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Analysis of Potential Shifts in Mobility Behavior with the Introduction of Autonomous Vehicles

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Master's in Management of Services and Technology

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This is undoubtedly one of my greatest achievements. I am very grateful to everyone who somehow influenced me to reach this milestone. It wasn't easy at all, there were many obstacles and doubts, but I got here and I'm very proud of all of my efforts, but above that, I'm very thankful to all those who were by my side and who ensured that I would succeed.

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Resumo

Os veículos autónomos (AVs) são vistos como uma das principais tecnologias disruptivas da atualidade, capazes de mudar completamente a mobilidade como a conhecemos. E é através desta tecnologia que surgem novos conceitos como Veículos Autónomos Partilhados (SAVs), que prometem tornar-se um elemento crucial para os serviços de mobilidade sob demanda. Esta pesquisa explora as potenciais mudanças no comportamento de mobilidade dos cidadãos com a disponibilização de AVs em sistemas de mobilidade.

Através da realização de um inquérito, foi possível auferir os padrões e preferências de mobilidade, a perceção de utilidade sobre serviços de transporte partilhado e veículos autonomos, assim como, a intenção de uso desta tecnologia. E através da análise dos dados recolhidos, de uma amostra de 252 respostas, foi possível identificar alguns elementos que afetam a intenção de uso, o quanto a perceção sobre os AVs e SAVs varia entre grupos sociodemograficos e por fim, as oportunidades que surgem com as experiências de mobilidade identificadas.

Keywords: Veículos Autónomos; Veículos Autónomos; Veículos Autónomos Compartilhados; Mobilidade; Intenção de Uso; Utilidade Percecionada

JEL Classification System:
R41- Transportation: Demand, Supply, and Congestion; Travel Time; Safety and Accidents; Transportation Noise
O31 - Innovation and Invention: Processes and Incentives

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Abstract

Autonomous vehicles (AVs) are seen as one of the main disruptive technologies today, capable of completely changing mobility as we know it. And it is through this technology that new concepts such as Shared Autonomous Vehicles (SAVs) emerge, which promise to become a crucial element for on-demand mobility services. This research explores the potential changes in citizens' mobility behavior with the availability of AVs in mobility systems.

By carrying out a survey, it was possible to assess mobility patterns and preferences, the perception of the usefulness of shared transport services and autonomous vehicles, as well as the intention to use this technology. And through the analysis of the data collected, from a sample of 252 responses, it was possible to identify some elements that affect the intention of use, how much the perception of AVs and SAVs varies between sociodemographic groups, and finally, the opportunities that arise with the identified mobility experiences.

Keywords: Autonomous vehicles; Shared Autonomous Vehicles; Mobility; Intention to Use; Perceived Usefulness

JEL Classification System:

R41- Transportation: Demand, Supply, and Congestion; Travel Time; Safety and Accidents; Transportation Noise

O31 - Innovation and Invention: Processes and Incentives

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Glossary

AV – Autonomous Vehicle

EU – European Union

MaaS – Mobility as a Service

NHTSA – National Highway Traffic Safety Administration

PT – Public Transports

SAV – Shared Autonomous Vehicles

VMT – Vehicle Miles Traveled

1. Introduction

Autonomous vehicles (commonly represented as AVs) rely on a disruptive technology that allows a vehicle to move without a driver and is expected to revitalize urban mobility and, consequently, the behavior of people towards mobility itself. And as with any other technology, AVs represent an opportunity for some and a threat for others. For the overall society, it is a positive panorama, due to its advantages for the environment, but for the transport sector stakeholders, the picture can be different due to the risks this sector is going to take if the AVs prosper.

Many authors have already studied and enumerated the advantages of this technology, such as improvements in accessibility, vehicle safety advances, crash decrease, reduced congestion, fuel consumption and travel time, and parking savings, among others (Townsend, et al, 2021; Correia, Looff, Cranenburgh, Snelderd & Arem, 2019; Anderson, Kalra, Stanley, Sorensen, Samaras & Oluwatola, 2016; Fagnant & Kockelman, 2015). However, there are also many causes for resistance towards it, such as potential loss of privacy, costs with the vehicles, inconsistent state of legislation, insurance providers insecurity, insufficient tests and research on the matter, and so on (Townsend, et al, 2021; Fagnant & Kockelman, 2015).

Nevertheless, at the moment it is vital to recognize the positive outcomes of AVs, wherein, they have the potential to improve accessibility through urban transport, which is one of the most important factors to determine the level of social inclusion or exclusion of the individuals (Özkazanç & Sönmez, 2017).

Cass, Shove, and Urry (2003) paper specifies the causes of social exclusion as economic deprivation due to unemployment or poverty, lack of education, disability, geographic segregation, self-exclusion, lack of information as well as lack of access to services. Subsequently, it was stated that specific groups can be excluded due to mobility such as women and those underage due to safety reasons, the elderly and disabled due to lack of mobility, individuals with employment status with disproportionally work hours, and single parents as a result of different schedules and responsibilities with their progenies (Cass, et al., 2003). All these groups of individuals could be, somewhat, socially excluded and there's a chance that AVs can mitigate these problems.

There have been some studies on the behavior of individuals in certain situations related to transportation that could come to terms with what Cass, Shove, and Urry (2003) stated. For instance, it is possible to affirm that currently, women are more likely to travel with older and/or child dependents, than men, and for this reason, they have more varied travel patterns, thus

requiring more than one stop and more than one mode of travel (Lecompte & Pablo, 2017). Additionally, the same authors stated that it is during peak traffic hours that women feel most insecure, and that is when public transport (PT) are crowded. For this reason, nowadays in Japan, Egypt, India, Dubai, and Brazil among others, it is possible to find a sort of service for prioritization for women, that offers exclusive train wagons or seats for them.

Along with it, in a study developed by Dobbs (2005: 274) in Northeast England, it was concluded that women have insecurities towards using public transport (PT), revealing that they fear traveling on public transport (PT) and that they perceive stops and stations as "threatening and intimidating". Moreover, during the research, when women were asked if they felt safe traveling by night, only 2.7% of those with none or very limited access to private transport answered positively, however, on the other hand, 15.2% of those with full access to private transport responded affirmatively (Dobbs, 2005), therefore it is clear the insecurity discrepancy between these two groups, with or without private vehicles.

A proposed solution for the reduction of the insecurity felt by individuals and suppression of all problems affecting the most socially excluded groups by urban transport is the development of transports that can meet all individual needs regardless of the individual itself, the situation, the location, or the time it is needed. Additionally, it is important to revive that with the removal of the human element from the driving action way more positive outcomes may occur, that don't need to be necessarily related to individual needs, but to society in general, such as environmental improvements, vehicle accidents decrease, a better quality of life and moreover.

Since AVs are only in a testing phase, it is difficult to accurately predict actual results. However, it may be useful to estimate approximately the magnitudes of impact. The AVs can be used as a tool to revitalize one's individual quality of life, whether in terms of personal safety, independence from others, public/personal health, or even freedom of choice. With this technology, citizens would be less dependable on driver's licenses, needing to be asking for lifts or being cautious with the timetable of their travels. Furthermore, the Vehicles Miles Traveled (VMT) is expected to increase due to the latent demand which represents the currently desired demand that ends up not being effectively realized due to a wide variety of constraints (Clifton & Moura, 2017), being these constraints such as costs of transportation, lack of offer (timetable related, geographic distribution or the need to switch through various transportation modes, increasing the time travel), not providing the necessary adaptations for those who are impaired, and many others.

Even though the AVs have driving systems with great potential to improve road safety and efficiency, many challenges will need to be addressed wisely, including the systems security and control, legal liability issues, and most importantly for this work, the public perception, since much effort is still required to encourage widespread acceptance (Kyriakidis, Happee & Winter, 2015).

1.1. Objective and Research Questions

AVs present opportunities for changes in the mobility experiences of the cities where they will be introduced and it is expected from the academic and industrial fields that they will be used to ameliorate current difficulties faced by certain transport users. The objective of this dissertation is to explore the potential shifts in the citizens' mobility behavior with the availability of AVs in mobility systems. To reach this objective the following research questions will be answered:

- What affects the intention to use AVs and SAVs?
- How do perceptions of AVs and SAVs vary across sociodemographic groups?
- Which opportunities appear according to current mobility experiences?

1.2. Study's structure

This work was divided into 7 sections. The first being the Introduction of the topic to be addressed with the presentation of the objectives and research questions. The second chapter is the Literature Review, in which I will approach and analyze concepts and results of previous works. The third chapter is the Methodology, in which I present the hypotheses of the research and present the data collection method of this work. In the fourth chapter, Results, and Discussion, I present the collected data and draw conclusions, as well as, present the results of the research hypotheses. In the fifth chapter, Conclusion, I briefly present all the conclusions drawn from this work, as well as the limitations of this work and recommendations for future research. In the sixth chapter, References, I present all the references of this dissertation. And finally, in the seventh chapter, Annexes, will be all the extra data for consultation.

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2. Literature Review

The context of this dissertation comes mainly from work on the impact that autonomous vehicles can have on mobility and the changes likely to occur for all stakeholders.
In this chapter, I'll go over previous research and pertinent conclusions by reviewing concepts and analyzing previous studies, regarding Transport demand focusing on the assumed meaning of Mobility for this study, and then I'll go through Transport-related Social Exclusion and its importance for Mobility related studies, and lastly, I'll explore Avs in urban mobility and shared autonomous vehicles, opportunities, and obstacles of this technology.

2.1. Transport Demand

An urban transport network system is usually substantially large, complex, and often difficult to manage effectively. It consists of several forms - currently, an individual can move through an automobile, a motorcycle, a bus, a train, a subway, a shared bike or scooter, a boat, as a pedestrian, and many other innovative forms - with which the user can rotate between. Furthermore, today users have access to a variety of resources that provide online maps, directories, location-based services, and route planners with the ability to create and deliver efficient information to users so that they choose their mobility mode and path (Booth, Sistla, Wolfson & Cruz, 2009).

A key factor in urban transport is the presence of various modes of transport and a good interconnection network between them. In addition, as stated by Yatskiv and Budilovich (2017), the urban public transport system should stimulate greater user mobility as well as generate greater equity among citizen groups. However, this is only possible if the policies and planning are made considering the characteristics of the users, taking into account that not all users will suit certain types of transport.

The current urban transport system concept encompasses several important factors, however, to analyze the public's intention to use AVs, we need to understand the current unmet needs, more specifically, the Latent and Induced demand. According to Clifton and Moura (2017), Latent Demand represents the currently desired demand or the need for some goods and/or services, that can't be suppressed due to a wide variety of constraints, which can be considered suppressed demand. And, Induced demand was described as the need for goods and/or services that wouldn't occur if there weren't improvements in the transport system, this is, a demand that is stimulated or even perceived, following capacity improvements, since the

user is oblivious of that transportation need and doesn't realize that is missing it until it is brought to light, and so, it is unable to satisfy it (Clifton & Moura, 2017). Therefore, by better defining and quantifying latent and induced demand, transports planners will be able to make better predictions on the future effects of investments and other social, economic, and technological changes (Clifton & Moura, 2017).

Clifton and Moura (2017) designed a framework (Fig.2.1.1) for the Latent and Induced demand, that it was important to mention in this work taking into account how much these terms and the study of them can influence the analysis of the acceptance of AVs. This framework is a correlation between the extent of how much-desired accommodation can the current activity and transport system offer with the extent of a conscious desire to participate in an activity that requires travel.

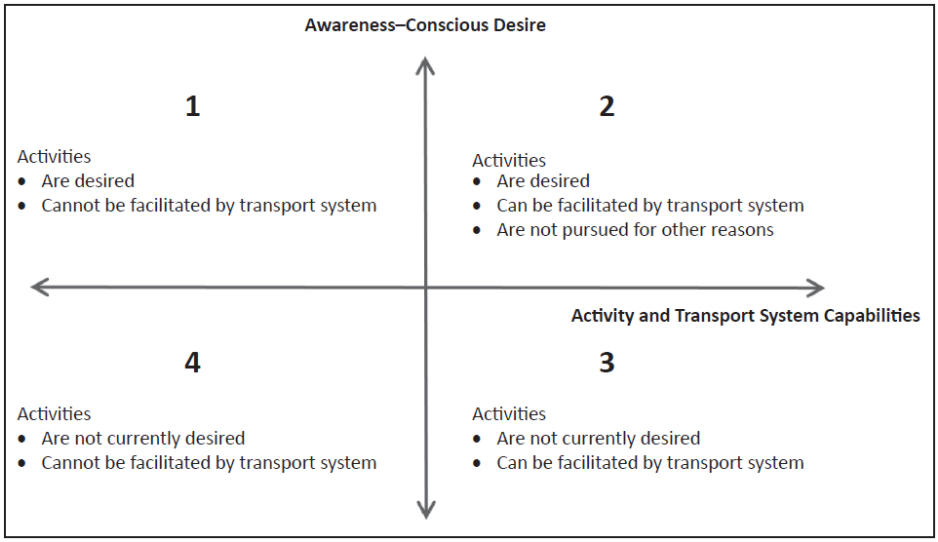

Figure 2.1.1 - A proposed framework for latent and induced demand (Source: Clifton & Moura, 2017)

It is important to note that the level of the intention of the desired activity, by users, may vary from an effectively planned activity to just an idealized activity, being the latter the least explored. Much discussion goes around on how AVs may change some travel patterns, and as a consequence, it is required a new conceptualization of the users' desires and how will it impact the behaviors towards this new technology (Clifton & Moura, 2017).

Part of this research will be focused on the analysis of the 1st and 4th quadrants (Fig.2.1.1) that represent activities that, regardless of whether desired or not, cannot be performed due to lack of transportation or land-use reasons.

2.2. Mobility

The term Mobility has been present for decades, however, in the last few years it has been gaining more attention due to its impact on urban life. Plus, the higher environmental awareness of citizens has also been an incentive for changes and improvements in the transport systems.

This increase in environmental consciousness ensures that governments are increasingly focusing on more sustainable travel alternatives and a possible path to this is to promote environments that lead to the use of alternatives to the private vehicle, such as walking, cycling, and/or public transport (Coevering, Maat & Wee, 2018). However, in addition to increasing the focus on environmental awareness, governments need to ensure that their citizens have access to a fair and good enough transport network to ensure that they opt for public and/or shared transport.

For this research, the concept of mobility will be considered as the ability of users to move from one place to another which mainly depends on the availability of different modes of transportation, to access opportunities and "social networks" (Costa, Neto & Bertolde, 2017; Pyrialakou, Gkritza & Fricker, 2016; Morris, Dumble & Wigan, 1978). Allied with the above concept, I will also analyze the accessibility of the individuals in the methodology, therefore, for this work I'll assume is defined as the ability to access the transport service through a combination of land-use patterns with the transport system performance (Morris, et al., 1978).

It is essential to try to understand why there is no social inclusion for all individuals. As Lucas (2012) mentioned, unequal mobility emerges from differences in age, status, financial capacity, and geographical distribution of activities and people. Thus, the (social) exclusion related to mobility results in the impossibility or inadequate capacity of those individuals to reach such opportunities (Pyrialakou, et al, 2016).

2.2.1. Transports Accessibility

Every human being needs access to a variety of daily activities so that they can be fairly integrated into society. However, one of the main fragilities of mobility is indeed transport-related social exclusion, which I'll discuss and present the importance to eradicate this exclusion.

Levitas, Pantazis, Fahmy, Gordon, Lloyd, and Patsios, (2007) presented a compilation of definitions of Social Exclusion, and so, they were able to define social exclusion as the absence or inexistence of access to resources, goods, and services and/or rights, as well as the impossibility of participating in activities, considered normal by a large part of the population, whether they are related to economic, social, cultural or political issues. As for transport-related

social exclusion, commonly known as transport disadvantage, it stands for the difficulty or inability in accessing public transport (PT) - lack of mobility - and opportunities - lack of accessibility -, or both (Pyrialakou, et al, 2016).

As Pritchard, Moura, Silva, and Martinez (2014) stated, social exclusion is a very divergent issue that is often associated with economic poverty. However, the poor are not always excluded, and the rich can also be excluded. In other words, transport-related social exclusion is not a synonym with transport disadvantage, since it is possible to be transport-disadvantaged but highly socially included or else, to be socially excluded but still have good access to transport (Lucas, 2012). Moreover, by transport-disadvantage, it is meant those individuals who encounter social, financial, psychological, or physical barriers to accessing transportation, opportunities, or both (Bascom & Christensen, 2017; Pyrialakou, et al, 2016), as well as the inability to travel when and where one needs to, without difficulty (Rachele, Learnihan, Badland, Mavoa, Turrell & Giles-Cortid, 2017).

As already shown by several studies, poor access to transport results in poor access to goods and services which leads to social exclusion, and even though disadvantages of transportation are a global phenomenon, the typical representation and experience of it differ significantly between nations, cultures and social groups (Pyrialakou et al., 2016; Pritchard, et al., 2014; Lucas, 2012). Additionally, even though the main means of access to public transport (PT) is by walking, this activity can vary greatly for each individual depending on various factors, such as demographic, clinical, racial, anthropometric, psychological, and physiological characteristics (Ribeiro, Fontes, Soares & Borges, 2021). Therefore, the focus of transport policy should be to reduce the social exclusion related to the transport of those who are disabled or who have some limitations (even if temporary), since these are the ones who face the greatest barriers to reaching the desired destinations. Access to transport is a determining factor for the social well-being of individuals, ensuring that they have access to the basic activities necessary for a human being, such as employment, health care, education, commerce, and social networks, all of which affect the quality of life (Spinney, Scott & Newbold, 2009). It does not necessarily mean that all transport disadvantage groups are socially excluded, it just means that they are at greater risk due to their lack of ability to travel/access and participate in activities (Kamruzzaman, Yigitcanlar, Yang & Mohamed, 2016).

In their paper, Church, Frost, and Sullivan (2000) grouped the main factors that may limit the mobility of socially excluded people, into seven categories, i. physical exclusion - related to physical and psychological barriers of people without access to transportation choices; ii. geographical exclusion - related to the inability to participate in certain activities within the

immediate local area - reduced community connectivity (Pyrialakou et al., 2016); iii. exclusion from facilities: related to the lack of accessibility to certain facilities (shopping, financial, leisure, health, and education facilities); iv. economic exclusion - related to the ability to access the labor market; v. time-based exclusion - related to the concept of 'time poverty' (e.g.: the decision to participate in the labor market is influenced by supporting social networks, and job location); vi. fear-based exclusion - related to perceived safety; vii. space exclusion - related to the perceived exclusion from public transport (PT) spaces due to security and space management strategies targeting socially excluded groups (Pyrialakou et al., 2016).

Furthermore, Church et al. (2000) concluded that research on social and transport exclusion should be made with questionnaires and focus groups to understand how individuals respond to the opportunities that may be open to them, at an individual level. These issues are important for transport policymakers, so they can assess where to best invest, to mitigate these divergences.

Preston and Rajé (2007) presented a conceptual diagram in which they suggested five policy strategies for social exclusion, i. reduce transport costs and increase frequency; ii. increase social contacts through information technology (virtual mobility); iii. promote accessibility/proximity to opportunities and facilities; iv. increase incomes to decrease transport budget constraints; v. increase proximate contacts by pro-family/pro-neighborliness policies.

Summing up, the first strategy is perfectly within the reach of the transport policymakers (assuming financial stability and capability). The second strategy is becoming more common due to globalization and access to the internet, as there has been more access to various types of services and activities that can be done at home, and due to Covid, there has been an exponential increase in investment from online commerce of services and goods. The third strategy is also possible with the correct planning of basic services and their strategic locations with the help of specialists in spatial planning, ensuring an increase in proximity contacts for users. On the other hand, the fourth and fifth strategies are far beyond the capabilities of policymakers, and for there to be the possibility of these two even becoming plausible, there must be a convergence of objectives and respective returns between all those involved (government officials, specialists, policymakers, etc.), as well as creating a greater focus on these social issues so that there is not so much disparity in accessibility between citizens.

The AVs and SAVs would ensure that the most vulnerable groups gained greater freedom of mobility and more access to social interactions (Rojas-Ruedan, et al., 2017), considering that "*social exclusion is not due to a lack of social opportunities but a lack of access to those*

opportunities" (Preston & Rajé, 2007: 153). A way of preventing social exclusion from occurring for a particular group in society, it is necessary for individuals to have access to certain facilities and social contacts, however, needs vary among individuals.

2.3. Autonomous Vehicles in Urban Mobility

Autonomous or "self-driving" vehicles (Fig.2.3.1) are defined by The National Highway Traffic Safety Administration (2013: 3) as vehicles in which at least some "*safety-critical control function (e.g. steering, throttle or braking) occurs without direct driver input*". In 2021 autonomous vehicles were classified into five categories by the SAE with its International Standard J3016, ranging from no driving automation to full driving automation (Fig. 2.3.2). And as stated by Jiang, Chen, and Chen (2022), in their compilation of research, it is predicted that this technology, specifically from levels 4 and 5 - high and full automation - will only be available to be commercialized around 2030, and will reach a market penetration of 50% to 90% only by 2060, however, these predictions are dependent on socio-economic constraints.

Figure 2.3.1 – Examples of autonomous vehicles in the testing phase (Source: Waymo, 2022)

The term Automated Vehicle is used to describe vehicles with the highest levels of automation, meaning that these vehicles only operate independently of human control. In today's vehicle mass market there are only partially automated vehicles, that can perform autonomous driving up to a certain level (Adnan, Nordin, Bahruddin, & Ali, 2018). More precisely, automated vehicles contain some technologies such as the use of sensors, cameras, GPS, and onboard telecommunications to gather information to make their own decisions

regarding critical safety situations and to act appropriately by owning control at some level (NHTSA, 2013).

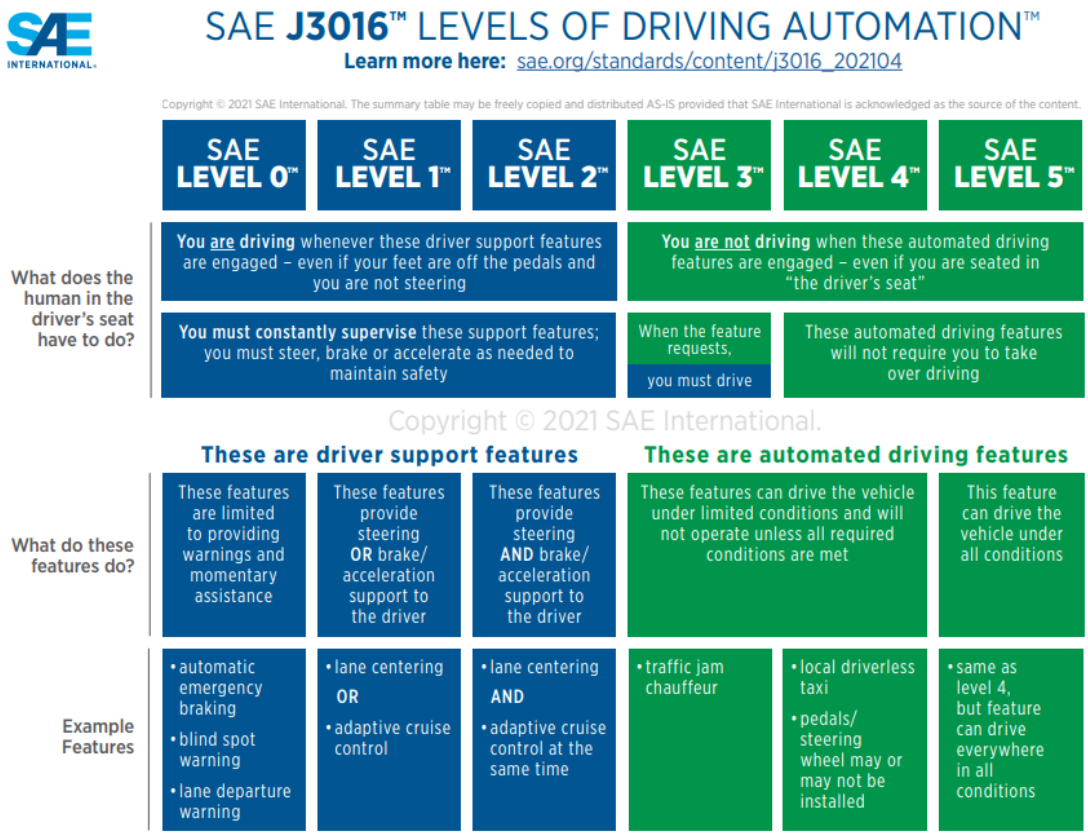

Figure 2.3.2 - SAE J3016: Levels of driving automation (Source: SAE International, 2021)

Levinson and Krizek (2017) argue that in fact, the Automated Vehicle is not as advanced as the autonomous and the difference between these two concepts relies on the degree of human intervention. An Autonomous Vehicle could decide the destination and the route, as well as the lane guidance, on the other hand, an Automated Vehicle would only follow orders of destination and route as well as, adopt only some lane-keeping guidance. Therefore, for the purpose of this work, it will be assumed that the vehicles are Autonomous, due to their advanced capabilities.

Nowadays, there are several vehicles on the market with automated driving features, such as Adaptive Cruise Control, Automated Parking, Lane Centering, Steering support, and even, brake/acceleration support in which the vehicle matches the speed of the other one in front, in low-speed traffic, as well as being able to stop and restart the vehicle by itself (Payre, Cestac & Delhomme, 2014). However, even though these interesting features are available for drivers, it only makes the vehicles partially automated (SAE, 2021), therefore, knowing that fully AVs are not available on the market yet, the possible acceptance or rejection of drivers must be studied, as well as the habits and intentions of consumers (Payre, et al., 2014).

In this sense, studies have already been conducted for the most varied scenarios and in different realities around the world, with interesting conclusions such as, in the future people will use AVs just as much as they use a vehicle with a human driver, with the advantage that everyone inside the vehicle will be free to perform any task they want during the trip (Townsend, 2017). Or that people will no longer own private vehicles and that the new reality will be the use of shared autonomous vehicles on a daily basis, through the services we currently have with Uber, Taxify, and/or even BlaBlacar (Cassetta, Marra, Pozzi & Antonelli, 2017). Also, several studies indicate that the media has a great influence on the perception of AVs, as they can influence the increase or decrease of confidence in these technologies (Zhu, Chen & Zheng, 2020), since, for example, after a fatal accident in 2018 in Tempe, Arizona, the percentage of North Americans who were very afraid of riding in a fully AV went from 63% to 73% (Clark, Atkinson-Palombo & Garrick, 2019).

Currently, we have seen more and more examples of public transport without a human driver around the world, either in the testing phase or even in full operation, as is the case of the subway in Instabul, or as it is with the increasingly common shuttles, such as the E-Palette Project that was present in Tokyo at the 2020 Olympics (Toyota, 2019), as well as the AVENUE (Sustainable Bus, 2022) Project that aims to change mobility habits in Luxembourg and Switzerland with the offer of SAVs. In Portugal, a vehicle - Mobi Cascais (Dinheiro Vivo, 2019) - has been in operation since mid-2019 in Carcavelos - Cascais, which makes a predetermined route and holds about 16 people, but in the meantime, the country has already had more vehicles being tested in other cities, such as Aveiro - Ride2Autonomy (CM Aveiro, 2022) - and Valença do Minho - 5G-Mobix (Lavrador, 2022).

Supplementarily, and focusing on AVs with the purpose of being part of a mobility-as-a-service (MaaS) system – which is a way for users to travel and switch smoothly from one mode of transport to another –, there are already companies investing in the research and development of AVs' technologies, such as Zoox and Rivian (Goncharov, 2022), and others that are already carrying out tests in an urban environment in which citizens can sign up to have an experience inside an AV, like Waymo (Waymo, 2022)- operating in San Franciso, USA and Arizona, USA - and Cruise (Hawkins, 2022) - operating in San Francisco, USA.

2.3.1. Shared Autonomous Vehicles

Shared mobility stands for the shared utilization of different types of transportation, such as motor vehicles, bicycles, or other low-speed transport. It allows its users to have short-term transportation access as needed instead of requiring ownership (Shaheen, Cohen, and Zohdy,

2016). Specifically, Shared Autonomous Vehicles (SAV) (Fig. 2.3.1.1) are usually referred to for two purposes, (i) exclusive use of the vehicle at a time, by each individual, or else, (ii) simultaneous use by different individuals, whether they are known or unknown to each other, in which all are in agreement to share the vehicle whether they have the same departure and destination or just part of the route in common. (Paddeu, Parkhurst & Shergold, 2020).

Figure 2.3.1.1 – Example of Shared Autonomous Vehicle – Project of a Shuttle vehicle developed by GM, Cruise, and Honda (Source: Electrive, 2020)

Regarding the first referenced purpose (i), it is a system similar to the one we currently have with on-demand mobility services in which the only difference would be the absence of a human driver (Levin, Odell, Samarasena & Schwartz, 2019) in which, it would enable an increase in individual mobility (Li, Huang & Qian, 2022). For the second purpose of the SAVs (ii), it was noticed that it could become even less appealing by adding the fact that people have some discomfort in sharing a small vehicle with strangers, combined with the fact that this same vehicle does not have a driver, which in this case, would be a neutral figure that could convey some tranquility/safeness (Paddeu, et al., 2020). In short, A SAV can supply the need to have a vehicle of its own, and only one SAV would be used for many more trips, thus increasing its vehicle miles traveled and increasing traffic on the roads. (Li, et al., 2022; Levin, et al., 2019). However, the benefits of improved route choices become limited if all users want to use the vehicle separately from others. On the other hand, autonomous mobility-on-demand systems could reduce significantly costs for an individual compared to a taxi service like the ones we currently have since without a driver and by not having the costs of his salary, it can reduce the cost of the SAV service to the point of being similar to owning your vehicle (Levin, et al., 2019).

Several studies have already been carried out in the USA that proves the shared mobility service can guarantee support for public transport, where they are not so easily reached, especially in low-income, remote or low-density neighborhoods where it is not worth having a route with public transport (Li, Zhai, Jiao & Wang, 2022; Yang, Huo, Pan, Xie, Zhang & Luo, 2022). However, it was also verified that this type of service has a limited offer in the types of neighborhoods mentioned above (Khavarian-Garmsir, Sharifi & Abadi, 2021) and that it is a type of service with greater adherence and offer to individuals with greater purchasing power (Dias, Lavieri, Garikapati, Astroza, Pendyala & Bhat, 2017).

Shared transport services were expected to be among the first to join AVs when they become available with automation level 5 (Fig. 2.3.2), however, with the covid-19 pandemic this type of service has had a significant drop in the number of users, either by changes in urban mobility or by changes in the way of working - hybrid and remote working models (Morshed, Khan, Tanvir & Nur, 2021; Siddiqui, F., 2020). In short, the pandemic has only increased distrust and uncertainty regarding the acceptance of AVs, which depends entirely on being seen with good eyes by the majority of the public (Townsend, Atkinson-Palombo, Terbeck & Garrick, 2021). And so, more studies need to be done in order to follow the changes in the opinions of this target audience.

2.3.2. Opportunities and Obstacles of AVs And SAVs

AVs are a disruptive technology with many opportunities and barriers. Several authors have already described the potential benefits of this technology, such as vehicle safety improvement, crash and fatalities decrease, less traffic, less pollution, efficient fuel consumption, road capacity and travel time efficiency, parking savings for the users, creation of new jobs, economic growth and one of the most important ones for this paper, better accessibility to the socially excluded citizens (Townsend, et al, 2021; Correia, Looff, Cranenburgh, Snelderd & Arem, 2019; Anderson, Kalra, Stanley, Sorensen, Samaras & Oluwatola, 2016; Fagnant & Kockelman, 2015). On the other hand, some of the difficulties of AV adoption that are more discussed are costs with the vehicles, inconsistent state of legislation, insurance provider's insecurity, insufficient tests and research on the matter, electronic security, privacy concerns, unsustainability of the technology itself and the possibility of not solving the current problems like equity, safety, and access (Townsend, et al, 2021; Fagnant & Kockelman, 2015).

One of the biggest advantages of this technology, which was mentioned above, is the possible positive impact on the environment through vehicle miles traveled and its carbon emissions, however, the opposite could happen and there will be a negative impact, which will depend

exclusively on the type of use that this technology has, that is, whether it will be through single or shared use, whether it will be for own purchase and whether it will be an electric vehicle or not (Sperling, 2018; Rojas-Ruedan, Nieuwenhuijsen & Khreis, 2017; Wadud, MacKenzie & Leiby, 2016).

Moreover, there's a breakthrough for the overall society through the AVs, which is the opportunity to push for social equity by offering the possibility of improvements in quality of life to socially excluded members of society due to their incapacity to drive vehicles such as the elderly people or other individuals with driving disabilities (Adnan, et al., 2018; Fagnant & Kockelman, 2015).

2.3.2.1. Trust

Trust is recognized as the determinant factor of reliance on the acceptance and use of automation in the most varied sectors, standing in between users' beliefs toward automation and influencing their intention to use it (Paddeu, et al., 2020; Choi & Ji, 2015).

Several studies regarding trust in AVs have been conducted, and the main results show that most of the users that participated in those studies had an overall positive opinion regarding AVs as to feeling safer, having interesting trips, and decreasing accidents (Panagiotopoulos & Dimitrakopoulos, 2018; Choi & Ji, 2015). However, as regards data privacy and cyber security concerns, the majority of the participants were at least moderately worried. And so, as those same studies showed, the perceived trust had a positive effect on the Intention to use, which means, that even though users show enthusiasm for economic, social, and environmental advantages, their concerns about trust have a direct impact on the possible acceptance of this technology.

Interviews were carried out during journeys made by SAVs and the conclusion drawn from these experiences is that the public associates trust and safety with vehicle characteristics (e.g., speed and motion); the public's perception of safety is directly correlated to trust in the technology; and, users tend to feel uncomfortable sharing the ride with strangers in such a small space (Nordhoff, Stapel, Arem & Happee, 2020). For the latter finding, Nordhoff, et al., (2020) proposed the investment in fast internet inside these vehicles so that the passengers can be distracted during the trips, without having to interact with each other.

2.3.2.2. Privacy

There is another crucial variable in the acceptance study of AVs, which is Privacy. AVs will have the ability to transmit in real-time, the location of users, as well as the pattern and history of trips made, creating the possibility of predicting future trips and putting the user in a vulnerable position regarding his or her privacy, and subject to targeted marketing, mass surveillance and/or law enforcement (Glancy, 2012). However, as Gurumurthy and Kockelman (2020) discovered, contrary to popular belief, Privacy is not at the top of concerns when it comes to AVs. This topic only gains relevance if studied separately, as these authors were able to prove, that after being asked about their privacy separately from other topics, 89% of Americans show at least some concern. Additionally, 39.8% of the participants were unwilling to pay an additional amount for the anonymity of their location when using the SAVs and almost 48% are somewhat comfortable that their data is used for traffic management, activities policing, and surveillance of the general community. On the other hand, analyzing another study carried out, in this case on the campus of the University of Central Florida, the percentage of participants who expressed concern about their privacy reached approximately 50% (Islam, Abdel-Aty, LeeWu, Yue, & Cai, 2022). These differences in different studies prove that the results will always differ, depending on the geographic or social characteristics of the participants, as well as the year in which the study is carried out since several external factors can also influence the opinions of users (eg.: Inflation, Covid-19 pandemic, conflicts between countries, etc).

2.4. Conclusion of the Literature Review

This article will contribute to the literature by bringing together the different concepts associated with Mobility, which are mostly studied separately. The social exclusion associated with transport can be alleviated with the introduction of AVs and SAVs in urban mobility. And it is through the analysis and review of the literature previously presented (Table 2.4.1) and the analysis of the data collected in the research presented in the next chapter, that we can draw some important conclusions, or open the way for new analyzes of this very promising technology.

Table 2.4.1 – Summary of Research Papers data analysis methods (Source: Own authorship)

Reference	Research Context	Sample Design	Research design	Data analysis methods
Payre, Cestac and Delhomme (2014)	Versailles, France	5 interviews 421 responses	5 semi-directive Interviews and a Survey with 39 questions	Confirmatory factor Analysis
Kyriakidis, Happee, and Winter (2015)	Among 109 countries	5000 responses	Online survey with 63 questions	Correlation Analysis
Nordhoff, Winter, Madigan, Merat, Arem, and Happee, (2018)	EUREF Campus, Berlim, Germany	274 responses	On-site filled survey (after a ride on an Autonomous shuttle)	Principal Component Analysis; Pearson Correlation analysis
Huang and Qian (2021)	China	849 responses	Online survey	Structural equation model; Correlation analysis
Islam, Abdel-Aty, Lee, Wu, Yue, and Cai (2022)	University of Central Florida (UCF), USA	315 responses	Physically filled survey with 32 questions	Structural equation model; Correlation analysis

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3. Methodology

In this chapter, I will present the methodological approach to carry out the analysis of this work, as well as the assumed and analyzed hypotheses. Subsequently, we will present the structure of the survey carried out, as well as relevant details. Then the methods used to analyze the data will also be presented.

3.1. Conceptual model

The following conceptual model was developed in order to serve as a guide to creating the research hypotheses, as well as for designing the survey. In this context, it is suggested that the Intention to use and Perceived usefulness of AVs depends on factors such as perception of ride-hailing utility and functionality, perception of AV Utility, the users' mobility satisfaction, trust, perception of privacy safety, and accessibility. Being all these variables dependent on the sociodemographic characteristics of individuals.

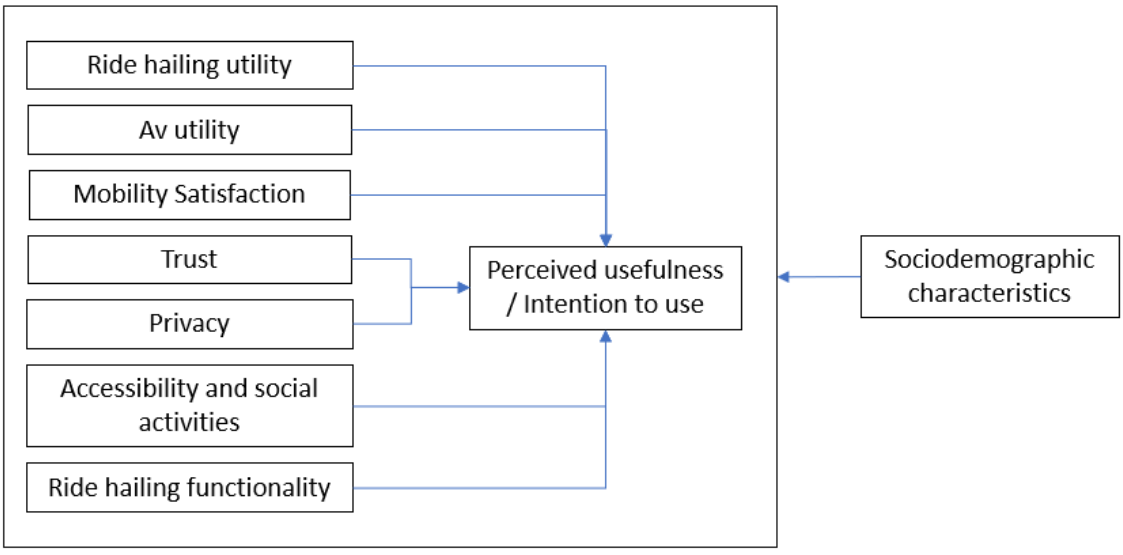

Figure 3.1.1 – Conceptual Model (Source: Own authorship)

3.2. Research Hypotheses

To achieve the objectives proposed at the beginning of this work and answer the research questions, the hypotheses below were proposed, based on the findings of the literature review:

	Hypothesis	**Reference**
H1	Men will be willing to use AVs sooner than women;	Hohenberger, Spörrle & Welpe, 2016
H2	Women will feel less safe going out at night, than men;	Hidayati, Tan, & Yamu, 2020
H3	Men will feel more secure with their data when using an AV compared to women;	Self-developed
H4	The time of commuting trips influences the perception of productivity of an AV;	Islam, et al., 2022
H5	Preference for ride-hailing services has a positive correlation with the intention to use AVs;	Xiao & Goulias, 2022
H6	The location where one lives, affects access to transport and consequently satisfaction with their means of transport;	Self-developed
H7	The longer the commuting time, the greater the intention to use an AV will be;	Islam, et al., 2022
H8	The level of education has an impact on the perceived usefulness of AVs;	Islam, et al., 2022
H9	Income level affects perceived trust in technology, like AVs;	Self-developed
H10	Age has a negative correlation with the intention to use AVs;	Islam, et al., 2022
H11	The emotional perception regarding the time spent commuting is positively correlated with the positive opinion regarding ride-hailing services;	Islam, et al., 2022
H12	Trust positively influences the Intention to use AVs.	Benleulmi & Ramdani, 2022

3.3. Survey Design

To understand public perceptions of AV technology, it is necessary to collect data on public opinion. Currently, there is limited research regarding the relationship between AVs and transport-related social exclusion, so we developed and implemented this research to try to infer new insights.

The survey was divided into ten main groups, which are, i. Perceived usefulness / Intention to Use AVs; ii. Mobility Choices to understand the patterns and preferences of the respondents regarding their means of transport; iii. Mobility Satisfaction to understand the obstacles respondents face and possible opportunities; iv. Trust on Avs; v. Privacy, to observe how much respondents value the anonymity of their personal data; vi. Accessibility and Social Activities, to analyze possible situations of social exclusion; vii. Ride-Hailing Utility, to verify the value that respondents give to these types of services; viii. Ride-Hailing Functionality, to verify the level of

practicality that these services bring to the lives of respondents; ix. AV Utility, to verify the level of practicality that these services would bring to the lives of respondents; and x. Participant's Characteristics, to obtain the sociodemographic data of the participants.

All of the items on the following groups were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree): Mobility Satisfaction, Trust, Privacy, Accessibility and Social Activities, Ride-Hailing Utility, Ride-Hailing Functionality, and AV Utility. As to the Perceived usefulness / Intention to Use group, only some of the questions were measured using a five-point Likert scale.

Every group and its respective item was developed based on previous studies (Annex A) to ensure the validity and reliability of this research (Annex E). And a pre-test took place with 30 replies that helped to finalize the survey design.

A total of 309 responses were collected, 252 of which were from participants residing in Lisbon, and 58 responses from participants residing in a non-EU country. The survey was produced in LimeSurvey and shared on the author's social networks and with those close to him (LinkedIn, Facebook, and Instagram), as well as via WhatsApp and e-mail to the author's acquaintances. The number of responses reached was extremely affected by the topic being addressed, since the target audience, which is mostly residents of Portugal, does not have easy access to technologies such as AVs. Therefore, the author received some feedback at the end of the survey regarding this study being extremely important, but difficult to answer because the participants could not visualize how the technology itself works. As proof of this, the survey had a total of 104 incomplete participations.

For the purpose of this study, the 252 full and anonymous replies of residents in Lisbon were used. As for the statistics of the replies outside the EU, are presented in Annex C.

Regarding the reliability analysis, the Cronbach's alpha was evaluated through SPSS Statistics and the values are presented in Annex E. Most of the group questions presented an acceptable Cronbach's alpha while for some others it was low, indicating that more statements are required to be analyzed to achieve internal consistency.

3.4. Data Analysis methods

In this analysis of the data collected in the survey, I will use five analysis methods, using SPSS software, namely, Pearson correlation, Independent T-test, One-way ANOVA, Kruskal-Wallis, and Mann-Whitney. I will now explain each of the methods and the assumptions to be taken into account for each one:

I. Pearson's correlation, or formally Pearson product-moment correlation coefficient (PPMCC), is a measure able to calculate the linear correlation between two variables, this is, its strength and direction of the association. This method attempts to draw a line of best fit across the data for two variables, and the Pearson correlation coefficient, *r*, indicates how far all of these data points are from that line of best fit (Laerd Statistics, 2018e). The assumptions to consider are, as follows:

a. The variables have to be continuous, which means, they are measured in an interval or ratios level;
b. There has to be a linear relationship between the variables;
c. There must be no significant outliers;
d. The data from the variables should follow an approximately normal distribution.

For the analysis of the results, we have a perfect degree of correlation when the value of *r* is very close to ±1, a high degree of correlation when the value of *r* is between ± .5 and ± 1, a moderate degree of correlation when is between ± .30 and ± .49, and finally, a low degree of correlation when it is below ± .29. If the coefficient is negative, it means that the variables tend to move in opposite directions.

II. Independent T-test compares the means between two groups unrelated in the factor's variable, dependent and continuous, to verify if there is statistical evidence that the associated population means are significantly different. The assumptions are as follows:

a. The variables have to be continuous, which means, they are measured in an interval or ratios level;
b. The factor variables should consist of two categorical, independent groups;
c. The variables are independent;
d. The data from the variables should follow an approximately normal distribution;
e. These distributions have the same variance (homogeneous).

In this analysis, I drew conclusions for cases in which the rejection of the null hypothesis was verified, and the null hypothesis consists of having equal means.

III. One-way analysis of variance, or as I'll call it One-way ANOVA, is a technique used to check whether there are statistically significant differences between the means of two or more independent (unrelated) groups (Laerd Statistics, 2018d). There are four primary assumptions to be considered in the method:

a. The variables have to be continuous, which means, they are measured in an interval or ratios level;
b. The data from the variables should follow an approximately normal distribution;
c. The variables are independent;
d. These distributions have the same variance (homogeneous).

For this work, I will assume that we have a normal distribution when for each category of the factor we have at least 30 answers. And to guarantee the homogeneity of the variances, I'll analyze Levene's test for equality of variances (if $p < .05$ then the population variances are not equal).

IV. Kruskal-Wallis H test is a ranking-based nonparametric test that I will use to check whether there are statistically significant differences between two or more groups of an independent variable taking into account a continuous dependent variable (Laerd Statistics, 2018b). The assumptions of this test are as follows:

a. The variables have to be continuous, which means, they are measured in an interval or ratios level;
b. The factor variables should consist of at least three categorical, independent groups;
c. The variables are independent;
d. The distributions of each group have the same variability.

This method is considered the non-parametric alternative to one-way ANOVA, and an extension of the Mann-Whitney U test to allow the comparison of more than two independent groups (Laerd Statistics, 2018b).

V. Mann-Whitney was used to compare differences between two independent groups when the factor variable was ordinal or continuous but not normally distributed (Laerd Statistics, 2018c). I had to take into account the following assumptions:

a. The variables have to be continuous, which means, they are measured in an interval or ratios level;
b. The factor variables should consist of two categorical, independent groups;
c. The variables are independent;

This method was used, when I had only two categories on the factor variable, otherwise, the Kruskal-Wallis was the method to use.

4. Results and Discussion

4.1. Survey Sample Statistics

Analyzing the gender of the participants in this survey (Table 4.1.1), we can see that is in line with the real Portuguese gender distribution, which in 2021 was approximately 48% male and 52% female[1]. In this sample, the Female gender is predominant (54%).

Table 4.1.1 – Gender Distribution (Source: Own authorship)

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	112	44.4	44.4	44.4
	Female	136	54.0	54.0	98.4
	Other	4	1.6	1.6	100.0
	Total	252	100.0	100.0	

Regarding the age distribution of the participants (Table 4.1.2), the majority are under 34 years old, with a cumulative percent of 71%. Thus, this sample is quite young and with little reference from more mature participants, which can be beneficial for this study, since AVs are expected to be in the market after 2030 (Jiang, et al, 2022).

Table 4.1.2 – Age distribution (Source: Own authorship)

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	51	20.2	20.2	20.2
	25-34	128	50.8	50.8	71.0
	35-44	21	8.3	8.3	79.4
	45-54	31	12.3	12.3	91.7
	55-64	14	5.6	5.6	97.2
	+65	7	2.8	2.8	100.0
	Total	252	100.0	100.0	

Analyzing in detail the living and working locations of respondents (Table 4.1.3 and Table 4.1.4), we can that most of the respondents live in an urban environment (42.5%) while 38% work in central zones and 39% in urban areas.

Table 4.1.3 – Living location distribution (Source: Own authorship)

How would you describe your living location?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural environment	24	9.5	9.5	9.5
	Suburban environment	59	23.4	23.4	32.9
	Urban environment	107	42.5	42.5	75.4
	Central / Downtown Area	62	24.6	24.6	100.0
	Total	252	100.0	100.0	

[1] https://www.pordata.pt/portugal/populacao+residente+segundo+os+censos+total+e+por+sexo-1

Table 4.1.4 – Work/School location distribution (Source: Own authorship)

How would you describe your work/school location?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural environment	16	6.3	6.3	6.3
	Suburban environment	41	16.3	16.3	22.6
	Urban environment	99	39.3	39.3	61.9
	Central / Downtown Area	96	38.1	38.1	100.0
	Total	252	100.0	100.0	

As for the occupation of respondents (Table 4.1.5), the largest proportion is employed, while 24.7% are still in the study phase, either full-time or as working students.

Table 4.1.5 – Occupation distribution (Source: Own authorship)

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	35	13.9	13.9	13.9
	Student-Worker	28	11.1	11.1	25.0
	Worker	170	67.5	67.5	92.5
	Unemployed	8	3.2	3.2	95.6
	Retired	10	4.0	4.0	99.6
	Other	1	.4	.4	100.0
	Total	252	100.0	100.0	

Regarding the time spent commuting from home to work (Table 4.1.6), 30% have trips of less than 15 minutes, and approximately 71% have journeys of up to 45 minutes. Still, when asked about their degree of relaxation or stress regarding these daily trips (Table 7.2.3), the respondents revealed feeling more neutral (30.7%) or stressed (22.6%).

Table 4.1.6 – Time spent on commuting from House to Work (minutes) distribution (Source: Own authorship)

Approximately, how long (in minutes) do you take on your House-Work/School trip?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 15 minutes	78	31	31	31
	15-30 minutes	52	20.6	20.6	51.6
	30-45 minutes	48	19	19	70.6
	45-60 minutes	30	11.9	11.9	82.5
	More than 60 minutes	44	17.5	17.5	100
	Total	252	100	100	

Regarding the level of education, (Table 7.2.4), the Bachelor's category was the one with the highest incidence with 36.9%, followed by Master's with 35.7%.

Regarding monthly gross income (Table 7.2.5), almost 64% earn less than €1500. When asked about their perception of their income (Table 7.2.6), the category with the greatest weight was "Covers my expenses" (55.6%) which may indicate that most respondents are not economically comfortable.

4.2. Intention to Use AVs and SAVs

Pearson's correlation method was used to analyze possible associations between the intention to use and the perceived usefulness of AVs with the different variables collected in the survey.

The first correlation to be analyzed was between the intention to use and the perception of the usefulness of AVs. There was a strong and positive correlation between these two topics, which was statistically significant (r = .638, n = 252, p < .001), indicating that the more useful the user finds the AV to be, the greater will his desire to use this technology.

Regarding the correlation between satisfaction with mobility and intention to use, no results were found. That is, contrary to what would be expected, users' satisfaction or dissatisfaction with their mobility does not influence the intention of use.

An analysis was also made between Trust in this technology with the intention to use (PU04.1) and also with the perception of usefulness (PU04.5). In both analyses, it was proven that there is a correlation between the variables (Table 4.2.1). That is, the more a person trusts that AVs will perform well and have their best interests in mind, the greater the likelihood of wanting to use them and the greater the perception of usefulness.

Table 4.2.1 – Pearson Correlation Output between Trust and Intention to use (Source: Own authorship)

		T01.1	T01.2	T01.3	T01.4	T01.5	T01.6
PU04.1	Pearson Correlation	.502**	.355**	.245**	.519**	.344**	.460**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001
PU04.5	Pearson Correlation	.620	.476	.267	.495	.448	.495
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001

Then, an analysis was performed to assess the correlation of Privacy variables with the intention of use and it was found that there is a positive correlation (Table 4.2.2). That is, the more they feel secure with their data and personal information, the greater the intention to use it.

Table 4.2.2 – Pearson Correlation Output between Privacy and Intention to use (Source: Own authorship)

		P01.1	P01.2	P01.3	P01.4
PU04.1	Pearson Correlation	.638**	.360**	.327**	.370**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001

Then, an analysis was made to verify the correlation between the variables of the Accessibility and Social Activities group and the intention of use. From this group, there was only a weak and negative correlation with the variable "The Public transport I have access to, is good for work/school trips" (r = -.177, n = 252, p = .005). That is, the more dissatisfied the user is with public transport for commuting, the greater the probability that he will want to use an AV.

Additionally, for the correlation analysis between the variables of Ride-hailing utility and Intention to use, although weak, I had a positive result for some variables. I can thus conclude that the more advantages users recognize that shared transport services have, the greater the probability of adopting this technology. As well as, for the variables of Ride-hailing functionality, I had some positive correlations. It can also be concluded that the greater the trust and preference for this type of service, the greater the intention to use AVs.

Table 4.2.3 – Pearson Correlation Output between Ride-hailing utility and Intention to use (Source: Own authorship)

			RHU02.1	RHU02.2	RHU02.3	RHU02.4	RHU02.5	RHU02.6
RHU	PU04.1	Pearson Correlation	-	-	.245	.168	.218	.196
		Sig. (2-tailed)	-	-	<.001	.008	<.001	.002
RHF	PU04.1	Pearson Correlation	.231	.227	-	-	.235	-
		Sig. (2-tailed)	<.001	<.001	-	-	<.001	-

An analysis was also conducted to assess the correlation between AV Utility variables and intention to use. I thus had confirmation of the positive correlation with all the variables in this group, and can therefore conclude that the more the user agrees that AVs are advantageous and enable the possibility of improving their mobility, the greater the intention to use them.

As regards the monthly income, an analysis was made to check for the possible correlation between with the intention of use and another with the perception of usefulness. I found a positive correlation between these variables, however, it wasn't strong. Even so, I can conclude that the higher the monthly income, the greater the probability of the user wanting to use an AV (r = .174, n = 252, p = .005), and perceiving the usefulness of this technology (r = .171, n = 252, p = .007).

The possible correlation between the Living Location and the intention of use was also analyzed, whereby it was verified that there is indeed a positive correlation, although it is weak (r = .159, n = 252, p = .012). Even so, we can infer that the closer the person lives to the city, the greater the intention of use.

With regard to the emotional perception of time spent commuting, we also found that there is a negative correlation with the Intention to use AVs. (r = -.145, n = 252, p = .021), however, regarding Age and Intention of use (r = .029, n = 252, p = .650), contrary to what I expected, no correlation was found.

4.3. Sociodemographics and Perceptions of AVs and SAVs

4.3.1. Perceived Usefulness

I. An independent T-test was performed to compare means between Gender on the same dependent variable regarding Intention to use, which was "How many years after the technology is introduced to the market would you feel comfortable using a vehicle with an autonomous driving system?" (PU03). As we can see (Table 7.4.1), the group means are statistically significantly different, as the two-sided *p*-value < 0.05.

This analysis allowed us to confirm that men show a greater predisposition to use AVs earlier than women, with a mean difference of -0.49 (Table 7.4.2). The majority of the male respondents said they were interested in having an experience between 1 and 2 years after becoming aware of this technology being already available on the market (25%), on the other hand, women showed greater resistance since most said they were interested in using this technology between 1 to 2 years (26%) and 2 to 3 years (26%) as the distribution between the two options was equal.

II. Another Gender comparison analysis was made, with variables from the group questions of Perceived Usefulness through an independent T-test. Two of the variables had a 2-tailed *p*-value < 0.05, which were “I prefer to drive myself rather than others driving me” (PU04.8), and “I enjoy driving” (PU04.9). However, on these two variables, Levene’s test for equality of variances returned a p-value < 0.05 (Table 7.4.3), therefore it has been shown that the assumption of equal variances cannot be assumed. Even so, with the result of this test, we were able to verify that men have a greater preference for driving, compared to women.

III. Next, the Kruskal-Wallis method was used to determine whether there was evidence of a statistically significant difference between the Work Format variables regarding Perceived Usefulness, which was indeed found (Table 7.4.4).

Thus, according to the pairwise comparisons, for the variable "I intend to use a Public transportation or shuttle bus with no ‘driver’ chaperone" (PU04.2) respondents in full-time in-office work format believe much less in this statement (Table 7.4.5) when compared to respondents in hybrid work format (*p*-value = .005). That is, we observed that respondents who go to their workplace every day are not as willing to use autonomous public transport.

IV. Regarding the Work Location, a question from this group rejected the null hypothesis (Table 7.4.6), which was "Using an autonomous vehicle could increase my productivity"

(PU04.3). By analyzing the pairwise comparisons (Table 7.4.7), we can observe that the respondents who work in the rural environment believe much less in the statement than those who work in the urban environment (Figure 7.4.1), which would be somewhat expected.

V. Then, using the One-Way ANOVA method of analysis, we analyzed whether the Time Spent Commuting and the perceived usefulness variables had statistically significantly different means, and thus, we observed that one of the variables in this group has a significant value (Table 7.4.8), which was “Using autonomous vehicle could increase my productivity” (PU04.3).

Interestingly, Tukey's post hoc and Scheffe’s tests revealed that those who make a trip of 30 to 45 minutes have a significant difference with those who have a trip of more than 60 minutes (MD = .74432), contrary to what would be expected, ie. that the longer the trip, the more they would agree with the statement described above. In short, these results show that respondents with trips of 30 to 45 minutes are the ones who recognize the most that an AV can increase their productivity, as well as those in the group with trips of 45 to 60 minutes, who also recognize this advantage (Table 4.3.1). On the other hand, the group that has trips lasting 60 minutes or more, seems to agree less with this statement (Figure 7.4.2).

Table 4.3.1 – Mean distribution on Time Spent Commuting regarding Increase in Productivity using AVs (Source: Own authorship)

	Less than 15 minutes	15-30 minutes	30-45 minutes	45-60 minutes	More than 60 minutes
	Mean	Mean	Mean	Mean	Mean
PU04.3	3.4	3.54	3.81	3.67	3.07

VI. Concerning the Education Level of the respondents, through the Kruskal-Wallis analysis, one of the variables rejected the null hypothesis, "I find that driverless vehicles are useful" (PU04.5) (table 7.4.9).

Thus, analyzing the paired comparison (Table 7.4.10), we observe that the respondents with the education level from the 10th to the 12th grade believe much less that AVs can be useful when compared to those who have a bachelor’s degree, a postgraduation, and a master's degree. With these results (Table 4.3.2), we can also observe that the higher the level of education, the greater the probability of perception of utility the respondents may have.

Table 4.3.2 – Mean distribution on Education level regarding Usefulness of AVs (Source: Own authorship)

	9th grade or less	10th to12th grade	Bachelor’s/ Licenciate degree	Postgraduation / Specialization	Master’s degree	Doctorate
	Mean	Mean	Mean	Mean	Mean	Mean
PU04.5	3.50	3.50	3.77	4.00	3.99	4.00

VII. Regarding the Gross Monthly Income of the respondents, the variable "Using an autonomous vehicle could increase my productivity" (PU04.3) reject the null hypothesis (Table 7.4.11). In this analysis, we can see that respondents with an income equal to or less than the minimum wage in Portugal (740€) agree less with the statement about increased productivity, compared to those with a higher income, such as, for example, those with an income below 740€ present a significant statistical discrepancy in relation to those earning between €1001-€1500 (*p*-value =0.006), equally to those earning between €4001-€4500 (*p*-value =0.012), as well as with those earning more than €5001 (*p*-value =0.006). Additionally, we can see that there is a tendency for, the higher the salary, the better the opinion regarding productivity with Avs Figure 4.3.1).

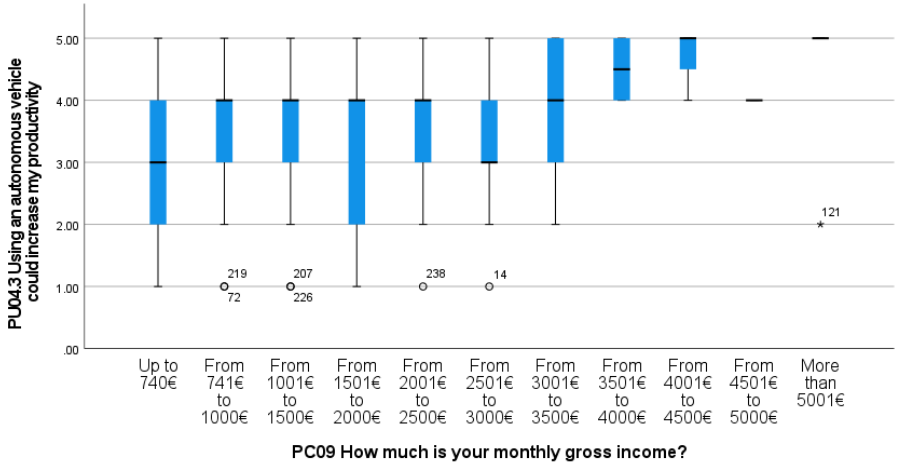

Figure 4.3.1 – Variations of opinions regarding Productivity with Avs by income levels (Source: Own authorship)

VII. Lastly, the Mann-Whitney U Test was used to analyze whether differences could be found between respondents who have an Elderly or Disabled Person who depends on them to get around and the variables in this Perceived Usefulness group.

Table 4.3.3 – Mann-Whitney Test Statistics for those who have dependents and Intention to use an autonomous PT (Source: Own authorship)

Mann-Whitney U	320.5
Wilcoxon W	881.5
Z	-2.18
Asymp. Sig. (2-tailed)	0.029

One of the variables (Table 4.3.3), "I intend to use a Public transportation or shuttle bus with no 'driver' chaperone" (PU04.2), presented a Z score of -2.18 and 2 tailed *p*-value of .029. Therefore, we can confidently reject the null hypothesis that the groups "Has dependents (Disabled and/or elderly) to move from one place to another" and "Has no dependents" come from the same underlying population, and the result of the Mann-Whitney U test supports the assertion that these two groups have different perceptions regarding the willingness to use an

AV. Therefore, we can say that respondents who are responsible for ensuring the mobility of another person (whether elderly or disabled) show a greater willingness to access and use an AV (Figure 7.4.3), compared to those who do not have dependents in this regard (Table 7.4.12).

4.3.2. Trust

I. The first analysis for the Trust variables was through an independent T-test to compare the means between those variables based on Gender, thus, understanding if there are differences between Men and Women when it comes to trust in AVs. In this case, we had a variable that presented a 2-tailed *p*-value < 0.05, and Levene's test for equality of variances returned a *p*-value < 0.05 (Table 7.4.20), being the variable, "I think autonomous vehicles would operate better than human drivers" (T01.2).

In general, we can assume that men are more likely to trust the capabilities of this new technology and that women are more reticent and have greater concerns about trusting an AV, compared to a vehicle with a human driver.

II. Afterwards, the Kruskal-Wallis method was used to determine if there was evidence of a statistically significant difference between the trust variables and the Education Level of the respondents. The variable "My trust in AVs will be based on the car manufacturer's reputation for safety and reliability" (T01.5) rejected the null hypothesis with a *p*-value of .033. Through the pairwise comparisons (Table 7.4.21), we can see that there is a significant difference in the perception of those who have between the 10th and 12th grade, with those who have a Master's degree. We can thus assume that a respondent with a master's or equivalent higher education may have a greater level of confidence in this technology taking into account the reputation of the brands, however, the lower the level of education, the more fearful they may be. Additionally, verifying the variations of the answers by levels of education, regarding the confidence that AVs make trips, we verified that the higher the level of education, the greater the degree of confidence (Figure 4.3.2).

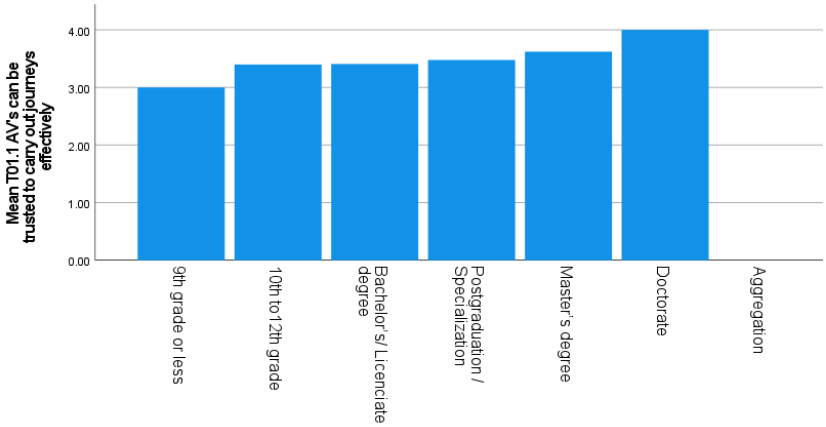

Figure 4.3.2 – Variations of opinions regarding trust by Education Level (Source: Own authorship)

III. Through the One-Way ANOVA method, the Feelings towards gross income and variables of trust were analyzed to see if they have statistically significantly different means, and thus, we observed that the variable "I think autonomous vehicles would operate better than human drivers" (T01.2) had a significant value (i.e., $p < .05$) (Table 7.4.22).

Tukey's post hoc and Scheffe's tests revealed that those who claim their income "is not enough" do not believe that AVs could perform better than human drivers, compared to respondents who claim to live comfortably (p-value = .046) or that income covers expenses (p-value = .039) (Figure 4.3.3). Therefore, we can say that those who consider their income sufficient for a comfortable and carefree lifestyle are likely to trust this technology much more than those whose income is not enough. This conclusion can be combined with some of the comments received in the survey about the concern with the end of some professions, thus affecting the most disadvantaged families.

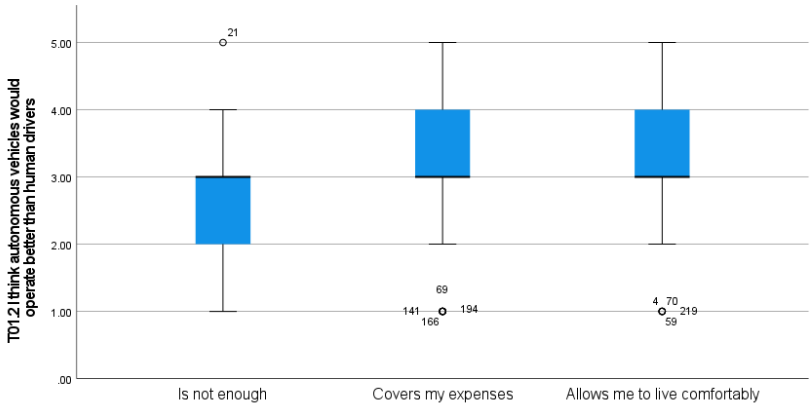

Figure 4.3.3 – Variations of opinions regarding trust by feelings towards income (Source: Own authorship)

4.3.3. Privacy

I. An independent T-test was conducted to compare the means between Privacy variables based on Gender, thus, understanding if there are differences between Males and Females when it

comes to the respondent's privacy concerns towards AVS. We had three of the four variables that presented a 2-tailed *p*-value < 0.05, and Levene's test for equality of variances returned a *p*-value < 0.05(Table 7.4.23). The variables in question are, " I would feel safe about Data privacy (location and destination tracking) issues, regarding AVs" (P01.1), "I would feel safe about Personal information privacy issues, regarding AVs" (P01.2), and "I would feel safe about Mass surveillance issues, regarding AV's" (P01.4). Overall, we can assume that women are more likely to feel safe with their data privacy, and personal information, and regarding mass surveillance issues when it comes to technology and on the other side, men are more conservative and cautious about their privacy (Figure 4.3.4; Figure 7.4.8).

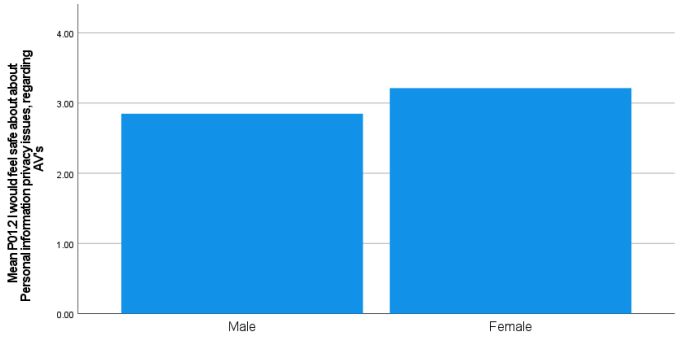

Figure 4.3.4 – Variations of opinions regarding privacy concerns by gender (Source: Own authorship)

4.4. Sociodemographics and Mobility Experiences

4.4.1. Mobility Satisfaction

I. Subsequently, using the KW method, we analyzed the existing variances between the Living Location and the respondents' satisfaction with their mobility. Two of the six variables rejected the null hypothesis, being, "The transportation mode I use the most for work/school fits perfectly for my needs" (MS01.4) (*p*-value -0 .002) and " If I had accessibility to more travel options, I would change my daily travel mode" (MS01.6) (*p*-value = .021).

With the Pairwise comparisons (Table 7.4.13), we can observe that those who live in the Suburban area, agree much less that the current mode of transport serves their mobility needs, compared with all of the other respondents. Regarding the differences between those who live in suburban areas and those who live in urban or central areas, this is perfectly expected, since the closer to the center, the more access to transport there will be.

On the other hand, it is important to emphasize that those who live in rural areas are more satisfied with the current mode of transport, compared to those who live in suburban areas and this may be because 75% of the respondents have their own vehicle as their main means of

transport. On the contrary, those who live in suburban areas have the highest percentage of public transport users, 35.6% (Table 7.4.14).

Regarding the possibility of changing the means of transport, respondents who live in the city center agreed much less than those who live in suburban areas (*p*-value = .002). And those who live in the suburban area demonstrate a greater willingness to change means of transport (Table 7.4.15).

II. Regarding their Time spent on daily Commuting, we used the One-Way ANOVA method to observe if this factor and the variables related to mobility satisfaction have statistically significantly different means (Table 7.4.16). The following variables presented a significant value of less than .05 ($p < .05$). Being them, "My travel mode facilitates my daily life" (MS01.2), "My daily travel makes me feel good" (MS01.3), "The transportation mode I use the most for work/school fits perfectly for my needs" (MS01.4), and "When I think of my daily travel the positive aspects outweigh the negative" (MS01.5).

Tukey's post hoc and Scheffe's tests were used to understand the differences found. As for the MS01.2 and MS01.3 variables, I realized that those who have daily trips of more than 60 minutes agree substantially less with these statements compared with the remaining respondents (Tukey HSD *p*-value < .001). That is, these respondents believe that their mode of travel does not make their life much easier and does not make them feel so good (Figure 7.4.4). And aligning this information with the fact that 75% of respondents with daily journeys longer than 60 minutes use public transport, we can see that there is greater dissatisfaction with the mode of travel associated with public transport (Table 7.4.17).

Regarding the MS01.4 variable, respondents with trips longer than 60 minutes agree less with this statement than those who make daily trips of less than 45 minutes (Tukey HSD and Scheffe *p*-value < .001). That is, those who take more than 60 minutes on their way to work do not agree in the same proportion as others that the mode of transport they use fits perfectly with their needs (Figure 7.4.5). Lastly, referring to the MS01.5 variable that presented a statistically significantly different mean, we observed that respondents with trips longer than 60 minutes agree less that the positive aspects outweigh the negative aspects of daily trips, compared to those who have trips shorter than 30 minutes (*p*-value < .005).

III. As we did with the perceived usefulness variables, we analyzed the variables of this group with the respondents' Feelings towards Commuting Time, and the following ones rejected the null hypothesis, with a *p*-value < .05, "My travel mode facilitates my daily life" (MS01.2), "My daily travel makes me feel good" (MS01.3), "The transportation mode I use the most for

work/school fits perfectly for my needs" (MS01.4), "When I think of my daily travel the positive aspects outweigh the negative" (MS01.5), and "If I had accessibility to more travel options, I would change my daily travel mode" (MS01.6).

In summary, comparing respondents who have positive feelings (Relaxed and Very Relaxed) with those who have negative ones about the duration of daily trips (Stressed and Very Stressed), we see that the latter believe much less that the means of transport used makes their day-to-day life easier (Table 7.4.18), they don't feel so good, it doesn't fit perfectly with their needs and the positive aspects don't outweigh the positive ones. On the other hand, concerning the possible change in the current means of transport (Figure 4.4.1), respondents who view daily travel time as relaxed, very relaxed, or neutral, believe this statement much less than those who are in fact, stressed.

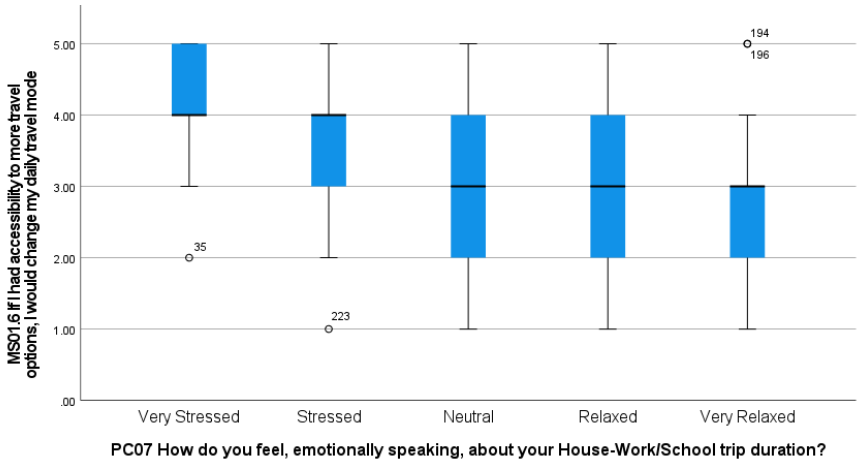

Figure 4.4.1 – Variations of opinions regarding wanting to change their daily travel mode by stress levels with commuting trips (Source: Own authorship)

IV. For the analysis to find if there are differences between those who have a Driver's License and the variables of mobility satisfaction, a Mann-Whitney U Test was used. All of the variables of this group presented a 2 tailed *p*-value smaller than .05 (table 7.4.19). Therefore, we can confidently reject the null hypothesis that the groups "Has driver's license" and "Doesn't have" come from the same underlying population, and the result of the Mann-Whitney U test supports the assertion that these two groups have different perceptions regarding the variables of mobility satisfaction. In this way, we can draw some conclusions, such as those who have a driving license are more likely to have a car available (Figure 7.4.6); they believe more that the means of transport they use makes their life easier (Figure 7.4.7); and that this means of transport makes them feel good. Additionally, they believe more that the means of transport perfectly fits their needs and that the positive aspects outweigh the negative ones. On the other hand, those who do not have a driving license are more likely to be willing to change their means of transport.

4.4.2. Accessibility and Social Activities

I. A Gender comparison analysis was made with variables from the group questions of Accessibility and Social Activities through an independent T-test. The variable "I feel completely safe in my neighborhood, at night" (ASC01.8) had a 2-tailed *p*-value < 0.05, and Levene's test for equality of variances returned a *p*-value > 0.05 (Table 7.4.24), therefore it has been shown that the assumption of equal variances can be assumed. From these results, we can conclude that men feel much safer in their neighborhood at night than women (MD = .034) (Figure 4.4.2).

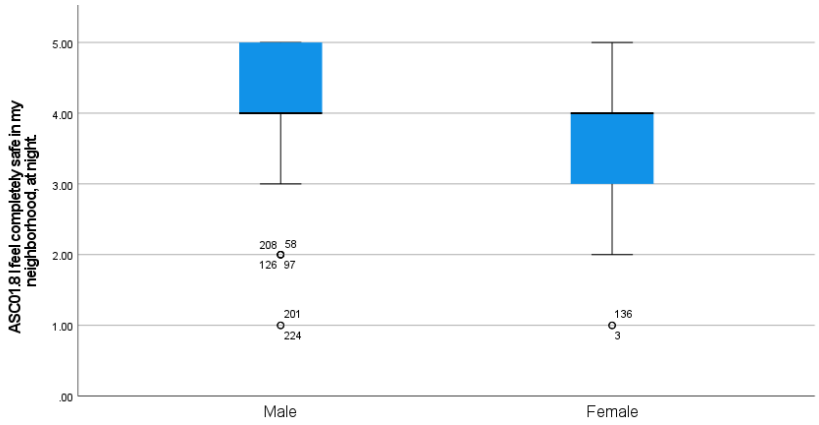

Figure 4.4.2 – Variations of opinions regarding Accessibility and social activities concerns by gender (Source: Own authorship)

II. As for the analysis of the respondents' occupation and the variables of accessibility and social activities, an analysis was performed using the Kruskal-Wallis test to verify whether there are significant variances. The variable "The Public transport I have access to, is good for work/school trips" (ASC01.1) rejected the null hypothesis (*p*-value = .006). Through the pairwise comparisons (Table 4.4.1), we observed that compared to students and student-workers, workers agree less that the public transport they have access to, is not that good for their daily commute (Figure 7.4.9). That is, taking into account that 83% of respondents work full-time in-office or in a hybrid way, there's great potential here for users who are not so satisfied with their means of transport.

Table 4.4.1 – Pairwise comparisons between Occupation regarding Accessibility (Source: Own authorship)

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
Worker-Student-Worker	36.621	14.330	2.556	.011	.159
Worker-Student	40.149	13.042	3.079	.002	.031

III. As for the Living location, three variables of this group rejected the null hypothesis (*p*-value < .05), which were, "The Public transport I have access to, is good for work/school trips"

(ASC01.1), “The Public transport I have access to, is good for trips, e.g. shopping, leisure” (ASC01.2), and “My neighborhood offers me a wide range of leisure activities” (ASC01.4).

Through the pairwise comparisons (Table 7.4.25), we can observe that, as expected, those living in rural areas agree less about having good access to public transport (Figure 4.4.3), whether for commuting trips or for leisure, as well as not having such a wide range of leisure activities. Regarding the latter, those who live in the suburban area also do not have such a varied offer compared to those who live in central areas.

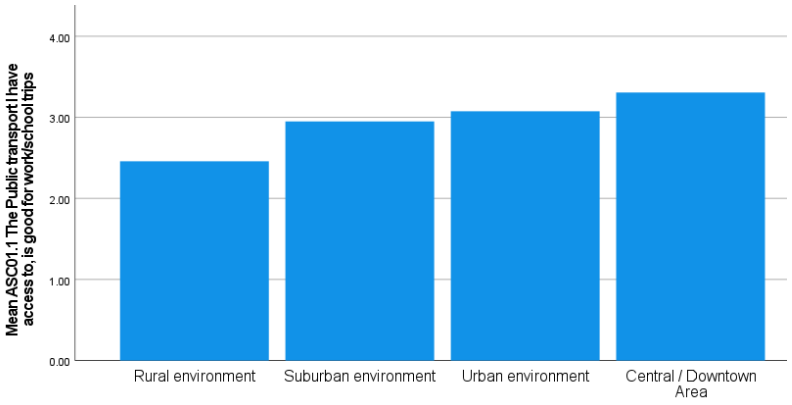

Figure 4.4.3 – Variations of opinions regarding Accessibility and social activities concerns by Living location (Source: Own authorship)

IV. Through the One-Way ANOVA method, Time spent commuting and variables of accessibility social activities were analyzed to see if they have statistically significantly different means, and thus, the variable “I would prefer to use another type of transportation than my current one for my commuting journey (home - work/school)” (ASC1.6) presented a significant value (i.e., p = .007) (Table 7.4.26).

Tukey's post hoc and Scheffe's tests revealed that those who take a trip of less than 30 minutes are not as willing to change their current daily means of transport, compared to those who take a trip of more than 60 minutes (Figure 4.4.4). Therefore, we could say that the longer the daily travel time, the greater the probability of wanting to change the means of transport.

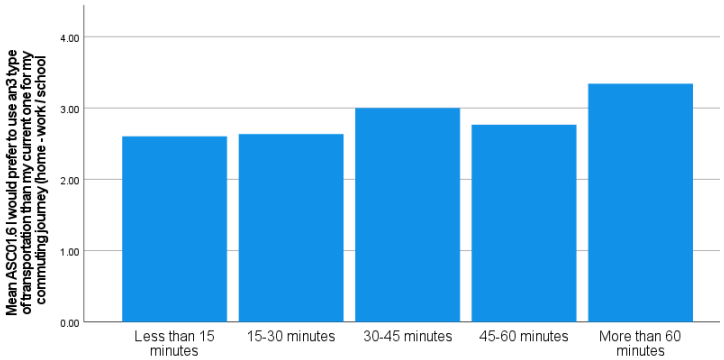

Figure 4.4.4 – Variations of opinions regarding Accessibility and social activities concerns by Time spent commuting (Source: Own authorship)

V. As with the perceived usefulness and mobility satisfaction variables, we analyzed the variables of this group with the respondents' Feelings towards Commuting Time, and the following ones rejected the null hypothesis, with a *p*-value < .05. “The Public transport I have access to, is good for work/school trips” (ASC01.1) with *p* = .012, “The Public transport I have access to, is good for trips, e.g. shopping, leisure” (ASC01.2) with *p* = .01, “Lack of easy access to the transport system often makes me feel socially excluded” (ASC01.3) with *p* = .049, “I would prefer to use another type of transportation than my current one for my leisure activities” (ASC01.5) with *p* = .021 and “I would prefer to use another type of transportation than my current one for my commuting journey (home - work/school)” (ASC1.6) with *p* < .001.

Thus, we can draw the following conclusions (table 7.4.27): respondents who consider their daily commuting trips stressful and very stressful agree less that the public transport they have access to is good for those same daily commuting trips. Respondents at an emotionally stressed level regarding commuting, do not agree as much as those who are neutral, relaxed, or very relaxed, that the public transport they have access to is good for leisure travel. On the other hand, regarding the lack of easy access to the transport system creating a feeling of social exclusion, respondents with a very stressed emotional level were the ones who most agreed with this statement, compared to all the other respondents. Additionally, when asked if they would prefer to use another mode of transport for leisure, respondents with an emotionally stressed level in relation to commuting trips were the ones who most agreed with this statement. As well as, for the possible change of means of transport for commuting trips, the respondents with a stressed level were the ones who most agreed with that option, as well as a good part of those who revealed to be very stressed.

4.4.3. Ride-Hailing Utility

I. The Kruskal-Wallis method was used in determining if there are significant variances between the Work Format of the respondents and ride-hailing utility variables, in which, the variable “I can have a less stressful driving/commuting experience” (RHU02.6) rejected the null hypothesis with a *p*-value = .048.

Through the pairwise comparisons (Table 7.4.28), we can observe that those who are in the full remote work model are the ones who agree more that shared transport services offer a less stressful travel experience. Additionally, 56.5% of respondents who work full-remote claimed to use shared transport services at least once a month (Table 4.4.2), which was the highest percentage compared to the other groups of types of work format. In this way, we can understand why this group has a more positive perception of these services.

Table 4.4.2 – Count distribution regarding How often each work format respondent, uses a ride-hailing service (Source: Own authorship)

		Full Remote	Hybrid	Full In-office	Other
MC02	Rarely or never	10	51	81	14
	At least once a month	10	29	20	3
	At least once a week	3	11	17	3
	Daily	0	0	0	0

II. To analyze the variances in the variables of this group with the Age factor, we again used the Kruskal-Wallis method. Two variables rejected the null hypothesis, "I can have better access to Social activities, Cultural activities, hobbies and/or Sports" (RHU2.3) and "I can have a more productive commute (e.g: get to my destination faster or need less switches)" (RHU2.5). Through the pairwise comparisons (Table 4.4.3), we can conclude that those who are between 45 to 54 years old, don't agree as much that with ride-hailing services they would have better access to social activities and that they could have a more productive commute. Additionally, all respondents between 18 and 34 years of age showed a neutral or positive opinion regarding the advantages of this type of mobility service, thus revealing that younger layers are more willing to use these mobility platforms.

Table 4.4.3 – Pairwise comparisons between Age regarding Ride-hailing utility (Source: Own authorship)

	Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
RHU2.3	45-54-25-34	41.502	13.849	2.997	0.003	0.041
	45-54-18-24	41.573	15.756	2.639	0.008	0.125
RHU2.5	45-54-25-34	35.923	13.867	2.59	0.01	0.144
	45-54-18-24	51.215	15.777	3.246	0.001	0.018

III. Regarding the emotional perception towards the time respondents spend on daily commuting, the variable "I can have a less stressful driving/commuting experience" (RHU02.6) rejected the null hypothesis (*p*-value = .014). And through the pairwise comparisons (Table 4.4.4), we can observe that the respondents who feel very stressed with their commuting are the ones who agree more with the statement (RHU02.6). That would be expected since those are the users who are suffering the most with their daily trips (Figure 7.4.10).

Table 4.4.4 – Pairwise comparisons between Feelings towards commuting time regarding Ride-hailing utility (Source: Own authorship)

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
Very Relaxed-Very Stressed	75.596	22.517	3.357	<.001	.008
Neutral-Very Stressed	62.956	19.248	3.271	.001	.011
Relaxed-Very Stressed	58.482	20.156	2.902	.004	.037
Stressed-Very Stressed	57.729	20.120	2.869	.004	.041

4.4.4. Ride-Hailing Functionality

I. As I was interested in analyzing the behavior of the ride-hailing functionality variables with the Gender factor, an independent T-test was used. The variable "I have the possibility of relaxing and not drive through these services" (RHF01.5) presented a 2-tailed *p*-value of less than .05 and Levene's test for equality of variances returned a *p*-value > 0.05, therefore it has been shown that the assumption of equal variances can be assumed (Table 7.4.29). From this analysis, we infer that women agree much more with the statement referring to being able to relax during the journey by using a shared transport service.

4.5. Discussion on AVs Utility

In this section, we will cover all the results obtained, as well as some more pertinent information that will be presented, and thus verify which sociodemographic characteristics have greater variations in the perception of AVs and which ones demonstrate a greater affinity for intention and use.

Starting with Gender, we were able to verify in the analysis of the perceived usefulness of AVs that, on average, women intend to have some experience with an AV later on, compared to men. However, regarding the questions asked about the utility that AVs could have in everyday life, women demonstrated to agree more than men in almost all statements, that is, women agreed that they could visit family and friends more, that they could go to areas further away from their neighborhood, that they could also have better access to social activities, that they could have more productive commuting and that the driving experience would be less stressful (Table 7.4.30). The only statement that they did not agree with as much as men was regarding having better access to commuting. Additionally, looking at the data from the Intent to Use question (PU04.1), women show a slight positive difference compared to men (Figure 7.4.11), which means that, although they demonstrate a desire to use the technology later than men, in general, they have a greater intention to use AVs, compared to men. Allied with the fact that they do not feel as safe at night in their neighborhood as men do (Figure 4.2.3.6) and they think that shared mobility services allow them to relax and not have to drive, we may be facing a group with relevance in terms of adherence to the AVs.

Regarding Age, I did not find a correlation with the intention to use AVs, however, we can still draw some conclusions. It is possible to observe that younger people value the advantages

of shared mobility services more. Additionally, it is here that we see that the group of people aged over 65 is starting to stand out from those aged between 35 and 64. Because it is the two youngest groups together with the oldest who demonstrate a greater affinity for the use of shared transport, as well as these, were the age groups that most agreed with the useful advantages that AVs could provide (Figure 7.4.12). Interestingly, with regard to being able to visit family and friends more often, as well as traveling to more distant areas of their neighborhood, the elderly stand out in how much more they believe in these statements (Figure 7.4.13). Therefore, combining the fact that this group of elderly people shows that they agree that AVs can be useful in their daily lives, with the fact that they prefer shared transport services (Figure 7.4.14) and also, with the fact that this group agrees that they would like to use public transport or shuttle bus without a driver, we see that we have here an age group that presents excellent results as for the Intention to Use this technology (Avs and SAVs).

Regarding the Work Format, I found in the analyses above that respondents in full-time remote and hybrid format, agree more about using an AV and autonomous public transport, and concerning the usefulness that AVs could have in everyday life, these two groups were also those who agreed the most compared with the full in-office (Figure 7.4.21). Plus, remote and hybrid groups demonstrate a greater preference for shared mobility services as they value more, for having better access to social activities and having a more productive commute, and when asked if they would switch to a shared mobility means of transport through an AV, it was these two groups that had the largest share in the distribution of those who said they would (Hybrid Group with 41% and Remote with 38%). (Table 7.4.36). We can thus observe that the greatest intention of using AVs and SAVs is verified in formats that do not involve a daily routine of commuting trips.

Analyzing the results obtained with the Living Location investigation, I observed that those who live in suburban areas were more dissatisfied with the means of transport they had access to, therefore if they had other options for means of transport, they would switch. Additionally, this group shows interest in using AVs and finds them useful, although not to the same extent as those living in urban or downtown areas, since, as mentioned above, there is a weak but positive correlation between the intention of use and the proximity of central areas (Figure 7.4.15). However, analyzing the questions raised about the usefulness that an AV would have in the mobility of the respondents, the group that lives in suburban areas demonstrated to agree more with the vast majority of statements, noting in particular statements such as having better access to commuting trips (since they were dissatisfied in this regard), being able to travel to

more distant places and have better access to social activities (Figure 7.4.16). Thus, we can see that those who live in suburban areas recognize the advantages that AVs would have in their lives, but still do not show as much inclination to use them, compared to those who live closer to the center. Even so, we have one more group identified, which, due to the dissatisfaction it shows, could have improvements in mobility with AVs.

Another characteristic that was evaluated in this research, the Emotional perception of the Time spent on Commuting trips, demonstrated that there are differences between the different groups in the perception of AVs. Before starting this analysis, a test was performed to see if there was a correlation between emotional perception and the time effectively spent on these commuting trips, which in fact proved that there is a considerable correlation, that is, the longer the trips, the more stressed users feel (Table 7.4.31; Table 7.4.32).

As I presented in chapter 4.2, there was a negative correlation, although weak, between emotional perception and intention to use, that is, the more stressed the respondents felt about the time they spend commuting, the more interested they were in using AVs. Likewise, there is a negative correlation between wanting to change the current means of transport for an AV as a ride-hailing service (eg.: Uber) or shared mobility service (eg.: BlaBlaCar), that is, the more stressed the respondent felt, the more he agreed to want to change (Table 7.4.33).

We also saw that the group with commuting trips longer than 60 minutes were the most dissatisfied with the means of transport they have access to and use. Besides, those who felt very stressed agreed more that with shared mobility services they would have less stressful travel experiences. Therefore, analyzing the respondents' perception of the usefulness of AVs, we found that the higher the stress level, the more they recognized that this technology could facilitate their daily lives. Especially about being able to have less stressful trips, more productive trips, and better access to social activities (Figure 7.4.17).

As I mentioned in the introduction of this thesis, with this technology, people would be less dependent on the Driver's License and, therefore, we will aggregate the data to verify if those who do not have one, see advantages in this technology. Starting with the analysis of intention to exchange current means of transport for an AV as a ride-hailing service or shared mobility service, I found that 39% of those who do not have a driving license would like to exchange for such an option (Table 7.4.35). Additionally, those who do not have a driving license value more the usefulness and practicality that shared mobility guarantees on a daily basis, compared to those who have one (Figure 7.4.18), since this group also proved to be the one whose social life is most affected by the limitations they have with transport (Figure 7.4.19).

Therefore, I analyzed the perception that this group has about the usefulness that AVs would have and as I suspected, the group values much more, the amenities that AVs could provide (Figure 7.4.20). And since the variance was still quite noticeable, I analyzed the existence of a correlation between the AV Utility variables with "Having a Driver's License" and indeed there is a negative correlation with five of the six variables (Table 7.4.35). I can therefore conclude that those who do not have a driving license value more the opportunities that an AV can offer.

Compiling the information I was able to collect, we can thus identify six groups that have a more positive perception in relation to AVs and SAVs and that, overall, it is expected that with this technology they will have more social opportunities and better mobility experiences. Being these groups, women; elderly (+ 65 years); hybrid and remote work formats; residents of suburban areas; high levels of stress about commuting time; and not having a driving license.

4.6. Research Hypothesis Validation

For the first hypothesis, we were able to prove through the T-test that men were predisposed to use AVs earlier than women.

For the second hypothesis, women showed much less agreement regarding feeling safe at night, therefore, we observed a greater probability of women feeling socially excluded for being afraid of dangers at night.

Regarding the third hypothesis, it was not verified that the longer the commuting time, the greater the perception of productivity using an AV, since users with trips longer than 60 minutes did not agree that their productivity could be greater with an AV.

For the fourth hypothesis, we concluded that, contrary to what we had predicted, men were more conservative in terms of their data than women.

As regards the fifth hypothesis, despite the correlation being weak, we observed that the more advantages respondents agreed that ride-hailing services offered, the greater the intention to use an AV.

For the sixth hypothesis, we were able to see that the further away from the center, the less satisfaction they had with the means of transport they had access to and they demonstrated a willingness to use other means, however, the factor of owning a car has a great weight, because residents of rural areas mostly use their personal vehicle and for this reason, they do not agree with the statements, and therefore, we cannot confirm this hypothesis.

Regarding the seventh hypothesis, it was rejected because we did not find any correlation between these two variables, and analyzing the distribution, over the different time intervals, there are no considerable variations.

Referring to the eighth hypothesis, we confirmed that the higher the respondents' education level, the greater the perceived usefulness of the AVs.

For the ninth hypothesis, we found that the more positive the respondent's perception of his/her income, the more confidence he/she demonstrates for AVs.

Concerning the tenth hypothesis, no correlation was found between age and intention to use, and in the Kruskal-Wallis analysis, we obtained retention of the null hypothesis, which in this case was statistically different mean terms between the age groups (*p*-value = .540).

For the eleventh hypothesis, we found that the more stressed the respondents felt with their daily commuting trips, the more they valued the advantages of ride-hailing services, such as being able to have less stressful travel experiences.

And for the twelfth hypothesis, we were able to verify that the greater the level of confidence of the respondents in relation to AVs, the greater the intention of use.

Table 4.6.1 – Summary of hypothesis results (Source: Own authorship)

	Hypothesis	Result
H1	Men will be willing to use AVs sooner than women	Supported
H2	Women will feel less safe going out at night, than men	Supported
H3	The time of commuting trips influences the perception of productivity of an AV	Rejected
H4	Men will feel more secure with their data when using an AV compared to women	Rejected
H5	Preference for ride-hailing services has a positive correlation with the intention to use Avs	Supported
H6	The location where one lives affects access to transport and consequently satisfaction with their means of transport	Rejected
H7	The longer the commuting time, the greater the intention to use an AV will be	Rejected
H8	The level of education has an impact on the perceived usefulness of Avs	Supported
H9	Income level affects perceived trust in technology, like AVs	Supported
H10	Age has a negative correlation with the intention to use AVs	Rejected
H11	The emotional perception regarding the time spent commuting is positively correlated with the positive opinion regarding ride-hailing services	Supported
H12	Trust positively influences the Intention to use AVs	Supported

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5. Conclusion

5.1. Main Findings

This research aims to add information to the current literature regarding AVs and SAVs with an emphasis on the Portuguese reality. As mentioned in the introduction, the objective of this dissertation is to explore the potential shifts in the citizens' mobility behavior with the availability of AVs in mobility systems. In order to guide the analysis of this objective, three research questions were proposed, which we will evaluate below:

The first research question raised concerns about what affects the intention to use AVs and SAVs. And so, for confirmation, I started by analyzing the correlation between the perception of usefulness with the intention to use and I observed that both concepts are positively correlated, that is, users have to perceive the usefulness of this technology so that they can have the intention of using it.

Regarding the Perception of Data Security, it influences positively the intention to use, that is, the better informed and confident people are about their data, the more comfortable they will feel using this technology.

Concerning Trust, it also influences positively the intention to use AVs and SAVs, that is, the more people trust driverless vehicles to carry out journeys effectively and have enough safeguards, the greater the intention to effectively use them. On top of that, the vast majority of respondents, 56%, agreed or strongly agreed that AVs can be trusted to travel effectively (Table 7.4.37), and 53% agreed and strongly agreed regarding using an AV in the future (Table 7.4.38).

Positive correlations were also found between the perceived usefulness of shared mobility services and the intention to use them, and the perception of the functionality of these services and the intention to use them. That is, the more advantages users recognize that shared mobility services can provide, and the more trust and preference for this type of service, the greater the probability of adopting the AVs and SAVs. Other positive correlations with the intention to use AVs and SAVs were presented, as with the AV utility variables, with the gross monthly income, and with the Living Location.

In general, we can conclude that the intention to use can be affected by several social, economic and geographic factors. However, only when people have access to this type of technology will we be able to have a real perception of the intended use, which from the

panorama of these results, could be a positive acceptance to the point of improving the lives of many citizens.

For the second research question, I had to analyze how perceptions of AVs and SAVs vary across sociodemographic groups. As for Gender, I came to the conclusion that although men, on average, intend to use AVs earlier than women and trust this technology more, it is women who, in fact, have a greater intention of using it and who value more the usefulness that this technology can provide.

Another characteristic that stood out was the Work Format, with those who work full-time in-office, showing less interest in using a SAV, as well as being the group that showed the least confidence in this technology. On the other hand, we had those who are in a remote or hybrid format with a more positive perception of this technology and the advantages they can enjoy.

Regarding Age, we can conclude that the elderly are the ones who most value the utility that AVs and SAVs can provide for their mobility, following the younger age groups, who highly value shared mobility services, as well as the usefulness of AVs.

Another characteristic that was revealed to influence the acceptance of AVs, the Education Level. Respondents with higher levels of education, such as postgraduate and master's degrees, showed a greater willingness to use AVs than those with 12th grade or less. Access to more information and technologies, present in universities or specialized forums, may be one of the major factors for this difference.

As for the Living Location, we found that the further away from the city center, the greater the level of intention to use AVs, as well as the perception of the usefulness of this technology.

Concerning a Driving License, it was also possible to verify that not having one is correlated with the intention to use AVs, that is, there is a greater probability of positively perceiving the usefulness of shared mobility services and AVs, and consequently the intended use. Therefore, we were able to verify that the socio-demographic characteristics of each individual affect the perception that he or she may have of AVs and SAVs.

As for the third research question, I had to identify which opportunities appear according to current mobility experiences.

During this research, I was able to observe some findings that may reveal greater dissatisfaction with the current mobility experiences, such as women demonstrating less agreement than men, when asked if they felt safe at night in their neighborhood, as well as, showing a greater predisposition to change their current means of transport. Additionally, the elderly, respondents over 65 years old, were the ones who least agreed to feeling safe at night

and that their social life is hampered by the failure in their transportation needs. In addition to the group of women and the elderly, we could also observe that those who live in rural areas agreed much less about having good access to public transport or a good offer of leisure activities in the surrounding area. We can thus be verifying a latent demand situation, as mentioned in the literature review, in which these users may come to experience obstacles to certain activities that they want to do, due to lack of transport or difficulties in accessing it.

The obtained data indicate that these groups have good perceptions of the usefulness and intention of using this technology. Therefore, we are dealing with sociodemographic groups that can benefit greatly from the opportunities that AVs and SAVs have to offer since the reasons for dissatisfaction of these groups can be solved with this technology.

Thus, we can conclude that users are willing to use AVs and SAVs, however, some groups show greater resistance, but with the passage of adequate information we could see an overturn on this matter. All new technologies go through a period of rejection or distrust, it would not be different with AVs.

5.2. Limitations and Future Research Recommendations

This research was conducted in the most rigorous way possible. The purpose was to create a thesis that would add information to the literature and conduct future studies in the area. Even so, some limitations must be taken into account. First, it is important to highlight that this analysis had a small sample for what would be desirable and even biased since the respondents were people close to the writer, hence a greater concentration of young people up to 34 years old. In this way, it is necessary to carry out a study on a larger scale, to obtain more varied data, closer to reality.

It is necessary to recognize that lack of real experience in using AV or even close contact affects the results of the research. Thus, in future studies, the perceptions of individuals who have already had some experience with AVs could be evaluated, since in Portugal, for example, there are already some options.

Finally, I recommend that for future research that wishes to study again the advantages that AVs can offer to groups at greater risk of social exclusion, they focus more on women, the elderly, and the disabled, because due to the size of the questionnaire and restricted access to potential respondents, it was not possible in this dissertation.

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7. Annexes

7.1. Annex A: Survey Design

Table 7.1.1 – Survey: Questions and Sources (Source: Own authorship)

		Construct and item	Source(s) / Inspiration
Perceived usefulness / Intention to use	PA01	Do you know what a fully autonomous vehicle is?	Islam, et al, 2022; Pettigrew, et al, 2019
	PA02	Please select the types of autonomous driving systems you have used or interected with.	Self-developed
	PA03	How many years after the technology is introduced to the market would you feel comfortable using a vehicle with an autonomous driving system?	Casley, et al, 2013
	PA04.1	I intend to use an autonomous vehicle in the future	Mouratidis, et al, 2021; Correia, et al, 2019
	PA04.2	I intend to use a Public transportation or shuttle bus with no 'driver' chaperone (Autonomous vehicle)	Kaur, et al, 2018
	PA04.3	Using autonomous vehicle could increase my productivity (work or do any other activity while commuting)	Islam, et al, 2022; Correia, et al, 2019; Townsend, et al, 2021
	PA04.4	Using autonomous vehicle could enhance my effectiveness while driving.	Correia, et al, 2019; Choi,et al, 2015
	PA04.5	I find that driverless vehicles are useful.	Kaur, et al, 2018
	PA04.6	It is more fun to take an automated vehicle compared to a conventional car	Ashkrof, et al, 2019
	PA04.7	I believe that an automated vehicle might produce fewer pollutant emissions	Ashkrof, et al, 2019
	PA04.8	I prefer to drive myself rather than others driving me.	Ashkrof, et al, 2019
	PA04.9	I enjoy driving.	Ashkrof, et al, 2019; Correia, et al, 2019
Mobility Choices	MC01	How often do you use public transport?	Pettigrew, et al, 2019
	MC03	How often do you use ride hailing services? (Uber, Taxify, VivaTaxi...)	Lavieri, et al, 2019; Rayle, et al, 2016
	MC05	What mode of transportation do you use the most for leisure?	Rayle, et al, 2016; Casley, et al, 2013
	MC09	What mode of transportation do you use the most for your commuting mode for work/school?	Mouratidis, et al, 2021; Zmud, et al, 2016
	MC06	Would you be willing to switch your current modes to use an autonomous vehicle as a ride-hailing (e.g Uber) or a shared mobility service (e.g. BlablaCar)?	Booth, et al, 2019; Ashkrof, et al, 2019
Mobility Satisfaction	MS01.1	There is a car available in my houseld and I can use whenever I need	Mouratidis, et al, 2021; Coevering, et al, 2018
	MS01.2	My travel mode facilitates my daily life	Wang, et al, 2020
	MS01.3	My daily travel makes me feel good	Wang, et al, 2020
	MS01.4	The transportation mode I use the most for work/school fits perfectly for my needs	Zeid, 2009
	MS01.5	When I think of my daily travel the positive aspects outweigh the negative	Wang, et al, 2020
	MS01.6	If I had accessibility to more travel options, I would change my daily travel mode	Wang, et al, 2020; Zeid, 2009

Trust	T01.1	AV's can be trusted to carry out journeys effectively	Mouratidis, K., & Serrano, V. (2021); Correia, G., Looff, E., Cranenburgh, S., Snelderd, M., & Arem, B. (2019); Kaur, K., & Rampersad, G. (2018); Choi, J., & Ji, Y. (2015)
	T01.2	I think autonomous vehicles would operate better than human drivers	Islam, M., Abdel-Aty, M., Lee, J., Wu, Y., Yue, L., & Cai, Q. (2022); Ashkrof, P., Correia, G., Cats, O., & Arem, B. (2019); Kaur, K., & Rampersad, G. (2018)
	T01.3	I trust that the government will protect me from possible problems using driverless vehicles	Kaur, K., & Rampersad, G. (2018).
	T01.4	Driverless cars have enough safeguards to make me feel comfortable using it	Kaur, K., & Rampersad, G. (2018).
	T01.5	My trust in AVs will be based on the car manufacturer's reputation for safety and reliability	Kaur, K., & Rampersad, G. (2018).
	T01.6	I trust driverless cars to keep my best interests in mind	Kaur, K., & Rampersad, G. (2018).
Privacy	P01.1	I would feel safe about Data privacy (location and destination tracking) issues, regarding AV's	Kaur, K., & Rampersad, G. (2018).
	P01.2	I would feel safe about about Personal information privacy issues, regarding AV's	Islam, M., Abdel-Aty, M., Lee, J., Wu, Y., Yue, L., & Cai, Q. (2022); Kaur, K., & Rampersad, G. (2018).
	P01.3	I would feel safe about Personal autonomy privacy (privacy of making individual choices) issues, regarding AV's	Islam, M., Abdel-Aty, M., Lee, J., Wu, Y., Yue, L., & Cai, Q. (2022); Kaur, K., & Rampersad, G. (2018).
	P01.4	I would feel safe about Mass surveillance issues, regarding AV's	Kaur, K., & Rampersad, G. (2018).
Accessibility and social activities	PSE01.1	The Public transport I have access to, is good for work/school trips	Olsson, L., Friman, M., Lattman, K., & a, S. Fujii. (2020)
	PSE01.2	The Public transport I have access to, is good for trips, e.g. shopping, leisure	Olsson, L., Friman, M., Lattman, K., & a, S. Fujii. (2020)
	PSE01.3	Lack of easy access to the transport system often makes me feel socially excluded.	Self-developed
	PSE01.4	My neighborhood offers me a wide range of leisure activities	Coevering,P., Maat, K., & Wee, B. (2018)
	PSE01.5	I would prefer to use another type of transportation than my current one for my leisure activities	Self-developed
	PSE01.6	I would prefer to use another type of transportation than my current one for my commuting journey (home - work / school	Self-developed
	PSE01.7	My social life is hampered by the failure in my transportation needs.	Bascom, G., & Christensen, K. (2017)
	PSE01.8	I feel completely safe in my neighborhood, at night.	Self-developed
Ride hailing utility	IA02.1	I can visit more often my family and friends	Self-developed
	IA02.2	I can visit more areas further away from my neighborhood	Self-developed
	IA02.3	I can have better access to Social activities, Cultural activities, hobbies and/or Sports	Self-developed
	IA02.4	I can have better access to my commuting mode for work/school	Self-developed
	IA02.5	I can have a more productive commute (e.g: get to my destination faster or need less switches)	Islam, M., Abdel-Aty, M., Lee, J., Wu, Y., Yue, L., & Cai, Q. (2022) - Adapted
	IA02.6	I can have a less stressful driving/commuting experience	Islam, M., Abdel-Aty, M., Lee, J., Wu, Y., Yue, L., & Cai, Q. (2022) - Adapted

Ride hailing functionality	RHF01.1	I feel safe taking ride-hailing services (e.g: Uber)]	Ashkrof, P., Correia, G., Cats, O., & Arem, B. (2019)
	RHF01.2	I prefer ride-hailing services compared to other means of transportation]	Mouratidis, K. (2022); Ashkrof, P., Correia, G., Cats, O., & Arem, B. (2019)
	RHF01.3	It makes me uncomfortable to ride on ride-hailing services with strangers (e.g: Uber)]	Ashkrof, P., Correia, G., Cats, O., & Arem, B. (2019)
	RHF01.4	I do not need to worry about parking my vehicle]	Fagnant, D., & Kockelman, K. (2015); Correia, G., Silva, J. & Viegas, J. (2013).
	RHF01.5	I have the possibility of relaxing and not drive through these services]	Correia, G., Silva, J. & Viegas, J. (2013).
	RHF01.6	I have the possibility of socializing and meet new people through these services]	Mouratidis, K., & Serrano, V. (2021); Correia, G., Silva, J. & Viegas, J. (2013).
AV utility	AU01.1	I would be able to visit more often my family and friends.]	Inoi, H., Nishiwaki, M., & Doi, K. (2017)
	AU01.2	I would be able to visit more areas further away from my neighborhood.]	Townsend, R., Atkinson-Palombo, C., Terbeck, F., & Garrick, N. (2021).
	AU01.3	I would have better access to Social activities, Cultural activities, hobbies and/or Sports]	Townsend, R., Atkinson-Palombo, C., Terbeck, F., & Garrick, N. (2021).
	AU01.4	I would have better access to my commuting mode for work/school]	Townsend, R., Atkinson-Palombo, C., Terbeck, F., & Garrick, N. (2021).
	AU01.5	I would have a more productive commute (e.g: get to my destination faster or need fewer switches)]	Islam, M., Abdel-Aty, M., Lee, J., Wu, Y., Yue, L., & Cai, Q. (2022)
	AU01.6	I would have a less stressful driving/commuting experience]	Islam, M., Abdel-Aty, M., Lee, J., Wu, Y., Yue, L., & Cai, Q. (2022)
Participant's characteristics	PC01	Gender	
	PC02	Age	
	PC18	Country	
	PC03	Occupation	
	PC20	What is your current work format?	
	PC04	How would you describe your living location?	
	PC05	How would you describe your work/school location?	
	PC06	Approximately, how long (in minutes) do you take on your House-Work/School trip?	
	PC07	How do you feel, emotionally speaking, about your House-Work/School trip duration?	
	PC08	Education Level (If it is the case, include ongoing education)	
	PC21	How much is your monthly gross income?	
	PC10	How would you describe your family income?	
	PC11	Do you have any of the following disabilities?	
	PC12	Do you live or interact with an elderly or a disabled person?	
	PC13	Is that person, at some level, dependent on you to transport around the city?	
	PC15	Do you have a drivers license?	
	PC16	Have you ever been on a car accident?	

7.2. Annex B: Demo of the Online Survey

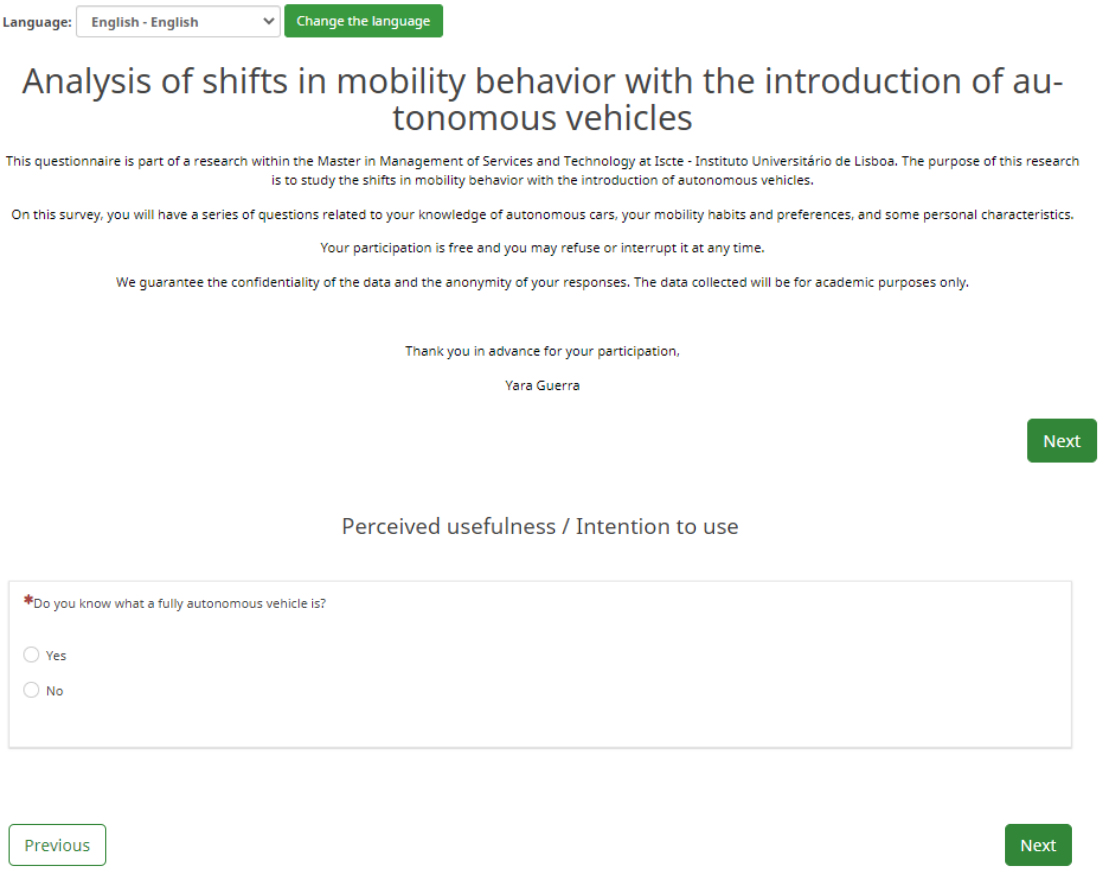


Figure 7.2.1 – Part 1: Demo of the online Survey (Source: Own authorship)

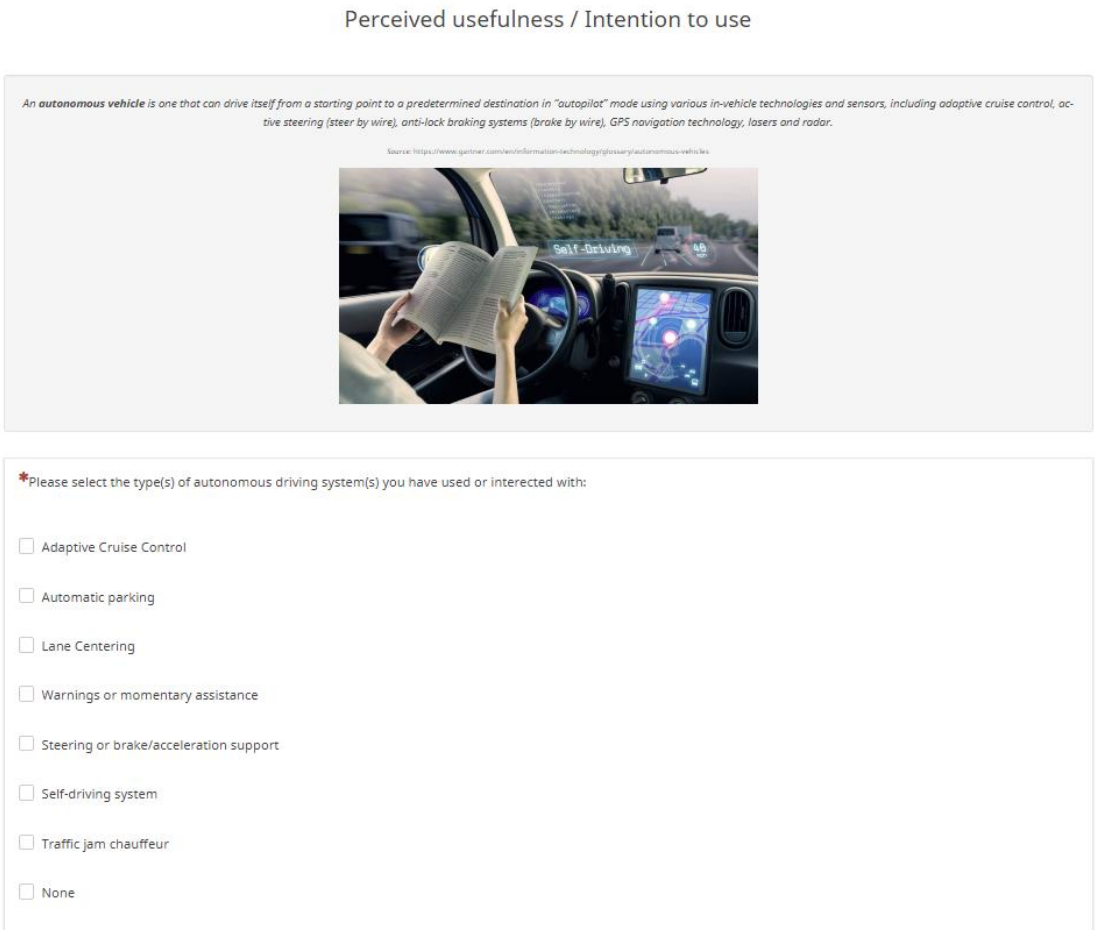
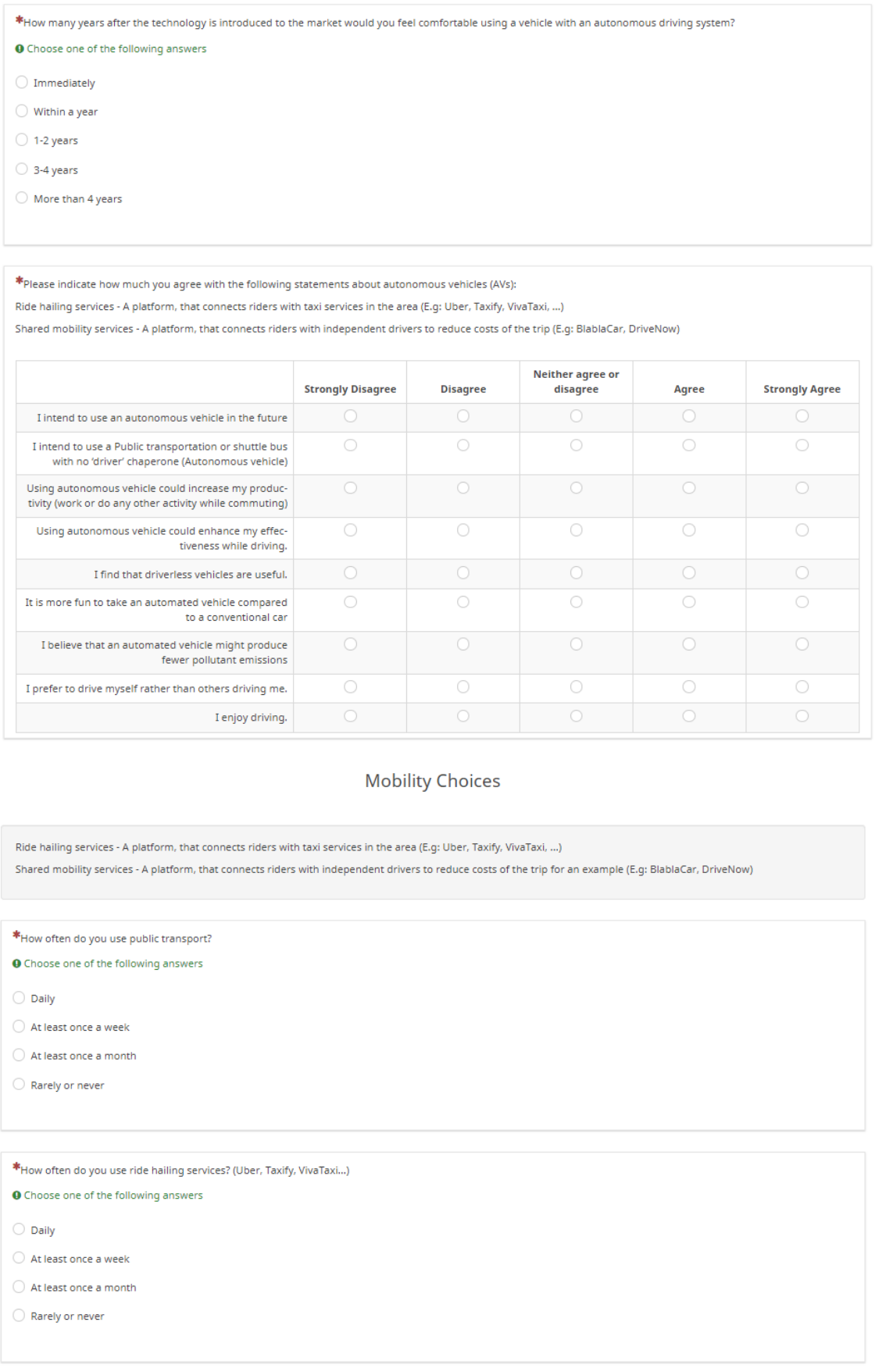


Figure 7.2.2 – Part 2: Demo of the online Survey (Source: Own authorship)



*How many years after the technology is introduced to the market would you feel comfortable using a vehicle with an autonomous driving system?

Choose one of the following answers

- Immediately
- Within a year
- 1-2 years
- 3-4 years
- More than 4 years

*Please indicate how much you agree with the following statements about autonomous vehicles (AVs):

Ride hailing services - A platform, that connects riders with taxi services in the area (E.g: Uber, Taxify, VivaTaxi, ...)

Shared mobility services - A platform, that connects riders with independent drivers to reduce costs of the trip (E.g: BlablaCar, DriveNow)

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
I intend to use an autonomous vehicle in the future					
I intend to use a Public transportation or shuttle bus with no 'driver' chaperone (Autonomous vehicle)					
Using autonomous vehicle could increase my productivity (work or do any other activity while commuting)					
Using autonomous vehicle could enhance my effectiveness while driving.					
I find that driverless vehicles are useful.					
It is more fun to take an automated vehicle compared to a conventional car					
I believe that an automated vehicle might produce fewer pollutant emissions					
I prefer to drive myself rather than others driving me.					
I enjoy driving.					

Mobility Choices

Ride hailing services - A platform, that connects riders with taxi services in the area (E.g: Uber, Taxify, VivaTaxi, ...)

Shared mobility services - A platform, that connects riders with independent drivers to reduce costs of the trip for an example (E.g: BlablaCar, DriveNow)

*How often do you use public transport?

Choose one of the following answers

- Daily
- At least once a week
- At least once a month
- Rarely or never

*How often do you use ride hailing services? (Uber, Taxify, VivaTaxi...)

Choose one of the following answers

- Daily
- At least once a week
- At least once a month
- Rarely or never

Figure 7.2.3 – Part 3: Demo of the online Survey (Source: Own authorship)

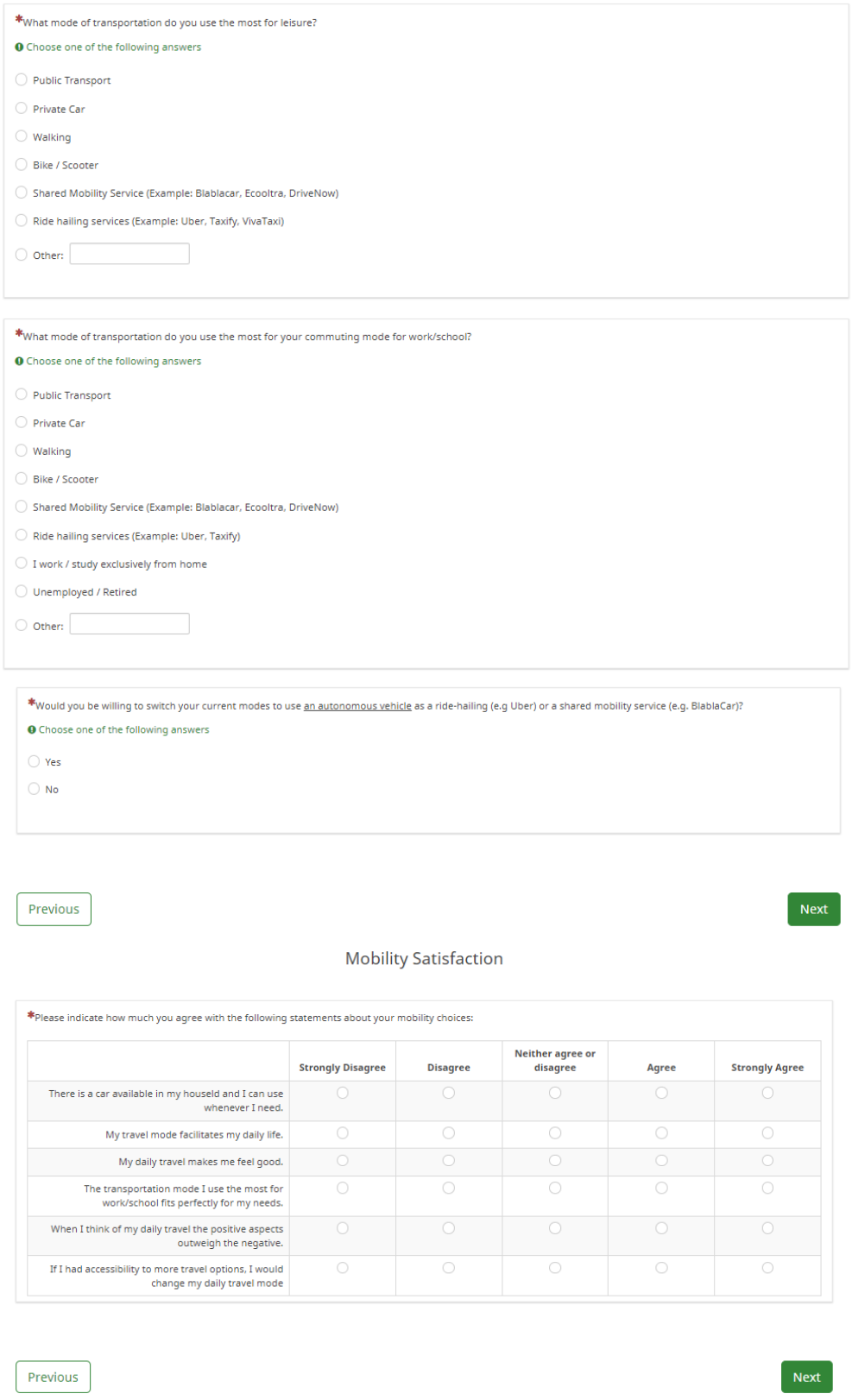


Figure 7.2.4 – Part 4: Demo of the online Survey (Source: Own authorship)

Trust

Ride hailing services - A platform, that connects riders with taxi services in the area (E.g: Uber, Taxify, VivaTaxi, ...)

Shared mobility services - A platform, that connects riders with independent drivers to reduce costs of the trip for an example (E.g: BlablaCar, DriveNow)

*Please indicate how much you agree with the following statements about autonomous vehicles (AVs):

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
AV's can be trusted to carry out journeys effectively	○	○	○	○	○
I think autonomous vehicles would operate better than human drivers	○	○	○	○	○
I trust that the government will protect me from possible problems using driverless vehicles	○	○	○	○	○
Driverless cars have enough safeguards to make me feel comfortable using it	○	○	○	○	○
My trust in AVs will be based on the car manufacturer's reputation for safety and reliability	○	○	○	○	○
I trust driverless cars to keep my best interests in mind	○	○	○	○	○

Previous Next

Privacy

Ride hailing services - A platform, that connects riders with taxi services in the area (E.g: Uber, Taxify, VivaTaxi, ...)

Shared mobility services - A platform, that connects riders with independent drivers to reduce costs of the trip for an example (E.g: BlablaCar, DriveNow)

[1] Mass surveillance is the intricate surveillance of an entire or a substantial fraction of a population in order to monitor that group of citizens. The surveillance is often carried out by local and federal governments or governmental organisations, such as organizations like the NSA and the FBI, but it may also be carried out by corporations

*Please indicate how much you agree with the following statements about autonomous vehicles (AVs):

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
I would feel safe about Data privacy (location and destination tracking) issues, regarding AV's	○	○	○	○	○
I would feel safe about about Personal information privacy issues, regarding AV's	○	○	○	○	○
I would feel safe about Personal autonomy privacy (privacy of making individual choices) issues, regarding AV's	○	○	○	○	○
I would feel safe about Mass surveillance issues, regarding AV's [1]	○	○	○	○	○

Previous Next

Figure 7.2.5 – Part 5: Demo of the online Survey (Source: Own authorship)

Accessibility and social activities

*Please indicate how much you agree with the following statements about your social characteristics

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
The Public transport I have access to, is good for work/school trips	○	○	○	○	○
The Public transport I have access to, is good for trips, e.g. shopping, leisure	○	○	○	○	○
Lack of easy access to the transport system often makes me feel socially excluded.	○	○	○	○	○
My neighborhood offers me a wide range of leisure activities	○	○	○	○	○
I would prefer to use another type of transportation than my current one for my leisure activities	○	○	○	○	○
I would prefer to use another type of transportation than my current one for my commuting journey (home - work / school)	○	○	○	○	○
My social life is hampered by the failure in my transportation needs.	○	○	○	○	○
I feel completely safe in my neighborhood, at night.	○	○	○	○	○

Previous Next

Ride hailing utility

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For this group, please assume that the cost of the following options (AV's and taxicabs / ride hailing services) are the same.

Ride hailing services - A platform, that connects riders with taxi services in the area (E.g: Uber, Taxify, VivaTaxi, ...)

Shared mobility services - A platform, that connects riders with independent drivers to reduce costs of the trip for an example (E.g: BlablaCar, DriveNow)

*Please indicate how much you agree with the following statements about ride-hailing functionality:

With the existent Ride-hailing and Shared mobility services ...

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
... I can visit more often my family and friends	○	○	○	○	○
... I can visit more areas further away from my neighborhood	○	○	○	○	○
... I can have better access to Social activities, Cultural activities, hobbies and/or Sports	○	○	○	○	○
... I can have better access to my commuting mode for work/school	○	○	○	○	○
... I can have a more productive commute (e.g: get to my destination faster or need less switches)	○	○	○	○	○
... I can have a less stressful driving/commuting experience	○	○	○	○	○

Previous Next

Figure 7.2.6 – Part 6: Demo of the online Survey (Source: Own authorship)

Ride hailing functionality

Ride hailing services - A platform, that connects riders with taxi services in the area (E.g: Uber, Taxify, VivaTaxi, ...)

Shared mobility services - A platform, that connects riders with independent drivers to reduce costs of the trip for an example (E.g: BlablaCar, DriveNow)

*Please indicate how much you agree with the following statements about ride-hailing functionality:

With the existent taxicabs/Ride hailing and Shared mobility services ...

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
I feel safe taking ride-hailing services (e.g: Uber)	○	○	○	○	○
I prefer ride-hailing services compared to other means of transportation	○	○	○	○	○
It makes me uncomfortable to ride on ride-hailing services with strangers (e.g: Uber)	○	○	○	○	○
I do not need to worry about parking my vehicle	○	○	○	○	○
I have the possibility of relaxing and not drive through these services	○	○	○	○	○
I have the possibility of socializing and meet new people through these services	○	○	○	○	○

Previous Next

AV utility

*Please indicate how much you agree with the following statements about the impact of autonomous vehicles (Avs):

With autonomous vehicles through ride-hailing services (Uber, VivaTaxi) and shared mobility services (DriveNow), ...

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
... I would be able to visit more often my family and friends.	○	○	○	○	○
... I would be able to visit more areas further away from my neighborhood.	○	○	○	○	○
... I would have better access to Social activities, Cultural activities, hobbies and/or Sports	○	○	○	○	○
... I would have better access to my commuting mode for work/school	○	○	○	○	○
... I would have a more productive commute (e.g: get to my destination faster or need fewer switches)	○	○	○	○	○
... I would have a less stressful driving/commuting experience	○	○	○	○	○

Previous Next

Figure 7.2.7 – Part 7: Demo of the online Survey (Source: Own authorship)

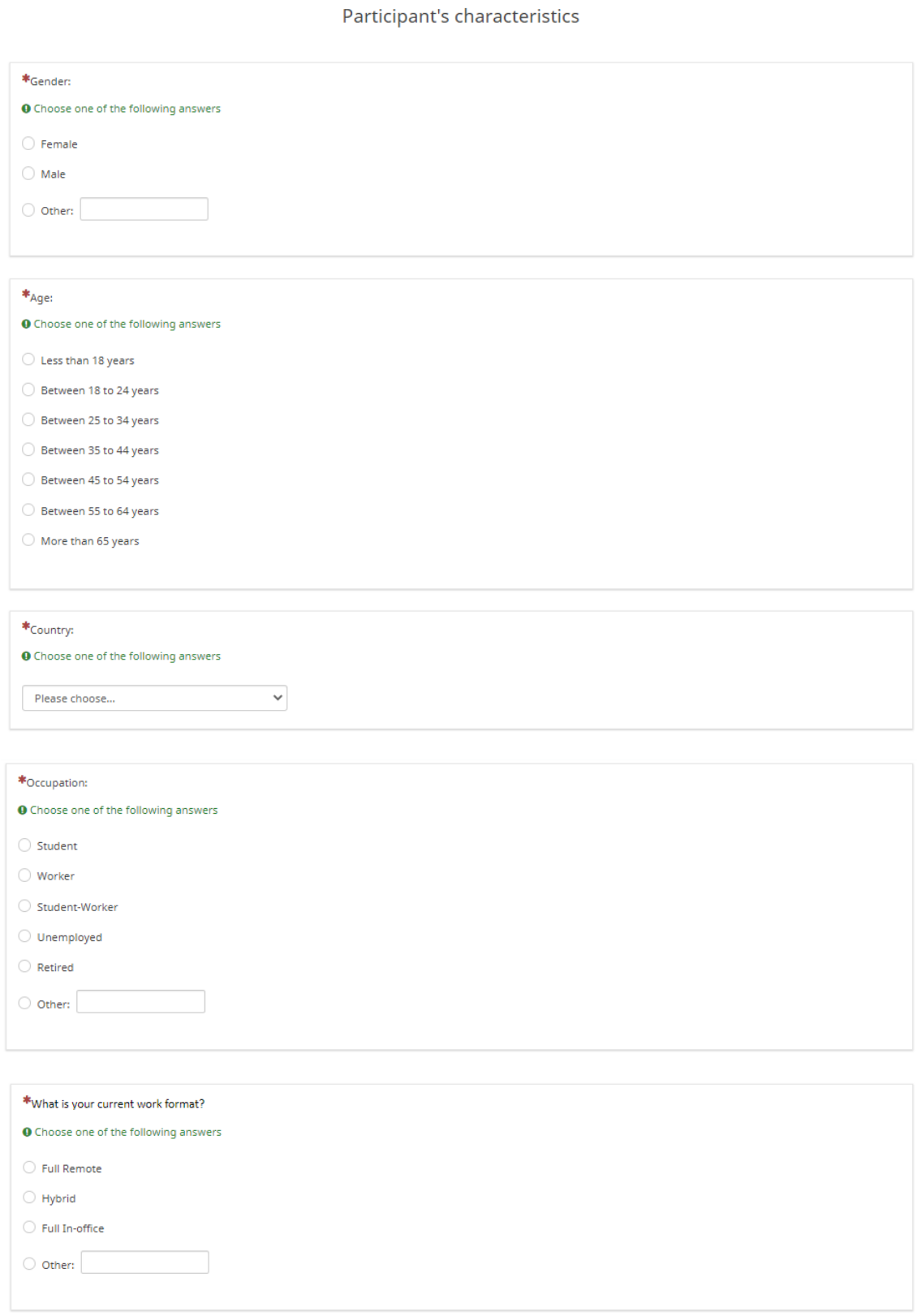

Figure 7.2.8 – Part 8: Demo of the online Survey (Source: Own authorship)

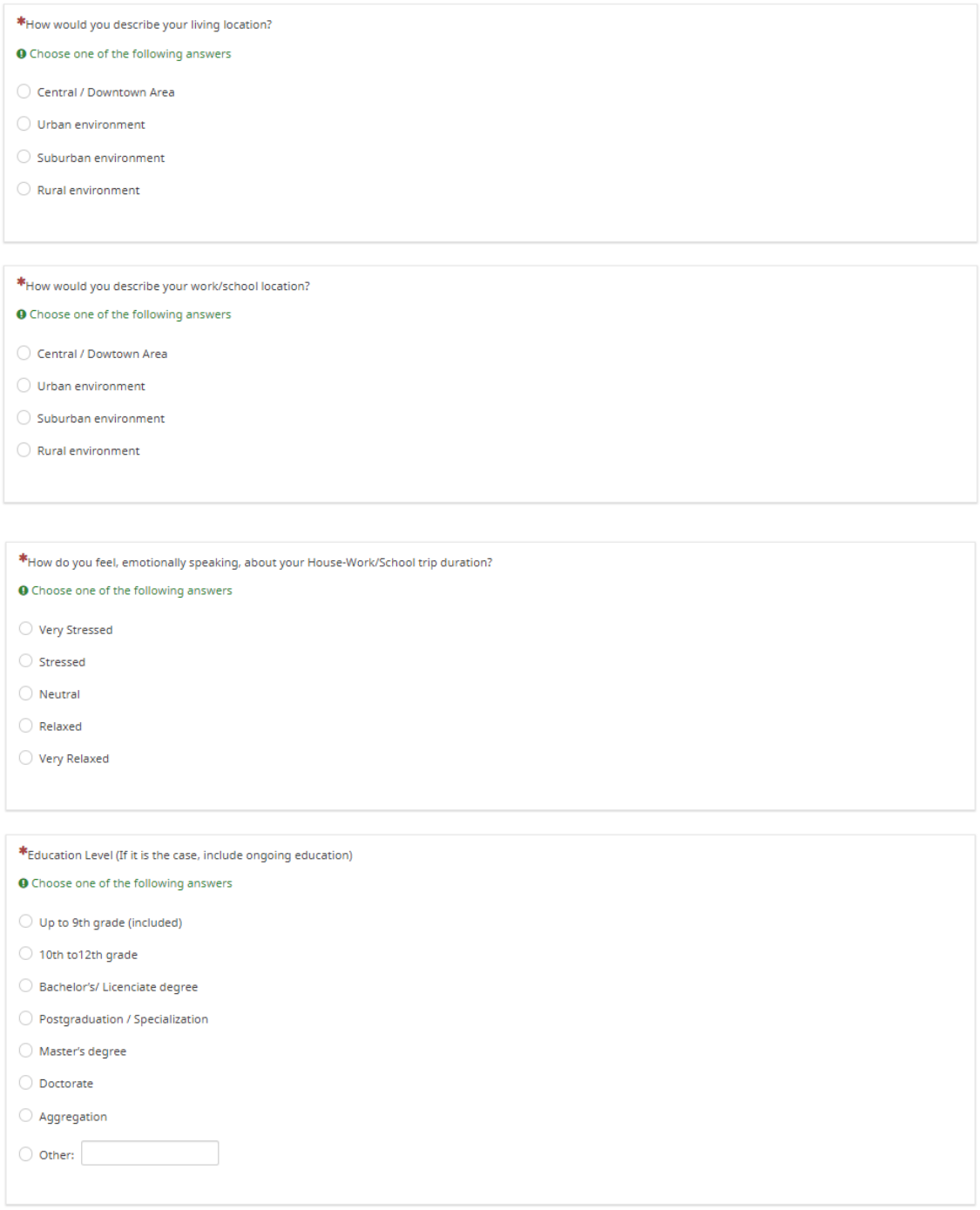

Figure 7.2.9 – Part 9: Demo of the online Survey (Source: Own authorship)

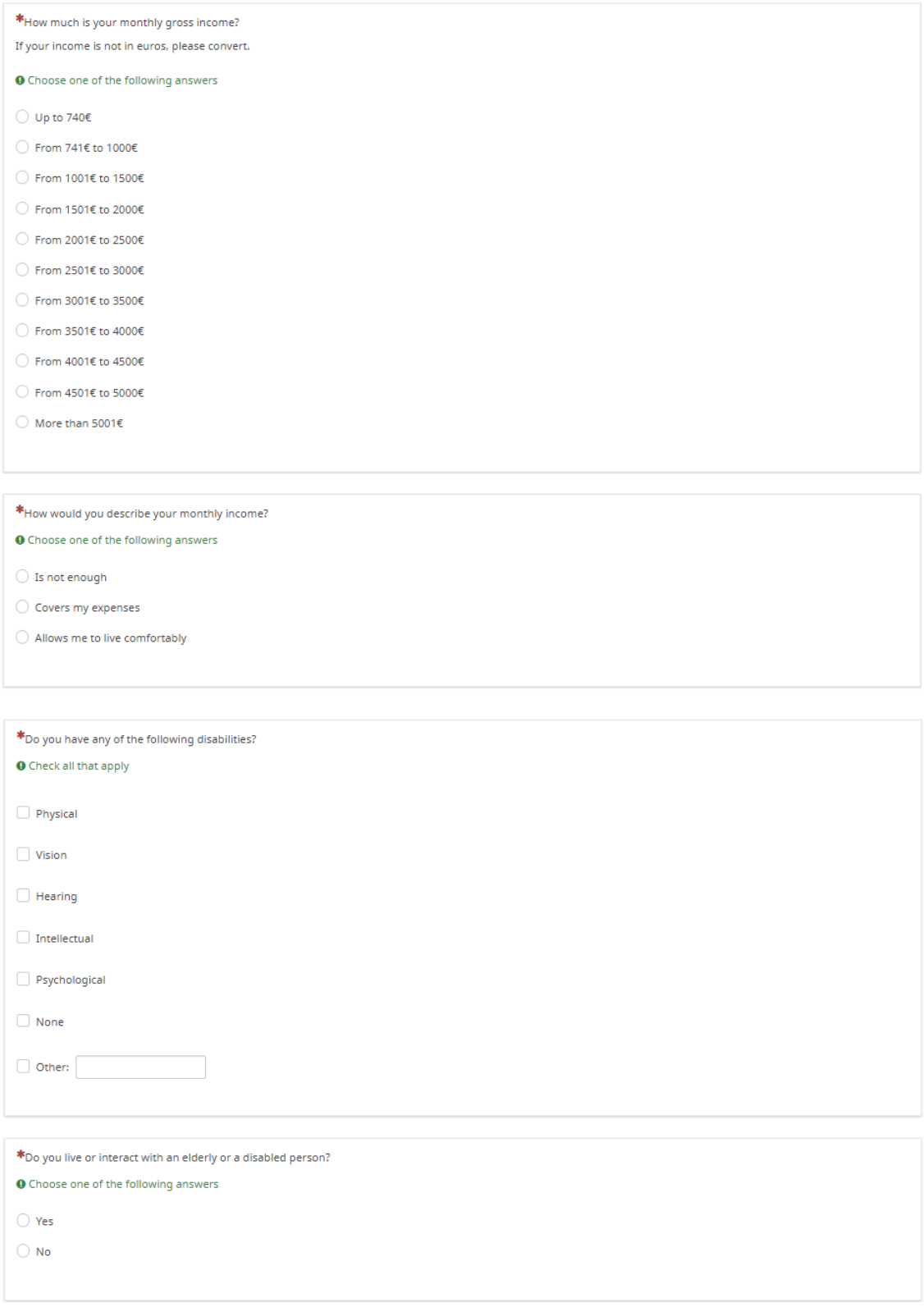

Figure 7.2.10 – Part 10: Demo of the online Survey (Source: Own authorship)

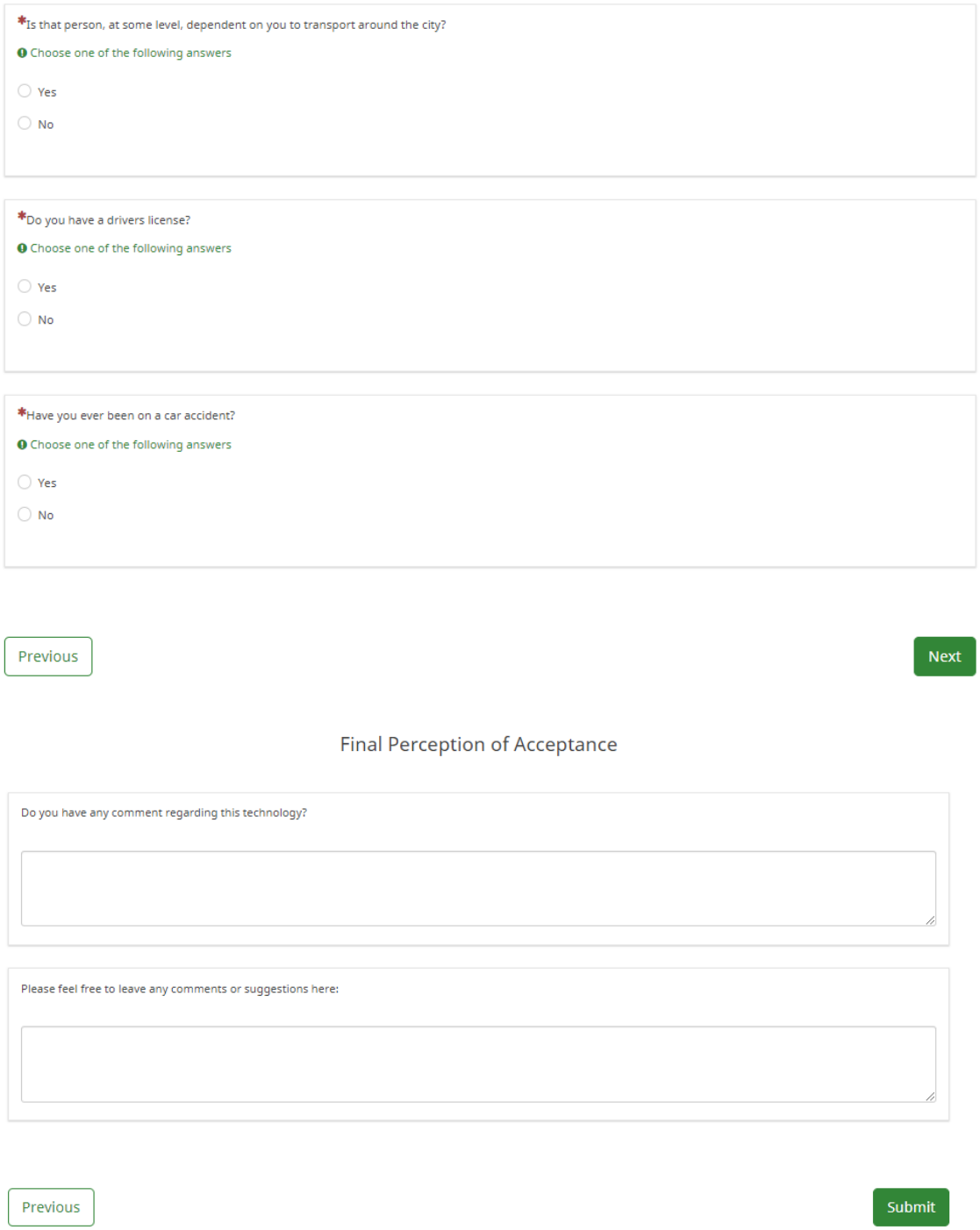

Figure 7.2.11 – Part 11: Demo of the online Survey (Source: Own authorship)

7.3. Annex C: Sample Statistics

Table 7.3.1 – Gender distribution (Source: Own authorship)

Gender (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	31	53.4	53.4	53.4
	Female	27	46.6	46.6	100
	Total	58	100	100	

Table 7.3.2 – Age distribution (Source: Own authorship)

Age (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	2	3.4	3.4	3.4
	25-34	15	25.9	25.9	29.3
	35-44	17	29.3	29.3	58.6
	45-54	16	27.6	27.6	86.2
	55-64	7	12.1	12.1	98.3
	+65	1	1.7	1.7	100
	Total	58	100	100	

Table 7.3.3 – Living Location distribution (Source: Own authorship)

How would you describe your living location? (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural environment	2	3.4	3.4	3.4
	Suburban environment	6	10.3	10.3	13.8
	Urban environment	24	41.4	41.4	55.2
	Central / Downtown Area	26	44.8	44.8	100
	Total	58	100	100	

Table 7.3.4 – Work distribution (Source: Own authorship)

How would you describe your work/school location? (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural environment	2	3.4	3.4	3.4
	Suburban environment	4	6.9	6.9	10.3
	Urban environment	18	31	31	41.4
	Central / Downtown Area	34	58.6	58.6	100
	Total	58	100	100	

Table 7.3.5 – Occupation distribution (Source: Own authorship)

Occupation (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	2	3.4	3.4	3.4
	Student-Worker	1	1.7	1.7	5.2
	Worker	51	87.9	87.9	93.1
	Unemployed	1	1.7	1.7	94.8
	Retired	3	5.2	5.2	100
	Total	58	100	100	

Table 7.3.6 – Time Spent Commuting distribution (Source: Own authorship)

Approximately, how long (in minutes) do you take on your House-Work/School trip? (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 15 minutes	20	34.5	34.5	34.5
	15-30 minutes	18	31	31	65.5
	30-45 minutes	9	15.5	15.5	81
	45-60 minutes	4	6.9	6.9	87.9
	More than 60 minutes	3	5.2	5.2	93.1
	Other	4	6.9	6.9	100
	Total	58	100	100	

Table 7.3.7 – Country distribution (Source: Own authorship)

Country (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mozambique	48	82.8	82.8	82.8
	Brazil	1	1.7	1.7	84.5
	United Arab Emirates	1	1.7	1.7	86.2
	Cape verde	4	6.9	6.9	93.1
	Australia	1	1.7	1.7	94.8
	Russian Federation	1	1.7	1.7	96.6
	Burkina Faso	1	1.7	1.7	98.3
	Angola	1	1.7	1.7	100
	Total	58	100	100	

Table 7.3.8 – Work format distribution (Source: Own authorship)

What is your current work format? (EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full remote	23	9.1	9.1	9.1
	Hybrid	91	36.1	36.1	45.2
	Full In-Office	118	46.8	46.8	92.1
	Other	20	7.9	7.9	100.0
	Total	252	100.0	100.0	

What is your current work format? (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full remote	3	5.2	5.2	5.2
	Hybrid	9	15.5	15.5	20.7
	Full In-Office	41	70.7	70.7	91.4
	Other	5	8.6	8.6	100
	Total	58	100	100	

Table 7.3.9 – Emotional perception of commuting trips distribution (Source: Own authorship)

How do you feel, emotionally speaking, about your House-Work/School trip duration? (EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Stressed	14	5.6	5.6	5.6
	Stressed	57	22.6	22.6	28.2
	Neutral	100	39.7	39.7	67.9
	Relaxed	56	22.2	22.2	90.1
	Very Relaxed	25	9.9	9.9	100
	Total	252	100	100	

How do you feel, emotionally speaking, about your House-Work/School trip duration? (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Stressed	3	5.2	5.2	5.2
	Stressed	11	19	19	24.1
	Neutral	26	44.8	44.8	69
	Relaxed	15	25.9	25.9	94.8
	Very Relaxed	3	5.2	5.2	100
	Total	58	100	100	

Table 7.3.10 – Education Level distribution (Source: Own authorship)

Education Level (If it is the case, include ongoing education) (EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9th grade or less	4	1.6	1.6	1.6
	10th to12th grade	40	15.9	15.9	17.5
	Bachelor's/ Licenciate degree	93	36.9	36.9	54.4
	Postgraduation / Specialization	21	8.3	8.3	62.7
	Master's degree	90	35.7	35.7	98.4
	Doctorate	4	1.6	1.6	100
	Total	252	100	100	

Education Level (If it is the case, include ongoing education) (Non-EU Residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9th grade or less	3	5.2	5.2	5.2
	10th to12th grade	9	15.5	15.5	20.7
	Bachelor's/ Licenciate degree	30	51.7	51.7	72.4
	Postgraduation / Specialization	4	6.9	6.9	79.3
	Master's degree	10	17.2	17.2	96.6
	Doctorate	2	3.4	3.4	100
	Total	58	100	100	

Table 7.3.11 Monthly gross income distribution (Source: Own authorship)

How much is your monthly gross income? If your income is not in euros, please convert. (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Up to 740€	43	17.1	17.1	17.1
	From 741€ to 1000€	45	17.9	17.9	34.9
	From 1001€ to 1500€	73	29	29	63.9
	From 1501€ to 2000€	37	14.7	14.7	78.6
	From 2001€ to 2500€	20	7.9	7.9	86.5
	From 2501€ to 3000€	18	7.1	7.1	93.7
	From 3001€ to 3500€	5	2	2	95.6
	From 3501€ to 4000€	2	0.8	0.8	96.4
	From 4001€ to 4500€	3	1.2	1.2	97.6
	From 4501€ to 5000€	1	0.4	0.4	98
	More than 5001€	5	2	2	100
	Total	252	100	100	

How much is your monthly gross income? If your income is not in euros, please convert. (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Up to 740€	12	20.7	20.7	20.7
	From 741€ to 1000€	13	22.4	22.4	43.1
	From 1001€ to 1500€	9	15.5	15.5	58.6
	From 1501€ to 2000€	7	12.1	12.1	70.7

	From 2001€ to 2500€	3	5.2	5.2	75.9
	From 2501€ to 3000€	3	5.2	5.2	81
	From 3001€ to 3500€	3	5.2	5.2	86.2
	From 3501€ to 4000€	1	1.7	1.7	87.9
	From 4001€ to 4500€	1	1.7	1.7	89.7
	From 4501€ to 5000€	1	1.7	1.7	91.4
	More than 5001€	5	8.6	8.6	100
	Total	58	100	100	

Table 7.3.12 Perception of the monthly gross income distribution (Source: Own authorship)

How would you describe your monthly income? (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Is not enough	52	20.6	20.6	20.6
	Covers my expenses	140	55.6	55.6	76.2
	Allows me to live comfortably	60	23.8	23.8	100
	Total	252	100	100	

How would you describe your monthly income? (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Is not enough	24	41.4	41.4	41.4
	Covers my expenses	24	41.4	41.4	82.8
	Allows me to live comfortably	10	17.2	17.2	100
	Total	58	100	100	

Table 7.3.13 Physical disability distribution (Source: Own authorship)

Physical disability (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	243	96.4	96.4	96.4
	Yes	9	3.6	3.6	100
	Total	252	100	100	

Physical disability (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	57	98.3	98.3	98.3
	Yes	1	1.7	1.7	100
	Total	58	100	100	

Table 7.3.14 Vision disability distribution (Source: Own authorship)

Vision disability (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	239	94.8	94.8	94.8
	Yes	13	5.2	5.2	100
	Total	252	100	100	

Vision disability (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	55	94.8	94.8	94.8
	Yes	3	5.2	5.2	100
	Total	58	100	100	

Table 7.3.15 Vision disability distribution (Source: Own authorship)

Hearing disability (EU residents)

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	No	252	100	100	100

Hearing disability (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	58	100	100	100

Table 7.3.16 Intellectual disability distribution (Source: Own authorship)

Intellectual disability (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	251	99.6	99.6	99.6
	Yes	1	0.4	0.4	100
	Total	252	100	100	

Intellectual disability (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	58	100	100	100

Table 7.3.17 Psychological disability distribution (Source: Own authorship)

Psychological disability (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	245	97.2	97.2	97.2
	Yes	7	2.8	2.8	100
	Total	252	100	100	

Psychological disability (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	58	100	100	100

Table 7.3.18 No disability distribution (Source: Own authorship)

None (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	28	11.1	11.1	11.1
	Yes	224	88.9	88.9	100
	Total	252	100	100	

None (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5	8.6	8.6	8.6
	Yes	53	91.4	91.4	100
	Total	58	100	100	

Table 7.3.19 Living or interacting with an elderly or disabled person distribution (Source: Own authorship)

Do you live or interact with an elderly or disabled person? (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	191	75.8	75.8	75.8
	Yes	61	24.2	24.2	100
	Total	252	100	100	

Do you live or interact with an elderly or disabled person? (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	38	65.5	65.5	65.5
	Yes	20	34.5	34.5	100
	Total	58	100	100	

Table 7.3.20 Dependency of the elderly or disabled person distribution (Source: Own authorship)

Is that person, at some level, dependent on you to transport them around the city? (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	33	13.1	54.1	54.1
	Yes	28	11.1	45.9	100
	Total	61	24.2	100	
Missing	System	191	75.8		
Total		252	100		

Is that person, at some level, dependent on you to transport them around the city? (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	19	55	55
	Yes	9	15.5	45	100
	Total	20	34.5	100	
Missing	System	38	65.5		
Total		58	100		

Table 7.3.21 Driver's license distribution (Source: Own authorship)

Do you have a driver's license? (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	23	9.1	9.1	9.1
	Yes	229	90.9	90.9	100.0
	Total	252	100.0	100.0	

Do you have a driver's license? (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5	8.6	8.6	8.6
	Yes	53	91.4	91.4	100.0
	Total	58	100.0	100.0	

Table 7.3.22 Car accident experience distribution (Source: Own authorship)

Have you ever been on a car accident? (EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	133	52.8	52.8	52.8
	Yes	119	47.2	47.2	100
	Total	252	100	100	

Have you ever been on a car accident? (Non-EU residents)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	21	36.2	36.2	36.2
	Yes	37	63.8	63.8	100
	Total	58	100	100	

Table 7.3.23 Descriptive Statistics of the survey questions (Source: Own authorship)

	N	Mean	Std. Deviation
PU04.1 I intend to use an autonomous vehicle in the future	252	3.4444	1.07159
PU04.2 I intend to use a Public transportation or shuttle bus with no 'driver' chaperone (Autonomous vehicle)	252	3.2341	1.12768
PU04.3 Using autonomous vehicle could increase my productivity (work or do any other activity while commuting)	252	3.4802	1.10936
PU04.4 Using autonomous vehicle could enhance my effectiveness while driving.	252	3.0595	1.16405

PU04.5 I find that driverless vehicles are useful.	252	3.8254	0.86618
PU04.6 It is more fun to take an autonomous vehicle compared to a conventional car	252	2.7579	1.0604
PU04.7 I believe that an autonomous vehicle might produce fewer pollutant emissions	252	3.373	0.9382
PU04.8 I prefer to drive myself rather than others driving me.	252	3.4921	1.20256
PU04.9 I enjoy driving.	252	4.0198	1.09126
MS01.1 There is a car available in my houseld and I can use whenever I need	252	3.9802	1.2254
MS01.2 My travel mode facilitates my daily life	252	4.123	0.93873
MS01.3 My daily travel makes me feel good	252	3.873	1.00186
MS01.4 The transportation mode I use the most for work/school fits perfectly for my needs	252	4.0198	0.89465
MS01.5 When I think of my daily travel the positive aspects outweigh the negative	252	3.9683	0.89653
MS01.6 If I had accessibility to more travel options, I would change my daily travel mode	252	3.2421	1.12953
T01.1 AV's can be trusted to carry out journeys effectively	252	3.4921	0.85848
T01.2 I think autonomous vehicles would operate better than human drivers	252	3.1468	0.98103
T01.3 I trust that the government will protect me from possible problems using driverless vehicles	252	2.6984	0.99617
T01.4 Driverless cars have enough safeguards to make me feel comfortable using it	252	3.119	0.8936
T01.5 My trust in AVs will be based on the car manufacturer’s reputation for safety and reliability	252	3.7897	0.86971
T01.6 I trust driverless cars to keep my best interests in mind	252	3.1667	0.86775
P01.1 I would feel safe about Data privacy (location and destination tracking) issues, regarding AV's	252	3.0476	1.07011
P01.2 I would feel safe about Personal information privacy issues, regarding AV's	252	3.0357	1.05747
P01.3 I would feel safe about Personal autonomy privacy (privacy of making individual choices) issues, regarding AV's	252	3.246	1.05004
P01.4 I would feel safe about Mass surveillance issues, regarding AV's	252	3	1.04099
ASC01.1 The Public transport I have access to, is good for work/school trips	252	3.0437	1.2345
ASC01.2 The Public transport I have access to, is good for trips, e.g. shopping, leisure	252	2.6706	1.14604
ASC01.3 Lack of easy access to the transport system often makes me feel socially excluded.	252	2.4762	1.07647

ASC01.4 My neighborhood offers me a wide range of leisure activities	252	3.3294	1.11788
ASC01.5 I would prefer to use another type of transportation than my current one for my leisure activities	252	2.7738	1.08981
ASC01.6 I would prefer to use another type of transportation than my current one for my commuting journey (home - work / school	252	2.8333	1.16558
ASC01.7 My social life is hampered by the failure in my transportation needs.	252	2.2937	1.06046
ASC01.8 I feel completely safe in my neighborhood, at night.	252	3.9167	0.93034
RHU02.1 I can visit more often my family and friends	252	2.9921	1.02942
RHU02.2 I can visit more areas further away from my neighborhood	252	3.0079	1.04478
RHU02.3 I can have better access to Social activities, Cultural activities, hobbies and/or Sports	252	3.2659	1.02009
RHU02.4 I can have better access to my commuting mode for work/school	252	2.9246	1.02861
RHU02.5 I can have a more productive commute (e.g: get to my destination faster or need less switches)	252	3.3175	1.06484
RHU02.6 I can have a less stressful driving/commuting experience	252	3.5317	0.9378
RHF01.1 I feel safe taking ride-hailing services (e.g: Uber)	252	3.6587	0.85771
RHF01.2 I prefer ride-hailing services compared to other means of transportation	252	3.2222	1.09972
RHF01.3 It makes me uncomfortable to ride on ride-hailing services with strangers (e.g: Uber)	252	2.8452	1.11663
RHF01.4 I do not need to worry about parking my vehicle	252	4.0675	0.96524
RHF01.5 I have the possibility of relaxing and not drive through these services	252	3.9365	0.77558
RHF01.6 I have the possibility of socializing and meet new people through these services	252	2.8056	0.97268
AU01.1 I would be able to visit more often my family and friends.	252	2.7698	1.06118
AU01.2 I would be able to visit more areas further away from my neighborhood.	252	2.9286	1.0799
AU01.3 I would have better access to Social activities, Cultural activities, hobbies and/or Sports	252	3.0198	1.02732
AU01.4 I would have better access to my commuting mode for work/school	252	2.7897	1.04071
AU01.5 I would have a more productive commute (e.g: get to my destination faster or need fewer switches)	252	3.1865	1.0604
AU01.6 I would have a less stressful driving/commuting experience	252	3.3333	1.02945

7.4. Annex D: Data Analysis

Table 7.4.1 – T-test on gender variables regarding Intention to Use (Source: Own authorship)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PU03	Equal variances assumed	4.686	0.031	-2.895	246	0.002	0.004	-0.493	0.170	-0.828
	Equal variances not assumed			-2.851	219.06	0.002	0.005	-0.493	0.172	-0.83

Table 7.4.2 – Group Statistics on gender variables regarding Intention to Use (Source: Own authorship)

	PC01.1 Gender	N	Mean	Std. Deviation	Std. Error Mean
PU03	Male	112	2.96	1.45	0.14
	Female	136	3.45	1.23	0.11

Table 7.4.3 – T-test on gender variables regarding Perceived usefulness (Source: Own authorship)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PU04.8	Equal variances assumed	8.922	0.003	2.963	246	0.003	0.446	0.150	0.150	0.744
	Equal variances not assumed			3.011	245.799	0.003	0.446	0.148	0.155	0.739
PU04.9	Equal variances assumed	6.297	0.013	3.533	246	<.001	0.465	0.131	0.206	0.725
	Equal variances not assumed			3.617	245.372	<.001	0.465	0.128	0.212	0.719

Table 7.4.4 – Kruskal-Wallis hypothesis test summary between Work Formats regarding Perceived usefulness (Source: Own authorship)

	Null Hypothesis	Test	Sig. a,b	Decision
2	PU04.2	Independent-Samples Kruskal-Wallis Test	0.043	Reject the null hypothesis.

Table 7.4.5 – Pairwise comparisons between Work Format variables regarding Perceived usefulness (Source: Own authorship)

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
Full In-Office-Hybrid	27.673	9.806	2.822	.005	.029

Table 7.4.6 – Kruskal-Wallis hypothesis test summary between Work Location regarding Perceived usefulness (Source: Own authorship)

	Null Hypothesis	Test	Sig. a,b	Decision
3	PU04.3	Independent-Samples Kruskal-Wallis Test	0.037	Reject the null hypothesis.

Table 7.4.7 – Pairwise comparisons between Work Location variables regarding Perceived usefulness (Source: Own authorship)

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
Rural environment-Urban environment	-48.048	18.571	-2.587	0.01	0.05

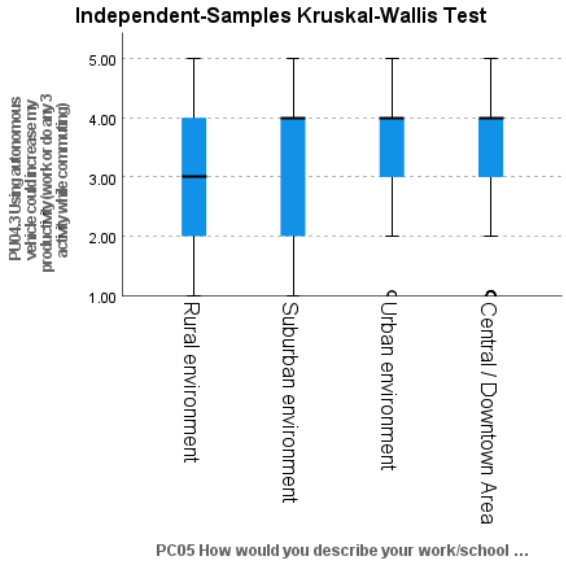

Figure 7.4.1 – Independent-Samples Kruskal-Wallis Test between Work Location variables regarding Perceived usefulness (Source: Own authorship)

Table 7.4.8 – One way ANOVA test between Time spent Commuting variables regarding Perceived usefulness (Source: Own authorship)

		Sum of Squares	df	Mean Square	F	Sig.
PU04.3	Between Groups	14.524	4	3.631	3.047	0.018
	Within Groups	294.377	247	1.192		
	Total	308.901	251			

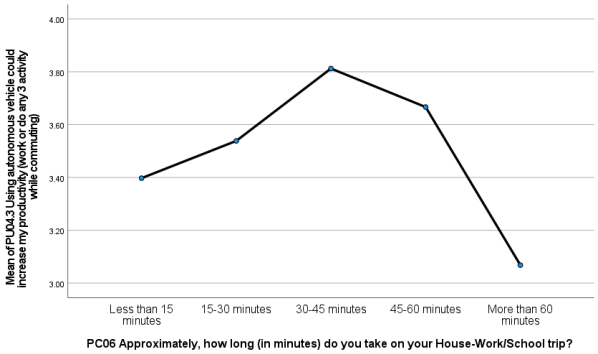

Figure 7.4.2 – Opinion variation regarding productivity with AVs by different commuting times (Source: Own authorship)

Table 7.4.9 – Kruskal-Wallis hypothesis test summary between Education level regarding Perceived usefulness (Source: Own authorship)

	Null Hypothesis	Test	Sig. a,b	Decision
5	PU04.5	Independent-Samples Kruskal-Wallis Test	0.013	Reject the null hypothesis.

Table 7.4.10 – Pairwise comparisons between Education level variables regarding Perceived usefulness (Source: Own authorship)

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
10th to12th grade-Bachelor's/ Licenciate degree	-26.911	12.170	-2.211	.027	.405
10th to12th grade-Postgraduation / Specialization	-38.825	17.345	-2.238	.025	.378
10th to12th grade-Master's degree	-44.547	12.231	-3.642	<.001	.004

Table 7.4.11 – Kruskal-Wallis hypothesis test summary between Income variables regarding Perceived usefulness (Source: Own authorship)

Hypothesis Test Summary

	Null Hypothesis	Test	Sig. a,b	Decision
3	PU04.3	Independent-Samples Kruskal-Wallis Test	0.013	Reject the null hypothesis.

Table 7.4.12 – Mann-Whitney Ranks result regarding having dependents to transport around (Source: Own authorship)

		N	Mean Rank	Sum of Ranks
PU04.2	No	33	26.71	881.5
	Yes	28	36.05	1009.5
	Total	61		

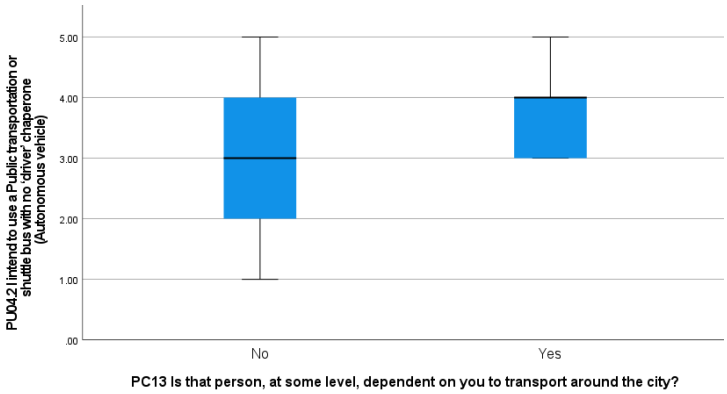

Figure 7.4.3 – Variations of opinions regarding Intention to use autonomous PTs by having dependents to transport (Source: Own authorship)

Table 7.4.13 – Pairwise comparisons between Living Location variables regarding Mobility Satisfaction (Source: Own authorship)

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
Suburban environment-Urban environment	-30.498	10.920	-2.793	.005	.031
Suburban environment-Central / Downtown Area	-41.791	12.248	-3.412	<.001	.004
Suburban environment-Rural environment	48.381	16.305	2.967	.003	.018

Table 7.4.14 – Count distribution of means of transport for commuting trips, per living location types (Source: Own authorship)

Sample 1-Sample 2	Rural environment	Suburban environment	Urban environment	Central / Downtown Area
Public Transport	2	21	33	20
Private Car	18	31	57	25
Walking	0	3	7	8
Bike / Scooter	0	0	1	0
Shared Mobility Service	0	0	0	0
Ride hailing services	0	0	1	2
I work / study exclusively from home	3	2	6	2
Unemployed / Retired	1	2	1	2
Other	0	0	1	3

Table 7.4.15 – Mean distribution on Living location regarding desire to change daily travel mode (Source: Own authorship)

	Rural environment	Suburban environment	Urban environment	Central / Downtown Area
	Mean	Mean	Mean	Mean
MS01.6	3.25	3.56	3.27	2.89

Table 7.4.16 – ANOVA results regarding Time spent on daily Commuting regarding mobility satisfaction (Source: Own authorship)

		Sum of Squares	df	Mean Square	F	Sig.
MS01.2	Between Groups	28.337	4	7.084	9.074	<.001
	Within Groups	192.849	247	0.781		
	Total	221.187	251			
MS01.3	Between Groups	40.039	4	10.01	11.668	<.001
	Within Groups	211.898	247	0.858		
	Total	251.937	251			
MS01.4	Between Groups	23.765	4	5.941	8.284	<.001
	Within Groups	177.136	247	0.717		
	Total	200.901	251			
MS01.5	Between Groups	14.341	4	3.585	4.725	0.001
	Within Groups	187.405	247	0.759		
	Total	201.746	251			

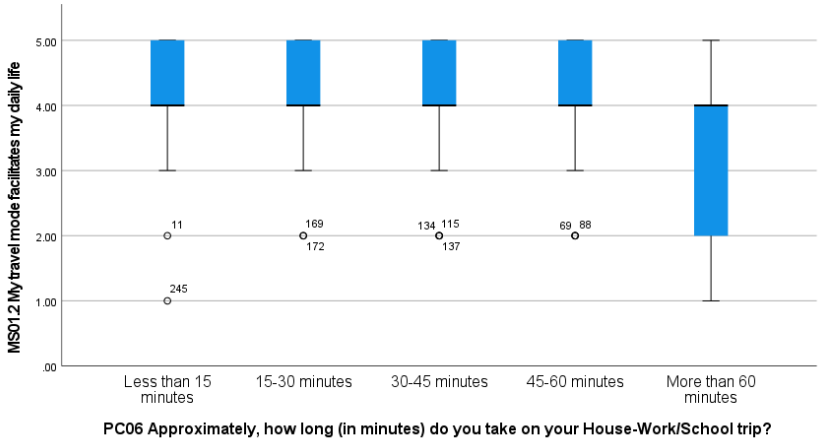

Figure 7.4.4 – Variations of opinions on Mobility satisfaction regarding their time spent on daily commuting (Source: Own authorship)

Table 7.4.17 – Percentage distribution of means of transport for commuting trips, per time spent on daily commuting (Source: Own authorship)

		Public Transport Row N %	Private Car Row N %	Walking Row N %	Bike / Scooter Row N %	Shared Mobility Service Row N %	Ride-hailing services Row N %	Work/study exclusively from home Row N %	Unemployed/ Retired Row N %	Other Row N %
PC06	Less than 15 minutes	10.3%	46.2%	14.1%	0.0%	0.0%	3.8%	14.1%	7.7%	3.8%
	15-30 minutes	9.6%	73.1%	13.5%	1.9%	0.0%	0.0%	0.0%	0.0%	1.9%
	30-45 minutes	39.6%	58.3%	0.0%	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%
	45-60 minutes	36.7%	60.0%	0.0%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%
	More than 60 minutes	75.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

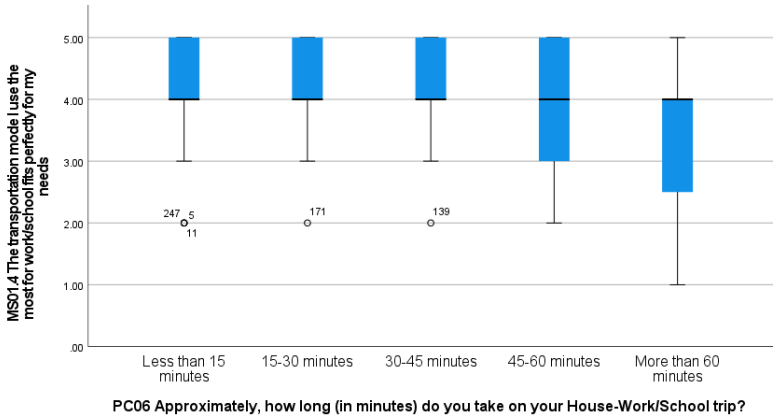

Figure 7.4.5 – Variations of opinions on Mobility satisfaction regarding their time spent on daily commuting (Source: Own authorship)

Table 7.4.18 – Pairwise comparisons between Feelings towards commuting time variables regarding Mobility Satisfaction (Source: Own authorship)

	Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
MS01.2	Stressed-Relaxed	-44.197	12.585	-3.512	<.001	0.004
	Stressed-Very Relaxed	-58.691	16.045	-3.658	<.001	0.003
	Very Stressed-Very Relaxed	-53.057	22.328	-2.376	0.017	0.175
	Neutral-Relaxed	-23.95	11.164	-2.145	0.032	0.319
	Neutral-Very Relaxed	-38.445	14.957	-2.57	0.01	0.102
MS01.3	Very Stressed-Neutral	-42.327	19.252	-2.199	0.028	0.279
	Very Stressed-Relaxed	-56.607	20.159	-2.808	0.005	0.05
	Very Stressed-Very Relaxed	-81.457	22.521	-3.617	<.001	0.003
	Stressed-Neutral	-38.347	11.197	-3.425	<.001	0.006
	Stressed-Relaxed	-52.627	12.694	-4.146	<.001	0
	Stressed-Very Relaxed	-77.477	16.184	-4.787	<.001	0
MS01.4	Very Stressed-Neutral	-41.795	19.217	-2.175	0.03	0.296
	Very Stressed-Relaxed	-67.33	20.123	-3.346	<.001	0.008
	Very Stressed-Very Relaxed	-93.07	22.48	-4.14	<.001	0
	Stressed-Neutral	-33.089	11.177	-2.96	0.003	0.031
	Stressed-Relaxed	-58.624	12.671	-4.627	<.001	0
	Stressed-Very Relaxed	-84.364	16.155	-5.222	<.001	0
	Neutral-Relaxed	-25.535	11.24	-2.272	0.023	0.231
	Neutral-Very Relaxed	-51.275	15.059	-3.405	<.001	0.007
MS01.5	Stressed-Neutral	-31.602	11.085	-2.851	0.004	0.044
	Stressed-Relaxed	-38.368	12.567	-3.053	0.002	0.023
	Stressed-Very Relaxed	-65.472	16.022	-4.086	<.001	0
	Neutral-Very Relaxed	-33.87	14.935	-2.268	0.023	0.233
MS01.6	Very Relaxed-Stressed	65.315	16.843	3.878	<.001	0.001
	Very Relaxed-Very Stressed	92.176	23.438	3.933	<.001	0.001
	Neutral-Stressed	42.82	11.653	3.675	<.001	0.002
	Neutral-Very Stressed	69.681	20.036	3.478	<.001	0.005
	Relaxed-Stressed	41.381	13.211	3.132	0.002	0.017
	Relaxed-Very Stressed	68.241	20.98	3.253	0.001	0.011

Table 7.4.19 – Mann-Whitney Ranks result regarding having having a drivers' license (Source: Own authorship)

	MS01.1	MS01.2	MS01.3	MS01.4	MS01.5	MS01.6
Mann-Whitney U	1347.5	1610.5	1467	1833.5	1623	1820.5
Wilcoxon W	1623.5	1886.5	1743	2109.5	1899	28155.5
Z	-4.117	-3.345	-3.782	-2.598	-3.309	-2.533
Asymp. Sig. (2-tailed)	<.001	<.001	<.001	0.009	<.001	0.011

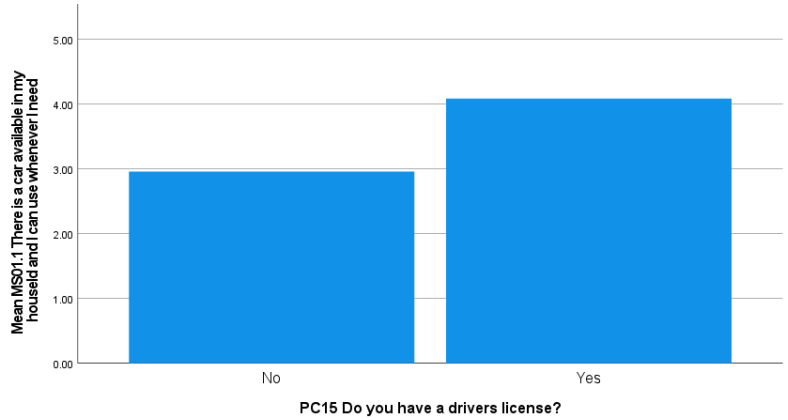

Figure 7.4.6 – Variations of opinions on Mobility satisfaction regarding having a driver's license (Source: Own authorship)

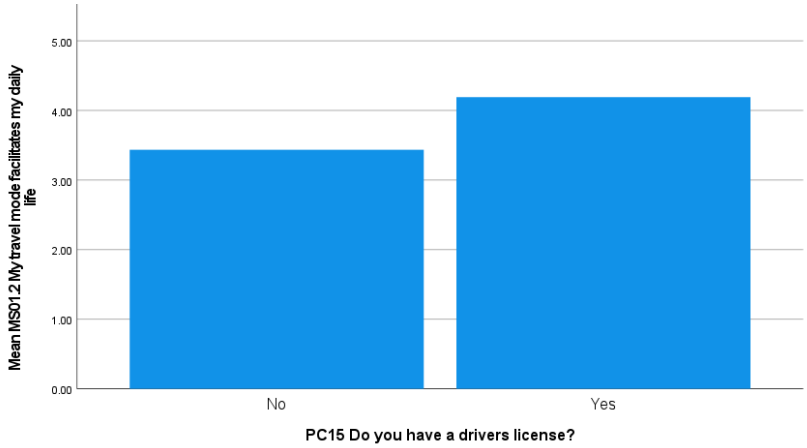

Figure 7.4.7 – Variations of opinions on Mobility satisfaction regarding having a driver's license (Source: Own authorship)

Table 7.4.20 – T-test on gender variables regarding trust on AVs (Source: Own authorship)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
T01.2	Equal variances assumed	3.644	0.057	2.702	246	0.007	0.33193	0.12287	0.090	0.574
	Equal variances not assumed			2.692	233.449	0.008	0.33193	0.12331	0.089	0.575

Table 7.4.21 – Pairwise comparisons between Education Level regarding Trust in AVs (Source: Own authorship)

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
10th to12th grade-Master's degree	-41.085	12.716	-3.231	.001	.019

Table 7.4.22 – ANOVA results regarding Feelings toward income regarding Trust in AVs (Source: Own authorship)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
T01.2	Between Groups	6.82	2	3.41	3.617	0.028
	Within Groups	234.747	249	0.943		
	Total	241.567	251			

Table 7.4.23 – T-test on gender variables regarding Privacy (Source: Own authorship)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
P01.1	Equal variances assumed	2.036	0.155	-2.305	246	0.022	-0.307	0.133	-0.570	-0.045
	Equal variances not assumed			-2.314	240.4	0.021	-0.307	0.132	-0.569	-0.046
P01.2	Equal variances assumed	1.647	0.201	-2.787	246	0.006	-0.365	0.130	-0.623	-0.107
	Equal variances not assumed			-2.801	241.0	0.006	-0.365	0.130	-0.622	-0.108
P01.4	Equal variances assumed	0.035	0.853	-2.762	246	0.006	-0.358	0.129	-0.614	-0.103
	Equal variances not assumed			-2.768	238.9	0.006	-0.358	0.129	-0.613	-0.103

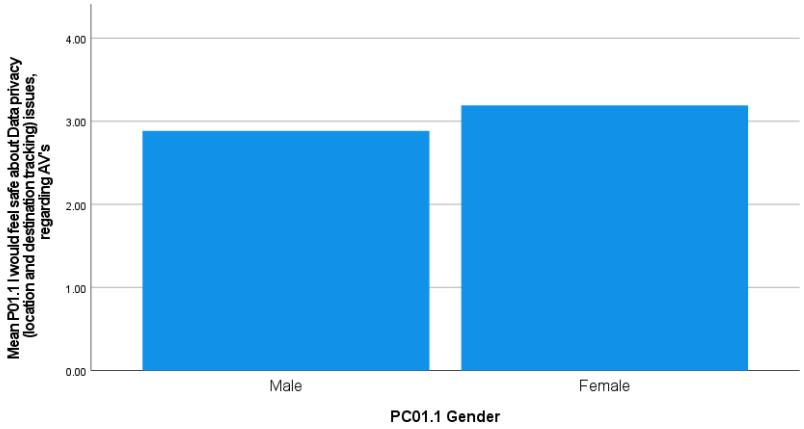

Figure 7.4.8 – Variations of opinions on Privacy concerns regarding gender (Source: Own authorship)

Table 7.4.24 – T-test on gender variables regarding Accessibility and social activities (Source: Own authorship)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ASC01.8	Equal variances assumed	.018	.893	2.127	246	.017	.034	.24790	.11654	.01836
	Equal variances not assumed			2.130	237.953	.017	.034	.24790	.11641	.01858

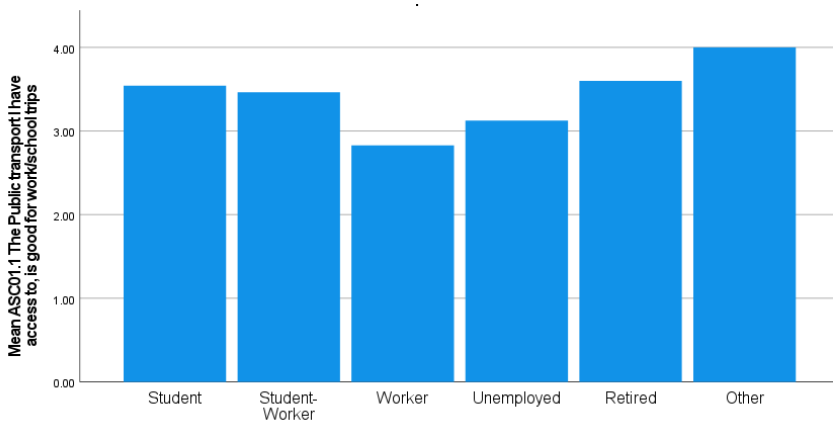

Figure 7.4.9 – Variations of opinions on Accessibility issues regarding Occupation (Source: Own authorship)

Table 7.4.25 – Pairwise comparisons between Living Location regarding Accessibility (Source: Own authorship)

	Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
ASC01.1	Rural environment-Urban environment	-35.793	15.869	-2.256	0.024	0.145
	Rural environment-Central / Downtown Area	-48.541	16.891	-2.874	0.004	0.024
ASC01.2	Rural environment-Urban environment	-36.887	15.873	-2.324	0.02	0.121
	Rural environment-Central / Downtown Area	-52.498	16.895	-3.107	0.002	0.011
ASC01.4	Rural environment-Urban environment	-42.437	15.499	-2.738	0.006	0.037
	Rural environment-Central / Downtown Area	-54.766	16.497	-3.32	<.001	0.005
	Suburban environment-Central / Downtown Area	-30.177	12.48	-2.418	0.016	0.094

Table 7.4.26 – ANOVA results regarding Feelings toward TimeCommuting regarding Accessibility (Source: Own authorship)

		Sum of Squares	df	Mean Square	F	Sig.
ASC01.6	Between Groups	19.01	4	4.752	3.646	0.007
	Within Groups	321.99	247	1.304		
	Total	341	251			

Table 7.4.27 – Pairwise comparisons between Feelings towards Commuting time regarding Accessibility (Source: Own authorship)

	Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
ASC01.1	Very Stressed-Relaxed	-45.911	20.994	-2.187	0.029	0.288
	Very Stressed-Neutral	-53.659	20.049	-2.676	0.007	0.074
	Very Stressed-Very Relaxed	-57.799	23.454	-2.464	0.014	0.137
	Stressed-Neutral	-29.568	11.661	-2.536	0.011	0.112
	Stressed-Very Relaxed	-33.708	16.854	-2	0.046	0.455
ASC01.2	Stressed-Relaxed	-31.503	13.223	-2.382	0.017	0.172
	Stressed-Neutral	-37.295	11.664	-3.198	0.001	0.014
	Stressed-Very Relaxed	-47.64	16.859	-2.826	0.005	0.047
ASC01.3	Very Relaxed-Very Stressed	71.113	23.403	3.039	0.002	0.024
	Relaxed-Very Stressed	50.125	20.949	2.393	0.017	0.167
	Neutral-Very Stressed	49.478	20.006	2.473	0.013	0.134
	Stressed-Very Stressed	44.498	20.913	2.128	0.033	0.334
ASC01.5	Very Stressed-Stressed	-54.504	20.827	-2.617	0.009	0.089
	Very Relaxed-Stressed	44.334	16.749	2.647	0.008	0.081
	Relaxed-Stressed	27.263	13.137	2.075	0.038	0.38
	Neutral-Stressed	23.359	11.588	2.016	0.044	0.438
ASC01.6	Very Relaxed-Very Stressed	66.583	23.488	2.835	0.005	0.046
	Very Relaxed-Stressed	83.922	16.879	4.972	<.001	0
	Relaxed-Stressed	56.616	13.239	4.276	<.001	0
	Neutral-Stressed	53.202	11.678	4.556	<.001	0

Table 7.4.28 – Pairwise comparisons between Work Format regarding Accessibility (Source: Own authorship)

Pairwise Comparisons of PC05.1 What is your current work format?

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. a
Full In-Office-Full remote	42.625	15.375	2.772	.006	.033
Hybrid-Full remote	32.598	15.743	2.071	.038	.230

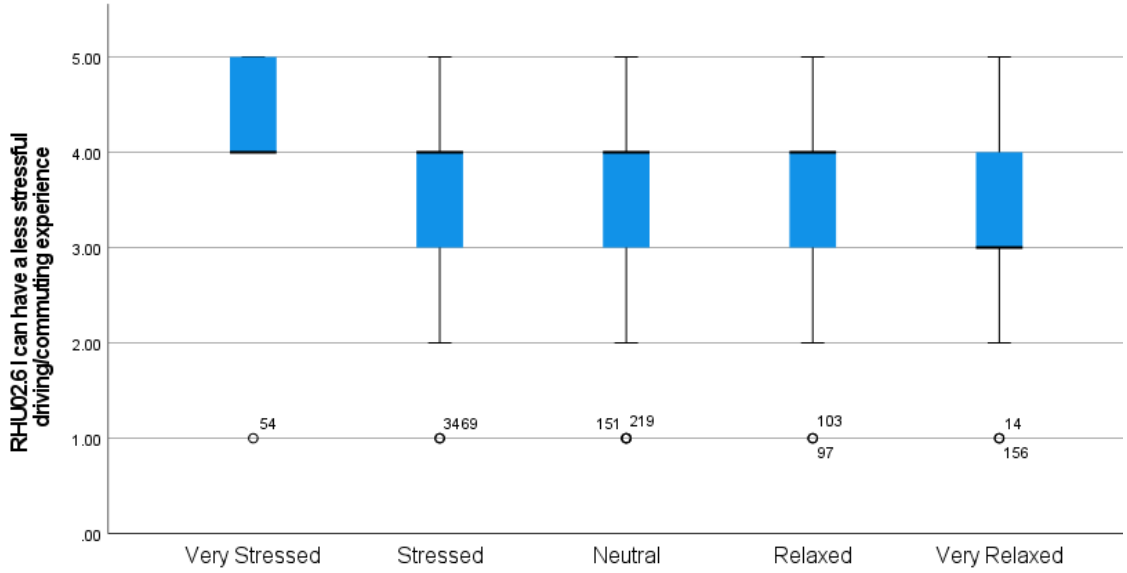

Figure 7.4.10 – Variations of opinions on Ride-hailing utility regarding Feelings towards commuting time (Source: Own authorship)

Table 7.4.29 – T-test on gender variables regarding Ride-hailing utility (Source: Own authorship)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
RHF01.5	Equal variances assumed	3.359	.068	-2.114	246	.018	.036	-.207	.098	-.401
	Equal variances not assumed			-2.085	221.26	.019	.038	-.207	.099	-.404

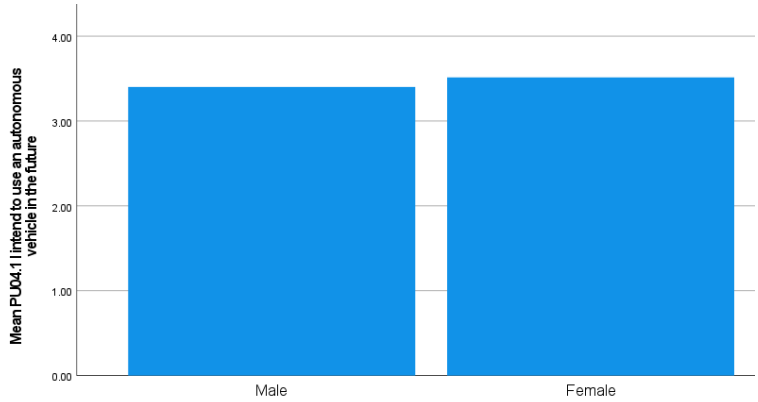

Figure 7.4.11 – Variations of opinions on Intention to Use AVs regarding Gender (Source: Own authorship)

Table 7.4.30 – Mean Distribution between Gender regarding AVs Utility(Source: Own authorship)

	Male	Female
	Mean	Mean
AU01.1 I would be able to visit more often my family and friends.	2.64	2.88
AU01.2 I would be able to visit more areas further away from my neighborhood.	2.79	3.07
AU01.3 I would have better access to Social activities, Cultural activities, hobbies and/or Sports	2.87	3.12
AU01.4 I would have better access to my commuting mode for work/school	2.79	2.78
AU01.5 I would have a more productive commute (e.g: get to my destination faster or need fewer switches)	3.13	3.24
AU01.6 I would have a less stressful driving/commuting experience	3.35	3.35

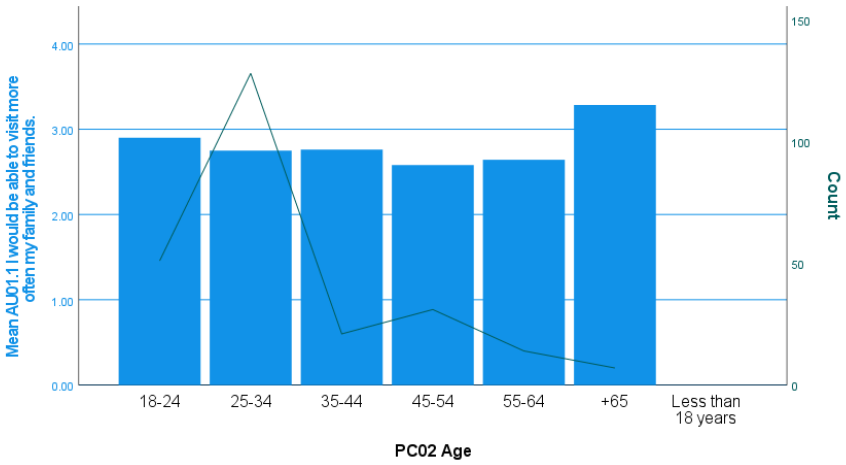

Figure 7.4.12 – Variations of opinions on Intention to Use AVs regarding Age (Source: Own authorship)

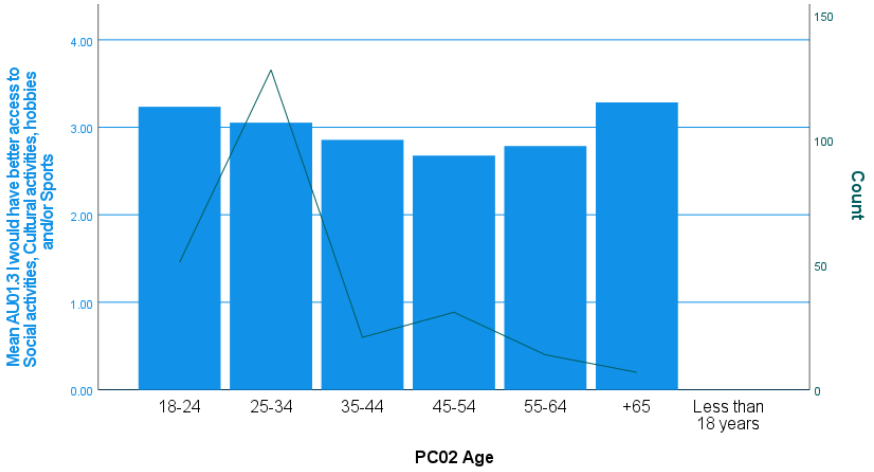

Figure 7.4.13 – Variations of opinions on Accessibility regarding Age (Source: Own authorship)

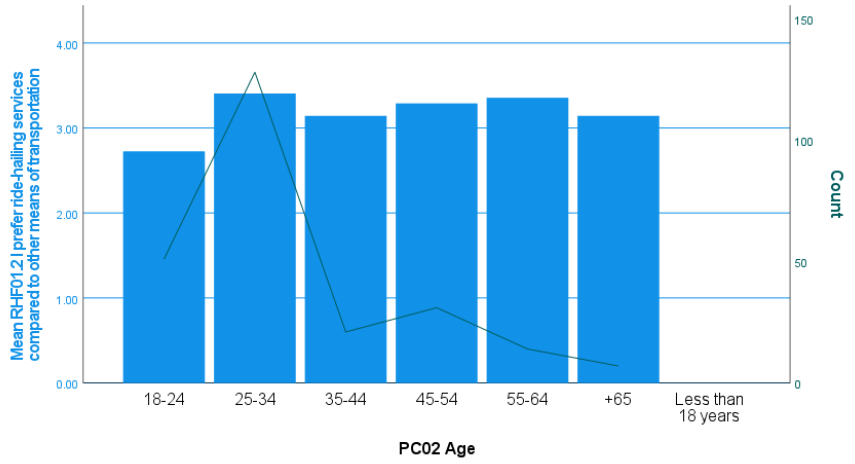

Figure 7.4.14 – Variations of opinions on Ride-hailing functionality regarding Age (Source: Own authorship)

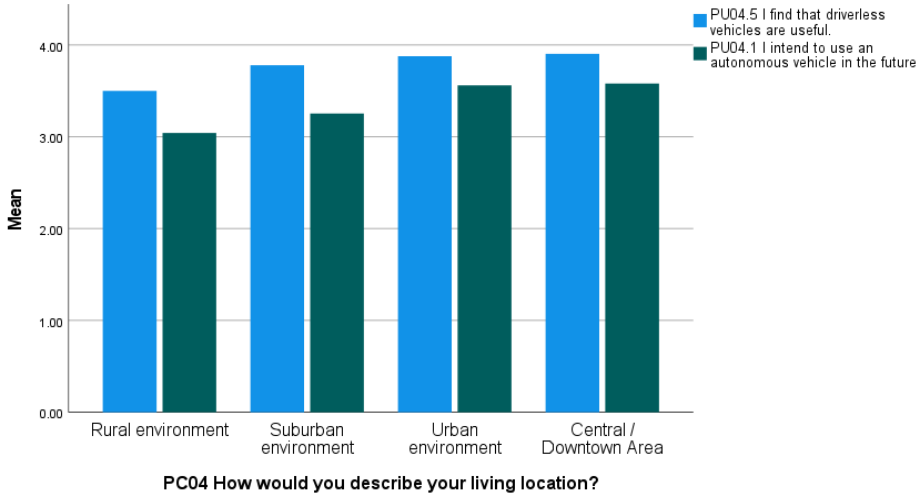

Figure 7.4.15 – Variations of opinions on Perceived usefulness regarding Living Location (Source: Own authorship)

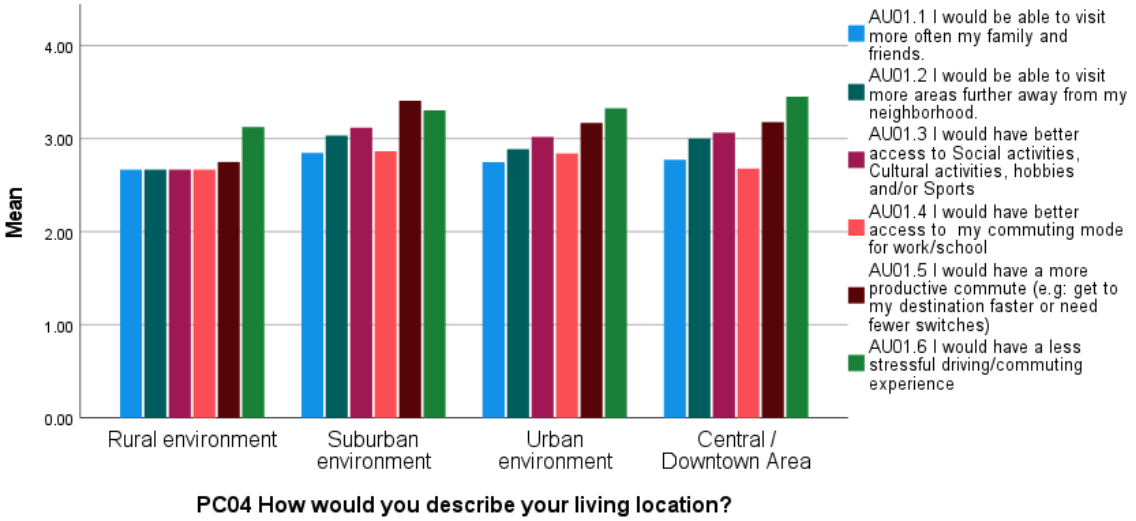

Figure 7.4.16 – Variations of opinions on AVs Utility regarding Living Location (Source: Own authorship)

Table 7.4.31 – Pearson Correlation Output between Time spent Commuting and feelings towards Time spent commuting (Source: Own authorship)

PC06 Approximately, how long (in minutes) do you take on your House-Work/School trip?		
PC07 How do you feel, emotionally speaking, about your House-Work/School trip duration?	Pearson Correlation	-.534
	Sig. (2-tailed)	<.001

Table 7.4.32 – Data distribution regarding Time spent Commuting and feelings towards Time spent commuting (Source: Own authorship)

		Less than 15 minutes	15-30 minutes	30-45 minutes	45-60 minutes	More than 60 minutes
		Count	Count	Count	Count	Count
PC07	Very Stressed	0	0	3	6	5
	Stressed	8	3	12	10	24
	Neutral	26	28	23	13	10
	Relaxed	26	16	8	1	5
	Very Relaxed	18	5	2	0	0

Table 7.4.33 – Pearson Correlation Output between Willingness to change transport mode and feelings towards Time spent commuting (Source: Own authorship)

MC05 Would you be willing to switch your current modes to use an autonomous vehicle as a ride-hailing (e.g Uber) or a shared mobility service (e.g. BlablaCar)?		
PC07 How do you feel, emotionally speaking, about your House-Work/School trip duration?	Pearson Correlation	-.205
	Sig. (2-tailed)	.001

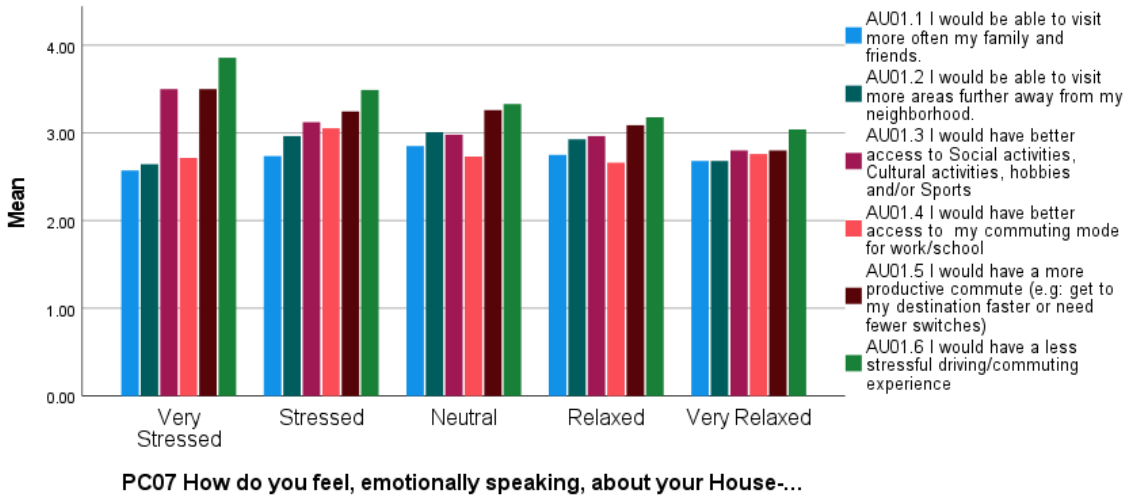

Figure 7.4.17 – Variations of opinions on AVs Utility regarding feelings towards Time spent commuting (Source: Own authorship)

Table 7.4.34 – Data distribution, in percentage, regarding having a Drivers' license and Willingness to change transport mode (Source: Own authorship)

		PC15 Do you have a drivers license?	
		No	Yes
		%	%
MC05 Would you be willing to switch your current modes to use an autonomous vehicle as a ride-hailing (e.g Uber) or a shared mobility service (e.g. BlablaCar)?	No	61%	66%
	Yes	39%	34%

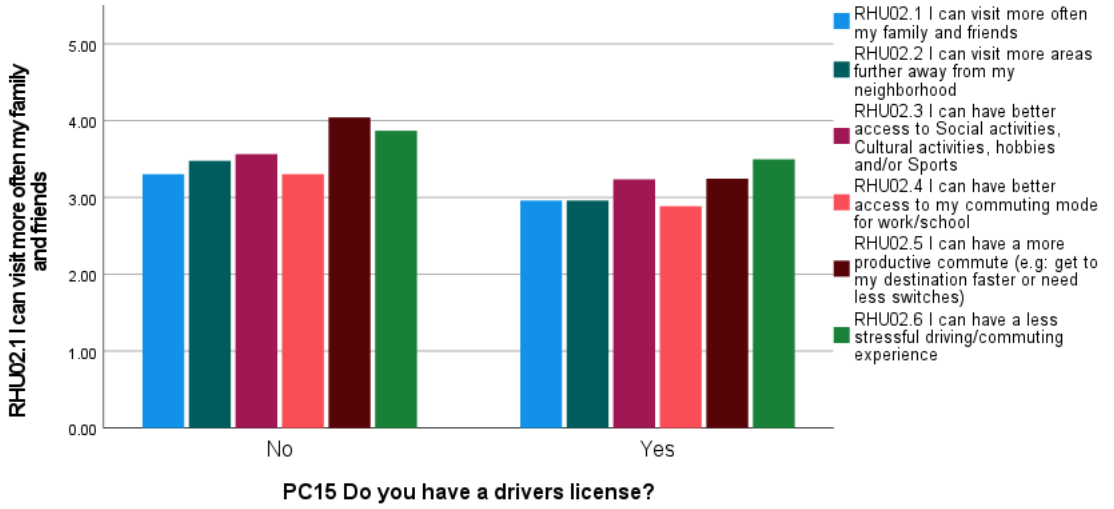

Figure 7.4.18 – Variations of opinions on Drivers' licenses regarding Willingness to change transport mode (Source: Own authorship)

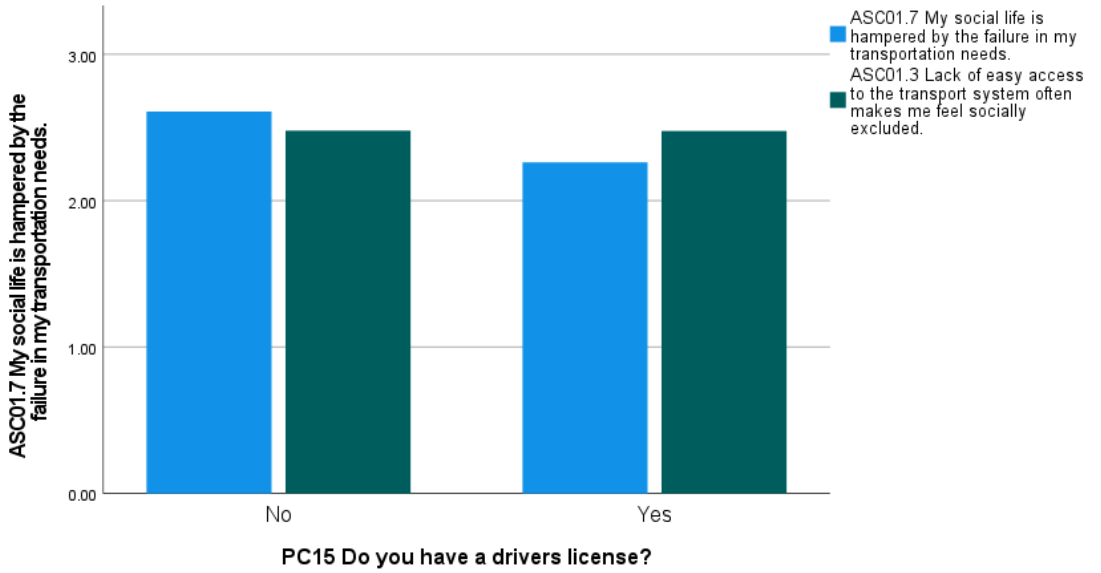

Figure 7.4.19 – Variations of opinions on Drivers' licenses regarding Accessibility (Source: Own authorship)

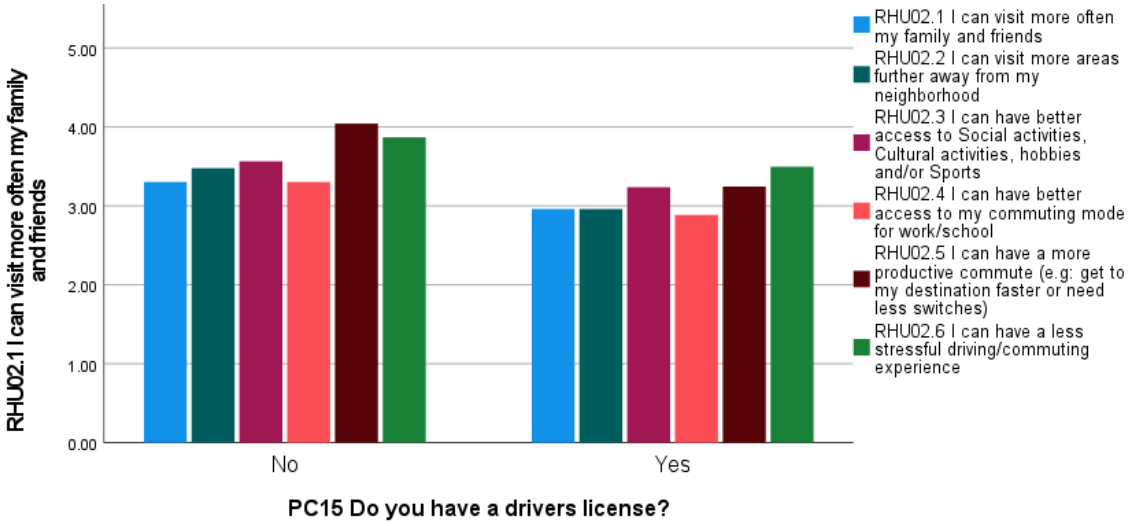

Figure 7.4.20 – Variations of opinions on Drivers' licenses regarding Ride-hailing Utility (Source: Own authorship)

Table 7.4.35 – Pearson Correlation Output between Avs utility and having Divers license (Source: Own authorship)

		AU01.1	AU01.2	AU01.3	AU01.4	AU01.5	AU01.6
PC15 Do you have a drivers license?	Pearson Correlation	-0.108	-0.187	-0.155	-0.131	-0.192	-0.072
	Sig. (2-tailed)	0.087	0.003	0.014	0.038	0.002	0.258

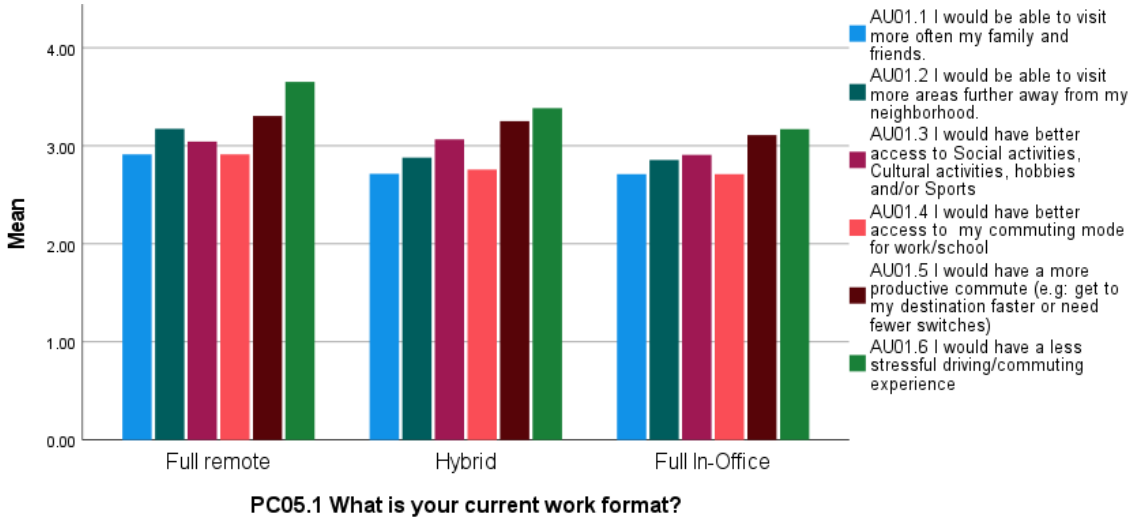

Figure 7.4.21 – Variations of opinions on Work Format regarding AVs Utility (Source: Own authorship)

Table 7.4.36 – Data distribution regarding having a Work Format and Willingness to change transport mode (Source: Own authorship)

MC05 Would you be willing to switch your current modes to use an autonomous vehicle as a ride-hailing (e.g Uber) or a shared mobility service (e.g. BlablaCar)?

		No	Yes
		Count	Count
PC05.1	Full remote	13	10
	Hybrid	55	36
	Full In-Office	85	33
	Other	11	9

Table 7.4.37 – Question "T01.1 AV's can be trusted to carry out journeys effectively" Distribution (Source: Own authorship)

T01.1 AV's can be trusted to carry out journeys effectively

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	2.8	2.8	2.8
	Disagree	22	8.7	8.7	11.5
	Neither agree or disagree	81	32.1	32.1	43.7
	Agree	124	49.2	49.2	92.9
	Strongly agree	18	7.1	7.1	100.0
	Total	252	100.0	100.0	

Table 7.4.38 – Question "PU04.1 I intend to use an autonomous vehicle in the future" Distribution (Source: Own authorship)

T01.1 AV's can be trusted to carry out journeys effectively

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	16	6.3	6.3	6.3
	Disagree	28	11.1	11.1	17.5
	Neither agree or disagree	73	29.0	29.0	46.4
	Agree	98	38.9	38.9	85.3
	Strongly agree	37	14.7	14.7	100.0
	Total	252	100.0	100.0	

7.5. Annex E: Reliability Analysis

Table 7.5.1 – Cronbach's Alpha on Perceived Usefulness

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.650	.669	9

Table 7.5.2 – Cronbach's Alpha on Mobility Satisfaction

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.534	.589	6

Table 7.5.3 – Cronbach's Alpha on Trust

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.817	.823	6

Table 7.5.4 – Cronbach's Alpha on Privacy

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.936	.936	4

Table 7.5.5 – Cronbach's Alpha on Accessibility and Social Activities

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.375	.364	8

Table 7.5.6 – Cronbach's Alpha on Ride-Hailing Utility

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.876	.875	6

Table 7.5.7 – Cronbach's Alpha on Ride-Hailing Functionality

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.394	.455	6

Table 7.5.8 – Cronbach's Alpha on AVs Utility

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.912	.912	6