.010	-0.113	0.910
	Nationality (Danish)	0.132	0.159	0.067	0.829	0.409
	Gender (Male)	0.040	0.149	0.021	0.271	0.787
	Car usage	-1.108	0.230	-0.413	-4.814	0.000
2	(Constant)	-0.652	0.409		-1.595	0.113
	Age	-0.003	0.006	-0.030	-0.589	0.557
	Nationality (Danish)	-0.080	0.100	-0.040	-0.801	0.425
	Gender (Male)	-0.034	0.090	-0.017	-0.378	0.706
	Car usage	-0.286	0.151	-0.107	-1.902	0.059
	Attitude	0.500	0.074	0.343	6.796	0.000
	Subjective norms	0.153	0.069	0.113	2.212	0.029
	Perceived behavioral control	0.515	0.053	0.576	9.757	0.000
	Habit	0.001	0.040	0.001	0.031	0.976
1	R Square					0.163
	Adjusted R Square					0.140
	F Change					7.098
	Sig. F Change					0.000
2	R Square					0.707
	Adjusted R Square					0.691
	F Change					42.930
	Sig. F Change					0.000

a. Dependent Variable: Intention

As the research model towards intention to adopt active mobility is hierarchical and the attitude, subjective norms and PBC have been modeled as latent variables, it is reasonable also to understand if those dependencies can be verified. Firstly, the model one was created by containing the background variables and then extended with the research model's variables towards attitude (see table 10). In both models, the nationality (Danish – non-Danish) is significant at the 0.01 level with similar coefficients. However, none of the rest background variables seems to be significant. Regarding the extended model two, which presents also a higher adjusted R-square, climate change knowledge is significant at the 0.01 level. Moreover, the perception of availability and quality of infrastructure are significant at the 0.05

level. On top of that, perceived cost, perceived health benefits, perceived safety of infrastructure and attractiveness of the surrounding environment cannot be characterized as predictors of the attitude as there is not a significant relationship among them.

Table 10

Multiple linear regression analysis towards attitude

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.273	0.217		19.652	0.000
	Age	0.004	0.007	0.050	0.545	0.587
	Nationality (Danish)	0.300	0.116	0.221	2.593	0.010
	Gender (Male)	0.070	0.109	0.052	0.644	0.520
	Car usage	-0.209	0.167	-0.114	-1.248	0.214
2	(Constant)	1.868	0.512		3.646	0.000
	Age	0.005	0.006	0.070	0.850	0.397
	Nationality (Danish)	0.284	0.106	0.210	2.671	0.008
	Gender (Male)	0.056	0.101	0.041	0.553	0.581
	Car usage	-0.052	0.160	-0.028	-0.325	0.746
	Perceived cost	0.034	0.057	0.051	0.591	0.555
	Perception of availability and quality of infrastructure	0.160	0.078	0.182	2.058	0.041
	Perceived health benefits	0.113	0.084	0.117	1.348	0.180
	Perceived safety of infrastructure	0.005	0.065	0.006	0.071	0.943
	Climate change knowledge	0.264	0.067	0.315	3.953	0.000
	Attractiveness of the surrounding environment	0.040	0.080	0.045	0.507	0.613
1	R Square					0.056
	Adjusted R Square					0.030
	F Change					2.153
	Sig. F Change					0.077
2	R Square					0.281
	Adjusted R Square					0.230
	F Change					5.472
	Sig. F Change					0.000

a. Dependent Variable: Attitude

Similarly, the predictors of subjective norms were modeled (see table 11). Firstly, they were modeled only based on the background variables, where nationality and car usage were significant at the 0.05 level. However, in the model two, which performs better based on the adjusted R-squared values, only nationality (Danish – non-Danish) was significant from the background variables. Additionally, cycling culture is highly significant at the 0.01 level towards the subjective norms, in contrast to the perception of authorities' signals on active mobility, which is not significant and thus cannot be characterized as predictor.

Table 11

Multiple linear regression analysis towards subjective norms

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.830	0.233		16.464	0.000
	Age	-0.006	0.007	-0.078	-0.859	0.391
	Nationality (Danish)	0.293	0.124	0.200	2.368	0.019
	Gender (Male)	-0.132	0.116	-0.091	-1.140	0.256
	Car usage	-0.367	0.179	-0.185	-2.048	0.042
2	(Constant)	1.466	0.532		2.755	0.007
	Age	-0.007	0.007	-0.084	-0.985	0.326
	Nationality (Danish)	0.344	0.117	0.236	2.936	0.004
	Gender (Male)	-0.131	0.109	-0.090	-1.203	0.231
	Car usage	-0.234	0.169	-0.118	-1.380	0.170
	Perception of authorities' signals on active mobility	0.098	0.072	0.112	1.365	0.174
	Cycling culture	0.447	0.110	0.320	4.046	0.000
1	R Square					0.071
	Adjusted R Square					0.046
	F Change					2.801
	Sig. F Change					0.028
2	R Square					0.203
	Adjusted R Square					0.169
	F Change					6.095
	Sig. F Change					0.000

a. Dependent Variable: Subjective norms

Likewise, the connection between the perceived behavioural control and the perceived support from employer/university, does not present a significant p-value (see table 12). Nonetheless, car usage is

significant at the 0.01 level in both models, where its coefficient has a negative value. That indicates that car users present a lower capability of controlling themselves.

Table 12

Multiple linear regression analysis towards perceived behavioral control

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.909	0.330		11.832	0.000
	Age	0.002	0.011	0.015	0.173	0.863
	Nationality (Danish)	-0.009	0.176	-0.004	-0.052	0.959
	Gender (Male)	0.119	0.165	0.054	0.721	0.472
	Car usage	-1.300	0.254	-0.433	-5.114	0.000
2	(Constant)	3.677	0.505		7.276	0.000
	Age	0.002	0.011	0.019	0.218	0.828
	Nationality (Danish)	0.005	0.177	0.002	0.028	0.978
	Gender (Male)	0.126	0.166	0.058	0.762	0.447
	Car usage	-1.291	0.255	-0.430	-5.054	0.000
	Perceived support from employer/university	0.065	0.107	0.047	0.607	0.545
1	R Square					0.184
	Adjusted R Square					0.161
	F Change					8.211
	Sig. F Change					0.000
2	R Square					0.186
	Adjusted R Square					0.158
	F Change					6.614
	Sig. F Change					0.000

a. Dependent Variable: Perceived behavioral control

4.3 Conclusion

Based on the hypotheses confirmed (see table 13), all three original variables of TPB confirmed as predictors of intention, with the attitude and PBC being significant at the 0.01 level and subjective norms at the 0.05 level. Nevertheless, habit was not confirmed as a predictor of intention. As for the attitude's predictors, climate change knowledge and perception of availability and quality of infrastructure were significant at the 0.01 and the 0.05 levels respectively. On top of that, nationality (Danish – non-Danish) was also confirmed as significant at the 0.05 level. Similarly, nationality (Danish – non-Danish) was also verified as a predictor of subjective norms at the 0.05 level along with cycling

culture at the 0.01 level. Lastly, car usage was confirmed as a strong predictor of PBC at the 0.01 level. A visual overview of all hypotheses' testing is presented in Figure 6.

Table 13

Summary of hypotheses' testing

Hypothesis		Outcome
H1	Attitude positively influences citizens' intentions to adopt active mobility in commuting.	Confirmed
H2	Subjective norms positively influence citizens' intentions to adopt active mobility in commuting.	Confirmed
H3	Perceived behavioral control positively influences citizens' intentions to adopt active mobility in commuting.	Confirmed
H4	Perceived cost negatively influences on citizens' attitudes.	Rejected
H5	Perception of availability and quality of infrastructure positively influences on citizens' attitudes.	Confirmed
H6	Perceived health benefits positively influence on citizens' attitudes.	Rejected
H7	Perceived safety of infrastructure positively influence on citizens' attitudes.	Rejected
H8	Climate change knowledge positively influence on citizens' attitudes.	Confirmed
H9	Attractiveness of the surrounding environment positively influence on citizens' attitudes.	Rejected
H10	Perception of authorities' signals on active mobility positively influence on citizens' subjective norms.	Rejected
H11	Cycling culture positively influence on citizens' subjective norms.	Confirmed
H12	Perceived support from employer/university positively influence on perceived behavioral control.	Rejected
H13	Habit negatively influences citizens' intentions to adopt active mobility in commuting.	Rejected

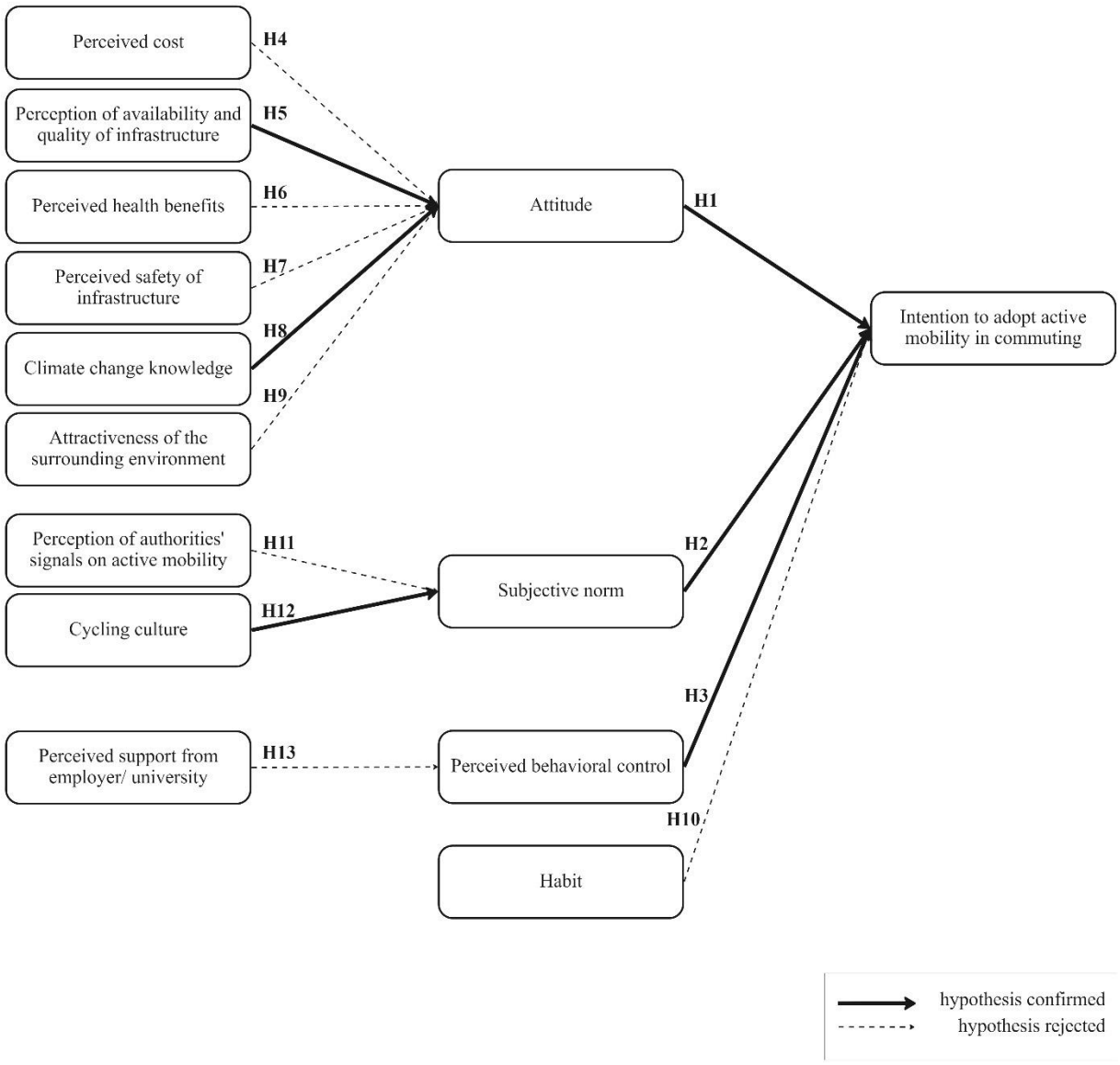

Figure 6

Visual representation of hypotheses' testing

5. Discussion

Considering the research results derived both from study 1 and 2, this section discusses the main findings, theoretical contribution, practical implications, limitations and suggested directions for future research.

5.1 Main findings

The purpose of this research was to identify the factors influencing people's intention towards active mobility in commuting, by taking the Capital Region of Denmark as the study context. Firstly, as

for intention, all three original constructs of TPB were confirmed as predictors, with attitude and PBC being strong ones and subjective norms significant at a lower level. In the same vein, Warner et al. (2021) indicated the effect of attitude on people's decisions about transport modes, with Donald et al. (2014) having found PBC as a pivotal predictor of work commuters' intention in using -other than car- transportation. Additionally, Shukri et al. (2022) and Dütschke et al. (2022) indicated PBC as a superior predictor of intention towards not violating traffic rules as well as towards sustainable transportation use in commuting and long-distance leisure travel. As for subjective norms, available literature confirms their influence on intentions towards public transit travel (Chen & Chao, 2011; Zhao & Gao, 2022) and demand shared ride-hailing services (Nguyen-Phuoc et al., 2022).

Regarding attitude's predictors, climate change knowledge was highlighted as a strong one, with the participants seeming to be aware of the pollution motorized transportation cause. Considering the survey's highly educated (94%) sample, that might be linked to the environmental awareness being nurtured by the education. Dütschke et al. (2022) had also underlined a possible connection of higher education and higher level of climate knowledge for people selecting more sustainable transportation in commuting and leisure travel. Also, Romero-Colmenares and Reyes-Rodríguez (2022) found the influential role of education for sustainable development on attitude towards sustainable entrepreneurship among university students in Bucaramanga in Colombia. In conjunction with Denmark's high sustainability scores, which place the country second globally (Global Sustainability Index, n.d.), that could also justify the influential power of climate change knowledge towards intention to adopt active mobility in commuting. Although the factor's mean score is 3.78, the tendency observed towards sustainable transport modes, such as active mobility, is an indicator for intensifying communication by the municipalities and grassroots policymaking. The latter is also underlined by Rich (2022) who highlighted the need for further active mobility's regulation in Denmark.

As for perception of availability and quality of infrastructure, that was also confirmed as a less significant predictor of attitude. Huemer and Strauß (2021) underlined the influential role of infrastructure design through street markings (e.g., bike lanes) on attitude. Additionally, as cited by Koszowski et al. (2019) wider pavements have a positive effect on walking. Lyu and Forsyth (2021) found that traffic jams play a role in how positively people will experience the street conditions, which could relate to the infrastructure's quality as for whether it can accommodate bigger crowds. In this research, participants seem to perceive as sufficient the cycling and walking infrastructure of the Capital Region. Looking though at the factor's mean score, which is close to neutral, it can be argued that there is still room for improvement in the network's quality, with that being again supported by Rich (2022).

As for perceived cost, perceived health benefits, and perceived safety of infrastructure, these were rejected. With regards to the former, a negative correlation has been found between age and income with perceived cost. Thus, older generations might perceive cost of active mobility more negatively compared to the younger generations. Concerning perceived health benefits, in contrast with previous literature, survey's participants seem not to be affected by this factor. Cornet et al. (2021) and De Vos (2018) discussed the health benefits active mobility convey in terms of physical and mental health and lower exposure to emissions, respectively. Similarly, as cited by Raser et al. (2018), commuting to work by bike positively affects coronary heart disease (CHD) risks and contributes positively to the quality of life in terms of health. Concerning the perceived safety of infrastructure, Bennetts et al. (2017) underscored the importance of making space for pedestrians instead of cars and connecting the infrastructure efficiently. Similarly, Müggenburg et al. (2022) found that high car traffic and parked motorized vehicles are perceived as safety risks. Nonetheless, the factor was not confirmed as a predictor of attitude. Specifically, participants generally feel that using active mobility compared to a private motorized vehicle does not make them feel more vulnerable or exposed to a possible crash, as the mean score (2,56)

revealed. Projects ran by the Capital Region, such as the Cycle Superhighways, which aim to increase bike commuters across the region through the in-progress development of 746km network with protected bike lanes by 2045 (Supercykelstier, n.d.), could have mitigated that factor's effect. Lastly, as for attractiveness of the surrounding environment, Müggenburg et al. (2022) found that shared spaces with benches and cycling facilities are mostly favorable by the active users and conventional spaces by the car users. Nevertheless, this factor was not confirmed as a predictor of the participants' attitudes, while relevant literature seems to be limited.

Concerning subjective norms' and PBC's predictors as well as habit, only cycling culture was confirmed. Copenhagen is a city with a mature cycling culture (Pisoni et al., 2022), while the internationals' integration with this culture can be confirmed by the fact that no correlation found between nationality and cycling culture. Interestingly, the City of Copenhagen and politicians decided to start branding Copenhagen as a cycling city back in 2017 through the use of storytelling (Müller et al., 2022). The city's former brand was renamed from "I love Copenhagen" to "I bike Copenhagen" with souvenirs also being renamed and temporary installations being placed in the city center to urge people experience a car-free future (Müller et al., 2022). This strategic initiative could be linked to the strong influence cycling culture has for the participants. As for perception of authorities' signals on active mobility, it seems that a generic support towards active mobility in terms of political signals is perceived by the citizens. Interestingly, nationality seems to play a role with Danes perceiving more negatively the available policies compared to internationals. That might happen because of the language understanding when these are communicated or due to the lack of relevant signals in internationals' home countries. However, the factor was not confirmed in this study, while previous literature was not identified. With regards to PBC's predictor, perceived support from employer/university, this was not confirmed. Participants seem not to recognize any motivation or education towards using active mobility in commuting from the employers and universities. However, car usage was confirmed as a strong predictor of PBC, which is not surprising as people who already use the car is reasonable to be more resistant towards active mobility. Regarding habit, it can be seen that it does not affect participants' intention to adopt active mobility in commuting. In contrast to this finding, Forward (2014) confirmed habit as a predictor of intention by finding that people's chosen transport mode is habitual. Likewise, Chen and Chao (2011) found car users' intention towards public transit is obstructed by their habits.

Looking at the results through the experts' perspective, attitude, subjective norms and PBC were expected to be confirmed, with that indicating a consensus among previous literature and findings from studies 1 and 2. As for attitude's predictors, in general mobility experts confirmed their effect with expressing doubts for climate change knowledge, perceived cost and perceived health benefits. Concerning the former one, interestingly their forecasts contradict with the survey's results as findings highlight that participants' climate change knowledge urge them towards adopting active mobility in commuting. Also, although experts indicated a moderate influence of perceived safety of infrastructure, this seems not playing an influential role. Regarding the perceived cost and health benefits, experts were quite skeptical, which was confirmed by the survey's findings. Similarly, in line with the survey's results experts predicted a moderate influence of perception of availability and quality of infrastructure. As for the factors derived from study 1, that is, attractiveness of the surrounding environment, cycling culture, perception of authorities' signals on active mobility and perceived support from employer/university, interestingly cycling culture was indicated as a significant one. Noteworthy is that this factor produced by the majority of the experts, who underscored how integrated cycling is in Copenhagen's culture. Lastly, although habit had been forecasted as a moderately influential factor by the experts, this was surprisingly not confirmed. Notably, Andy had underlined during study 1 that *"people do not want to admit their habits. They do not want to think of themselves as being stuck in a rut, but in practice they are".*

5.2 Theoretical contribution

By testing an extended version of TPB, this research studied the factors affecting the adoption of active mobility in commuting with a great focus on the role beliefs play in people's attitudes, subjective norms and PBC. Firstly, noteworthy is that the three variables of the original TPB were confirmed, which is in line with previous literature as discussed above. TPB was validated in predicting behavioral intention towards active mobility with that indicating the adequacy of the theory in relevant studies. Additionally, the dual study implemented constituted an interesting approach in identifying the factors influencing people's intention. Specifically, study 1 produced factors which were validated in study 2, with that highlighting the usefulness of the methods combined. Noteworthy is that a similar method has not been found in the available literature. Beyond that, although the use of sustainable transport modes have been studied either by focusing for example on public transit (Chen & Chao 2011) or bike sharing (Si et al., 2020), literature on the adoption of active mobility with a focus on commuting has not been found. Thus, this research's findings interestingly extends the current research body. As for the literature-based factors of the initial research model, only climate change knowledge and perception of availability and quality of infrastructure were confirmed as predictors of attitude. Given that available literature is not extensive yet on climate change knowledge's influence on people's intention towards the use of sustainable transport modes, this research constitutes an interesting addition. Concerning the availability and quality of infrastructure, this research confirms the findings of the previous literature about the factor's influence. As for habit, although it was expected to predict intention in line also with previous studies, it was surprisingly rejected. Also, cycling culture was interestingly indicated as a superior predictor of subjective norms with that shedding light on other parameters that could affect people's subjective norms. Although available literature has discussed the mature cycling culture of Copenhagen (Kodukula et al., 2018; Pisoni et al., 2022), no previous study has measured the influence this culture has on people's subjective norms. This research confirms the significant role wider social norms, such as a city's culture, play. Ultimately, this study confirms the predictability of TPB towards behavioral intention and the importance of beliefs to understand what affects attitude, subjective norms, and PBC in mobility contexts.

5.3 Practical implications

From a practical perspective, findings can be beneficial for the Capital Region of Denmark but also for other cities in Denmark and abroad. In terms of infrastructure, there is still room for further investment to enhance active mobility in commuting as it can be understood by the participants' close to neutral feelings for this factor. More available spaces for active mobility could be of importance. For instance, recently Copenhagen's Technical and Environmental Committee decided to remove half of public parking spaces of city center during 2023 (Prakash et al., 2023). These initiatives could also be accompanied by further regulation of the active mobility context. For example, congestion pricing was mentioned by the experts during study 1, while it has also been discussed a lot the previous years in Denmark without having been implemented though. Similar initiatives to prioritize people over cars through the creation of pavements and cycle lanes could also be taken from other cities trying to mitigate the car use surge. Furthermore, looking at the great influence cycling culture has on people's subjective norms, communication strategies could focus on intensive storytelling. For example, as discussed above Copenhagen has been promoting the city as a bike city since 2017. The Capital Region could join Copenhagen's branding goal, while other Danish or non-Danish municipalities which are now taking steps into increasing cycling levels can be inspired from Copenhagen's branding strategy and develop and communicate their own stories. Lastly, as indicated from this research finding's climate change knowledge has a great impact on people's attitudes. Therefore, storytelling or educational initiatives could also include an informative environmental angle by communicating how advantageous active mobility in commuting is for the environment.

5.4 Limitations

For this research, limitations need to be acknowledged. Noteworthy is that the research model measured the behavioral intention and not the behavior. Therefore, there is an intention gap as the influential factors cannot necessarily influence participants' final adopted behavior. On top of this, possible social-desirability bias needs to be pointed out. Participants may have not given accurate responses to feel favorable. Furthermore, it has to be acknowledged that relationships between the factors are correlational and not causal, and thus no effect outside of the model factors explored can be indicated. As for the sample, attention needs to be drafted on three limitations. Firstly, the sample is mainly consisted of people with a higher educational background. Considering the discussion above about the role of education in climate change knowledge, this does not allow to know how non-educated people would have answered to climate change knowledge's items. Secondly, the sample mainly represents the younger generation with the majority being under 30 years old (65%). On top of that, the income of this generation fluctuates between 30.000 and 50.000 DKK gross monthly. It is difficult to know whether these participants would have answered differently at a later life stage when they would also earn higher salaries allowing them to afford running a car. However, considering the strong influence of climate change knowledge, this seems to be more a conscious attitude rather than a situational one. Thirdly, the sample consisted of half Danes and half internationals, while the Capital Region's and Copenhagen's immigrants and their descendants do not exceed the 5% and 30% respectively (Statistics Denmark, 2022). Lastly, it is hard to know how participants' distribution across municipalities is, as the municipality of residence was not asked.

5.5 Suggestions for future research

Based on the results, interesting future research could be conducted. First of all, it would be of interest to test this research's final model to other cities which are taking steps into an active mobility culture or already have a mature cycling culture. For example, Barcelona, London, Paris or a Dutch city could constitute interesting study contexts. This way commonalities or differences could be identified. Additionally, this research model could be extended with the addition of behavior to see whether the factors that influence participants' intention would influence their actual behavior. This study could take place in the Capital Region of Denmark, but also in contexts like the ones mentioned above. From a more detailed perspective, given that cycling culture is not being extensively discussed in the literature and was indicated as a strong predictor of subjective norms, it would be of importance to study its influence further. That could be researched through an extensive qualitative study with interviews with both native and international citizens to also identify differences in mobility norms depending on the country of origin. Moreover, climate change knowledge can be possibly studied at a more targeted audience consisting of people aged above 50, who are also driven by a higher resistance or people who commute a long distance. Also, studying climate change knowledge's influence on people coming from different levels of education could shed light on education's possible effect. Furthermore, although attractiveness of the surrounding environment was not confirmed as a factor in this research, and considering the limited literature already exists, a more targeted study could shed light on the factor's level of influence. Lastly, employer's support was mentioned by two out of five experts with the rest not expressing a view on that. Considering that participants did not see their employers/universities taking a position as for active mobility in commuting, it would be interesting to research further whether this factor has been neglected on a motivational level or cannot contribute to the adoption of active mobility.

5.6 Conclusion

This study aimed to identify the factors influencing people's intention towards active mobility in commuting. By taking the Capital Region of Denmark as a study context, an extended version of TPB was used by also significantly focusing on the beliefs' role towards attitudes, subjective norms and PBC.

Firstly, interviews with five mobility experts were conducted to get their feedback and predictions on the factors identified in the literature as well as get their views on new factors. Interestingly, generally experts confirmed the predictability of the initial research model and contributed to it with four new constructs namely; attractiveness of the surrounding environment, cycling culture, perception of authorities' signals on active mobility and perceived support from employer/university. Secondly, an online survey ran among citizens living in the study context whose main commuting purpose was working or studying. Regarding the intention's predictors, all three original variables of TPB were confirmed, with attitude and PBC being strong predictors and subjective norms a less significant one. As for attitude's predictors, perception of availability and quality of infrastructure and climate change knowledge were acknowledged as determinants of attitude and cycling culture of subjective norms. The rest of the factors added in the form of beliefs as well as habit were rejected. Regarding demographic and background data, nationality was acknowledged as a predictor for both attitude and subjective norms and car usage of PBC. Ultimately, a city's cycling culture showed a great influence on people's subjective norms, with that underscoring the cycling culture's dynamic and the need of cities to invest in it to increase the intention of using more sustainable transport modes, like active mobility. Additionally, climate change knowledge's influence can contribute to studies which research the transition to sustainable transportation use, with that also being a direction for municipalities' communication strategies. Lastly, testing of the final research model in other active mobility cultures or contexts currently working towards this direction, could be of interest to identify commonalities and differences. An extension of the research model with the addition of behavior could indicate whether the influential factors towards intention could affect the actual behavior. From a more detailed perspective, future studies can research the role of climate change knowledge and cycling culture more, while further research on employers'/universities' role and the attractiveness of the surrounding environment would be of interest.

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Appendices

A. Interview guide

Introduction to the interviewee

Welcome. Thank you very much for meeting me today. To begin with, I would like to do an introduction so it is clear to you what this study aims for and what is the procedure we will follow.

A short introduction about me. I am originally from Greece, where I grew up and studied communication and media at the National and Kapodistrian University of Athens. After working 2 years in my home country at a communications agency, I relocated to the Netherlands to study Communication Science at the University of Twente. Now, I am MSc student working on my master thesis which aims to identify the factors affecting citizens to shift from private motorized vehicles to active mobility in commuting (to work or study). Capital region of Denmark will be the study context of this study.

As a first step, I am conducting interviews with experts in the mobility field based in Copenhagen to get their views on the topic. As a second step, I am analysing the interviews and integrate their input into a final research model which will be tested to citizens of the study context through an online survey.

Regarding the structure of this interview today, there will be 2 parts. At the first part we will do a discussion through which I would like to get your views on the topic, what you think as a professional. At the second part, an exercise will take place. I will show you my research model and I would like to come up with your predictions on the results of the different factors included. I will explain you in more detail once we are there.

Last but not least, I would like to inform you about the handling and safety of the data. Your name will be pseudonymized, the company you work for will be anonymized and your job position will be generally described. I also guarantee you that your data will be deleted after the thesis' submission, defense, and grading announcement are completed. Finally, you have the right to quit at any time.

At this point, if everything is understood and you have no questions, I would like to ask you to give your consent.

Warm-up questions

- Could you tell me some things about you, your educational and professional background and in general your path until now? (max. 5 minutes)
- How do you relate to active mobility? What have you done?

*Not all the questions will be asked. It depends on the interviewee's openness.

Follow-up questions

- Why do you think of this?
- Can you think of other factors?

Main parts

Part 1

The main goal of the 1st part is to get experts' views on new potential factors through a more general discussion and see if the existing research model's variables will be mentioned and in what way by the

experts. For this reason, the research model will not be shown to them to avoid influencing their answers and the discussion in general.

Topic 1 – Copenhagen's active mobility goals

1. Are you familiar with Copenhagen's active mobility goals?

27 municipalities and the Capital region of Denmark have agreed on a conceptual strategy defining the quality and criteria for a **cycle superhighway** and a vision plan for a fully built network by **2045**, to facilitate commuting and increase bike commuters numbers. A total length of **746km** is aspired to be achieved by **2045**. **167km** had been built by **2019**. (https://supercykelstier.dk/english/)
1st carbon-neutral capital globally by **2025**, including active mobility solutions.
In 2011, Denmark, setted the goal to be carbon-neutral at a national level by **2050**, with cycling shares in commuting being at 50%.

2. What do you think of Copenhagen's sustainability goals?
3. Do you think that they are feasible?
4. Do you think that the goals are ambitious enough?
5. How do you think that citizens relate to these goals?
6. What in your view should Copenhagen do to achieve these goals?

Topic 2 – Factors playing a role in achieving active mobility

7. What do you think affects citizens inclination to practice active mobility?
8. Right now we see an increase in cars' use. How can you explain that?
9. What is needed to engage more people in active mobility?

Topic 3 – Characteristics of Copenhagen

10. How does population growth in Copenhagen influence the shift to active mobility?
11. How does the multicultural element of the city influence the shift to active mobility?

Part 2

This part aims to get experts' forecasts on the outcomes of the research model's variables.

It will be an exercise session, where participants will work on the research model.

Guidelines to the participants:

- So, at the second part of the interview, I would like you to come up with predictions on the existing research model and tell me what results you foresee for each of the variables.
- This is the research model. Let me first explain how this research model was built and go through a short description of the variables, while you can also find the definitions on the 2nd sheet of paper, I gave you.

For this model, an extended version of the Theory of Planned Behavior was used. TPB was introduced by Icek Ajzen in 1991 and states that intention towards a certain behavior can be foreseen by attitude toward the behavior, by SUBJECTIVE NORMSs, and by perceived behavioral control (PBC). More specifically,

attitude is defined as a tendency to react positively or negatively to an object, person, institution, or event. **Subjective norms** are defined as the perceived social pressure to perform or not perform the behavior. **PBC** is defined as the perceived ease or difficulty of performing the behavior, while **intention** is defined as an individual's intention to perform a given behavior.

In addition, TPB encompasses the role of beliefs in human behaviors, namely salient, which are categorized as behavioral beliefs, normative beliefs, and control beliefs and are thought to influence attitudes, SUBJECTIVE NORMS, and PBC, respectively.

In this research, 6 variables have been added in the form of behavioral beliefs (an individual's belief about consequences of particular behavior) and is assumed that they have an influence on attitude.

Specifically, **perceived time** refers to the time an individual perceives an action takes and differs from the actual time spent.

Perceived cost differs from the actual cost and refers to the personally meaningful value people ascribe to practicing active mobility via contrasting their experience with it and its cost, with the result of contrast indicating the possibility of practicing it again. So in the context of active mobility, it refers to the extent people perceive that the cost of active mobility is worth and consequently their attitude towards such transportation is affected.

Perceived comfort refers to the availability and/or quality of infrastructure, such as seats or cleanliness, where weather can be seen as a factor related to cleanliness.

Perceived health benefits refer to the perception of the diverse positive health results active mobility can convey.

Perceived safety refers to people's perceptions of the safety of cycling and walking.

Climate change knowledge refers to people's awareness on climate change's existence and its consequences on different aspects of human lives, namely natural, social, territorial and threats to business.

Lastly, **habit** has been added as variable with a direct influence on intention and refers to people's habit to perform a task.

- As a **1st step** of the exercise, I would like you to indicate the level of influence of the variables. To do that you can use a 3 pluses, 2 pluses, 1 plus or 1 minus, to indicate if there is a strong influence, a moderate influence, a low influence or no influence. In this way, you will indicate how big the influence is.
- Throughout this step you can think aloud, while I will also ask you some questions.
- As a **2nd step** of the exercise, if you can think of your own factors, I would like you to write them on the paper and indicate their influence.

Questions for the researcher's use:

12. How big do you think the influence is?
13. Why do you think that there is no influence?
14. What about e.g., social influence? What about their relation?
15. Could you elaborate please?
16. Why do you think this?

Debriefing

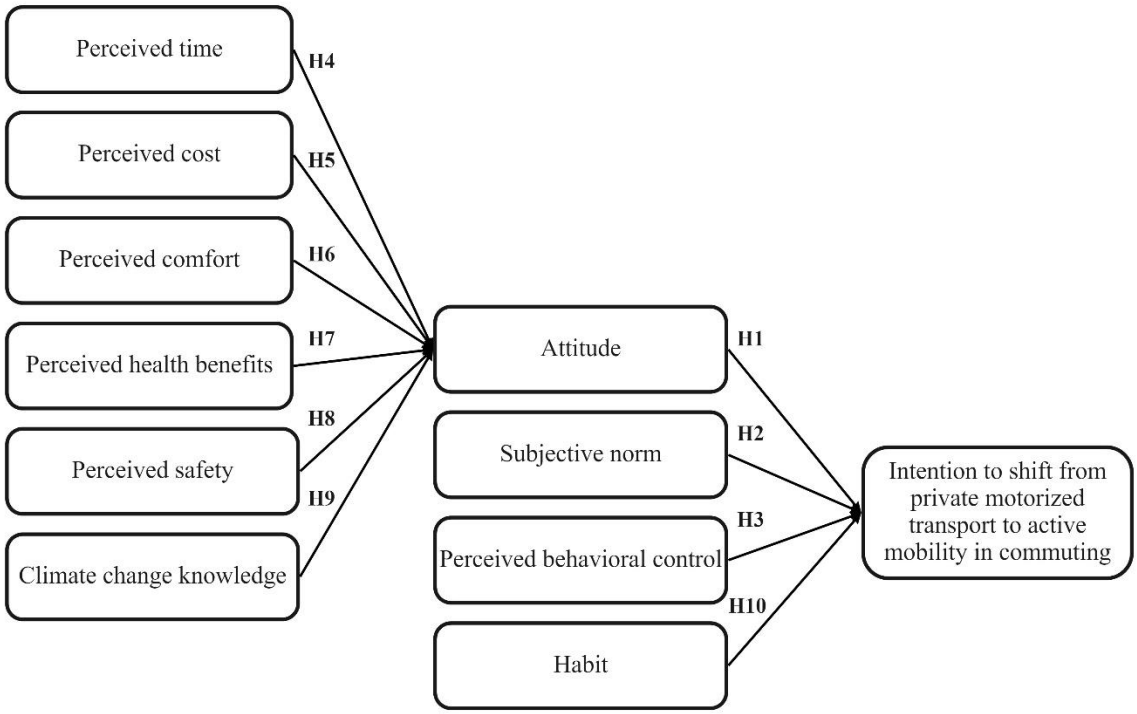
So this is the end of the session. Thank you very much for your time and for your input today. I would like to confirm once again that your name will be pseudonymized, the company you work in will be anonymized and your job title will be described. The data will be stored safely and will only be used for the purpose of this research project. Once the research will be submitted, defensed, and graded, the data will be deleted.

Appendix 1

Numbers at hand	
Study context	Region Hovedstaden
Region's residents	1,857,783 (2021, 3rd quarter)
Expected population in 2045	2,040,739
Commuting for employees in the region (2019)	15.5km (average distance)
Passenger cars stock	slight increase in 2022 compared to 2021
Walking share	19% (Kodukula et al., 2018)
Cycling share	29% (Kodukula et al., 2018)
Public transport share	18% (Kodukula et al., 2018)
Motorized personal transport	34% (Kodukula et al., 2018)

B. Initial research model used in interviews

Research model



+++ strong influence

++ moderate influence

+ low influence

- no influence

C. Definitions of the variables

Attitude is defined as a tendency to react positively or negatively to an object, person, institution, or event.

Subjective norms are defined as the perceived social pressure to perform or not perform the behavior.

Perceived behavioral control is defined as the perceived ease or difficulty of performing the behavior.

Intention is defined as an individual's intention to perform a given behavior.

Perceived time refers to the time an individual perceives an action takes and differs from the actual time spent.

Perceived cost differs from the actual cost and refers to the personally meaningful value people ascribe to practicing active mobility via contrasting their experience with it and its cost, with the result of contrast indicating the possibility of practicing it again.

Perceived comfort refers to the availability and/or quality of infrastructure, such as seats or cleanliness, where weather can be seen as a factor related to cleanliness.

Perceived health benefits refer to the perception of the diverse positive health results active mobility can convey.

Perceived safety refers to people's perceptions of the safety of cycling and walking.

Climate change knowledge refers to people's awareness on climate change's existence and its consequences on different aspects of human lives, namely natural, social, territorial and threats to business.

Habit has been added as variable with a direct influence on intention and refers to people's habit to perform a task.

D. Interview transcripts
Interview transcript – Noah

Researcher: Now I'm recording it.

Noah: Okay.

Researcher: So you give your consent?

Noah: I give my consent.

Researcher: Okay. So could you tell me some things about you, your professional background, your educational background?

Noah: Yes. So my name is Noah, and I work as Mobility professional at [-]. My background is in landscape architecture and urban planning. So I have a planning degree in my bachelor from Germany and a master of science and engineering in sustainable cities from the [-] University, where I focused on mobility planning in Greater Copenhagen. True, you could say. And I worked at the Capital Region of Denmark before and now I work the last 16 months, around one and a half years you could say, at [-]. And I have my role since January. And then I'm responsible for finding innovative mobility solutions with our partners. Together, we have a big partner network containing of cities, industry partners, cities and universities, and research institutions to find solutions, which create more livable cities and decarbonize the transport sector. And then, they can apply for our innovation fund, which happens once a year and have the possibility that they get funded with the idea from us. Co-funded. Yeah, that's broadly what I do.

Researcher: But I understand that you relate to active mobility both on your educational background and the internships you did before and now.

Noah: Yeah, exactly. So, um, I worked with another city too in Germany for six months on how to create the city's bicycle network and what kind of components are important for it and how to create the necessary infrastructure because that's what the city defined as one of the biggest obstacles, so there I worked really directly with active mobility and bicycles. And then in my master, we looked in a lot of different research topics and in my job now too. So active mobility is one of five challenge areas that my company has found European-wide together with the cities and partners. So they mapped 180 challenges and the five most urgent top ones were identified as our challenge areas and I'm not the challenge area lead for active mobility, mine is city logistics, but still I need to have an overview of all five because our partners operate in all five challenge areas. So we as a company run different events, we lobby them into consortia, we develop the project ideas with them. Yeah.

Researcher: Okay.

Noah: Yes.

Researcher: Sounds really interesting.

Noah: (laughing) very messy too sometimes.

Researcher: So my next question maybe it's familiar to you. Are you familiar with the active mobility goals of Copenhagen?

Noah: I am actually not.

Researcher: Okay. So one of the targets is that the city aims to be the first carbon neutral capital globally by 2025.

Noah: Yes.

Researcher: Including green mobility. The second one is that as part of the program to be carbon neutral on a national level, it aims at 50% of cycling shares by 2050.

Noah: Okay.

Researcher: And also another one is that they are working on cycle highways. So they have to complete 746 kilometers by 2045.

Noah: 2045.

Researcher: Yes.

Noah: Okay.

Researcher: So they can encourage bike commuters to commute more in that way.

Noah: Yeah. Yeah.

Researcher: and start abandoning their private motorized vehicles.

Noah: But the carbon neutrality, the goal until 2025 is that directly for them connected to active mobility?

Researcher: Not directly. It includes some parts for mobility, which aims to also 45% to 50% walking and cycling shares.

Noah: Yeah. Okay.

Researcher: So they are more or less all to the same direction in different ways.

Noah: Yeah. Okay.

Researcher: And also, I think the target of carbon neutrality of the city also includes the electric vehicles. But this is not part of active mobility.

Noah: No, no that's true. Okay.

Researcher: So what do you think of these sustainability goals?

Noah: For Copenhagen?

Researcher: Yes.

Noah: So, I mean, since I asked this now, what I think for the carbon neutrality for 2025?

Researcher: No, the active mobility goals of rising the shares of cycling and walking and encouraging commuting by bike.

Noah: I think it's very, very relevant and especially in the city of Copenhagen. I mean, Copenhagen is known for being so proactive and really far in developing active mobility infrastructure and being front runner in the green transition and the mobility sector. But the car, the share of private car still increased in the last five years constantly in Copenhagen, which shows that this is still like an urgent need for action.

So that's why I think it's really important that the city of Copenhagen pushes further and has these ambitious goals.

Researcher: And so why do you think that the cars are increasing?

Noah: That's a good question, because I think one of the biggest obstacles in this transition is the behavioural change which needs to be addressed. And this is such a difficult, yeah, difficult topic how to do this. And of course it's dependent on the right infrastructure. If it's not there, then which goes from the lanes themselves to charging infrastructure, to shower facilities at your work. If you want to bike to the work, for example, that you can shower and change and so on. But if the mindset is not the right one, like this needs to be actively encouraged. And this is super tricky. And yeah, Copenhageners have cars. They have them as one of the main reasons why they have cars is to use it on the weekends and for the summer houses, which is like they stand still very often but then they still like they have a car and they don't plan to get rid of it because there are no alternative business models for like the car sharing economy for these kind of trips, which is a big lack on the industry side, I would say. Yeah.

Researcher: So do you think that these goals are feasible?

Noah: I actually heard that the 2025 carbon neutrality got dropped.

Researcher: Yes, just the previous week.

Noah: Yes. So I guess it's not feasible, but I think it's important to set ambitious goals because otherwise you can't change the status quo. And I think it's okay to fail them too. I mean, if you don't set ambitious goals, you don't reach anything and then the failure is part of it, I would say. So, I mean, if they reach it in 2027, they are still front runners as long as they follow the strategy. But yeah, so the question why? I don't know exactly why they failed. Now, I don't know if you have more information on this.

Researcher: Actually, a contractor, he was supposed to get funding about an installation that would power green energy, but these funds never came, so.

Noah: Yeah. Yeah. Okay. Yeah, it's really sad, but I mean, that's a little off topic, but the carbon neutrality, like a big part of it was carbon offsetting, which is not the greenest thing to do to get rid of your carbon emissions. So it's like it depends on your perspective how you see, yeah, CO2 neutrality, carbon neutrality too. If you see carbon offsetting as like a proper way to do it, or if you think it's okay that it takes a little longer time and then to do it with the right methods and wait until there are new technologies which can replace.

Researcher: So why do you think that carbon neutrality is the best way to achieve these goals?

Noah: Carbon neutrality? Why I think this is the best way?

Researcher: No, no. I mean, why you think that carbon neutrality is not the best way?

Noah: No, I think carbon neutrality is good. I think the offsetting or what's the name?

Researcher: Yeah, yeah, offsetting.

Noah: Well, it always depends.

Researcher: Oh, you mean kind of greenwashing.

Noah: Yeah, exactly. So like, greenwashing is a big part of all the goals and maybe not too much in Copenhagen, actually. Oh, no. This is your phone. Where's my phone? Oh, because I think I missed the

term like the shady part. How they get rid of a lot of CO2 emissions. It has like a special name, and maybe that's not offsetting, but maybe I have to google it.

Researcher: It's okay.

Noah: Yeah.

Researcher: We are not focusing on offsetting, so it's totally okay.

Noah: But greenwashing is like always like a risk in these goals. Like what kind of an impact do they actually have in the end, I would say. And then you have to look really carefully. Yeah. How they cut the emissions so drastically. If it's really because they got rid of them, or did they just like shifted them somewhere else. Yeah. In another sector or.

Researcher: Okay, and how do you think that citizens relate to these goals?

Noah: I think they relate a lot to them because a lot of people move to Copenhagen because they know, like the city is very livable and known for the great transportation and climate. Yeah, climate friendly aspects which really like shapes and brands the city. And, I would say the majority of the citizens in Copenhagen support the strategy. Maybe a lot of them don't know exactly in detail how it looks like. But I would say there's no citizen who has something against creating more livable cities and fighting climate change at the same time. Maybe the car lobby or like car owners. But I would say, yeah, that's a difficult question. How much? I think the older generation maybe has a problem and a different mindset, but I would say the majority supports this.

Researcher: Okay, let me then shift to the city itself. What do you think that Copenhagen should do to achieve these goals?

Noah: That's a good question. I think they should support citizens on the one hand with financial support. If they buy a car or bike, for example, that they get. I don't know, 20-50% or a certain amount reimbursed. I know the German cities did it and that it was a very positive, uh, feedback and positive way of doing it. So a lot more citizens bought a cargo bike then and dropped their car at some point. I don't have statistics, but I think it's a very good way for doing this.

Researcher: And in which city of Germany that happened?

Noah: I think in Hamburg and maybe in Munich too. You know, like two, three years ago.

Researcher: Okay, so it's recent.

Noah: Yeah. Yeah. And I thought about buying it. It's not my professional perspective, but I would buy a cargo bag if I would get financial support because they are quite expensive, especially if you have an electric one and the car industry gets so much support and yeah, so many subjective normseaky ways of financing it. That's I think is the other financial funds to do this it's just yeah. Net of policy set up and the same goes for companies too that I think they could get more support from the city and setting up the right infrastructure to the people can park their bikes safely under a roof for example or locked if it's an expensive bike and then their shower facilities. All these barriers and obstacles which may hinder a private person from commuting by active mobility and not by a car.

Researcher: So what about the shower facilities? You mean in public? Just clarifying.

Noah: No, I mean.

Researcher: Or you mean in the companies?

Noah: Yeah, yeah, yeah, I mean, in the companies. That's actually something I looked at in my master so that this was a barrier. Why people sometimes didn't want to bike because if you work a whole day and your appearance matters a lot, you don't want to arrive sweaty and bring a change. Or like, like these kind of obstacles. So if there are good showers, then you can bike normally get sweaty and. Yeah.

Researcher: And what do you think that affects citizens intention to practice active mobility? These factors that you mentioned now about the shower facilities, the locks and all these things, can you come up of other factors that maybe affect the citizens to practice active mobility? You can take your time. It's totally fine.

Noah: Yeah. Yes, I think time is if it's faster and it is faster in Copenhagen to normally to take the bike instead of the car, then the health aspect could be relevant too. And there are some really interesting statistics from the city of, uh, from the municipality of Copenhagen that with every kilometer biked, the society saves like one kroner or something because it's like it's an added value on your health directly. So then financial. The car is super expensive. Um. And it costs not enough, but it costs something to park it in the city. And any other factors? Maybe it's about lifestyle, too, I think for a lot of Copenhageners that they like the image of themselves in a cargo bike or a bike with a family without a car because it's a little a trend too. yeah. Did I miss anything? Yeah, I think this is all of my stuff.

Researcher: And before we mentioned the cars increase in the car stock. Would you like to try a bit to come up with some factors there? Why may citizens of Copenhagen insist to use their cars?

Noah: I think it's like the status quo. Like people don't like change so much. It's always more work for them to change it. And people are lazy. Then the city is designed to some degree for car, even though there is a lot of alternatives. But we have still a car society. I think the storytelling matters a lot, how things are communicated to people to change their behavior. So if, um, if for example, if you say, "Oh, we make a car free district", then a lot of people get upset directly and say, "Oh, why is it car free?". But if you say, um, I don't know if you highlight the positive gains instead and say this is a quiet area but livable like that.

Researcher: Residential area.

Noah: Yeah. But you don't point out what's lost but what's gained instead. This can really change something and influence. In frankness, I wrote in my master thesis about it. So I can send it to you if you're interested. So yeah, so that matters a lot and that's something that's a little off topic now, it doesn’t answer your question, but like in Germany more than in Denmark, the coloring really shaped the image too, how the car scene, that it stands for livability, for masculinity, for financial freedom and so on. And this is like a certain value which is presented in the advertisement and which we learned from since we were a child. And the cities don't do it exactly the same, but if they point out like car free can be positive, but if it's like more put in a negative context, it can be a barrier. So it's really, the storytelling matters a lot, and how new development areas or rebuilt areas in the inner city are presented to the citizens to accept, to create an acceptance.

Researcher: So storytelling is a really important factor in your view, in a way to engage the people, to use active mobility as a transport mode?

Noah: Yes.

Researcher: What other ways we could use to engage them more?

Noah: I think experience is always a very important factor that they can try it if they are not so familiar with it. If that's, for example, that there are pop ups around the city where they can try a cargo bike or I'm really stuck on cargo bikes because I like them personally, but that they can try an e-bike because then maybe never sit on it and didn't realize how easy it is to bike long distances and then they can use them to work instead of the car if it's not around the corner. Or that could be the responsibility of the companies too, that they take ownership for this and offer them to try it and then give a certain percentage of and financial reimbursement if they like it. So I think experience is a really important factor or car free days is something it's a kind of way of storytelling too, that they can experience how this without cars being everywhere, that they really see the space which are occupied by the cars and how they could be used by active mobility instead. Open space, and like fun and sport activities too. So I think experience is a really powerful tool to shift the behavior or like make them yeah, make the citizens more open for an alternative.

Researcher: How would you approach the walking aspect, as also a way to commute? Either in combination or depending on the distance.

Noah: I think the inter-modality is really important that that's not just walking, but the combination of active mobility with the public transport, that it has to be seamless and very smooth because the moment there's a big gap of like 15 minutes, people don't want to do it anymore because everyone likes running out of time in these days. It needs to be fast for it to be, and no one wants to like spend time if it's not a seamless transportation, and especially if there's no like if you can't combine it with other needs on your daily life, like going to a supermarket or like another store where you need something or to a pharmacy or go to a little cafe that you can grab a coffee. Like things like this are really important for these mobility hubs, which combine the different modes of transportation to make it a positive experience, to have to use different ones. And part of it would be walking to that you like walk from your house to the S train, take the S train to the city, and then from the central station, um, to your office. And then safety is another really important aspect that this, but that goes in the direction of infrastructure. That's the right light in the night because that's the reason why especially women don't want to walk so much in the night that the car would be safer then. Benches, trash bins, all these, uh, positive city furniture, which makes it more livable.

Researcher: And let me then go to another part, which are the characteristics of the city. For example, the first characteristic is that the city is confronting with urbanization, and by 2035 there will be an increase in traffic congestion, 35% approximately. So more people within the cities, more cars within the cities. How does this population growth in Copenhagen influence the shift to active mobility?

Noah: I mean, you can ask how does it influence it if the city doesn’t take ownership for this change like that, they need to promote active mobility. Otherwise, it's hard to say how the future will look like. I guess it would just develop how it is now if there's no bigger interaction like COVID or, I don't know, geopolitical situations where gas prices are very high. But of course, growing population needs an adapted public transport system and then on top, like the right infrastructure to walk and to bike, I would say. I would because like mass transportation for like an increased population, it's even more important to shift or move people from A to B. Yeah. And then, I mean, cities will get more crowded even though they will expand, but they can't expand forever. So, the existing infrastructure needs to be maintained really well and be promoted to use because your growth just can't be limitless.

Researcher: And another element is that the city is multicultural. There are people from many backgrounds here. How do you think that this influences again the shift?

Noah: I think it's very important to promote the different modes of transportation and make them accessible for everyone. And for example, we have a pilot at our company, where we fund a project where we educate women who come from countries where it's not common to bike, to teach them how to bike, and to make them as like educate them as bike ambassadors, and then they can educate new groups of women to make the bike more accessible. I mean, it's quite unique to bike sometimes in Copenhagen, I would say. You have your own rules, how to stop, how to move to the left or to the right. So you need someone who introduces you to it because otherwise, how should you know? So that this is really that there's a system behind it, like a structure which is either promoted by the city or like organizations like ours too. But I mean, we like companies like us, we can fund it. But I think the structure setup needs to come from a city to make sure that every part of the society is integrated properly.

Researcher: Okay.

Noah: Yes.

Researcher: So this is the end of part one.

Noah: Okay.

Researcher: So let's proceed to the second part. You can drink some coffee, some water, whatever you want.

Noah: My coffee is that one.

Researcher: Okay, so at the second part, there will be an exercise.

Noah: Aha.

Researcher: This is my research model.

Noah: Aha.

Researcher: You can see it. So, at this part, I would like you to come up with predictions on the existing research model and tell me what results you foresee for each of the variables. But first, let me explain you the guidelines and how you can approach it.

Noah: Aha.

Researcher: So let me go through a description of the variables first. So you are aware of the contents behind each name.

Noah: Yeah.

Researcher: You can also have the definitions here.

Noah: Okay.

Researcher: So you can take a look as you are practicing on the model.

Noah: Yes.

Researcher: So this model is based on the theory of planned behavior. The theory of planned behavior was introduced by Ajzen in 1991 and states that the intention towards a certain behavior can be foreseen by the attitude towards the behavior, the subjective norms, and the perceived behavioral control. So,

attitude is a tendency to react positively or negatively to an object, a person, an institution. Subjective norms are, the social influence, the significant others of a person.

Noah: Yeah,

Researcher: The perceived social pressure to perform or not perform the behavior. Perceived behavioral control is the perceived ease or difficulty of performing the behavior.

Noah: Okay.

Researcher: And the intention is the individual's intention to perform a given behavior. So, Ajzen's model, after the intention, leads to the behavior, but it's not part of this model right now. So here we stop at intention. We want to predict the intention.

Noah: Okay.

Researcher: As part of the theory of planned behavior, there are also the behavioral beliefs, which are these six factors. So these influence the attitude at the specific model. So we have perceived time where you also mentioned before you also you mentioned time before. This is perceived time. It differs from the actual time. And this is combined with the effort spent, the effort needed from the individual to perform a task.

Noah: Yeah.

Researcher: To learn and perform a task. The perceived cost differs again from the actual cost and refers to the personally meaningful value people ascribe to practicing active mobility via contrasting their experience, and the cost of practicing with the result of this contrast indicating the possibility of reusing active mobility. Perceived comfort refers to the availability or the quality of the infrastructure. We can have seats or cleanliness; weather can also be related to cleanliness as a factor. Perceived health benefits, as you mentioned before. So if people are aware of the positive health results. Perceived safety, how safe cycling and walking is. Climate change knowledge. If people are aware of the climate change existence and the impact that can have.

Noah: Yeah.

Researcher: And lastly, we have habit because people are used to do things.

Noah: Yes.

Researcher: So as the first step of this exercise, I would like you to take your time, go through the definitions again, see the research model. And on the bottom of the page, you can see some, some symbols. So to work on the research model, you can use three pluses, two pluses, one plus or one minus to indicate if there is a strong influence, a moderate and low or no influence. So I want you also to indicate how big the influence of these factors is and basically how they relate. For example, perceive time has three pluses because it has a strong influence on attitude.

Noah: Yeah.

Researcher: So, wherever the arrow leads.

Noah: Okay. But they don't, they only have an influence on the attitude and not on the.

Researcher: These 6, yes.

Noah: Okay.

Researcher: So this way I want you to predict what the influence will be. Also, the second step, if you can come up with other factors apart from these that you're seeing right now, you can add them at the model wherever you want them to place. But I would like you also to indicate the influence again.

Noah: Okay.

Researcher: Based on the four options right there.

Noah: And the question is how I think the fact these factors influence the shift to active mobility. Yeah.

Researcher: What do you think that the outcome will be if I run the survey tomorrow, for example?

Noah: Yeah. So what has the biggest. Yeah. Okay.

Researcher: You can ask me whatever you want while you're going through it. While you're working on it.

Noah: Yeah, but. So it's not really my personal opinion. It's more what I think of society based on my knowledge, what I work with them.

Researcher: Well, this is your opinion, actually, because you have combined your knowledge, your stimuli, your professional experience, and what the society thinks.

Noah: Yeah. Okay. But is it how I perceive?

Researcher: How you predict.

Noah: So I, okay, so. Okay, so how I would answer it, not how I think the citizens would.

Researcher: No, how the citizens would, but based on your view. You think, for example, that the citizens are affected by that.

Noah: But for example, with the climate change knowledge, I know that I'm in a bubble where I work. I mean, I studied climate change mitigation. I know what like what added benefits of mobility has. But I know, too, that, like a lot of people are not in this like green.

Researcher: I want you to go out of this bubble.

Noah: I leave my bubble.

Researcher: And try to indicate how the citizens

Noah: Yeah.

Researcher: Would be influenced.

Noah: Okay. And, uh, I can use as many three pluses, for example, as I want. Not that I will give them now, all of them to be pluses.

Researcher: Whatever you want, whatever you think. You have a pen, so okay.

Noah: Yes. And these. I just, uh, don't.

Researcher: You can also indicate here, what do you think that the relation to the intention will be.

Noah: Okay. Mm hmm. Yes. So I would say perceive time is a very strong influence. So I give it 3 pluses. And the same goes for cost. Should I put it on the left? Maybe it's easier.

Researcher: Yeah, it's okay.

Noah: But I think. Health. Where was this? Here, I don't know if I gave it a. That's difficult. It's either moderate or low, I would say. I give it moderate and climate change knowledge, I would give a low influence and safety I think that depends really on the individual who answered it because I think female people, women are different than men and age wise too. I don't know. 20-year-old woman perceives this differently than maybe a 65-year-old one. Um, I give it 2. And comfort. Yeah, I think this is a very strong one. So I actually ranked that, the structure. And yeah, attitude.

Researcher: So think that attitude is basically influenced by all these you just marked.

Noah: Yeah. Then it's very strong. So. And the subject of norms are defined as the perceived social pressure to perform or not perform the behavior.

Researcher: So people are influenced by the people in their social circle, how huge that influence is on them.

Noah: But is it the way how you got educated and how you grew up, too? Which goes in there too, I guess.

Researcher: Yeah, it's also part of this because they are influenced by their opinion of their significant others, by their parents, their friends.

Noah: Yeah. I would say it's a moderate influence, not as strong as the attitude, but still like with a lot of impact and the perceived behavioural control is defined as the perceived ease or difficulty of.

Researcher: So how would you describe perceived behavioral control? Um, so it's basically how easy or difficult the action is for the individual.

Noah: Yeah, okay.

Researcher: How confident the individual feels to perform this action.

Noah: Okay. But for example, like the seamless of the different modes of transportation I discussed earlier, that's a little bit too. Because if it's like more difficult to switch between different modes of transportation, it's a barrier which influences citizens.

Researcher: Yeah, because. Let me set an example. An example of perceived behavioral control is that I am confident and that I have all the resources I need to perform this action, to use active mobility as a transport mode.

Noah: Yeah. Okay. But some people are not comfortable in biking because they never did it. They maybe are not in the shape for it. Hmm. I give it 2. Yes. I think it still has an influence, like a certain influence, but I think habit is very strong. Like, that's one of the strongest again, and that's the hardest to break and get like, done. Yeah. I didn't give anything in no one because everything is so important.

Researcher: No, it's also interesting that you see that. And I would like to ask a question about perceived safety. How do you see perceived safety? Because you mentioned an example about how safe a woman may feel. And of course, that is safety. Where would you categorize, for example, infrastructure safety?

Noah: Where would I categorize infrastructure safety, like in this model?

Researcher: Do you think that can be part of this as a second aspect, for example? Would you think that it's a different factor?

Noah: I mean, I would say infrastructure itself is part of safety and of the comfort. So it's an underlying category. So I would say you could keep it in perceived safety. But then the perceived safety is like. Like it has different subcategories, and one of them is infrastructure. And the same goes for comfort. Yeah. Yes.

Researcher: Okay. And I don't have further questions, I think because you elaborated on all the factors while you were indicating the influence.

Noah: Yeah. I think I don't have any other to add neither. I mean, I mentioned a lot earlier, but I think they are all. Like storytelling and communication are very important but that's maybe not for the citizen to take ownership of this, but from the city side. So this is not an influence on. Like it has an influence on the attitude and habit and so on. But not directly.

Researcher: Where would you put it on the model? Storytelling.

Noah: Mm hmmm. Good question. I think I would edit here And then it can get a line to habit. Well, maybe not habit, but maybe habit is not the most important one. Like which one was the social pressure, subjective norms. So I think it will. Should I write it there?

Researcher: Yes, sure.

Noah: And I would give it 2. I can write my own. And then I would make one line to subjective norms. And I don't know. Yeah. And it can influence the attitude, too. And I guess maybe all 4. Behavioral control? Yeah, but more the first two. And then this overall influences the habit.

Researcher: So you see storytelling both from a city perspective leading to attitude, but also from a closed social circle perspective.

Noah: Yeah.

Researcher: So do you think that storytelling is part of, I don't know, discussions with friends, for example?

Noah: Yeah, I think it plays a really like, I think our everyday stories play a bigger role than we think. And if we then only, like, highlight the negative part it has an influence. So I think everyone has a certain responsibility about storytelling for this, even though if you don't work with it or are not an expert in it. So next to the cities, this is another aspect that makes small stories being important too. Yeah.

Researcher: Okay. And I'm thinking of other factors that you mentioned before.

Noah: Yes.

Researcher: I think that most of them are within the model right now. But you also mentioned showers, for example, available showers.

Noah: But I think this can go with comfort. So that goes into the like.

Researcher: That was my question.

Noah: Yeah.

Researcher: If you can see it included in some of these factors or.

Noah: Yeah, I can see it included. It's the same with the safety for a certain user group, but it's part of the infrastructure and the infrastructure goes like. I would say infrastructure is like one part which needs to be there, then the mindset needs to be there, which goes a little bit more in this direction. So maybe you could write infrastructure a little bit like separate here too, but with another outline that's like it has a really special role. Like if infrastructure's not there, which goes from lanes to showers to storage facilities or charging infrastructure, it does not function. So I don't know. It can stay there or I would maybe put it.

Researcher: So you would put it in the middle as a factor with a direct influence on intention.

Noah: Yeah. These are more like the, I don't know, I'm really bad with these terms, but like the social mind stuff and this is like the hot technical factors. Maybe you can put it like this. So link to it?

Researcher: Yes.

Noah: So I just write it here.

Researcher: And also indicate the influence, please.

Noah: Yes. So I just give it another outline that it's clear that it has another category. So I just write hot, hot fact. And maybe here I would not suspect. That's not I mean, they're really important, too. It's just another category. I'm not sure if this is the right term I would use, but this is not my expertise, so.

Researcher: Yeah, I can see that here. You mean the more actual infrastructure and facilities.

Noah: The engineering part of it? Yeah. And this can change all 4. It's just it's the same in the storytelling. So I just make one line like this and then it goes more to attitude. Subjective norms. Yeah. Maybe this goes more to attitude and to habit.

Researcher: Okay.

Noah: And I would give it 3 pluses.

Researcher: For both? For attitude and habit?

Noah: To react positively. Yeah, actually, I would give it for both, 3 pluses. So I. How should I draw the line to habit?

Researcher: You can just draw it.

Noah: Set it around?

Researcher: Yeah.

Noah: Possibly design my paper.

Researcher: Okay. And I can see that you relate a lot of perceived comfort with perceived safety and that they have the same sub aspects.

Noah: Mm hmm.

Researcher: How do you think of this?

Noah: Yeah, I would say. Hmm. I mean, time is a little bit more soft, I would say too. You can't. I mean, of course, efficient infrastructure supports time too, but and costs it's really, I don't know. I see. Comfort and safety is directly linked to infrastructure. So.

Researcher: Okay.

Noah: But maybe perceived safety. Depends on to about like on the society in general, how the society functions, how the city is set up. So, it has different aspects too. Yeah. I don't know if I can elaborate any more.

Researcher: It's totally okay.

Noah: Yeah?

Researcher: Yeah. I think that was it.

Noah: Okay.

Researcher: If you don't have any further questions.

Noah: No, I have a hard time with, like, these definitions, sometimes, scientific definitions.

Researcher: Okay. So let me tell you once again about the data that will be handled very safely. And I will not appear your name or your company, and they will be deleted after the thesis' grading.

Noah: I hope it's going to be a great grade.

Researcher: So thank you very much for today and your input. I think it's really interesting.

Noah: I hope it was sufficient. And if you have any follow up questions, just ask me.

Researcher: Sure. So, I am stopping the recording.

Noah: Yes.

Interview transcript - Logan

2022_10_13_Interview_Logan

Researcher: So I would like you to say your name and give your consent.

Logan: Yes. Hi, I'm Logan. And yeah, I'm okay with this interview and the last one (data handling).

Researcher: Okay. So, could you tell me some things about you? A short intro about your professional background, how you relate to active mobility?

Logan: Yeah. Um. Yeah, I work with mobility for many years. I've worked at national level. I've worked for the city of Copenhagen and I work here at [company] with mobility aspects of urban planning, and I am lead, kind of mobility lead here and on with the studies something like political science. So, I worked a lot within economics and sociology and politics and also communication related to mobility, but also with the infrastructure aspects, cost benefit analysis, all these kind of different angles on mobility and urban planning. So. That's me, I guess.

Researcher: Okay. So you came from kind of different background and you moved within mobility? Because you studied political science and…

Logan: Yeah, not really. When I did my final thesis, like you now, years ago, I had to find out, okay, what would I like to work with? There was a lot of boring things. I thought, Oh, I don't want to work with that. But then I thought, okay, traffic is fun because there's a lot of politics in traffic, there's a lot of economics and there's a lot of psychology, sociology and why people behave as they do. And at the same time, it's also a topic that really affects people that sort of emotions around traffic planning and how to allocate space on the streets. And people get all engaged in it because it really matters for the everyday life. So I thought, okay, this is a topic that I find interesting and where I can kind of combine the different disciplines I work with during my study. So I did my master's thesis on mobility.

Researcher: Okay.

Logan: And then I worked within mobility, urban planning ever since.

Researcher: Okay, sounds really interesting.

Logan: Yeah, that's good.

Researcher: So I am now proceeding to the first part of the interview. Let me ask you first if you are familiar with the active mobility goals of Copenhagen.

Logan: Of the city of Copenhagen?

Researcher: Yes.

Logan: I'm quite sure I am. I've worked that for many years.

Researcher: I guess that too.

Logan: Yeah.

Researcher: Okay. I have highlighted two in my study until now. The first one is that on a national level Denmark aims to be carbon neutral. So also the cycling share should be at 50% minimum by 2050. And the other part is specifically on the capital region.

Logan: By 2050?

Researcher: Yes.

Researcher: City of Copenhagen?

Researcher: The whole country.

Logan: Ah the whole country?

Researcher: The city of Copenhagen aims to that by 2025.

Logan: Yes, exactly.

Researcher: As part of the carbon neutrality of the city.

Logan: Yeah, yeah, I know. But you said 2050.

Researcher: 2050 on the national level.

Logan: They want to increase cycling from 50%, I guess.

Researcher: Yes, minimum.

Logan: I thought you said the market share should be. Anyway

Researcher: No, no, no. Minimum 50%.

Logan: Okay. I trust that.

Researcher: And another goal is that they are currently working on a big network of super cycle highways to encourage people to commute by bike, etc... So what do you think of the sustainability goals? Of these active mobility goals? Do you think that they are feasible?

Logan: At the national level? What you just mentioned increase with 50%?

Researcher: I guess this is the same for Copenhagen also. So let's focus on Copenhagen having minimum 50% of cycling shares.

Logan: By 2025.

Researcher: Yes.

Logan: Yeah, but they can reach that by 2025. Well, I think it was 44% some years ago. I think they've gone incredibly close. When you look at the same time, the city is building a metro that mainly competes with cycling and bus traffic and walking. So I think, I think the goal of 50% has made sense. It's easy to remember. It's been good to communicate and it's ambitious, but it's not totally unrealistic. But I don't think that we'll get there. But they will. They have gotten surprisingly close.

Researcher: Why do you think they cannot succeed it?

Logan: Because when you look at the numbers, I mean, you have very high load shares for cycling. You know, all of the shoulder trips not so high and the long trips, that's the reason why the city of Copenhagen has promoted the super cycle highways and so on. But I think you need measures that are more strict on car access. And this is measures I don't think will happen before 2025.

Researcher: Okay.

Logan: So that's the main thing why I don't think. I mean, it's a very, very ambitious goal first of all. I mean, 50% of all commuters or people going to education to choose one mode of transport, which is like. So the combination is very ambitious and I don't think there's a willingness to decide on the measures needed. Part of that is also, for example, congestion pricing. There would be no national agreement on congestion pricing before 2025. I don't see that coming. So the city cannot do this on its own and they need help from the national level. I don't see that coming.

Researcher: But beyond the government, for example, how do you think that citizens relate to these goals?

Logan: I don't think citizens relate to this goal.

Researcher: Why?

Logan: I would ask the other way around. Why should you think as a citizen, why should I care about the moon splitting my city? I think citizens relates to the quality you provide them for movement. They really relate to new projects on transport in city of Copenhagen, whether it's a new metro, whether it's a new cycle track, whether it's even a footrest, a traffic signalized intersection. People really react to that. They really react to their local way to school for their kids. I don't think they react very much to an overall goal and motion.

Researcher: Okay. So do you think that the city, together with the government, should try? To motivate citizens? They should try to establish these goals to make them happen.

Logan: Maybe I misunderstand the question, but for sure, the city, together with the national level, should work on making reaching the goals. I mean, that's why they put out the goals. So they should work on that. Of course. This is what they're there for. I'm just saying, I don't think the citizens. Why should they care about all this is 50% or 35% or 58%? They care about good cycling conditions. They care about good conditions for the kids to walk to school they care about how often is the bus running and all these kind of things. They care about the quality of cycling in the city very much. Copenhageners really care about that. And there are options to give you opinion or when the city collects feedback from the citizens and transport and traffic and cycling, they get a lot of good feedback, very very good feedback. But you ask specifically if they care about the 50% mode share for commuting trips. I don't think people care that much about that.

Researcher: Okay.

Logan: Have you met anybody that cared about it? Do you care about it?

Researcher: I don't think that they care about the percentages themselves.

Logan: No.

Researcher: But I mean, they contribute to all this.

Logan: Yeah, but that's different.

Researcher: They are trying to make it happen.

Logan: Yeah, very much. But for me, that's a different thing.

Researcher: Okay. So what do you think about that? So how they can, um. What affects citizens towards meeting these goals? I mean, what do you think that affects them to their inclination to active mobility?

Logan: To change behavior and use more active mobility?

Researcher: Yeah. To make that shift.

Logan: I mean, obviously, you've seen there's a lot of research on this already, but I think the key thing is the quality of cycling or walking. If you speak active mobility, you know, how good are the cycle tracks, the sidewalks, the bridges, all this stuff. And then, of course, it also matters how good is the competition? How easy is it to drive a car? How much does it cost to park a car? All these kind of things. And then also, I think the culture of the city matters. And when I looked at the city, we looked into so what about newcomers to the city? How much do they cycle? And it was like there's like 37% cycle before they moved to Copenhagen and 70% to 80% cycle after they moved to Copenhagen. And part of that is due to having a good infrastructure for cycling and so on. But part of that is also, I think here you are kind of immersed in a culture where to go on a bicycle is very, very normal. So the culture also helps promoting these goals.

Researcher: Do you think that the same goes also for walking? That the infrastructure is the main enabler for the citizens to make this shift? That they need infrastructure, they need good connections.

Logan: Very much. But again, this is a long discussion, but it, of course, also matters where are the things you want to go to? Okay. So just as one example, the whole thing is you're not going to swim in the city of Copenhagen in the harbor. So you just maybe have two kilometers or four kilometers. You want to go swimming in the summer instead of having to go 15 kilometers to a beach to the south or the north. Also matters a lot for how many people walk inside. So also the location of important destinations is local. We need to move a long distance also. But apart from that, I don't know, I would assume the enablers and the drivers for walking and cycling are a little bit the same.

Researcher: Yes. Okay. Let me go to another question. Right now, the last years, we see an increase in cars' stock. So people are buying more cars in the region. Why do you think this happens? While at the same time we try to shift them to active mobility.

Logan: First of all, the car is a great product. It's a moving living room and you can plug all your things in there. And so it's a great product and it's a great product also, of course, if you can park it for very low prices, which you can in the city of Copenhagen. No matter what the city is saying, the parking fee for residents is very low. So that means if you have the money to buy a car, it's not that expensive to have it standing around. So people have grown more affluent. And it's not that expensive, actually. It's becoming more. It has become more cheap to buy cars in Denmark the last 15 years, no matter what the politicians have been saying about. You know, sustainable transport and so on. At a structural level, the pricing has been in favor of using cars and not in favor of using public transport. And you can say in a way disfavoring cycling also because the competition from the car has been cheap. So people are getting more money. Not that expensive to have a car in Copenhagen. And thanks to so many people cycling, it's not that bad to drive a car in Copenhagen. It's not that much congestion.

Researcher: And the city of Copenhagen, but also the region Hovedstaden, is confronting with urbanization in the coming years. How do you think that population growth in the city relates to make the shift happen?

Logan: I think the more you kind of densify the city, the more trips are shorter or can be shorter to reach the kind of activity you want to do. And that makes walking and cycling more competitive. So in this way, if we look at if we forget the numbers during Corona, if you looked into that, but the numbers for cycling during Corona is kind of dropping down and it's hard to know what is the new normal. But if you forget that for a moment, then the trend in Copenhagen has been more and more cycling in the last 30 years. And part of the reason for that has also been the number of people choose to stay in the city and live in the city. And the city have developed new areas, so you have more dense cities. So in this way, urbanization in the

central parts of Greater Copenhagen has promoted cycling. But if you look at the greater Copenhagen area, which you're also looking at, I'm not an expert, but it's my impression that that has not been so condensed, that has been allowed to spill out more. So it's my impression if you look at the Greater Copenhagen, then urbanization has not been so helpful for promoting cycling and walking.

Researcher: Okay. And also in the region, there are a lot of people from different countries, for example, different backgrounds. Do you think that this multicultural element influences the shift?

Logan: Yes, I'm quite sure, but maybe in different ways. This is about people from other countries and how you put it. The only number I know about the main reason is that we looked at, when I was at the city of Copenhagen, there we could see that immigrants from non-Western countries only cycle half as much on average as the average Copenhagener.

Researcher: Mm hmm.

Logan: So I think, for example, the shift to active transport is a little bit dependent on kind of a "what is the culture both in your family and maybe also if you're a recent immigrant? What is a culture where you come from?"

Researcher: Mm hmm.

Logan: And I think especially some countries maybe are seeing car as more important for your social status and thereby also seeing cycling as, "oh, this is not for me". And that, of course, makes it harder to have people from maybe some countries to choose to bike than people from other countries.

Researcher: Because it's way more different than their culture.

Logan: Apparently. I mean, it seems. Yeah, this is much more status to put into your mode of transport and car is the fanciest thing and to go on a bicycle is "Oh, that's for the poor people. That's not for whatever". So it takes my work, at least.

Researcher: Mm hmm. So this is the end of part one.

Logan: Good.

Researcher: You can have coffee, water, whatever you need until I make an introduction to part two.

Logan: Okay. Do you think we can do it? 10 minutes more and then it's? Or how much time do we need?

Researcher: I think 10 minutes. 15 months max.

Logan: Okay. Go for it.

Researcher: Okay, so here is my research model. And here I'm also giving you the definitions of the factors.

Logan: Yeah.

Researcher: While I'm making a short introduction of how we want to do this exercise. So, just a minute. Yeah. So this model is based on the theory of planned behavior. I don't know if you're familiar with that.

Logan: Planned behavior?

Researcher: Yes.

Logan: No, I don't.

Researcher: I will explain it so you can understand how the model is built. It's a theory that it was introduced in 1991 by Icek Ajzen, and they stated that the intention towards a certain behavior can be foreseen by the attitude towards the behavior, subjective norms and perceived behavioural control. So, the attitude is actually the tendency to react positively or negatively to a situation, to an object. Subjective norms are the social pressure to perform something and perceived behavioral control is the perceived ease or difficulty of performing the behavior. Intention is the individual's intention to perform a given behavior. But in this theory, there are also, there is also the role of beliefs in human behaviors, namely salient. And here we add six factors in the form of behavioral beliefs. So an individual's belief about consequences of a certain behavior. And we have perceived time, which refers to the time in combination with the effort spent needed for an individual to learn and perform a task. We have perceived cost, which is the combination of the cost and the personally meaningful value that the individual ascribe to practice active mobility. So via contrasting the cost and the experience we have a result of whether the individual will reuse active mobility, will re-practice active mobility. Then we have perceived comfort, which refers to the availability or the quality of infrastructure in terms of cleanliness, available seats, weather can also be seen as a factor related to cleanliness. Then we have perceived health benefits. So if the individual is aware of the positive health results that active mobility conveys. Then we have perceived safety. How the individual perceives the safety of cycling and walking basically. Then we have climate change knowledge. If the individual is aware of the existence of climate change and the impact this can have. And finally, we have habit, which is in the middle and has a direct influence on the intention because people are used to do things. So, at the bottom of the page you will find some symbols and I would like you to go through the definitions again if you want, see the model and indicate how big the influence you think is, between the factors. You can use 3, 2, 1 pluses or a minus to indicate if it's a strong, moderate, low influence or there is no influence. And as a second step, if you can think of other factors that are not included here, but you think that they are very important, you are more than welcome to place them wherever you think is the best in the model and also indicate, again, the influence. So if you have any questions.

Logan: I read all these and also these.

Researcher: Yeah. I would like, for example, to indicate if perceived time you think that has a very strong influence to attitude. These six have an influence in the specific model, only on attitude.

Logan: And then I rate these three afterwards.

Researcher: Yes. You can think aloud.

Logan: This one, perceived safety.

Researcher: Yes.

Logan: I think this is very nonlinear.

Researcher: Mm hmm.

Logan: It has to feel safe.

Researcher: Okay.

Logan: But if that's more almost a yes or no. You understand what I mean? It's not like I think it feels more safe. Just for you how you will interpret this.

Researcher: Okay. But you only have made added three pluses only in the perceived time. You think it's the most important of the six?

Logan: Yeah, together with comfort and safety, but I think I should not put everybody on everything on the same. I would say the time or the convenience. You don't have something that's convenient. But for me, convenience is a mix of time and comfort.

Researcher: Okay. Many people see time and cost as very important factors in whatever, not only in active mobility, but you have indicated with three pluses time and with only one plus cost. Why do you think that cost is not that influential?

Logan: Because here we are looking at Greater Copenhagen or Copenhagen.

Researcher: Okay.

Logan: And we can see from research done most of the people that cycle, for example. That's not because it's cheap. It's because it's the fastest and most easy for them. A lot of people drive a car and even though it's expensive, they just feel, "Oh, this is great for me. It's quick." But if people in Denmark have, I mean if they can save a bit on the cycling or taking the bus, it's not. As long as they can pay what the car costs. So I guess that's why.

Researcher: Okay.

Logan: Again, all this is relatively. I'm not saying it's not important. I'm just saying.

Researcher: No, I'm just curious on.

Logan: Yeah, yeah. Um. This, I think. Perceive behavioral control?

Researcher: Mm hmm.

Logan: What exactly?

Researcher: Yes, I can set an example. For example, I feel confident that they have all the resources I need to do active mobility. I have my equipment; I have the time. I can afford it.

Logan: Ah for you? When you relate the resources.

Researcher: I feel very confident that I can do it. Yes. It's the perceived ease or difficulty of doing it.

Logan: For me as an individual or how I think it is for people in general?

Researcher: How do you think that it's for people in general.

Logan: This is how I think it is for people in general. But on the other hand, I think, for example, if people knew more about the health benefits of cycling, just a short trip or walking, then it could matter more. But I don't think it matter that much because I don't think there's a big awareness around it.

Researcher: Okay.

Logan: Again, we know from research if you look in different segments of people, you know, in sociology or communication, there are marks that we divide people into different segments. For example, if you look at the group of kind of liberal people that go through fitness centers.

Researcher: Mm hmm.

Logan: That's one of the groups that actually is a market for more cycling, because they tend to like to go in the car because this is flexible, it's quick, it's a car, and maybe they have a little bit of these values of

copying these features. And you could argue it's interesting because they also go to the fitness center. So they want to be healthy, but they don't connect the daily mode of transport with how does a daily motor transport affect the health? And that's probably a mix of subjective norms, perceived behavioral control, but also maybe lack of knowledge on how much that using active transport actually impact the health.

Researcher: Okay.

Logan: Just a reflection on why I put it low.

Researcher: Yeah. Yes sure.

Logan: But I think there's something that you work with that is not being worked with in such a good way when we speak about communication because they can easily come off as. You know, condensating, speaking down to people.

Researcher: Mm hmm.

Logan: It has to be done in another way. Like two plus two without saying for censorship. But here's my waiting.

Researcher: Do you think also that awareness around climate change is low? Because you also have indicated.

Logan: I think, the impact of climate change on how people make that choice in transport is very low.

Researcher: Even Copenhagen, which is a more sustainable city?

Logan: Again, the research I've seen, you ask people, "so why do you cycle?". Again, using that as an example. So, the main driver is "it's convenient". Then for some people it's an added benefit that it's good for the climate, but it's not the main driver. I've heard of almost no people that change the individual transport behaviour because all this has to be better for the climate. I never heard about a car driver said, "no, I stopped driving my car." I was like, maybe it's part of the reason, but it has to be convenient as well. It's my impression from what I've seen of.

Researcher: Yes sure. And do you think that there are other factors that are also really important or less important that are not included here?

Logan: No, I think how you explained it or how the students. I think you both have these social norms. You have I feel equipped to do this. You have the happiness, which I think is very, very important. And for example, this one, again, just exciting as a case for the common man is saying, we're taking the bus or walking. We did research among people that did not cycle. And one of the key reasons mentioned for not cycling in Copenhagen. That these people brought up was, in fact, "I'm afraid to do something wrong and I'm not sure I know how to cycle in Copenhagen or when I do a turn at an intersection and there's a lot of people cycling, why should I stop my bike." And so they didn't feel. It was an encrypt.

Researcher: They felt a bit stressed.

Logan: So I mean, they could cycle, but they didn't know how to actually do this. And I'm not used to go in a car. So every time I have to go to a car "oh where's the key, where's the car? Why should I park? I don't know how to download the app. I don't want to do it. I just take my bike." And a lot of people have, as they say, just the other way around. I know how to use my car. I feel completely comfortable. I know how everything works. If I'm to take the bus or bike, how do I do it? And as I heard, you let this kind of in some of these parameters. So I think it looks good. The model.

Researcher: Thank you. Okay. I guess this is the end of the interview.

Logan: Okay. Excellent. When do you expect to be done?

Researcher: Well, I expect, first of all, to be done with the interviews by the end of the month. Then I will try to run the model as soon as possible in the middle of November so I can present the results in January.

Logan: Okay, great. I think it's interesting with your communication background looking at this modal shift because of course, there's more and more sociologists and psychologists, but it's still pretty kind of engineer driven. So yeah, so I'll be happy if you remember, I'll be happy to.

Researcher: To share it?

Logan: when you're done.

Researcher: Of course. Of course, I will.

Logan: Thank you.

Researcher: Thank you very much for your time.

Interview transcript – Robin

2022_10_17_Interview_Robin

Researcher: Okay, so please say your name and give your consent.

Robin: Yes, my name is Robin, and yes, I will participate.

Researcher: Okay. So could you tell me some things about you, a short introduction about your professional and educational background, how you relate to active mobility?

Robin: Yes, I'm a Mobility professional, where I work with consulting and municipalities, regions, traffic companies, public transport, etc. about sustainable mobility mostly. We also work some with city planning and like the field connects mobility, transport and city planning. And my background is I'm a civil engineer. But an education that's quite broad. And so I studied planning, and it's called urban, energy and environmental planning. And then sustainable cities as a master. So everything within urban planning and from also a lot of stuff, a lot of stuff that's more about good processes and how to make change and all these things that are not so technical as well. Yeah.

Researcher: So you're working in the part of mobility that you're taking people into account a lot.

Robin: Yeah, I would say so. Um and a lot about the planning processes as well. Yeah.

Researcher: It sounds very interesting and very relevant for my study.

Robin: Yes. And then before I worked in the city of Copenhagen, bicycle planning and I worked in a green think tank with the climate action planning.

Researcher: Okay.

Robin: Yeah.

Researcher: So you're a lot within sustainability and transport I would say.

Robin: Yes. That's my main focus.

Researcher: Yeah, really nice. So, regarding the first part of the interview, I would like first to ask you if you're familiar with the Copenhagen's active mobility goals.

Robin: To some extent.

Researcher: Um hmm, okay. I will mention some.

Robin: Yeah.

Researcher: The first one is that 27 municipalities, along with the Greater Copenhagen, with the city of Copenhagen, sorry, are constructing right now a super cycle highway.

Robin: Yeah.

Researcher: And they aim to complete it by 2045. So it's about 750 kilometers. So they aim to encourage commuters to bike more.

Robin: Yeah.

Researcher: And another one is that. I think that you have heard of the 2025 goal of the City of Copenhagen.

Robin: Yeah. But there are some differences. Yeah. If it's the city of Copenhagen goals or of the region's goals.

Researcher: Yes. The 2025 is only for the city.

Robin: Yeah, the climate neutral.

Researcher: Um hmm.

Robin: Yeah.

Researcher: Which also aims to at least 50% walking and cycling shares. So it's also part of active mobility targets. There are a lot, I think. I will stick to these two, as an example.

Robin: Yeah.

Researcher: So I would like to ask you, what do you think about these goals? Do you think that they are feasible?

Robin: To reach?

Researcher: Uh hmm. These high shares, these high levels of cycling and walking.

Robin: Yeah, it depends on what goals, what kind of them. Because there are a lot of different goals. And right now with the climate neutrality, that's not only transport, but all sectors.

Researcher: Yes, I am just focusing only on the active mobility shares of this goal. So, looking at both goals, the Greater Region aims to high shares of cycling and walking,

Robin: Yeah.

Researcher: Aims to encourage people to cycle and walk more in the coming years.

Robin: Yeah.

Researcher: Do you think that this is feasible?

Robin: Yes and no. It depends on a lot. The cycle superhighways is a really good example of a really successful initiative, I would say. They have some really, really great numbers on when you make it a cycle superhighway, you get a lot of more people to cycle and a considerable amount of them as well who have taken the car before. So that's definitely like a successful project. However, there are some general trends in Denmark with higher car ownership that makes it really challenging to get more people to use active mobility modes. Umm. So there are a lot of initiatives that are going in the right way, but there are also some great challenges, I would say.

Researcher: But do you think that these goals are ambitious enough?

Robin: If we take the cycle superhighway? I think the network that they are aiming for, for making the bicycle network of cycle superhighways, that's very ambitious. Then we can always look to the Netherlands and see the way the bicycle infrastructure is implemented and they put way more money into it than we do. So it could also be more ambitious, I would say. When we look to what they do in especially the Netherlands.

Researcher: So you're also doing some comparisons in your work between the two countries, taking Netherlands as a better example, for example?

Robin: Yeah, it's hard not to, I would say. When you work with the development and strategic planning, because there are a lot to learn as well in other countries.

Researcher: Okay. And how do you think that citizens relate to these goals, in the accomplishment of these goals?

Robin: I think most citizens don't know a lot about most goals, but only like the general gist. So, the climate neutrality has been a big thing for Copenhagen and something I think everybody knows about, almost everyone at least. The most specific goals and somehow gets more technical and it's not as wide known, but the city of Copenhagen, where I worked before, it has done a really great job with making, for instance, a bicycle account. They, every second year, communicate the results in a way that's more attainable for other people than those within the field.

Researcher: So it was a platform created by the city of Copenhagen to communicate...

Robin: Bicycle account. So it's, they have done it since 1995, I think.

Researcher: Okay.

Robin: So they just take what is the status, what are the goals we have and then what is the status today and our goals. And then they also collect all kinds of numbers and figures bicycling in Copenhagen and then communicate that in a way, in a publication that's readable for, I would say most people.

Researcher: Yeah.

Robin: So it can also be for citizens. It's also internationally and mainly for the politicians, actually.

Researcher: Um hmm.

Robin: Yeah.

Researcher: So do you think that this is a way that the city and generally the region could implement to inform people about these goals by, for example, adopting such a bicycle account or relevant ways?

Robin: Yeah. That's what they're doing now. Of course, if we're talking, depends on who we are talking about as well as citizens, there are always some citizens who are more interested in topics like this and some who are not directly interested. Yeah.

Researcher: Let me go to another topic. Before you mentioned that there is a cars' increase in Denmark the last years. Even though Copenhagen, for example, is a sustainable city with many goals. They advertised a lot the carbon neutrality and they have many active mobility goals. Why do you think that people insist on buying new cars?

Robin: Why the car ownership is increasing? Yeah. Well, if you usually what studies show is that the richer people get, the more cars they will own. And since we're getting richer and richer, the people have the money to own more and more cars. That's like the usual economic explanation. But at the same time, we also see in Denmark that it's also have become cheaper to own a car. So that also means that more people can buy a car. And at the same time, we also see that the general prices for public transportation have not gotten cheaper over the last, I don't know how many years, but that's the tendency. So it's getting more expensive to use public transportation and cheaper to use cars.

Researcher: Okay.

Robin: Then there are some ways in like that's one thing, economics and finance. Then there are a lot in terms of how cities are being built. Is it close to stations? Is it close to functions or is it far away?

Researcher: So the proximity of...

Robin: Yes. You might have rid of the 15-minute city that they have as a concept they use like in Paris, which is something that's being discussed more and like city planning in Denmark as well. To try and create these more where everything is more in proximity because that's just, yeah, it makes more people walk and cycle and use public transportation, because you don't need the car in the same way if you have a good city planning. So I would say that's also a factor that influences it. And also one reason why it's like it's going quite well in Copenhagen compared to maybe other places because we have this Finger plan. You probably also have read about that's quite structured, where should there be housing and where should there not be and try to have it around these corridors of public transportation.

Researcher: Okay. So, going a bit deeper on the factors that affect citizens to their intention towards active mobility. I can see that proximity and distances and thus time is a very important factor, as you mentioned. What other factors could influence people to their inclination towards active mobility?

Robin: Yeah, I would say yeah proximity. What they have of financial situation. Then one of the reasons the city of Copenhagen; what is usually being said, why there are so many people who bike, is because we have a lot of bicycle infrastructure. Bicycle. What's it called.

Researcher: Network or lanes?

Robin: Network. Yes. A lot of lanes. And not only like, it's like it's separated from the cars in the way that it's not like just what's it called where you just.

Researcher: Paint it.

Robin: Paint it. It's not just painted. It's actually had this, where it's just separated from the road, which is like a big reason for people to feel safe to bike that there is a bicycle infrastructure that's of high quality.

Researcher: And what do you think that is needed to engage more people practicing active mobility in commuting?

Robin: It's a lot of different things. But yeah, now Copenhagen, you could say, has a good bicycle network and the cycle superhighway tries, this initiative tries to make it that this not just in Copenhagen, but for the whole region where you can have a coherent network across. But otherwise it's you have the sticks and carrots if you know that kinds of initiatives and that's what you can use. So building bicycle networks is more like the carrot and the stick kind of initiative is making cars, making it less attractive to use cars. So I don't know how many years ago, maybe ten or maybe more years ago, there was a big discussion if there should be a congestion charge around Copenhagen, that never came to be. But that would be another initiative that could probably.

Researcher: Congestion pricing?

Robin: Yeah, make more people use active mobility.

Researcher: Um hmm. Okay.

Robin: And all kinds of different initiatives that make it more difficult to use the car.

Researcher: And as for walking? Do you think that infrastructure is also the main enabler? Having good connections? Pavement connections?

Robin: Yeah. Yeah, I would say that's like a, it's a fundamental. At least in Copenhagen, walking has been a little neglected actually, compared especially to the bicyclists. It has not been a very strategic focus in promoting walking.

Researcher: Also, the shares are lower compared to bikes.

Robin: Yeah. Because the bikes have taken the focus. You could say that, maybe? And now it's like, it's coming slowly, that there is an increasing focus on walking as well in Copenhagen. But I think walking, if we're talking active mobility and promoting that, it's much more connected up to public transportation and promoting that. There is a great guy called [name of other person] who has studied walking a lot and he has also held some really cool numbers on how: if you promote walking, you can also promote public transport and that these two are very interconnected because the public transport is usually people are walking a lot to that actually. I think he has some numbers that something like 50% of the route a person in public transport takes, that 50% of the time is actually walking because you walk down to the station, you walk from the station or to your office etc. And he is also showing, I think it's something like 70% of. You can get people to walk 70% more if there is a high urban environmental quality, like a high quality in the urban environment, if it's dense, if it's interesting to walk, and if it's not just really dull and closed facades and these things are not making people walk more, that makes people walk less. It's also probably read a bit of Gehl, the Danish architect, who was married to a psychologist and who showed all these things that what is it that makes it a good urban environment with eyes on the streets and facades that are open and interesting. And yeah.

Researcher: It should be a bit inspiring to citizens to walk.

Robin: Yeah, yeah.

Researcher: Okay.

Robin: Yeah, that's right. I would say yeah, that's more walking. I guess the experience and the urban environment might be more important. Of course it can also be important for cycling, but there it just goes fast so you don't. It's not as important as it is for walking.

Researcher: Yes. And considering that you said that the prices in public transport the last years are stable and not going down. Maybe we should focus also on public transport pricing? If we want to promote it with walking.

Robin: Yeah. I would say so. That's people who mainly use at least the bicycle a day. If you want to promote that as well. I think they are very interconnected that promoting public transportation is also, yeah, helping and promoting active mobility. Because when you don't take the bike one day, then what I would take in then? Are you taking the public transport or are you taking a car, if you have that.

Researcher: Okay and some other questions I have for the first part are focused on the characteristics of the city and the region in general.

Robin: Um hmm.

Researcher: So, the Capital Region is confronted with urbanization in the coming years. How do you think that population growth is related to the shift to active mobility?

Robin: It depends where people live. Like where population growth, how you are planning it. So are people building new houses, for instance, along the highway or are building it in a place with close proximity to public transportation and daily functions? That affects a lot.

Researcher: So you think that urbanization can be an enabler, but also a drawback.

Robin: Yeah, yeah. It depends on where it's built, where it's situated.

Researcher: And another characteristic is that the region is multicultural. Many people are living here and are coming from different countries. Do you think that this relates to the shift to active mobility?

Robin: Hmm.

Researcher: That you have citizens that haven't born here. They are coming from another background.

Robin: Yeah. If that's a factor that makes a higher share of active mobility or lower?

Researcher: I mean, if you think that their culture, their background, has an influence on them to shift to active mobility or not.

Robin: Yeah. For the individuals.

Researcher: Yeah.

Robin: I don't know. Depends. I would say from personal experience, I have experienced that people who move to Copenhagen often feel that they need to bike because it's somehow, it's part of the Copenhagen DNA that you bike everywhere especially maybe if you are a younger person as well. That's at least in my study. Of course, I have also studied something with sustainability, but it's like if people have not biked a lot before, then they will definitely bike now when they move. Of course, there are also some people who do not. Yeah, but I also remember that some of the people in the study who did not bike were looked a bit like "don't you just bike?", like a bit. Yeah.

Researcher: They started here.

Robin: Yeah. It's, it's part of the culture like of the norms and it's expected to do it and if you don't do it, then there will maybe be some remarks on that. You could also just bike or why don't you just bike or something like that.

Researcher: Okay. So this is the end of part one. You can have some water. I will do a short introduction about the part two. So you can be familiar of how we will approach part two. Because there will be an exercise. So. But I forgot my pen.

Robin: I can. Just a second.

Researcher: Thank you very much. This is my research model. And here are the definitions of the variables. So I will go through the definitions once and then you can take your time to go through them again. Are you familiar with the theory of planned behavior?

Robin: A little bit, yeah.

Researcher: Okay. That's good, because I think that you can understand a bit how this is built, but I will explain it. So, for this model, an extended version of the theory was used and the theory states that the intention towards a certain behavior can be foreseen by the attitude towards the behavior, subjective norms and perceived behavioural control. So attitude is defined as the tendency to react positively or

negatively to an object person, etc. Subjective norms are defined as the perceived social pressure to perform or not perform the behavior. Perceived behavioral control is the perceived ease or difficulty of performing the behavior. And intention is defined as an individual's intention to perform a given behavior. At this case individual's intention towards active mobility. As part of the theory there are also some human beliefs, namely salient, and this extended version I have used the behavioral beliefs, which are the six on the left. So we have perceived time, which refers to the time that an individual perceives that the action takes and in combination with the effort spent, with the effort needed. We have perceived cost, which is the combination of the cost and the total experience. So the person by contrasting these two elements concludes if he or she will re-practice active mobility. Then we have perceived comfort which refers to the availability and quality of infrastructure, such as seats or cleanliness. Weather could be a factor, for example, which relates to cleanliness. We have perceived health benefits, which is if people perceive the positive health results that active mobility convey. Then we have perceived safety, which refers to the people's perception of how safe cycling and walking is. And finally, we have climate change knowledge. So, if people are aware of the existence and the impact that climate change has. Then, we have added a last factor, which is habit and leads directly to intention, which is, people are used to do things. So these six are added in the form of behavioural beliefs. So attitude is influenced by all of this at the specific version. So, as a first step of the exercise, I would like you to take your time, go through the definitions. You can ask me whatever you want if something is not clear to you and I would like you to indicate the level of influence of the variables, by using 3, 2, 1 plus or a minus to indicate if there is a strong, moderate, low influence, or no influence. You can think aloud. I will ask you questions and you can ask me back. And as a second step of the exercise, if there is any factor that you think that it's important to take into account and it's not included here, I would like you to place it wherever you think is the best on the model and indicate the influence.

Robin: Hmm. Yeah.

Researcher: Is it clear?

Robin: I think perceived time is very important. I don't know if I would give it three, but it, it is like two or three.

Researcher: Okay.

Robin: Because. But on the other hand, as perceived then it might be more. Yeah. Because that's at least what if you ask people, if you look at the bicycle account for Copenhagen, they have a question where they always ask, why do you bike? And people say it's because it's the fastest, it's the easiest, and that's why I bike.

Researcher: So this is perceived time?

Robin: Yes. Yes. That's at least it's the fastest people say. Then people also say it's the easiest. And that's, I guess also somewhere, it's not only about the time, it's also because it's. It's easy. It's. Maybe it's the comfort. I don't know.

Researcher: With regards to ease or difficulty there is perceived behavioral control.

Robin: Yeah. Maybe it could be that, yeah, in the model.

Researcher: So how easy or difficult the individual perceives this behavior.

Robin: Yeah.

Researcher: I don't know if you mean exactly this. I'm just saying what perceived behavioral control is.

Robin: Yeah.

Researcher: Okay.

Researcher: It's something. First if you used the bike then you perceive it as the easiest because you don't have, you just do it. It's like what you used to after some time other than using public transportation, you have to plan it more, for instance, using the car and you have to think about where to park it and things like this.

Researcher: So it's also habit.

Robin: It could also be habit. Yeah. Yeah. There is also some people who say that the strongest way to predict behavior is what did you do yesterday? That's the most likely what you would do tomorrow. It's not a very thing that shows us a lot about how to change behavior. But it's I think, it's often a high predictor.

Researcher: But you don't think that it's the highest, one of the highest?

Robin: Habit?

Researcher: Yeah.

Robin: It could be. But if it's about shifting mobility. Then it's, it's different, I would say. And then it's hard to use habit to shift because you want people to do something else but.

Researcher: But is it a very high predictor, for example, that people insist on using their cars? I mean, we can see here habit for both commuters, car commuters and active mobility commuters. So it has a moderate influence on their intention to shift or not to shift?

Robin: Yeah, that's a good question. Looking more at the intention to shift. Yeah, I don't really know.

Researcher: Because people may, for example, be used to take their cars and that has an influence on not to shift.

Robin: Yeah, I would say.

Researcher: So, I'm just making clear that it's not specifically for active mobility commuters, but as a factor, if you think that has an influence?

Robin: Yeah. I would say it has an influence, but in a negative way.

Researcher: Okay.

Robin: For car commuters.

Researcher: Um hmm.

Robin: Yeah. Because when people are used to use the car and out of habit and they will continue to do so. More likely, right? Should I put it then as "no"? Yeah, I don't really know.

Researcher: No, it's totally okay.

Robin: It has an influence, but it might be negative for car.

Researcher: Um hmm.

Robin: Perceived cost is also a high one. I just put two and I will see if I put an extra on some of them. Perceived comfort: quality of infrastructure, it says. It's also important. Don't know if it is as important as the others. Health benefits is also really important, and that might be two. That's what people say when at least when they are asked for the cycle superhighways. Why do you use actually more time on the bike that you could in the car? Then they say it's because I also get something out of it.

Researcher: So they are aware of the health benefits?

Robin: Yes.

Researcher: Okay.

Robin: That's a very strong motive, I think, for many people to bike, especially if it takes more time than just to take the car, because then they see it as a part of also getting, what's called, getting the exercise. So they don't have to get home and then do the exercise.

Researcher: Yes.

Robin: They do it on the way.

Researcher: Yeah.

Robin: And in that way, in the total, you could say they still don't use more time than they would have before. That's at least the rationale, I think that's going on. Perceived safety is also important. Perception of safety. Yeah. Traffic safety is quite important, especially if you want many people to bike and not only the men in lycra who might bike everywhere, and especially more people who don't have so many experiences with biking who have not biked that many kilometers and maybe...

Researcher: Maybe they are afraid of...

Robin: Yeah, maybe not even learned how to bike so much when they were kids as well. And it's really important that people feel safe.

Researcher: But you think the same for walking also. I mean if they walk around.

Robin: Yeah, definitely for walking as well. I think that's something as we talked about with the urban environmental quality, that some of the comfort things that might be more important for walking and if it's a nice urban environment. Climate change knowledge. I think in many, many transport stuff, it does not play a big role, unfortunately. And low influence maybe. But of course it maybe more than this one. If I put it here then I rearrange the others. I would say this one comes; this one gets three. This one also gets three. This one gets two. Yeah. No, it gets a lot. This also get three. Yeah, that goes into attitude, I guess. Should I also.

Researcher: Indicate the difference of attitude to intention?

Robin: Yeah.

Researcher: If you want to. But I mean, it's. It's the sum of all these six. You have indicated four out of six factor with three pluses. So I guess that also attitude has a significant influence on the intention.

Robin: Yeah, but of course it's compared to these ones.

Researcher: Yes. But it's interesting because Copenhagen, as I said before, is a sustainable city and talks a lot about that. But people are not aware enough.

Robin: I think they are aware, but I think there is an intention behavior gap that some of the theory might also point that we can have a lot of intentions, do a lot of stuff and have a lot of good, be concerned and so on. But if you don't have the infrastructure, if you don't have the context that motivates you to do those kind of sustainable behavior things, then it's not necessarily happening. And there are happening so many other things in people's lives when they're deciding on how to get from one place to another. Yeah.

Researcher: And what about subjective norms?

Robin: Yeah. What was that? Social pressure? Yeah. I would also say that's important.

Researcher: The significant others of the person. Family, friends, colleagues.

Robin: Yeah. Put one to that. I would actually say I think attitude compared to the others would have the least influence.

Researcher: Um hmm. Okay.

Researcher: And I think norms and these others, perceived behavioral control as well actually, and habits have more influence on what people do. But of course, I don't really remember. It's also one thing whether you have intention and then one thing...

Researcher: It’s the behaviour, but it's not part of the specific version.

Robin: Yeah. So what it does end out with. Yeah.

Researcher: It's the final step to adopt the behavior.

Robin: Yes, but do you. Do you want. Yeah, it's the intention. Yeah, not the behavior. Okay. Because some of these things, I think, are more important than the attitude, for instance, to make it real behavior.

Researcher: Okay.

Robin: Yeah. And I think that's how I, that's the way I put it. The exes now.

Researcher: Well if they have big influence at the model.

Robin: Yeah.

Researcher: Most of the times people will also adopt the behaviour finally. But even if these have a positive influence on intention, doesn’t mean that the behaviour will change necessarily.

Robin: Yeah. Yeah.

Researcher: But do you think that there are other factors that you think are important?

Robin: Than these? Well, we have all the, what's really out there. All the infrastructure. I know it's not in the same way when you are doing a survey. Not necessarily as relevant to take into account and these things are maybe easier to ask people about.

Researcher: But perceived comfort includes...

Robin: But there is like one thing what is the perceived stuff and what's really out there, I would say.

Researcher: Um hmm.

Robin: So how many kilometers of bicycle lanes do you have? How many cars? Like, you know, what is there of a physical material stuff, but also pricing mechanisms, all these other stuff, not only what's perceived. But I would put that maybe outside of the model.

Researcher: Okay.

Robin: Then I would also put. What's it called? Economic and demographic variables.

Researcher: Yes.

Robin: Just not together. They might be two separate. That's something like when you're younger, all older, more money, less money, income, like these background stuff.

Researcher: Yes.

Robin: It's also often as least there is a correlation often.

Researcher: And what level of influence do you think that these two could have?

Robin: I don't know, quite important, but a. Yeah.

Researcher: Do you have any other questions?

Robin: No, I don't think so.

Researcher: okay, I have neither. So, this is the end of the interview.

Robin: Yeah.

Researcher: Thank you very much for your time.

Robin: Yes. You're welcome.

Interview transcript – Andy

Researcher: Good. So could you tell me a short introduction about your professional, educational background? How you relate to active mobility.

Andy: Umm. So today, I work in the insurance industry in the Innovation Department with a focus on future mobility. So we're looking at basically different ways that people are using mobility in the future and then what role the insurance industry is going to play in that because it's a shift for the insurance industry just like it is for everyone else. Umm. And I don't work actively with active mobility today. But in my previous job I was at [-] and I also didn't really work actively with active mobility, there, but it was one of the areas that we had looking at how you can come up with new ideas. It's all commercial innovation in the area of active mobility as well as all other areas and how you can use that to help cities and you know public sector to reach their societal goals, basically. And prior to that I worked in [-], which is a transport consultancy in Sweden.

Researcher: Mm-hmm.

Andy: And there I worked on a very wide range of projects towards the end of my time. There was a lot more about a decarbonization of the transport sector. I've also worked a lot on sort of future mobility topics and the implementation of new innovations in the transport sector and how they're managed as an example of that electric bicycles, which I worked on for several years in different projects about how they have been introduced into Sweden and what role they can play within the transport landscape. I've also worked a lot with the health impacts of active mobility, so mainly in this project called PASTA promoting active mobility as sustainable transport alternative or think was its acronym and which was a really fantastic project looking at like the health impacts of active mobility, so that's walking cycling, but also in combination with public transport and how we do that. And then prior to that I worked in Brussels and there, I worked on one project called PRESTO, which was about promoting cycling, which is also when I got the introduction to electric bikes actually in that project. And that was a European collaboration project and then I have a PhD in traffic modeling from ITS in Leeds. So mobility transport have always worked with and then in certain cases, a bit of active ability has been the focus.

Researcher: Okay. It sounds an impressive path. So let's proceed to the first part. I would like to ask you if you're familiar with the Copenhagen's sustainable, active mobility goals actually.

Andy: For the city or the region?

Researcher: Both.

Andy: Okay. So what do I know about the city of cycling so in the in the city of Copenhagen. So the commune of Copenhagen. They have a very high share of cycling. But it's also very it's they're very ambitious in also maintaining that and improving it and so I think already they have over 50% mode share if I remember correctly and but they also want to improve that and they do a lot on them. Cycle lanes and new ways, they do, I'm kind of been in touch with about innovation kind of stuff and it's, you know, with different ways to do that.

Researcher: You're right actually. I can remind you the two of them that I have also included in my thesis. The first one correctly is that they aim to 50% of cyclic shares, by 2050 specifically in commuting. And the other one is that they are currently working on the cycle superhighways, so to enable commuters to bike more.

Andy: Yep, Yep.

Researcher: So what do you think of these goals do you think that they are feasible? To increase the shares in commuting in the long run?

Andy: Umm definitely so. Umm there is there is definitely a possibility to that that can be done. But I think one of the difficulties you have here is also about the how you calculate this and how you follow up on the goals. And. So I mean, so that's one thing to think "can they increase cycling for commuting trips" and now we're talking about some of the greater Copenhagen region because a lot of those commuting trips are then coming from like other communes outside of the city of Copenhagen and the workplace would be in Copenhagen. And there's definitely a potential for that and also as soon as you increase the quality of the cycling infrastructure you know that that makes a difference and I think they've been very good at kind of following up on that and showing that within the cycling superhighways in Copenhagen. And it's also a lot to do with communication and understanding how you can do that structure in the right way, and I know they've had a lot of trickiness for example, with the National Authority on like the particular kind of signs that they wanted to use and it's like there's lots of details in kind of the communication of it that become really, really difficult that I know that they've had problems with and but I think that's important to be able to do that, so you have like the clear capacity. I've always said to them as well that I hope that they take a greater Copenhagen perspective on that plan because it would be really good if we had that also in the South of Sweden, where I live.

Researcher: Mm-hmm.

Andy: I worked previously a lot with the Region Skåne and they also need to have a bit more of a regional think about, you know, bicycle planning and so to increase their commuter trips. But then there's the question about the data. So, like, how do you know if you are actually getting 50% of the commuter trips and we don't really have very good data about cycling in general. And you need to go into sort of the travel survey type of data on a sort of population level and to be doing that kind of survey. They're very, very expensive. They're quite difficult to do and then you don't you just tend to have a subjective norm of what's happening so. And so I think there's difficulty is also in the measurements areas, there if you'd like that is your goal.

Researcher: Mm-hmm and do you think that citizens are related to these goals?

Andy: And. I think in... Yes and no. I think Denmark prides itself as a bit, as a bicycling nation. And we know that. But at the same time, it is a very car dominated culture still.

Researcher: Mm-hmm.

Andy: And especially when you're looking at the regional perspective, a lot of people really drive cars. So, I think, if. It's a, It's a tricky one because I think people, like, think "yeah, yeah that's a good idea, but like not for me in this particular journey that I'm doing right now." You get a lot of that, like how do you fit that into to the everyday. And I think a lot of the communication that that has been done about it, which is like taking up specific cases and why it's a good idea for those particular segments to, like, you know, cycle longer distances and how you can make it easy. That's a good thing, but then. It's not really just about the people then you have to get that all of the structure in place. So you have to also, if you're thinking about commuting then you really need to get the workplaces on board as well. So if you're commuting a longer distance by bike and it's not an electric bike okay. That's the electric is a little bit easier. But if it's not an electric bike. Then you want to shower, when you get to your workplace. And you need to have a secure place that you're keeping your bike and you know what happens when your bike breaks down and we are offering, are they being offered also like maintenance programs for the cycling etc. So there's kind of a lot of everyday barriers that get in the way even though that I think a lot of people

are like “yeah, it's a good thing to have more cycling”. But then when it comes to the actual decision it's quite often easier to jump in the car because there isn’t really that much restriction of our use in Denmark. And I think that that would be one of the major barriers to actually getting it to work.

Researcher: Yeah, and regarding to the car ownership, for example, even though Copenhagen and the region is a sustainable…

Andy: Mm-hmm.

Researcher: Region and have many sustainable goals. We see that the cars are increasing the last years. Why do you think that this happens? Why people insist on buying cars?

Andy: I don't think it's the buying of the cars that's necessarily the problem. It's the using of the cars.

Researcher: Umm.

Andy: If you want to look at it like that, and it's just it's still very easy to use cars and then it's a… And when you have something that is, you've designed your whole system around using cars and you, I mean, you have to admit that. It's still pretty easy to drive around…

Researcher: Mm-hmm.

Andy: and I work in Copenhagen. Now I work not in the center, but I work outside and place called [-] and at least 95% of my colleagues drive a car to work because it's very difficult to get here by another means. And I think it's just, it becomes at the end of the day about the ease and the cost and there's very little that is done on the government level that really says that we don't want people to be driving cars at the end of the day. It's not just about making high class alternatives. It's also about it's you know the carrot and stick approach and there's quite a lot of. And research has been done on this like if you want to increase the cycling, you have to decrease the cars and you can't do that just by making the cycling better you also have to make it worse for driving.

Researcher: For cars, yeah.

Andy: Umm. And I think it's also, a little bit the case that that is this. We have the same problem in Sweden as well that people are very rich.

Researcher: Mm-hmm.

Andy: So the cost of the car doesn’t become an issue anymore.

Researcher: Yeah.

Andy: And for you know in the normal Danish people or normal Swedish people that that's it's not it's not what is gonna make the difference for them because it is very expensive owning and running a car. But it's not really the issue.

Researcher: Okay, and apart from making the cycling better. What other factors do you think that affect citizens to their inclination towards active mobility?

Andy: Umm. You can I think this is what I suggested this report that we did. I have to try and remember what were all the things that we, we found out in that report was a long time ago I wrote it. But there's lots of different things. So, I think we, we, we talked about in that report. It was about there's the physical infrastructure. And there's the social environment as well. And on the physical infrastructure side of

things is there's partly, you know, that you have the infrastructure of the cycling and it should be high class and you would talk about that, but then there's also other elements. Like the topography.

Researcher: Uh-huh.

Andy: And the weather.

Researcher: Mm-hmm.

Andy: And what else have we got in the physical infrastructure and physical environment. This is so there's like different factors. There, which are kind of like the physical environment factors and. They actually make a difference to people, obviously so, so hilliness I mean, we know that people cycle less in hilly areas and I mean, even though it's flat right in the center of Copenhagen, it's not flat everywhere else and then you get this problem about the physical exertion and then you need to shower, at work and then you need to have a shower at your, you know, on offer and it needs to you to fit all of that. In it needs to kind of be easy, and smooth and we know that makes a difference to people. And the weather, not so much rain I think is a thing

Researcher: Umm.

Andy: but wind. Which you get if you have like flat landscapes. And subjective norms and ice obviously our problem and that will also affect people. So this is there's some things that's on the physical side of things and then there's the social side of things about you know if it's normal to cycle and then there's a lot of groups where it's not normalized to cycle and I give the example of my workplace where I have now it's not normalized to cycle to work. Like it's you're a bit different if you cycle and that's what's within this subculture that we have, but you know it. It depends on what your friends and family. What is normal within that that makes a big difference about whether you're going to like take a bike or not, and if it's if it's deemed as within that group

Researcher: Mm-hmm.

Andy: you're in your bubble. If it's deemed as something that only crazy green conscious people who vote for the Green Party do then. That's not something I'm gonna do because I'm like right wing or whatever, so these different kind of social cues actually make a big impact on whether you're gonna cycle or not, and also whether you choose to have a car and the status of the car and all of that kind of thing, so there's social factors play a big role as well. And so I think one of the things we looked at in those research was how do you think about normalizing cycling in the different cultures and what makes us cycling culture. And even if you have a cycling culture in the center of Copenhagen's people who live in the center of Copenhagen and say there's definitely a cycling culture, there, but if you're looking at the commuting trips. Then you're taking the people from outside and there's not necessarily that same cycling culture in those parts. So when you're targeting the commuter segments. Then it's a different culture of people that you're targeting maybe that would. That would make a difference of whether they would choose to cycle or not.

Researcher: Okay.

Andy: Hmm. Umm.

Researcher: I think your answer is kind of related with my next two questions because I'm thinking of the characteristics of the region. The first one, is urbanization, for example, that the city is confronting with in the coming years and the other one is that there are a lot of people from different countries, from different backgrounds. So how do you think that these two relate to the shift to active mobility?

Andy: Umm so I mean, cycling isn’t urban phenomenon really mainly of the type that we're talking about as well. But so I think the urbanization definitely plays a role when you're thinking of like densification of urban areas, then it becomes a lot about space and when it becomes about space then it makes a lot of sense to kind of move towards bicycle because cars just don't have the same ability to move easily and it becomes less easy.

Researcher: Mm-hmm.

Andy: And I think that's what is often kind of if you design things right, then you design it so that it's faster by bike and then people will automatically choose that because it's just the easiest option. It's like. Yeah, okay, and so I think that the urbanization makes a difference, but also probably the types of people who are living within the urban environment and the values that they have probably also makes a difference, so if you if you think of like the classic family

Researcher: Mm-hmm.

Andy: who I mean, I think that's still very common. You know when you when you have a family, you move out to a house from the city and that's still we see that very much happening. It's like probably more so with COVID and post COVID because people got used to working at home. So it's like they didn't feel they needed to be near to the office so they really like moving out. And this is, that's the urbanization of the workforce, even if you're continuously urbanizing the environment and I think that will also have an effect on levels of cycling when you have that. And as for the more heterogeneity in the population, I think that will also have an effect because when you bring in people with different cultural norms, then they will act, they will kind of take that with them in their new setting and in some cases I mean, I guess depending on how strong the cycling culture is

Researcher: Mm-hmm.

Andy: within the sphere that they end up in, how much they will end up becoming part of that. But if it. I mean, it's quite a strong cycling culture in Copenhagen. So I think a lot of foreign people tend to kind of adapt just into that because that's just what you do. That's a very strong cycling culture. But it would obviously be difficult. I mean, I also have met people who have never felt secure riding a bike

Researcher: Mm-hmm.

Andy: and they find it a little bit too scary in Copenhagen because it's not like a gentle cycling promenade. You know along the beach or something it's like really hardcore cyclists and it can be a little bit scary. So it can be quite difficult to get sort of get into that and feel secure in that culture and I think it can also be very difficult if you have families because you have if you have children who are cycling. Then they’re very insecure on the bike lanes and they're all like all over the place. They have no idea what's happening around them. It's, it's a nightmare cycling with children and so I think that in the center of Copenhagen that would be like a bit of a barrier. So if you if I think it just depends a little bit on who it is. And what they come with and what they sort of interested in but yeah.

Researcher: So do you think that there is a margin on safety for example from the part of the city to make the infrastructure better, so people feel safer when they bike.

Andy: Yeah, I mean, I definitely think that that's part of it is making the infrastructure, but then it's also how the infrastructure is used and. I think one of the difficulties is that mean little bit at the issue that I mentioned before when you have like lots of different types of users using the bike lane.

Researcher: Mm-umm. Okay.

Andy: And what happens when you kind of get over a certain like volume of cyclists, which you have like in certain areas of central Copenhagen and very, very high volume of cyclists, then that. Those cyclists tend to be quite homogeneous because it's a bit like you know you have the same thing with car traffic, right? That it works most efficiently when it's homogeneous when everything is the same. And kind of becoming part of that homogeneity and it's like you know, people who bike themselves, if they have a child they're sitting on a seat so you can still cycle at the same speed as everyone else and you don't tend to like in rush hour when there's high volumes. You don't tend to see older people cycling. You don't tend to see small children, so it's like. It's also about yeah, there's only so much you can do with the infrastructure, but then it's like, how do you manage these differences in different groups of cyclists? Who you might want to encourage

Researcher: Mm-hmm.

Andy: and that's a, it's a problem that I've discussed with cycle planners in the Netherlands, for example, when people get to a certain age, and then they're worried about cycling in certain circumstances. They cycle their whole lives. There's a very strong cycling culture. But then it, then it becomes really difficult because it's like "well, but I can't cycle at that speed anymore. So I'll choose to cycle at a different time of day or something like that." So then it's also about thinking about the different groups that you have using this cycle lanes and how you can do that. And I think there's probably, the easy infrastructural stuff that can be done

Researcher: Umm.

Andy: but it's also about like thinking of the different user groups and maybe some communication stuff as well about how you can do that.

Researcher: Mm-hmm. Okay, this is the end of part one.

Andy: Umm.

Researcher: So I haven't done the second part before online. So I think that it's better to send you the research model, so you also have it, but I will also share it.

Andy: Okay. Okay.

Researcher: Okay. For some reason. I can't send it to you. But I will share it.

Andy: Okay.

Researcher: Can you see it?

Andy: Umm let's see. I can see your screen, yeah. I haven't received a copy but yeah, I can see your screen fine.

Researcher: Yeah, I can't send it to you. I don't know why I can't attach a document to the chat.

Researcher: I can send them by mail.

Andy: Hmm.

Researcher: Just a quick e-mail. Okay, so. Sorry for that.

Andy: No, but you can share the screen, it works well.

Researcher: Oh, okay, okay then. Okay, so here is my research model. And I also have another doc with the definitions, but I will go through them now with you.

Researcher: So are you familiar with theory of planned behavior?

Andy: Yes.

Researcher: Okay, that's good. Because you understand I guess how this model is built. So. Yeah, this is an extended version based on the theory of planned behavior and intention towards a certain behavior.

Andy: Umm.

Researcher: at this case, towards active mobility in commuting, can be foreseen by the attitude towards the behavior, subjective norms, perceived behavioral control. I do you want me to go through the definitions of these three or you are familiar?

Andy: You can go through the definitions.

Researcher: Okay, so I think you just defined as the tendency to react positively or negatively to an objective person and institution or an event. Subjective norms are defined as the perceived social pressure to perform or not perform the behavior. So the significant others of the person, a friends family, colleagues, the social circle. Perceived behavioral control is defined as the perceived ease or difficulty of performing the behavior and intention is defined as the individual's intention to perform a given behavior.

Andy: Umm.

Researcher: There are also human behaviors, namely salient, that are included in this theory and here I have included the six on the left in the form of the behavioral beliefs. So the individuals believe about consequences of the of the particular behavior. And we have perceived time, which refers to the time and individual perceives an action takes and differs from the actual time because it is combined also with the efforts spent to perform the behavior. Perceived cost which is the cost and the value that the individual ascribes to this behavior, so by contradicting these two, the person concludes if he or she will re-practice active mobility. Then we have perceived comfort which refers to the availability and quality of infrastructure for example, seats or cleanliness. Weather can be also a factor related to cleanliness and then we have perceived health benefits so if the person is aware of the positive health results that active mobility convey. Perceived safety refers to the perception of how safe cycling and walking are. And finally we have climate change knowledge, which refers to people’s awareness on climate change existence and the impact climate change can have. And also in the middle of the model, we also have habit which is a variable which directly leads to intention because people are used to do things in a certain way. So, here, I have these symbols you can use. Uh. Three pluses, 2, 1 plus or minus to indicate if the level of influence of these factors is strong, moderate low or there is no influence.

Andy: Umm.

Researcher: So you can take your time to think about it, you can ask me whatever you want if it isn’t clear.

Andy: Hmm.

Researcher: Uh. So what I want you to do is to indicate the level of influence of these variables. And the at the second part if you feel that there is a very important or less important factor that is not included in this model, you think that it should be.

Andy: Umm.

Researcher: let me know so we can place it wherever you think is the best.

Andy: Hmm. Umm-hmm.

Researcher: Too much information maybe?

Andy: Yeah, it's a lot of information. Let me, let me think.

Researcher: Yes, sure.

Andy: Umm. Can you again just explain what attitude means?

Researcher: Yeah, it's the tendency to react positively or negatively towards something. But in this model. Uh it is assumed that attitude is influenced by the six factors on the left.

Andy: Umm. And. This is why I'm a bit. Subjective norms

Researcher: Umm-hmm.

Andy: would also influence attitude, right?

Researcher: Uh. They are two different things because attitude is the personal tendency.

Andy: Hmm. Umm.

Researcher: While the subjective norms has to do with the influence that the individual receive from the significant others, from the family, the friends. So there is a direct influence from social norms there.

Andy: Hmm. Because I think whether you see something as positively or negatively.

Researcher: Mm-hmm.

Andy: It's also, you know, what others think of me. What do other people think of me

Researcher: Mm-hmm.

Andy: makes a difference to your attitude of like how positively you see something.

Researcher: Yes, uh I haven't thought like that. But maybe.

Andy: So I think

Researcher: the main variables

Andy: Umm. Umm. Umm.

Researcher: Yes, the main variables of the of the original theory are attitudes, subjective norms and perceived behavioral control. So all these three in combination can affect intention and subsequently the behavior. But do you think that subjective norms actually has an influence on attitude?

Andy: Yes, that's what, that's what I'm thinking and I think it has a very strong influence on it as well.

Researcher: Mm-hmm.

Andy: If we're thinking about people who are going to shift from a motorized transport to active mobility. Umm. Because it's different if you're thinking about people who have basically always been cyclists. And I think, I think that's a little bit the thing when you're. Most of the cyclists that you have in Copenhagen

Researcher: Mm-hmm.

Andy: they've just always been cyclists. That's part of their identity that you know that's what they do, and they've chosen to live in central Copenhagen because they also like cycling and they think that cycling is a good idea. And they believe all of these things here, but when you're looking at someone who's currently driving a car to do, to commute

Researcher: Umm.

Andy: Then, there are different, they're in a different place and they're in a different group. And I think what people around them think about cycling makes a big difference like you don't wanna be like the odd one out to, who's come sweaty to work. Because it's not socially accepted in the same way

Researcher: Mm-hmm.

Andy: and that will affect your attitude. So I think particularly for this shifting from motorized vehicle to active transport. Umm. Well, let me think. So I think habit.

Researcher: Yes.

Andy: What do I think? Oh, let me think.

Researcher: Mm-hmm.

Andy: has a very strong influence I would say. 3 pluses.

Researcher: Mm-hmm.

Andy: Subjective norms, I would also say very strong influence. Perceived behavioral control. So that's how much you think that you have the ability to change.

Researcher: Uh if you perceive it as an easy or difficult task to do it. If you, if you feel confident, if you feel that you have all the resources to perform it.

Andy: Well, I find it difficult to evaluate that one. Umm, we'll leave it for now. I think attitude, I have difficulty with whether It's a strong or not. I think that's when you ask people

Researcher: Mm-hmm.

Andy: they will say that these uh these values are very important in their choice. But in their actual revealed behavior I think it will be different. So, I think it's very difficult to ask people, the right questions so that you get. So I'm pretty sure when you ask people, you know, why they don't cycle they'll say, "Oh, it's because it takes too long blah blah blah", you know, but then if you actually show them the facts that will actually it's cheaper. It's quicker. It gives you lots of health benefits. If you show them like the facts on all of that because the facts are there, then it won't get them to change their behavior.

Researcher: And actually intention and the final adoption of the behavior are different.

Andy: Yeah.

Researcher: I mean here, the model stops to intention

Andy: Yeah.

Researcher: and then I haven't included the final step, which is behavior. Maybe all these four has a positive effect on intention. But that doesn't necessarily mean that the individual at the end will adopt the behavior.

Andy: Hmm. Umm. Yeah, so in this case then I would also put attitude high because I'm pretty sure that people will say. That's what I think. There's high intention there if you have the facts that you'll make a decision based on that, but then the revealed thing it will be different because of the other factors as well.

Researcher: So this.

Andy: And so now I'm basically saying that everything has a high influence, but I don't know. It depends how you do the survey and if you're gonna rank them. Do you want me to rank them maybe? Hmm.

Researcher: No, I just want to know if you think that they will have a strong influence or not. For example, as I understand you think that attitude has not the same level of influence as the other three below attitude. You are very confident about subjective norms or habit but not so much about attitude.

Andy: No, but I was thinking about actual behaviour and now you've told me that I should be thinking about intentions that I'm a I'm gonna backtrack a little bit. And because you're gonna send out a survey to people, right? And then it's gonna be some kind. Umm. Hmm.

Researcher: Uh there will be question items. I mean, the person will not know if I'm asking something about that, attitude, subjective norms or perceived behavioral control.

Andy: Umm.

Researcher: There will be just items and then I have, I will know which items correspond to which of the variables.

Andy: Umm.

Researcher: When I'm doing the analysis.

Andy: Because I think people don't recognize so much in their selves. So I think that when they answer the survey

Researcher: Mm-hmm. Umm.

Andy: attitude will be top, like, that will be the most influence.

Researcher: Okay.

Andy: And that subjective norms a bit less and habit a bit less because people don't really want to admit that their habits so. Yeah. They don't want, people never want to think of themselves as I'm stuck in a rut, but I think it's in practice. That's why you get into a habit and it's very difficult to break. And then the perceived behavioral control and how people respond about that I think that. Yeah, so I'd say, 3 pluses on attitude. Two on subjective norms, one on habit and then probably. Umm. That perceived, I think people will think that they have the masters of themselves, I think.

Researcher: Mm-hmm.

Andy: So, then that one. That will probably come out as high that they had, they have the ability to do it. It's just because of other things they haven't managed to do.

Researcher: Mm-hmm.

Andy: So probably 2 pluses on that one. We'll see.

Researcher: Okay and what about the behavioral beliefs on the left with regards to their influence towards attitude?

Andy: Umm. I think time and cost will come out. See it's for active mobility, the time will come out really high. 3 pluses. Umm. Let's say the other ones. I think climate change knowledge will also come out. Two pluses for that one. Perceived safety 2 pluses. Health benefits 2 pluses. Perceived comfort. One plus. Perceived cost. Neutral.

Researcher: So cost has a minus?

Andy: Um. Maybe not a minus. 1 plus.

Researcher: And comfort for example, it refers to the availability and quality of infrastructure. Why do you think that it has a low influence?

Andy: If it's a bit the quality of the infrastructure. No, I was thinking that. Because you're thinking of the comfort. I'm thinking of like the typical commuter who's in a car. Why are they taking a car. They feel it's so much more comfortable to do that. And for that person and they're like, "oh, well, you know, I can easily drop my kids off at preschool on the way and I can pick up the shopping on the way home or even if you don't do that. You know if you have other things. It's very comfortable. I've got my phone is tied up, I can listen to the radio or whatever. If that is your comfort level and then you're like, okay now you're going to cycle.

Researcher: Mm-hmm.

Andy: And a lot of that disappears. From the perspective of the car user.

Researcher: And do you think that the existing infrastructure also facilitate more the car? Compared to the bike.

Andy: Yeah, yeah.

Researcher: Okay.

Andy: Definitely.

Researcher: Okay. And.

Andy: Not in the center of Copenhagen. But as soon as you get out to where I work now, it's yeah, I mean, it's a terrible bicycle infrastructure.

Researcher: Okay.

Andy: Hmm.

Researcher: So the network is really good only in the center?

Andy: No, and then the cycle superhighways also and there's pockets, where it's good, but where I am. So

Researcher: Umm.

Andy: The bicycle lane disappears on my way to the station that's how bad it is out here. And there's potholes in the bicycle lane.

Researcher: And.

Andy: Umm. Umm.

Researcher: Perceived health benefits and climate change knowledge. You rated them with two pluses. So you think that people are aware of the positive health results and the climate change.

Andy: Yes, I think now.

Researcher: Okay. I think that's it.

Andy: Good.

Researcher: I don't have further questions unless you have.

Andy: No.

Researcher: Okay.

Andy: But it'd be super interesting. Do you let me know when you finished your thesis?

Researcher: Yes, of course. I will also, I hope that I can publish the survey in the middle of November.

Andy: Umm.

Researcher: Because I need approximately 200 responses.

Andy: Okay. Umm.

Researcher: So yeah, I hope that by the end of January, I can get it done. And I'll let you know.

Andy: Good. Well good luck with the rest of it.

Researcher: Thank you very much and thank you very much for your time today.

Andy: Yeah, no problem. Have a good day.

Researcher: You too. Bye.

Andy: Bye.

Interview transcript – Riley

Researcher: Okay. So could you make a short introduction about your professional background, how you relate to active mobility?

Riley: Yeah. I studied, I graduated from Roskilde University at something called [Danish word], which is a technology-based planning line. It's called something else today, but when I did mine it was called that and I also mastered in cultural geography, and that's where I firstly started to focus. That has an environmental aspect to planning and that's why I first became focused on the transportation side of things, of planning. So, that's kind of set out the pathway into transportation or mobility. While studying ended up having my first internship and follow up by being employed as a student and later on as a graduate at the Danish Railways. So the railway system. And that's actually how I got into more focus on the bicycle aspect of transportation mobility because, for whatever reasons, I got to work with how people got to and from stations with their bikes, and then one thing led to another, and then suddenly I was focusing on specializing by coincidence on the cycling aspect. And that led to another job for the city of Copenhagen when they initiated a program they called at the time "World's Best Cycling City 2015". It was kind of like a branding or a way of communicating that they wanted to do something extraordinary, to do more than they have done in the past. They set an office, they set up an office for that and hired people for various positions and I got involved in that for a while. And for the past ten years, I've been working as an independent consultant, which means that I can offer mobility, that work on mobility, both for municipalities in Denmark and internationally, for a city that wants to start that transitions towards a more active mode on greener transportation, especially in their cities. So yeah, pretty much that. Yeah.

Researcher: A lot of relation with active mobility.

Riley: Well, the focus is I mean it is active mobility. So, at the beginning with railways, obviously that was about combining bicycling to and from station with a trip by train to somewhere else. So that could be the combination traveling between the two modes. But of course, when you work with cities, even that you're focusing on active modes, all the other elements will always play a part. So cars play a part. Public transportation plays a role. Pedestrian, cycling, so on. And of course, the overall interconnection between the various things and how we live. So. So you renovate a place like this? Yeah. There are some needs for people to get to and from this place. How does that connect to the rest of the city that all these things always comes into play at some sort. So even that I wouldn't probably, wouldn't see myself working on a project that was solely promoting private car usership. But of course, in any project there's also the element of a concern or a consideration, at least, towards. So if I do this, does that mean that you can drive that I mean, maybe that's the purpose, but it also means that maybe you have to find somewhere else where people can drive then or park or whatever. And then you need to incorporate and you will be incorporating that into your design. So at the end of the day, just the way you put your focus, I guess. But it also, in my world anyway, the modes always comes together in a sense, because I mean you wouldn't find people that would work for complete car-free city, but that's that might not be too realistic, not depending on how you look at it anyway but yeah. Mm hmm.

Researcher: Interesting. So are you familiar with Copenhagen's active mobility goals?

Riley: Yeah. I will presume I am.

Researcher: Okay. I will just mention two of them I have as an example in my research. The first one is the cycle superhighways. And the other one is that they target to 50% of a cycling shares by 2050.

Riley: That was the target that they put up in that description I made of that branding of World Bicycle City by 2015. That was the target that was specifically mentioned in that reasoning to have that office. So that goes back to that time.

Researcher: So you're well familiar with.

Riley: I would think so, yeah.

Researcher: Okay. So I'm taking in my research region Hovedstaden as a research context. So I'm focusing on the active mobility goals on this region. Do you think that these goals, I guess that you are familiar also with others, which are feasible?

Riley: Well, first of all, I think the. Depend how you look at it, because the 50% target when it was originally announced or formulated was 50% of all bicycle traffic. So that also meant crisscrossing the municipality boundaries. So that was the Greater Capital. You could be someone, could be riding from Helsingør or wherever, long distances. And then they never reached that goal. I think they sit on 36% now or something for that. The 50% is already obtained or achieved within the municipality. So internal traffic inside the city of Copenhagen.

Researcher: But not in the region.

Riley: But not in the region. Correct. Well, in the region, meaning crossing into the city of Copenhagen, because obviously there will be regional cycling outside Copenhagen that does encounter that statistic. So I guess your question was if the 50% across the boundaries of bicycling routes. Yeah. I don't think we will reach that number in the current environment of what the city and government for that matter are doing to increase cycling. So that means if the public doesn't introduce, change the policy and be introducing road pricing or all the regulations that make it harder to drive, make it more expensive to drive. So yeah, get road pricing, cost of parking, whatever instruments you would envision to make it more expensive to drive. I think without those, uh, harsher tools, I don't think it's likely to get to 50%. Um, and from a communication perspective or a branding perspective, I think when that number was formulated in 2007, 2008 or something, maybe 2009. Uh, no, no, no. It would have been before that. 2005 or 2006. Um, I think, first of all, again, it sounded nice to say 50% because if you say 42%, how are you going to communicate that in an advertisement campaign? And we're not doing a campaign and so. But, you know, when you brand stuff. So obviously 50%. And I think what I like with the city at that point does, as I mentioned also when I actually joined that office, was that it was an extremely ambitious goal. And I think we all knew that we wouldn't reach that goal, especially not within 2015, which is obviously already seven years ago. But first of all, it was easy to communicate. It was a nice round figure rather than, as I said, just say something like 40% something, nobody remembers the number like that anyway. But it also sent a signal that if you want to reach that goals, you need some of those instruments, as I just mentioned, like road pricing or harder things to obtain that access. So you could get to a certain point. But I, I remember discussing at that point that I think it was nicer to have an ambitious goal that you kind of know that you're maybe you're probably not going to get there, but then you might get to 42%, just to keep that number in mind. But if you had a very easy target, you might have been mentally thinking, "Oh, okay, we can do that. We can do that in a few years." So that's let's just, you know, you're not as you're maybe not as motivated or as driven to reach a goal because it was easy to get there. So I think it was from a communication perspective wise to sit at. Well yet achievable if the society would have put that pressure on. But also still, you knew you had to really put yourself out there and do hard work if you should be just partly successful. But the short answer would be no to whether it's achievable in the current political environment, basically where the regulation sits as of now.

Researcher: And how do you think that citizens relate to these goals?

Riley: I think in people's everyday life they don't read. Why should they care? I guess they ride their bicycles if they find that as the right thing for them. I usually refer to cycling as a tool. So I don't, I don't really care why people cycle. I don't think people would cycle because they want to be part of that 50% or help their city to become part of a strategy or obtain a goal. They do it because the city has. The way the city is functioning, the way that us working with it have created the city, it has become, in many cases, the most logical, obvious choice for people. So, they're doing it and I'm doing it. You can also see that when those surveys asking why people ride. I mean, very few people ride because they don't have money for anything else or they can't afford any other modes. A few people would say they ride for the environment. Maybe that's just nice to say when you get interviewed on the street, for someone, but at the end of the day what scores highs is the most convenient or practical mode for people, because they have it right outside their door and they can go wherever. And that happens because the city is designed for that and you feel comfortable and safe about doing it for most people. So that's the reality, I think, for most people. So they wouldn't be considering whether that's a target for this for the city or not. And that's a more way. Because again when you communicate to your citizens, it's nice to have these catch phrases and slogans or whatever to. And I think it is valuable to, I think the city has been good at that in that campaign to acknowledge people often you see. Like if they have billboards or, you know, sometimes they have some stickers on the footrest at red lights that they use where they say, "thank you cyclist for riding" or "thanks for riding your bike". So that's, I think that's an asset like a token to the cyclists saying, you know, "we appreciate that you're doing". But I don't think anyone expects people to ride their bikes to be nice to their city. They're doing it for their own sake. And that's just very nice for the city. And so in terms of its price, a better city, less congestions, less pollution, cheaper to run your city, basically, rather than if we all insisted on driving. But so, I like that part of it, that the city acknowledges and say thanks to its citizens for doing it. But obviously I don't think the individual would be like. I wouldn't be reading it and I wouldn't see an ad in the paper and think "Oh, the city wants to have half of us riding. I better do that". Right? I don't think we go that far for being nice towards a municipality.

Researcher: And on the other hand, we also have citizens that prefer to take their cars. And the last years we see a cars' increase in Denmark. Why do you think that this happens? Even though the city and the region are sustainable and aim too high?

Riley: Well, first of all, I guess the default answer these years is that COVID changed people behavior a lot. And as just as a disclaimer, I didn't live in Denmark during COVID, so I don't really know that, you know, day-to-day discussions that people would have had on the topic or even reading papers and watching the news. But I think that had obviously I think all our all our numbers and statistics have some kind of scrutiny around those specific years, have mingled with the users of smartphones, users of how much we're streaming, how we are transporting ourselves. All that would be a little bit crooked due to a whole society changing patterns and behavior for 1 to 1 and a half years or so. But on a more general basis. So, I think that has just emphasized or even amplified the focus on individuals and the transportation of individuals. So, I think the trend has been there for a while and the society of our state cities have been able to keep a good balance and not having too much of a leap towards private driving. But I think that individual mindset has been there for a while. For some years it's been the introduction of these microcars that are very tiny and thereby also cheaper to purchase, has seen a trend towards where now in some areas you can see outside high schools there will be tons of small mini cars with 18-19 years old students. That's never been the case before. So that's a shift towards a different mindset of "oh", and the reasoning will be that because there were some tax changes in how we tax our cars. So suddenly they became cheaper due to that. Plus these very tiny ones were introduced. So suddenly people could look at

maybe the differences of having a monthly ticket for the public transportation system were not that different from the monthly expenses concerning buying a car. Overall wealth, so more parents would have been maybe able to assist on paying some of the expenses. So suddenly that balance of change over a decade or so. So, I think COVID has probably just accelerated that trend towards "okay, I actually don't want to sit in a bus next to someone else because they might sneeze at you and virus and so" and what not people would be afraid of. So: "Oh, okay. And I have to finance it or can afford it. So why not have a have a car in our household?" Or maybe you go from one car to two cars because suddenly, yeah, you feel you can afford it. And there's another element. So maybe you would kind of be annoyed by things, but then suddenly Corona and lockdown. That might have been the tip, the trigger point for someone to then make that decision where they were riding their bike or using public transportation or whatever through a commute. So I think you can isolate it due to COVID, but you can definitely see a trend, as I said, over the past decade or so where cars have become cheaper relatively, people have got more wealthy relatively, and that individual mindset has been growing as well.

Researcher: Mm hmm. What do you think that is needed to engage more people in active mobility? Do you think that it's also about their mindset, as you mentioned, or the governments can also do something for that, the cities themselves?

Riley: I think there will always be some people that would be driven by their own mindset and possibly in recent times, a growing focus, at least on climate and maybe the need to be more aware of not just polluting and eating too much meat and whatever topics that people are becoming increasingly aware of. Uh, now we have public elections, as you probably know that, you know, that's also a focus point "how do we start taxing people's emissions and so on?" Well, differently than we do today anyway to. So I think to a certain point, that would be some people that are ready to make changes or even smaller sacrifice for the greater good of society and the world as such. Maybe that's a bit big, but some people would be willing to have a discussion at home saying, "okay, maybe eating meat five times a week may not be necessary. Let's do it twice a week." Whatever. Whatever they do, they feel they are contributing to on the small scale. But I think it's also obvious also from what we just spoke about, that individualism has come into society. People are buying more cars. I think it's obvious that as an entire society, that change won't happen unless from a public, from a government side that you introduce some of the penalties or some of the taxation systems towards the behaviour that we want. So as kind of saying, I retain that 50% commuting goal by bike. The city has moved to a certain point and maybe that's around the standstill or where they are now and it requires some extra tools to get more people, forced is the wrong word, but intensifies to go that direction. And I think the same goes with discussions on emissions and climate. Yeah. Right now people are concerned about their electricity bills because prices are high. So it shows if you do make things, this is not done politically, but it happens to be expensive now to or more expensive than they were before to use your electricity, people are start thinking about it. And so to me that proves that if we can only get to a certain point with being nice and motivating people and at some point, if you want to take the next step in a major change, you need to put some pressure on the things you don't want people to do or don't want them to use. So, say the car so much or electricity or whatever you want them to save on and you have to incentivize maybe by making it then cheaper in the other end of saying: "but we have an alternative over here which is actually more attractive to you financially". So I think we won't get that changed really in large scale unless the political will is present too. I'm using the word punish again, but make it less attractive to do what the society don't want us to do and make it more attractive to do the things that society wants us to do. Very few people ideally enough themselves to do that? Uh, yeah. So that's probably why we sit on, well basically everything in society and it's not new to Denmark. We have, you know, any country, any nation, I guess you have your taxation. So you already have that system of trying to influence behavior. But seems like every time people are, especially now with the

election going on, they are some... Well, some of them are more clear than others. But at the end, they are showing something this morning in the paper. Yeah. Yeah. We want people to eat less meat, but it shouldn't be more, it shouldn't cost them more. And like, if you're not making that meat more expensive again, there's no incentive for the bigger part of the nation to actually change their behaviour. So obviously, if you don't make it more expensive to buy meat, how are you going to expect people to change? So that's the mindset. I think we just have to accept that thing. Well, I don't know if you have to accept that, but I think if state wants to get to where they claim they want us to be, they also need to regulate with that perspective or that lens on it.

Researcher: And discussing what may affect citizens. Currently the city and the region in general is confronting with population growth. Do you think that urbanisation relates to the shift to active mobility?

Riley: If it relates to.

Researcher: The shift if it plays a role.

Riley: Yeah, I would. I would presume that because if you get denser cities, uh, there would be more people potentially living at shorter distance to workplaces that would obviously lead to a shorter distance of commute, which then makes it more likely not to drive because most people kind of maybe at least in cities, understand that a commute through the city center is probably not the most clever idea you could have in the rush hour. So that's where public transport, transport and especially bike/cycling would by far be the fastest mode. And that makes that the obvious mode again with. And that is the reason why people do it. It's, you know, it's just the obvious choice. So, a dense... I think all evidence shows that if you work from a perspective of sprawl. So like the American way of planning, you get a lot of driving. If you make your cities compact, you get less driving. And that can only be intensified by growing the cities. Of course, then it's also how you do your urban planning, because if you do your new housing areas attractive for driving you will get a certain amount of driving. Maybe not as bad as you could have been because it's in the city, but you still intensified it. So you have that regulation tool of how much and how little car parking should be available. At what cost, is it private or is it public priced? So there is a lot of, there are tools to regulate the numbers and then I think the municipality has an important role to play to make sure that all these new housing areas they do that they are designed in a way that is in accordance with the overall target of having a greener, nicer, a more bikeable place. So obviously, if you want that, if that's your headline of your strategy, but at the same time, everything you build new, you just make a lot of car parking to it. I'm not saying they do that, but if that's the case, you kind of contradict your own target. So of course, the more they make sure that the new housing areas and places for work they are aligned with their goals and aims for the city. And they have a role to play there. Obviously, some of the other areas will be also influenced by the state. So like Nordhavn and stuff where they also are public or state interest in, they might not see eye to an eye on specific how that should look. But I think that's why the municipality has a chance to have a lot of influence in how that looks and that forms the future as well of what they what they're looking at.

Researcher: And do you think that there's an advantage that the cities will be more dense in the city of Copenhagen, but also in the outskirts, that the region is not that dense?

Riley: Sorry. Did you ask me if I think it's an advantage to have denser cities.

Researcher: Yeah, you said that it's good that we have denser cities because the distances are shorter to commute. But do you think that this is the case both for the city itself but also for the outskirts of Copenhagen, that is not that dense?

Riley: Yeah. I think, you know, there's a fair amount of... I don't know what they are in terms of, mid-sized cities within commuting distance to Copenhagen, and they are luckily placed -and that's due to planning history- connected to railway. So you have bigger, bigger hubs that also could be more dense. I would. You know, they're doing it in Køge, which is what? 40-45 kilometers out of the city, along the railways by the coast. They're doing a lot of new developments down there and obviously, I mean, even build a new train station to make sure that people can access the public system. And I think those things are important for. Because of course, again. But then of course, they also had, I think, an extension of the highway. So then you kind of water down the incentive to go public transport. But if they weren't connected to rail, to the commuter rail, it would have been an issue transport wise. But at least, so I think if you're intensifying those places that are well connected to the city, that at least give people the opportunity to use public transport and they're too far away to I wouldn't be looking at I know we do cycle superhighways, but it's still a fraction of people that are willing to ride a bike for 30, 40 kilometers each way. So that's probably not going to be what I would consider being the major impact that we can have. That's where I would focus on making sure that we provide a good train option as an alternative for people who are driving into the city. Uh, so, these hubs definitely have a role to play and it's also due to obviously the real estate prices are slightly, at least lower than they would be in the city. So, that also plays a role. But obviously within the same distance of Copenhagen there's also quite a lot of open land still or even smaller villages that that are disconnected from, at least from rail, but probably also have quite infrequent bus service. And to me, that's fine. If you want to live like that, that's still a fraction. It's. It's. That's fine. You know, that's an individual choice if people want to live in a small place and that makes them as an individual household car dependent. And that's I think that's fine. And I mean, if I live on the countryside somewhere, I would probably also have a car in my household, because otherwise, how should you get anywhere? But then it comes down to -that's on a more maybe, that's not a city perspective, but on a national perspective- then I think that's where we need to look at. So how do we make sure that people make the driving that is needed, but not the non-needed driving? So, again, if you live there, maybe in a smaller village still, if you only have 500 meters to the local shop, groceries, normally you should not be driving then. That's a silly way of driving or using your car. But of course, if you're facing a two-three-hour commute to get to work or you can do that in a 45-minute drive, I would drive myself because otherwise your day would be not functioning well. So, I guess that's fine. But again, as a society, of course, the more we focus on us, urban planning and connecting hubs of dense living, at least we give the people an option again. And then, at the end of the day, you're giving people an option. And then you can also, with the way you tax or the way the cost structure of things, you can still influence people to make it more attractive to, in this case, public transportation rather than individual driving. So as a system, we still have a lot of toolbox to regulate the behavior. Whether they have the willingness? That's a different thing. But I think we know the tools and we know how to use them and how they will work if we use them. And then, of course, it's a political question whether you do that and to what extent you do that. Mm hmm. Yeah.

Researcher: Okay. And I have one last question for the first part. Many people are coming to the capital region of Denmark from different backgrounds and countries. Do you think that this multicultural element influences the shift to active mobility?

Riley: I'm sure that it influences it in both ways. So if we talk about people, international people. So coming to Denmark and some will come, I think maybe because they've seen the lifestyle of moving around on a bike and you can also see that with tourists. So that appeals to them. So some will come with the idea that they want to be part of that. I'm guessing, that's my impression. They will come with the intention of being part of that and have that free kind of living. So of course, they will tap into that. But I would also presume that some people will come from some nationalities, some countries that are very car

centric. Maybe they still have that perspective that owning a car is also prestigious in terms of you made it in society and that kind of cultural mindset. So if you bring that cultural mindset in and maybe you come here and you are a young professional and you also get your first job here and then suddenly you start making money as you can actually. So that's an alternative. You can actually buy a car. Now you have the money. If you still have that mindset that is prestigious, then you might buy one here. You could then think that after a few years they probably discover, well, we don't really care things whether you have a car and such so. So maybe you shouldn't do it for the prestige, but I could. I'm just saying. I think you will have both. So whether international people living in Denmark, in Copenhagen for a longer or a shorter period, I think that will be some whose their influence is positive because they buy into the biking thing. But you also have those who come with a mindset, which is the way they were grown up. So totally understandable. But maybe they bring that with them and then. So it probably goes both ways. But what I noticed is that, and especially the last couple of years, so while I didn't live here. So coming back to Denmark after two and a half years, I noticed how many of these Swapfiets that are now around with the blue tires.

Researcher: Huh, yes.

Riley: And my guess is that 80% of those who ride on them seems to be international people that are here for a shorter while. So maybe that's the cheapest way to get a good bike by monthly payment or six months or whatever it is. Um, so, that was the one of the major changes in mobility or transportation that I noticed when we got back that suddenly saw these blue tires all over the place. And yeah, almost every time you pass one or they pass you, they don't speak Danish necessarily, at least with an accent. So, I guess they have understood either beforehand or shortly -I think at their staying- "ah, maybe this is actually a really nice way to get around" and then have adapted that culture. Probably, I mean, if they're at university, they would have been presented with the "are we going to meet somewhere? Yeah, but where is the bus", then people be like "now we are biking". And then it would be hard not to discover that that is probably the way that other people get around. A lot of people get around anyway. So that's a cultural thing that you would. Just a personal anecdote for that I remember. 20, 25 years ago. Just for the argument's sake. Uh, my girlfriend, now wife, at the time girlfriend. We were in South America and we had met three guys, Argentinian guys, local, and we stayed with them and for a while and then their conversation went around dating or whatever and we like and then cars and bicycle and then, suddenly they asked me: "So if you were inviting her out, what would you do? And I said it as the most natural thing" "I will ride over to her and then we're ride into town and go out. And they were like" "Nooo". And then they turned to her and said: "Really? Would you be okay with that? And she was like: "Yeah, yeah, of course". And for them their mindset would be. They said: "but the woman she wouldn't accept being picked up on a date by bicycle because that was unheard of. That was unthinkable. And I think I kept that story in my mind for many years because it was definitely a cultural class and as natural it would be for me to show up on a bicycle and as natural would be for her to expect me to show up on a bike. The opposite just with a car would be as natural for them. And so it was just, you know, there's no right or wrong. It's just completely different mindset to what is acceptable. And that's you probably see those cases today as well around the world. And that if you told them that story today, they will be like: "no, no, you can't do that". Anyway. But no, and then generally, I think bringing. I mean, I'm born and raised in the city, so I lived here my entire life and it's definitely way more international they were when I was a student, when I was younger. So the whole whether (it influences the shift) -and that doesn’t only go for transportation obviously- but that just has changed the vibe or the feel to the city that has definitely changed. And even without international people coming in and changing the vibe at universities and the city. Just the way of living. I mean, the outdoor serving it was there when I was younger as well, but it's you can really see how that cafe scene and going out and numbers of restaurants and so on has changed

dramatically, probably in the last 20 years or so anyway. And of course, that has also emphasized of having more people coming from outside and also tourists. And then there's a bigger need for restaurants. And so I guess that's just a get into like a spiral of events that pushes a change towards something else. Yeah. And I guess that goes with transportation as well. Uh. But if the question was aiming at having an answer of whether it makes more people cycling or less people cycling having international visits or stays? I have no idea. No. I don't know.

Researcher: I think that both you mentioned are correct. That some people join the culture and some others feel that this is not for them, because they are coming from car-oriented countries.

Riley: Yeah. But I would guess then, it will be interesting to see how if they came with that mindset, which is understandable as we talk about. Then see how many of them have changed their minds after a year, after two or three years if they stay here. Because I think it's, at least some of them would be influenced, as I said, by friends. So every time they show up at a party, they show up in a car and people be like, but then you can't have a drink because "oh yeah". And then suddenly they see how people mingle, you know. And if they want to go somewhere else, you're the only one not jumping on a bike to go to the next party or where, you know, wherever you decide to go. And they'll be like: "this is impractical.

Researcher: Huh, yes.

Riley: I'm left, I'm left outside this". And I guess at some point you'll be like: "No, I'm gonna bike. Can I borrow your bike? Can I try this?". You know, you will. Most people will be curious at some point, I guess.

Researcher: Yeah. Okay. So this was the first part.

Riley: Yeah.

Researcher: So, let's now proceed to the second one. So here is my research model. And here are the definitions of the variables, but let me first go through them. Are you familiar with the theory of planned behavior?

Riley: Not sure.

Researcher: Okay. I will explain it so you understand how the model is built. So it's based on the theory of planned behavior. It's an extended version. The theory of planned behavior was introduced by Ajzen 1991 and states that the intention towards a certain behavior can be foreseen by the attitude towards the behavior, by subjective norms and perceived behavioral control. So attitude is the tendency to react positively or negatively to an object, a person or something like that. Subjective norms are the social norms. They are defined as the perceived social pressure to perform a behavior or not. So it's the family, friends, colleagues, the social circle. Perceived behavioral control is defined as the perceived ease or difficulty to perform a behavior, and the intention is the individual's intention to perform a given behavior. So, this model has a final step, that of behavior, but it's not included here. Here we try to foresee what affects citizens regarding their intention to shift to active mobility. In the theory of planned behavior there are also beliefs, namely salient, and here we have added six variables in the form of behavioral beliefs. So the individual's beliefs about consequences of a particular behavior and we have perceived time, which is the time that individual perceives that an action takes and differs from the actual time. We have perceived cost, which differs from the actual cost, and it's in combination with the experience. We have perceived comfort which refers to the availability and quality of infrastructure. And also some examples are seats or cleanliness. Weather can be related to cleanliness, for example. Then we have

perceived health benefits. So, if the individual is aware of the positive health results that active mobility convey. Then we have perceived safety, which refers to how safe the individual perceives cycling and walking. And we have climate change, which is actually if the individual is aware of the climate change existence and its different consequences. And also, we have habit, which is added in the middle of the model because it is assumed that it has a direct influence on intention, because people are used to do things in a certain way. So, as a first step of the exercise, I would like you to take your time, go through the definitions again. You can ask me whatever you want if it's not clear, and I would like you to indicate the level of the influence you think that the variables have by using 3, 2, 1 plus or a minus to indicate if the influence is strong, moderate, low, or there is no influence. And as a second step, I would like you to if you think that there are variables, factors that are not included in this model and you think that they should, you can place them wherever you think is the best and again indicate their influence.

Riley: Yeah.

Researcher: Maybe too much information?

Riley: Oh, well. It might be, but let's go through it.

Researcher: Yes, sure.

Riley: So these are the definitions that you just spoke to? Yeah, yeah. And do you come up with a different theme or just.

Researcher: I would like you to indicate with the pluses and the minus, what do you think that the influence will be. For example, that SUBJECTIVE NORMSs, you think that would have a strong influence for people to shift (to active mobility).

Riley: For shifting. So that's the intention towards this shift. Yes. Okay. Got it. To expect it to be scored that way? So first here and then there or doesn’t matter?

Researcher: I would suggest you can start with them with regards to the attitude first and then you can go through the rest.

Riley: I'm not quite sure that I got it, but I will speak out loud and then you can correct me if I'm on the wrong path.

Researcher: These are assumed that influence attitude. So I would just first focus on these six if you think that they have an influence on people's attitude.

Riley: Yeah. Am I looking at this from a person that's already. So, am I a car driver and these are the way that I look at a change to active mobility or how? Because what I think is that well, what statistics are also showing, there's a tendency to the perceived time, if you ask a car driver that drives back and forth to work every day, they have a tendency to overestimate how long that journey would take by public transport. And they will also tell you and you will ask them usually: "but how long time does it take to drive?". And then the minutes they give you there, the time they give you there would be the most the most ideal. So that's the way everything works for them. That's no extra cue for some reason. There's no accident on the highway that makes it go slower or they forget that they all had to scrape up ice from the front windscreen before going or whatever. So they give you the option, their best shortest driving times they would normally have. So there's a tendency generally to overestimate your mode. So justifying why you do this and you're optimistic on your own behalf and you expect the things you're not doing to be way worse. So they would be like - if you are the car driver, you'll be like... They will overestimate how long it takes with train. They will tell you how often, way overexaggerated, how often trains would be delayed

or be like: "Oh, every second train would be late." But statistically that is not the case. And they will probably also be telling you about the comfort: "No, no, that's probably not even a seat in the train." But how do you know you've never been in a train? But and I think that's very human. Well, whatever we do as humans, most of us will be trying to do our best towards the other. So I will be saying the things that I expect to be the right thing to say, to watch you in a conversation and maybe, you know, still. And then that's different biologies of being honest and dishonest. But we have a tendency, I guess, as humans to try to please, but also to justify what... So this could also be with the meat again. So I would be personally inclined to justify why I think it's important for me to eat meat every day. But you might have the facts that I don't actually need it physically, but I will still probably be able to somehow justify my actions. And the same goes with you'll be driving or something else. But I drifted off.

Researcher: No, no. So do you think that perceived time, for example, and perceived comfort you mentioned, play a role in people's decision?

Riley: Yeah, definitely. I think they play a strong role in people's reasoning why they do what they do. So that means that.

Researcher: 3 pluses?

Riley: Yeah, I think we have. And do we put them here?

Researcher: Yeah.

Riley: Okay. Well, comfort, maybe not as much. They have an idea of it, but. Perceived cost. You know, that would have no influence. I think I'm speaking to you because I'm not quite sure where I get this completely. But I think if you were car driver, you wouldn't change into active modes, wouldn't influence your cost because you would know that obviously it's next to free to walk and cycle because yeah, you need to have shoes and a bicycle potentially. So that wouldn't be a reason not to do it. So I would guess that would have no influence into change. On the other hand, you could be thinking about having a car and then have a perceived cost idea that it's cheaper than, or too expensive. You don't know but maybe you just have an idea, but you haven't really got into the numbers. They all would go the other way. But if I look at it from changing from passive to active mode, I don't think the health benefits would be there. They would have very low influence. People would be like: "Nah, I go to the gym instead" or. They will justify that they're doing other stuff that keeps them healthy. Perceived safety plays a pretty good role. You see that with parents as well who argument why they have to drive their kids to school. That it's dangerous for the kids to go to school. And basically, they say because you and all the other ones parents are driving, right? So they kind of infusing them. But they would claim that they perceive that is unsafe to let them go on their own or with friends or whatever the reasoning would be. In the city is less, is different than at a national level. Climate change knowledge. Unfortunately plays a very low role on people's (intention). Okay.

Researcher: So, is this a minus or a plus?

Riley: Low and no, somewhere. I don't think it... At the end of the day it's a minus, because I don't think that's the reasoning for being active on your mobility. Okay. And then you score them again here?

Researcher: Uh, yeah, but I would say this first. Yeah. I don't know. Yeah. Let's start with subjective norms, and then we can see if you think that attitude has less or more influence than the other three. So, do you think that subjective norms have an influence on intention? It's -I'm just reminding- friends, family.

Riley: Yeah. So how other people around you impacts you?

Researcher: Mm-hmmm.

Riley: Somehow it would have. I think that's moderate. I mean, of course, people are influenced by their surroundings, for good or worse.

Researcher: Mm hmm.

Riley: Yeah. Yeah. And then you wanted to move on to this one?

Researcher: Yes.

Riley: Perceived behavioral control. And what was that about?

Researcher: Uh if it's easy or difficult.

Riley: To change?

Researcher: To shift. Yeah. If you feel confident, if you feel that you have all the resources you need.

Riley: Oh, yeah, okay. I think that has a strong influence. I mean, if it's not easy, you lose a lot of incentive. Habit plays a strong role as well. Well, you can see that in numbers as well. The best time to change behavior in transport is when you either you move or your workplace moves or you change jobs. So you suddenly have to do something that you did not do for the past, whatever, time. Then that's a chance to be open for alternatives to the way you move. Attitude. What's should you?

Researcher: It's a tendency to react positively or negatively, but it's influenced by all these here.

Riley: So it means that. Is it how I would, as an individual, think that others react to me? If I'm just a car owner, then I don't care about whatever people think.

Researcher: Yeah, it's personal. An example is it's fast. It's cost efficient. I like it. I want to shift.

Riley: Okay.

Researcher: I like cycling, I like walking. I am aware of health benefits.

Riley: How much influence. But, you know, if you test that, that's a very strong approach. If you kind of defined: "I want this, I'm going to do this."

Researcher: Uh, no. The statement of "I want" comes later. But this is more about "I like it. It seems comfortable. It seems cost and time efficient."

Riley: Mm, well that will have a strong influence then obviously. That's a major selling point towards the change.

Researcher: Mm-hmm.

Riley: Yeah. Okay.

Researcher: Okay. And do you think that there are other factors that are also important and are not included in this model?

Riley: I guess they're embedded. But again.

Researcher: Mm-hmm.

Riley: Well, maybe. It's outside the model maybe, but it's kind of what we spoke about earlier as well. I mean, the reason why these things are the possibility for even having the change is I think that the city has provided for that option by 100 years of how they plan their cities. So you could have all these. These will look different somewhere else because if active modes weren't a real alternative, you wouldn't be thinking that in those terms. So I guess this is only possible because society has provided for that option. But I guess that sits outside. That's just the facts of this specific city rather than if we were somewhere else in the world, I guess. Um, so I guess that comes into a historical perspective. But again, that will be sitting in what is expected from your surroundings. So I guess it's included then. No. Yeah. No, that's nothing that springs to mind. The only thing I can add.

Researcher: So you mean the norms and what it's normalized for many years in this city.

Riley: That becomes ingrained. When I was born. Maybe there wasn't anyone saying that cycling would be good for you in the sense of. That wouldn't be like a campaign saying - half of people should cycle or anything. They didn't do that. But it was still the norms. My parents would teach me to bike, to learn to bike. They wouldn't be thinking: "oh, yeah, it would be good for you Riley if you knew how to bike". They would just have done that because their parents did it to them. So it is also inherited into our culture that... Then I think you could speak to most Danes and they would have some kind of memory of their first bicycle, either type or color or something and the idea of mom or dad or granddad or someone running, you know, helping you getting your balance right. And I have memories of teaching my kids to ride a bicycle and the joy of them finally cracking the code and being able to ride on supported. So that is obviously a cultural thing that I just, unconsciously passed on for generations combined with that the city has made that possible. And if that wasn't the case, these goings will, of course, look different because my mindset would also be different. So I think we as citizens pass on that way of living. I mean, like my mom, my parents would take it for granted that that I would have a bike then. And of course, if you grew, they will get you actually a bigger bike. So you know, as you grow and they wouldn't be asking. So "Oh, so you're going. Where are you going? So how are you going to get there?". It wouldn't be necessary to have a discussion about because obviously you will be on your own and you will do it by bike or walk if it was close by. And that would just be something that wouldn't be a discussion and therefore there wouldn't be any discussions about the times or the cost of it, because that will just be like: "of course you do that." And I would know "Oh it takes me 10 minutes to get there" and they would know that "Oh, he needs a new tire. Okay, we'll buy one." You know, these are just those things that will be completely integrated and taken for granted. Not discussed. Anyway, that's of course, due to society. Combination of traditions and heritage. And the society has somehow, somewhere in history decided that this is what we do. We will make sure that we provide for this mode as well. Um, yeah. Again. Well, this one is a bad example because you have to look the poorest sidewalk outside this building, because there's the car always goes too far. Even this one does. So you have to move around. But if you have a proper sidewalk, if there weren't sidewalks, I guess less of us will be walking because it will feel uncomfortable. You see these American neighborhoods, where there's no sidewalks, So, like, "I'm not going to put my kids on the streets then", right? So what do you do? And if you don't bike? You probably drive them because otherwise how should they get? And that could be even 200 meters down the road to a friend, to a playdate if there are no sidewalks. Okay, the most logical way would be to drive them then, because you wouldn't feel comfortable, um, leaving them on the streets. Yeah. Anyway, but I think all these things can be of course, inhabited in the way that that tends off when it goes back to all the boxes I guess, because perceived safety would be. I'm sure that just if I can use you as an example, the first time you came to Copenhagen, you would have had maybe a different vision of how would you (move). Potentially you could have looked at the traffic pattern and thinking.

Researcher: Mm-hmm.

Riley: Whoa, am I going to ride my bike in this?" or even thinking "I'm never going to ride. I mean, this is crazy stuff. They all are all over the place with these bicycles." Because you come from a Greek perspective -and that looks whatever that looked like- and I'm born into it. So I wouldn't be looking at that psycho track of a maze of sight is going around saying: "okay, it's a busy day, but I would still jump into it." Because that would be my default to go solution, to go somewhere, while you might have some consideration about "that potentially doesn't look too safe."

Researcher: But I'm curious because you said that Danish people, you grew up with a heritage of cycling, but we also see Danish people to drive their own cars. Do you think that this is because... You mentioned before that people are getting wealthier. Do you think that this is the fact?

Riley: Well, yeah, it is a fact, but I still think. Of course, you can always find some. But I still think no matter... So, people that are becoming parents now, so in 2022, and maybe a larger percentage of them would be in a situation now where... The car ownership is higher than if you go back to when I was born. But I still think that the vast majority of parents, people becoming parents this year would in five years' time start learning their kids to bike. Even that they now live in a maybe place that is more car-orientated in the planning and, you know, each single plot and what not and maybe not too much of a city there and whatever. So they drive maybe every day themselves, just for the argument's sake. But I'm pretty sure that they would still be teaching their kids to bike just because that's what you do.

Researcher: Mm-hmm.

Riley: Maybe their kids aren't going to bike as much as I would have done in my childhood. And that will be down to what they see their parents are doing. They're now driving. So obviously that reflects to the kid. They also then likely live in a place where driving becomes the obvious choice, because the parents, for whatever reason, decided to live the way they live. So of course that is one of the reasonings to for the mode to change a bit. Again, we all a product of what our parents are presenting to us as lifestyle. So of course, if what you see is two parents, two cars in the driveway and a single plot house, and that's ten kilometers to your school suddenly and you have been driven there for the first years of your school life, the chances that you are going to insist on biking those ten kilometers or two kilometers, whatever it is, is lesser than it would have been in my childhood. So, of course, the change of events of our society that we have from car ownership and people tend to now, maybe, accept to live further away due to whatever reasons, real estate pricing or whatever, uh, that does influence the kids.

Researcher: Mm-hmm.

Riley: But I still. Of course, in a few generations to come, we might be different, but I have a hard time envisioning that... Again, you can always find one family that they never had a bike and they would never have one or whatever, you know, always. That's one example. But I think the vast majority of families, new families, will still be teaching their kids to ride a bike. And maybe then it changed them towards something that you see more internationally, that then bikes become something you do as an activity.

Researcher: Mm-hmm.

Riley: You go on a Sunday ride. You might even drive to somewhere. Like a countryside and safe environment of a forest or something. And then you have mom and dad and number of kids and they all have one bike on a rack of the car. And then they go for a, you know, a picnic trip, which is obviously

something different from the commuting. But it's still active, but it's still cycling. So I think. I mean, I'd rather have them use their bikes on a daily basis, but... So there is a change towards that and some parents, some families will be... But I still think the bicycle is ingrained in the sense that you will teach you bike. It's also something that I think, yeah, you pass that on in generations, as I mentioned. So it will be hard to be the parent that: "No, I'm not going to teach my kids to bike. Someday that might happen." But that would be weird, I think. But what do we might have one day? Who knows?

Researcher: Okay. I have no further questions.

Riley: Okay.

Researcher: Unless you have.

Riley: Um. No, I don't think so. Nothing that springs to mind.

Researcher: Okay.

Riley: Good.

Researcher: So, I'm stopping the recording.

E. Interview codebook

F. Category	Code	Description	Subcode
1. Feedback on factors	**1.1.** Attitude **1.2.** Subjective norms **1.3.** Perceived behavioural control **1.4.** Habit **1.5.** Perceived time **1.6.** Perceived cost **1.7.** Perceived comfort **1.8.** Perceived health benefits **1.9.** Perceived safety **1.10.** Climate change knowledge	**1.1.** The interviewee addresses views on attitude as a determinant **1.2.** The interviewee addresses views on subjective norms as a determinant **1.3.** The interviewee addresses views on perceived behavioral control as a determinant **1.4.** The interviewee addresses views on habit as a determinant **1.5.** The interviewee addresses views on perceived time as a determinant **1.6.** The interviewee addresses views on perceived cost as a determinant **1.7.** The interviewee addresses views on perceived comfort as a determinant **1.8.** The interviewee addresses views on perceived health benefits as a determinant **1.9.** The interviewee addresses views on perceived safety as a determinant **1.10.** The interviewee addresses views on climate change knowledge as a determinant	
2. New factors	**2.1.** Perceived support from the government **2.2.** Perceived support from employer/university **2.3.** Cycling culture **2.4.** Attractiveness of the surrounding environment	**2.1.** The interviewee refers to perceived support from the government as a possible factor **2.2.** The interviewee refers to perceived support from employer/university as a possible factor **2.3.** The interviewee refers to cycling culture as a possible factor **2.4.** The interviewee refers to attractiveness of the surrounding environment as a possible factor	
3. Predictions	**3.1.** Strong influence **3.2.** Moderate influence **3.3.** Low influence **3.4.** No influence	**3.1.** The interviewee addresses a strong level of influence of the variable on citizens' intention towards active mobility **3.2.** The interviewee addresses a moderate level of influence of the variable on citizens' intention towards active mobility **3.3.** The interviewee addresses a low level of influence of the variable on citizens' intention towards active mobility **3.4.** The interviewee addresses that the variable has no influence on citizens' intention towards active mobility	

G. Overview of experts predictions on literature-based factors

Determinants	Experts	Determinant's level of influence			
		No influence	Low influence	Moderate influence	Strong influence
Attitude	Noah				+++
	Logan				
	Robin		+		
	Andy				+++
	Riley				+++
Subjective norms	Noah			++	
	Logan			++	
	Robin			++	
	Andy			++	
	Riley			++	
Perceived behavioral control	Noah			++	
	Logan			++	
	Robin			++	
	Andy			++	
	Riley				+++
Habit	Noah				+++
	Logan				+++
	Robin			++	
	Andy		+		
	Riley				+++
Perceived time	Noah				+++
	Logan				+++
	Robin				+++
	Andy				+++
	Riley				+++
Perceived cost	Noah				+++
	Logan		+		
	Robin				+++
	Andy		+		
	Riley	-			
Perceived comfort	Noah				+++
	Logan			++	
	Robin			++	
	Andy		+		
	Riley			++	
Perceived health benefits	Noah			++	
	Logan		+		
	Robin				+++
	Andy			++	
	Riley		+		
Perceived safety	Noah			++	
	Logan			++	
	Robin				+++

	Andy			++	
	Riley			++	
Climate change knowledge	Noah		+		
	Logan		+		
	Robin		+		
	Andy			++	
	Riley	-			

H. Questionnaire
Background questions

Are you a worker, a university level-student, or both? In case you are both a worker and a student, please indicate which is your primary commuting purpose.

- Worker
- Student

Please answer the questions below based on the primary commuting purpose you indicated above.

Do you work or study within the Capital Region?

- Yes
- No

Could you indicate the distance (km) you commute on a normal day?

Could you indicate the time (minutes) it takes you to arrive at your workplace/university on a normal day?

Which transport mode(s) do you mainly use in your everyday commuting? (multiple answer)

- Car
- Motorcycle
- Bike
- Pedal-assisted e-bike
- Electric bike with no pedal-assist
- Electric scooter
- Kick-scooter
- Public transport
- I walk 400 meters or more
- I walk less than 400 meters

Demographic questions

What gender do you identify as?

- Male
- Female
- Non-binary
- Prefer not to answer

What is your age?

- Open

Please specify the country matching your nationality.

- All countries (dropdown list)

Please specify your most recently acquired education or your current education in case you are a student.

- Primary school
- High school diploma
- Bachelor's degree
- Master's degree
- PhD
- Other (*please specify)

Please indicate the range of monthly income (gross).

- 0 to 10.000 DKK
- 10.000 – 30.000 DKK
- 30.000 – 50.000 DKK
- 50.000 – 70.000 DKK
- Above 70.000 DKK
- Prefer not to answer

Questions per construct

For measurement, a 5-point Likert scale will be used.

Intention

I am willing to use active mobility over a private motorized vehicle.	Inspired by Beldad and Hegner (2018)
If I have a choice between a private motorized vehicle and active mobility, I will choose the latter for commuting.	Adapted by Beldad and Hegner (2018)
I will continue or make an effort to use active mobility when commuting next time.	Adapted by Chen and Chao (2011)
The probability that I will use active mobility in my commuting is high.	Adapted by Chen and Chao (2011)
My willingness to use active mobility in my commuting is high.	Adapted by Chen and Chao (2011)

Attitude

I think that using active mobility in commuting is a positive behavior.	Adapted by Nguyen-Phuoc et al. (2022)
I think that using active mobility in commuting is a good idea.	Adapted by Nguyen-Phuoc et al. (2022)
I think that using active mobility in commuting is pleasant.	Adapted by Nguyen-Phuoc et al. (2022)

Subjective norms

Most people who are important to me support the use of active mobility in commuting.	Adapted by (Nguyen-Phuoc et al. 2022)
Most people who are important to me agree with the use of active mobility in commuting.	Adapted by (Nguyen-Phuoc et al. 2022)

Most people who are important to me recommend the use of active mobility in commuting.	Adapted by (Nguyen-Phuoc et al. 2022)
I believe that most people who influence my behavior expect me to use active mobility in commuting.	Adapted by Beldad and Hegner (2018)

Perceived behavioral control

For me, using active mobility to commute is easy.	Adapted by Chen and Chao (2011)
I have enough time and energy to use active mobility in commuting.	Adapted by Nguyen-Phuoc et al. (2022)
I am capable to use active mobility in commuting.	Developed by the researcher
Active mobility fits my daily routine.	Developed by the researcher

Perceived time

Using active mobility in commuting	Inspired by Peng et al. (2019)

Perceived cost

Using active mobility in commuting	Inspired by Peng et al. (2019)

Perception of availability and quality of infrastructure

I think that there is an adequate infrastructure for active mobility in the Capital Region.	Developed by the researcher
I feel that the infrastructure for active mobility within the Capital Region is of good quality.	Developed by the researcher
The quality of cycle lanes and pavements within the Capital Region is good.	Developed by the researcher
I think that street furniture (footrests, benches, bins) within the Capital Region is sufficient.	Developed by the researcher

Perceived health benefits

Using active mobility in commuting can help me to control my weight.	Adapted by Bopp et al. (2013)
Using active mobility in commuting can help me to relieve stress.	Adapted by Bopp et al. (2013)
Using active mobility in commuting can help me to prevent chronic diseases, such as diabetes.	Developed by the researcher
Using active mobility in commuting can help me to maintain a good physical condition.	Developed by the researcher

Perceived safety

Using active mobility in commuting is safe.	Adapted by Liu et al. (2022)
Using active mobility in commuting makes me feel vulnerable.	Developed by the researcher

When using active mobility in commuting, I feel more exposed to a crash compared to the use of a private motorized vehicle.	Developed by the researcher
Using active mobility in commuting requires higher focus on staying safe compared to the use of a private motorized vehicle.	Developed by the researcher

Climate change knowledge

I worry about environmental problems caused by transportation.	Adapted by Gatersleben et al. (2002)
Motorized traffic is a huge problem for environmental protection.	Adapted by Müggenburg et al. (2022)
Using private motorized vehicles in commuting is unnecessary luxury.	Adapted by Gatersleben et al. (2002)
A better environment starts with myself.	Adapted by Gatersleben et al. (2002)

Habit

My commuting is a habit to me.	Developed by the researcher
I do not think consciously what is the best way for commuting.	Developed by the researcher

Attractiveness of the surrounding environment

When using active mobility there is always something interesting to discover.	Developed by the researcher
When using active mobility, I enjoy the built environment.	Developed by the researcher
When using active mobility, I enjoy the water elements (e.g., canals, lakes) around me.	Developed by the researcher
When using active mobility, I enjoy the green elements (e.g. trees) around me.	Developed by the researcher

Perception of policies

I believe that the political support in Denmark leans towards active mobility as a transport mode in commuting.	Inspired by Jensen et al. (2020)
I believe that the government recommends the use of active mobility in commuting.	Inspired by Beldad and Hegner (2018)
I believe that there are policies that promote active mobility in commuting in Denmark.	Inspired by Jensen et al. (2020)

Cycling culture

I feel that Copenhagen has a cycling culture.	Developed by the researcher
I feel that cycling is ingrained in the city for many years.	Developed by the researcher
I feel that using cycling in commuting is part of Copenhagen's culture.	Developed by the researcher
I feel that using cycling in commuting makes you feel integrated in the city's culture.	Developed by the researcher

Perceived support from employer or university

I feel that my employer/university supports me in the use of active mobility in commuting.	Developed by the researcher
I feel that my employer/university educates me towards the use of active mobility in commuting.	Developed by the researcher
I feel that my employer/university motivates me towards the use of active mobility in commuting.	Developed by the researcher
I feel that my employer/university provides adequate facilities (e.g., parking) for active mobility commuters.	Developed by the researcher

I. Survey's introductory message

Dear participant,

I am a master student studying Communication Science at the University of Twente in the Netherlands, currently working on my thesis project on active mobility (please see the definition below). Specifically, I am investigating the factors that affect citizens to shift from private motorized vehicles to active mobility in commuting.

If you live in the Capital Region of Denmark, I would like to ask you to participate in this survey and help me identify the factors that may impact your intention towards active mobility in your commuting. It will take approximately 10 minutes to fill out the questionnaire. It is completely voluntary and you can quit the survey at any time.

As for the anonymity, the submitted answers cannot be traced back to you. Additionally, the data will be stored safely and only be used for the purpose of this research project.

In case you have any questions, please feel free to contact me.

Thank you very much in advance for your time!

Kind regards,
Anna Kenanidi.

a.kenanidi@student.utwente.nl

Please give your consent to participate in this study.

- I do consent
- I do not consent

J. Distribution message

If you live in the Capital Region of Denmark and you commute to work or university, then you can definitely contribute to this research 💪DK

[survey link]

Make your mark and help me understand what affects your intention towards active mobility in commuting 🚶🚲

#research #university #mastersdegree #commuting #cycling #activemobility #copenhagen

K. Distribution material

If you live in the Capital Region of Denmark and you commute to work or university, then you can definitely contribute to this research.

Make your mark and help me understand what affects your intention towards active mobility in commuting.