Travel Behaviour and Society 35 (2024) 100740

Contents lists available at ScienceDirect

Travel Behaviour and Society

journal homepage: www.elsevier.com/locate/tbs

The relevance of social factors in sharing a trip with strangers: Creating travel communities in the autonomous vehicles era

Fabian Israel [a,b,*], Pnina Plaut [b]

[a] Department of Human Geography and Spatial Planning, Faculty of Geoscience, Utrecht University, Netherlands
[b] Technion – Israel Institute of Technology, Center for Urban and Regional Studies Faculty of Architecture and Town Planning, Israel

ARTICLE INFO

Keywords:
Mobility innovation
Change of travel habits
Social acceptance
Social inclusion
Automated Vehicles

ABSTRACT

There has been a growing interest in autonomous vehicles (AVs) for the past few years due to technological innovation and their far-reaching expected impacts on urban mobility. The impact of AVs depends ultimately on how the technology will be adopted, e.g. privately or shared AVs (SAVs), and integrated into the socio-technical mobility system. In this study, we evaluate how social considerations and the AV technology may enhance new social arrangements for travel, especially for groups suffering from some disadvantages in accessing transport. Particularly, we explore a proposed new form of social arrangement, coined "Travel Community" (TC), to create shared AVs trips based on individual preferences. An online national representative sample in Israel was conducted (N = 1009). The data was analyzed using multivariate methods including multinomial logistic regression models for the willingness to adopt TC in two contexts: commuting (TCC) and travel leisure (TCL). The findings suggest that TC was well accepted by the participants under certain assumptions and could address latent demand for improving travel options for people with different constraints accessing transport, such as women, young, sporadic travelers, and low-income individuals. The personal social preferences option might help overcome psychological barriers regarding shared mobility, such as the fear of sharing the trip with strangers and a social value promoting a new kind of social interaction. Planners and stakeholders should consider social considerations' relevance (opportunities and risks) for promoting and creating new forms of mobility and improving urban sustainability and social inclusion.

1. Introduction

For the past few years, there has been a growing interest in autonomous vehicles (AVs) due to the technology innovation, and to their far-reaching expected impacts on urban mobility. AVs might cause changes in many dimensions, such as road safety, travel amount, time utility, mode choice, and societal implications on equity, health, economy and environment (Milakis et al., 2017). AVs impacts depend ultimately on how the technology will be adopted, e.g. privately or shared AVs (SAVs), and integrated into the socio-technical mobility system (Fulton, Mason, & Meroux, 2017; Milakis et al., 2017; Miller & Heard, 2016; Ohnemus & Perl, 2016; Soteropoulos et al., 2019; Stocker & Shaheen, 2018; Thomopoulos & Givoni, 2015). Mobility sharing schemes are based on digital advanced technology coupled with GPS and location tagging. Most of them are instrumentally matching riders and drivers based mainly on origins and destinations, time and cost. Full AVs are expected to remove a major barrier for shared mobility- the reliance on a driver allowing self-re-location operations. Potentially, AVs might pave the way for more creative and innovative ways of sharing mobility models, for instance – new grouping schemes based on common interests and desired joint activity while travelling.

Most of AVs studies in the context of future usage are dealing with the effect of instrumental evaluations (e.g. cost and time and matching riders' optimization including concerns about use of travel time, safety, and privacy) on the decision-making process of mode choice (Bansal et al., 2016; Gkartzonikas & Gkritza, 2019; Morales Sarriera et al., 2017; Shabanpour et al., 2018; Steck et al., 2018; Stoiber et al., 2018; Yap et al., 2015). Although cost-benefit evaluations are out of scope of this study, it is widely recognized that AVs could impact the value of time, decreasing the stress for dead time during the trip and substituting for other productive activities or tasks (Pudāne et al., 2018; Singleton, 2018). The role of socio-demographic and travel characteristics, as well as social attitudes are also documented as factors affecting the intention to use SAVs or shared trips in general (Jing et al., 2019; Rahimi et al.,

* Corresponding author.
E-mail address: f.u.israel@uu.nl (F. Israel).

https://doi.org/10.1016/j.tbs.2024.100740
Received 12 April 2022; Received in revised form 17 December 2023; Accepted 6 January 2024
Available online 12 January 2024

2020; Yap et al., 2016).

A growing literature addresses the relative importance of social aspects and individual preferences in adopting different ridesharing or carpool options (Cui et al., 2021). AVs could complement and improve the operations of these services. However, the adverse effects of shared mobility for urban mobility is an emergent topic in the transportation research literature. Recent studies show that these services not only complement but also compete with public transportation and active transportation (Jin et al., 2018; Rayle et al., 2016) and might create social bias (e.g. the main users are white, young with higher education and higher socio-economic status) and exclusion (digital social division, social prejudices, lack of accessibility for remote geographical zones) (Clewlow & Mishra, 2017; Dill & McNeil, 2021). In this sense, a constellation of SAV models that could leverage the potential technology benefits will combine the principles of high occupancy vehicle level, integrated into mass transit multimodal systems (including non-motorized modes) where users can access them using a digital platform (Kamargianni et al., 2016; Wen et al., 2018; W. Zhang & Guhathakurta, 2018).

In this study, we explore how social considerations and social values may enhance ridesharing's willingness in AV trips. In particular, we explore a proposed new form of social arrangement coined "travel community" (TC) for creating shared AVs trips based on individual preferences. A TC is defined here as a group of persons formed voluntarily around individual preferences regarding social and travel characteristics with the aim of sharing a future trip in a random AVs though a digital platform. TC creates a pool of potential riders for SAVs trips, thus might encourage ridesharing adoption by supporting social compatibility among riders.

2. Literature review

2.1. The relevance of AVs in the context of shared mobility developments

The shared use of transport modes is part of the wider phenomenon of the sharing economy. Shared mobility consists of short-term access to transport as needed, rather than owning the mode of transport (Shaheen, S., Cohen, A., & Zohdy, 2016). Trip sharing and car sharing in the form of carpooling or vanpooling are concepts that were introduced and developed during the 1970 s and 1980 s. However, they did not take hold as a major form of travel and remained a niche, i.e., family carpool, subsidised carpool for the elderly and people with disabilities or employer programmes (Chan & Shaheen, 2012; Ferguson, 1997; Furuhata et al., 2013a; Shaheen & Cohen, 2019; Wang et al., 2019; Wu et al., 2019). The requirement that itineraries and schedules be coordinated between participants and the lack of effective methods to encourage participation are two of the factors that have inhibited a wide adoption of ridesharing (Furuhata et al., 2013b).

Beyond optimization restrictions, social obstacles represent one of the main barriers for the wide adoption of ridesharing systems. The major problems and challenges people face in adopting ridesharing are psychological and social factors like trust and social compatibility (Cui et al., 2021; Nielsen et al., 2015). Some research focus on the role of social ties and social network in overcoming social barriers for shared mobility such as trust, the fear of travelling with strangers, and intolerance for detours (Chaube et al., 2010; Nielsen et al., 2015; Wang et al., 2018). Thus, social ties may increase the matching probability for ridesharing trips. In addition, in recent years, shared mobility has developed rapidly due to technological developments (social media networking, GPS, real time data, mobile technologies, etc.) which have removed many barriers and opened the way to new mobility services based on the sharing concept. Uber, Lift, Waze, Moovit, Via, Car2go and BlaBlaCar are just a few examples for this trend. AVs remove an additional barrier for shared mobility - reliance on a driver. This opens the way for more creative and innovative ways of shared mobility.

2.2. Savs and social acceptance

The adoption of SAVs is ultimately an individual decision. One of the most cited approaches in the area of transportation technology and social science is the Technology Acceptance Model – TAM (El Zarwi et al., 2017; Madigan et al., 2017) highlighting fundamental concept constructs around 'perceived usefulness' and 'perceived ease of use'. TAM is complemented by the theory of diffusion of innovation that seeks to explain how new ideas and technologies are spread through society and become dominant (Rogers, 1962a; Rogers, 1962b). Research on the social acceptance of AVs, partially based on TAM, present different nuances, adding constructs for AVs use intention and adoption, such as, driving-related sensation seeking vs perceived risks, initial trust, and social influence (Acheampong & Cugurullo, 2019; Jing et al., 2019; Legris et al., 2016; Panagiotopoulos & Dimitrakopoulos, 2018; T. Zhang et al., 2019), hedonic motivation or enjoyment, and the importance of attitudes in specific domains rather than socio-demographic characteristics (Madigan et al., 2017; Nordhoff, van Arem, et al., 2016). Other studies are based on the theory of diffusion innovation highlighting critical factors for the diffusion of AVs, such as: price decrease trend, the importance of satisfied adopters, policy considerations influencing the diffusion process, social influence and the symbolic environmental value (El Zarwi et al., 2017; Nieuwenhuijsen et al., 2018; Talebian & Mishra, 2018).

Review papers were published in recent years as a result of the increasing literature dealing with S/AVs future adoption (Becker and Axhausen, 2017a; Gkartzonikas & Gkritza, 2019; Harb et al., 2021a; Rojas-Rueda et al., 2020; Soteropoulos et al., 2019). These reviews provide a general picture of state of the art by identifying how different conceptual approaches and methodologies are being applied. The main results reviewed by these papers show that SAVs may bring environmental and public health benefits (Rojas-Rueda et al., 2020), being more efficient for the transportation system, relaxing parking concerns, and supporting the urbanization process (depending on the assumptions) (Soteropoulos et al., 2019). However, cultural and current travel habits based on the solo automobility system (Dijkhuijs et al., 2023; Milakis & Müller, 2021) seem to be a major obstacle to public acceptance of SAVs. In fact, many papers show that this mode (Acheampong et al., 2021) is one of the least preferred by potential users.

Thus, policy incentives and regulation could leverage the potential factors for the adoption of SAVs and discourage current travel habits through regulation and social awareness campaigns (Acheampong & Cugurullo, 2019). This study represents a step exploring individual and social perceptions and preferences to use SAV in a specific new travel and social configuration which consists in the formation of travel communities. Potentially, the form of mobility analyzed here, may enhance the future adoption of SAVs (and shared mobility in general) and contribute to the design and imaginary of new sustainable travel practices.

2.3. Relevant concepts for SAV adoption

Research literature on social factors influencing the willingness to participate in shared systems highlights the importance of objective individual socio-demographic and travel characteristics, as well as the importance of social attitudes. Attitudes towards sharing values, trust and concerns, environmental benefits, hedonic motivations, and expected benefits, among others conceptual constructs, are strongly related to positive and negative individual's perception and the willingness to use new mobility forms or products. Six topics regarding sharing a trip in the SAVs era, that are relevant for this study, were identified from the literature and they are presented below.

Sharing economy and mobility perceptions. It is widely recognized that attitude are a major determinant of intentional behavior and of actual behavior which are relevant for a new technology adoption (Ajzen, 1991; T. Zhang et al., 2019). In the context of collaborative

consumption, ideological and moral motivations regarding social responsibility and sustainable ecology could play a role as intrinsic motivation for intention and consumption behavior (Hamari et al., 2016). In our context, it could be hypothesized that positive attitudes towards share mobility will trigger a higher willingness to participate in TC (Amirkiaee & Evangelopoulos, 2018). Another point considered for sharing mobility attitudes is related to the loss of privacy space which is more relevant for private car users. Lavieri et. al. (2019) highlight the negative impact of individual privacy concerns experienced in pooled ridesharing for the intention to share the AV with a stranger (Lavieri & Bhat, 2019). In this sense privacy concern attitudes is expected be negatively associated to the willingness to participate in TC.

Social similarity and identification. The importance of social categories and group membership on individual identity formation has been addressed by the theory of social identity. Tajfel (1979) proposed that the groups which people belong to are a significant source of pride and self-esteem (Tajfel, 1979). "Identification is the perception of oneness with or belongingness to a group" (Ashforth, 1989, p. 34). Reputation and commitment to the community have been important factors in understanding for example sharing activities participation in online platforms such as Wikipedia and Facebook (Hamari et al., 2016; Möhlmann, 2015). Thus, is expectable that individuals who value social reputation and commitment to the group will be more likely to use TC as a positive belonging sign to the group they belong.

Trust in the system and partners. Trust in the system is an important factor understanding technology innovations. Using the TAM framework, initial trust has been found as one of the main factors for understanding users' acceptance of automated vehicles (Zhang et al., 2019). Trust has received special importance in the context of sharing the ride with strangers (Amirkiaee & Evangelopoulos, 2018). Thus, a higher level of trust has a positive effect on ridesharing participation attitude and intention to use. Another aspect of the trust is the perceived risk or distrust regarding different aspects such as the system malfunction or perceived privacy risks that is especially relevant for sharing a ride (Liu et al., 2019; Wang et al., 2020). Higher levels of perceived risks and distrust is hypothesized to have a negative impact on ridesharing participation attitude and intention to use.

Hedonic motivation. Refers to the emotional experiences an individual perceives when using a certain service. A recent systematic literature review on the factors influencing people to choose ridesharing (Si et al., 2023) may shed light on the role of hedonic values on SAV. Comfort and pleasure were found as main motivators to use ridesharing. It was argued that ridesharing makes people feel relaxed during their journey. Riders do not have to worry about driving fatigue or limited parking spaces (Malodia & Singla, 2016). Instead, they can use their commute time to rest, read, or talk to fellow riders, thus generating the psychological comfort of being a passenger (Neoh et al., 2018; Nielsen et al., 2015; Raza et al., 2023). Furthermore, Nordhoff et al. (2016), suggest that AVs provide an enjoyable transport option where passengers can spend time in different forms, including the possibility of using the time for different tasks and promoting social networking. Thus, is expectable that positive hedonic expectation is related to the desire of using TC in the future (Amirkiaee & Evangelopoulos, 2018; Hamari et al., 2016; Madigan et al., 2017).

Time benefit expectation. The utility and disutility of the travel time, as other benefit expectations such as cost savings, have an indubitable role for SAV adoption. We can draw insights on the role of time benefits for SAV from previous research on carpooling and ridesharing. A systematic literature review focusing on psychological factors motivating people to carpool found that convenient location and time-saving were reported in the empirical literature as important factors encouraging this mode of travel. Riders do not have to wait for public transport to arrive based on their fixed timetables, and high occupancy vehicle (HOV) lanes can be used, if available, for faster passage (Julagasigorn et al., 2021). In addition, time is saved by the availability of a variety of pickup and drop-off times, many pickup locations, ease of getting to a destination and no need to transfer via or to a public transport link. Jie et al. (2021) found that a person is more likely to use ridesharing if he or she perceives it to be convenient, time-saving, environmentally beneficial, safe, or money-saving. Furthermore, AVs as a new technology could impact the value of time, decrease the stress of dead time during the trip and substitute for other work/personal/social (interaction in the case of TC or shared trips) productive activities or tasks (Pudāne et al., 2018; Singleton, 2018). In addition, participating in a travel community would make it possible to find suitable partners for the trip, saving time looking for social compatibility. Thus, individuals with higher time benefit expectations are expected to have a higher willingness to use TC and ridesharing services in general (Amirkiaee & Evangelopoulos, 2018).

Personal innovativeness. Classical theoretical frameworks such as TAM or TPB consider subjective beliefs about technology characteristics without considering personal characteristics. However, personal characteristics also have been found to be an important factor in understanding technology adoption and were incorporated in more recent studies. One of the most salient variables is the individual affinity with technology. Personal innovativeness refers to the degree to which a person tends to adopt new things such as new technologies, products, or services, earlier than others (Rogers, 1962a; Rogers, 1962b). Individuals who are more technology oriented feel more confident experimenting new technology products or services and have a proclivity attitude towards innovation systems, including consumer's intention to use ridesharing services (Wang et al., 2018). People with high levels of personal innovation tend to focus on the benefits of innovative technology, are less likely to consider associated risks, and have more positive attitudes towards ridesharing choices (Jie et al., 2021). Thus, a positive pro-innovation attitude is expected to increase the willingness to use TC.

These constructs are usually found in the traditional sharing and carpool literature in empirical research. However, they are partially incorporated in the developing SAV studies. In this study, we developed the conceptual framework based on our literature review and bridge this gap. The willingness to participate in a TC depends on three groups of variables including: 1. socio-demographic and travel characteristics, 2. attitudes towards sharing and technology adoption and 3. personal social preferences (PSP) for travel community formation regarding sharing a future trip with strangers (Fig. 1).

3. Methodology

3.1. The travel communities (TC) concept

The TC concept is defined in this work as a group of persons formed around individual preferences regarding social and travel characteristics with the aim of sharing a trip in a random AV. Belonging to a travel community will make it possible to easily find suitable and trusted partners for a shared trip saving cost of travel and time looking for potential partners. A person can join one or several travel groups according to his/her preferences and travel needs. The ideas analyzed in this study were qualitatively explored in five focus groups conducted by the authors in the dissertation research project to explore social and individual considerations to share the trip in the automated vehicles era (Israel, 2021a). The focus is on exploring individual preferences for social parameters which might contribute to the creation of the TC pool out of which participants are compiled and matched for a shared trip.

3.2. The sample and questionnaire

The study sample represents the Israeli population in various parameters such as gender, age and residential area. The questionnaires were distributed through a panel members in a web-based system of a survey company. The final representative sample included 1,009 respondents. The questionnaire was structured in four parts: 1. socio-demographic questions 2. travel behavior characteristics, 3. attitudes towards technology adoption and shared mobility in the context of

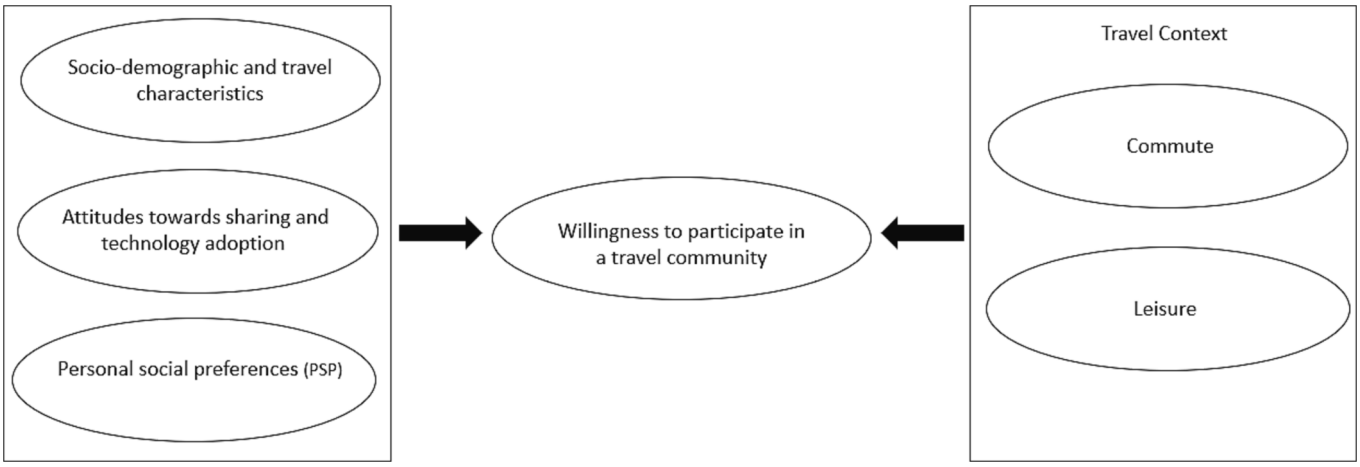

Fig. 1. The conceptual model explored in the study.

sharing economy and 4. willingness to take part in travel communities for daily trips.

A short video explanation of future SAVs usage and a short explanation of the travel communities' concept were presented at the beginning of the survey to give the respondents some idea about the futuristic scenario with a new form of travel. In the last part of the questionnaire, respondents were asked about the number of trips that they would perform if they were members in a TC for two travel contextual situations: commute and leisure. Two TC types were presented in the survey for SAVs trips: travel community for commuting (TCC) and travel community for leisure (TCL*)*. Respondents were also asked about the importance of personal social preferences (PSP) attributes for choosing partners for shared trips for - commuting (work and studies) and for leisure activities where one can choose different parameters such as socio-demographic characteristics (e.g. age and gender), common destination, common interests etc. They were finally asked how they would change their travel decision if their stated preferences were not completely met.

3.3. Measurement of the variables and data analysis

The components of the model explored are based on three groups of variables:

a. Socio demographic and travel characteristics include gender; age; income level; settlement type; travel frequency; carpool membership; current modes of travel for commute and for leisure trips.
b. Attitudes and perceptions towards sharing and technology adoption. Six conceptual constructs were explored. Respondents were asked to indicate to which extent they agree with the provided 12 statements, using a 5-point Likert scale ranging from totally disagree (1) to totally agree (5). Table 1 summarizes the variables and the relevant literature sources. Attitudes represent one of the major determinants of intentional and actual behavior. Here we are mainly concerned with attitudes and perceptions towards sharing and technology adoption. An exploratory factor analysis was performed in order to identify the principal latent components on which the statements could be organized. Based on eigenvalue criterion, principal component analysis and varimax rotation, three main factors were obtained including: 1. positive attitudes towards shared mobility, 2. distrust in the system and privacy concerns and 3. awareness of technology benefits. All factors' loadings are greater than 0.45, indicating high construct validity. These factors were included as factor scores in the models.
c. Personal social preferences (PSP) for joining a community and consequently sharing a trip with other community members. The respondents were asked to report their preferences in a 5-point scale ranging from 1 "not important at all" to 5 "it is (or it could be) very important to me". Two PSP properties are related to socio-demographic profile (preference to travel with woman or man; importance to travel with people of similar age), two other PSP properties are related to social evaluations and preferences (importance of common interests among riders; importance of the ability to rate the travel experience), other two properties are related to behavioral norms or rules during the trip (preference to travel with no smokers; importance of quiet travel).

Attitudes represent one of the major determinants of intentional and actual behavior. As it is noted in Table 1, the statements score average ranges from 2.86 to 3.78. There is a relatively limited variance among these scores. An exploratory factor analysis was performed to identify the principal latent components on which the statements could be organized. The three emergent components were identified and present a reasonable coherence in understanding the latent concepts among the items. The first component, accounting for the highest variance explained, is the positive perception about sharing, including positive attitude, social belonging and enjoyment items. The second factor is distrust regarding privacy (private information, privacy space) and operational issues (vehicle availability and cleanness). The third component is related to technology efficiency and includes personal innovativeness and productive time using technological devices. All factors' loadings are greater than 0.45, indicating high construct validity. These three components were recorded as independent factor scores representing the social attitudes.

For personal social preferences (PSP), 'rules' behavior are the most important properties mentioned by respondents (especially smoking during the trip). About 83 % of the sample indicated that they prefer to travel without smokers which reflects the importance of rules behavior criteria. A significant difference among male and female was found regarding gender preferences for sharing the trip with strangers (Table 2).

For women, sharing the trip with other women (37 %) is significantly more important than for men (15 % prefer sharing the trip with other men). In the literature, women expressed trust and personal safety concerns in sharing trips with strangers, especially in situations of one woman with one-man trips (Morales Sarriera et al., 2017). Thus, the ability to share the trip with other women might increase the willingness to participate in trip sharing.

Based on (Tables 3 and 4) multinomial logistic regression models to evaluate the probability of categorical membership, this study explores the effects of socio-demographic and travel characteristics, individual attitudes and PSP on the willingness to use TC. The willingness to adopt

Table 1
Description of the conceptual construct items and their source.

Construct	Item	Means (SD)	Source
Sharing economy and mobility perceptions*	I think that share products and service is a positive thing	3,8 (1,0)	Modified from Hamari et. al., 2016.
	Travel communities would seem like a good idea	3,6 (0,9)	Amirkiaee and Evangelopoulos, 2018.
	Having privacy is important to me when I make a trip	3,7 (1,0)	Lavieri and Bhat, 2019.
Social similarity*	The use of travel communities allows me to be part of a group of people similar to me	3,0 (1,0)	Modified from Henning-Thurau et al., 2007; Lamberton and Rose, 2012 in Möhlmann, 2015.
Trust in the system and partners*	I would trust other travel communities participants	3,1 (0,9)	Modified from Amirkiaee and Evangelopoulos, 2018.
	I am afraid that there will be no car available at the time I will need it	3,4 (1,3)	Yap et. Al., 2016; Payre et. al., 2014.
	I am worried that the car is not clean after its previous use	3,3 (1,1)	Wang et. al., 2020.
	I am concerned that my personal information will be shared or sold to others when enter the ride-sharing services platform	3,0 (1,2)	
Hedonic motivation*	I think travel communities could be enjoyable	3,7 (0,8)	Modified from Hamari et al., 2015 and Madigan et. al., 2017.
Time Benefit Expectation*	I would not mind having a longer commute if I could use my commute time productively	2,9 (1,2)	Lavieri and Bhat, 2019.
	My participation in travel communities saves me time	3,6 (1,0)	Modified from Bock et al., 2005 in Hamari et. al., 2015.
Personal innovativeness*	I like to be among the first to experiment with new technologies	3,3 (1,2)	Modified from Wang et. al., 2020.
Personal Social Preferences (PSP)**	Preference to travel with woman or man	2,4 (1,5)	Israel, 2021. Based on focus group study.
	Importance to travel with people of similar age	2,3 (1,3)	
	Importance of common interests among riders	2.3 (1,3)	
	Importance of the ability to rate the travel experience	2,9 (1,4)	
	Preference to travel with no smokers	4,2 (1,3)	
	Importance of quiet travel	3,4 (1,3)	

*5-point scale ranging from "totally disagree" (1) to "totally agree" (5).
**5-point scale ranging from "not important at all" to 5 "it is (or it could be) very important to me".

SAVs TC was measured by the amount of future travel compared with current practice and classified into four discrete options (detailed in Section 4.2). Two types of travel communities are studied here according to the trip purpose: travel community for commuting (TCC) and travel community for leisure (TCL). The possibility to use ordinal regression was also considered. The main reason to use the selected procedure consist in the conceptual importance in the differentiation of

Table 2
Gender preferences for share the trip with female or male.

		Travel preference		
		Male	Female	Not relevant
*Gender	Male	15 %	6 %	79 %
	Female	3 %	37 %	60 %

* $p < 0.05$.

Table 3
The dependent and latent variables included in the model.

		TCC Model	TCL Model
Intention to use TC	1- Unwillingness to use TC	9 %	14 %
	2- Less amount of travel with TC	38 %	28 %
	3- Same amount of travel with TC	42 %	35 %
	4 - Travel more with travel communities	11 %	23 %
Sensitivity for Stranger Based Travel Community	1- Unwillingness to Use TC	10 %	16 %
	2- Less TC use under preference violation	34 %	34 %
	3- Same amount of travel	56 %	50 %
Attitudes towards TC in the shared mobility context	Positive about sharing idea	Factor Score	
	Distrust on the system	Factor Score	
	Positive regarding the technology and the productivity	Factor Score	
The relevance of indivdual preference sharing the trip	The relevance of personal profile sharing the trip	Factor Score	
	The relevance of rules sharing the trip	Factor Score	

category types of (non) potential users. In this sense potential users and non-users has a clear difference which are beyond the order perception on the how much the people will use the system in already uncertain scenario and form of transport. It is interesting to explore what affect potential users but also which predictors are (different) related to refusers. Multinomial regression allows to compare and segment in the same model refusers and potential users.

4. Findings

4.1. Sample description

The sample represents the Israeli population regarding parameters such as gender, age and religiosity. The sample includes 1009 respondents with 50 % males and 50 % females. It is divided into three main age groups: 15–29 (35 %), 30–60 (45 % in sample vs 50 % national) and 61+ (20 %). Most of the respondents are Jewish (82 %) and live in the central area of the country - mostly in the Tel Aviv metropolitan area (72 %), 68 % of the respondents are employed (the survey was performed before the covid-19 pandemic), and about half of the households have a child under 18 years old. Half of the respondents reported lower income than the average income, while about 27 % reported earnings similar to the average and 23 % reported earnings higher than average.

Most of the respondents (68 %) have a car access most of the weekdays. The main mode of travel is private vehicle, including private car as a driver, as a passenger and motorcycle (54 % for commuting and 68 % for leisure trips), followed by public transport (36 % for commuting and 21 % for leisure trips) and non-motorized means of transport (e.g. walking and cycling, including electric micro-mobility) – 10 % for commuting and 12 % for leisure trips. Participants were asked about membership and usage of carpool/ridesharing systems. 23 % of the respondents reported having a carpool membership, where half of them is using carpools several times a week or several times a month.

Table 4
Distribution of the variables in the survey percentage / mean (sd).

	Variable	Category	Sample	TCC Model	TCL Model
Socio-demographic characteristics	Gender	Male	50 %	52 %	51 %
		Female	50 %	48 %	49 %
	Age	15–24	19 %	20 %	19 %
		25–34	28 %	29 %	28 %
		35–44	18 %	19 %	18 %
		45–54	11 %	11 %	11 %
		55–64	15 %	14 %	15 %
		65+	9 %	7 %	9 %
	Religiosity	Secular	36 %		
		Traditional	24 %		
		Religious	20 %		
		Ultra-Orthodox	20 %		
	Settlement type	Center	73 %	74 %	72 %
		Periphery	18 %	17 %	18 %
		Community	9 %	9 %	10 %
	Religion	Jewish	82 %		
		Arab	12 %		
		Other	6 %		
	Occupation	Work	68 %		
		Student	14 %		
		Soldier/National Service	3 %		
		Unemployed	6 %		
		Retired	10 %		
	Children under 18	Yes	47 %		
		No	53 %		
	Income household	Lower than average	50 %	50 %	49 %
		Similar to the average	27 %	26 %	28 %
		Higher than average	23 %	24 %	23 %
	Education	Less than 12 years	3 %		
		Full high school	24 %		
		Tertiary Education	23 %		
		Bachelor's degree	34 %		
		Second degree and more	16 %		
Travel characteristics	Car availability	Yes	68 %		
		No	32 %		
	Ride Sharing/Carpool membership	Yes	23 %	24 %	23 %
		No	77 %	76 %	77 %
	Carpool platform (Multi-Response)	Waze	51 %		
		Moovit	21 %		
		Whatsupp	65 %		
		Other	6 %		
	Mode of transport for commuting	Non-motorized	10 %	10 %	
		Public transport	36 %	36 %	
	Mode of transport for leisure activties	Non-motorized	12 %		11 %
		Public transport	21 %		20 %
		Private car	68 %		69 %
	Travel frequency	Less (C)	24 %	23 %	
		More than 4 trips per week	76 %	77 %	
		Less (L)	37 %		36 %
		More than 2 trips per week	63 %		64 %

The mostly used are Waze and/or WhatsApp platform.

4.2. *Willingness to adopt TC*

A series of multinomial logistic regressions were performed for two dependent variables. The first one is the willingness to join a travel community where community members fully match individual stated preferences and the second is the sensitivity to join a travel community when individual preferences are not fully met. According to the conceptual framework, the models include three groups of independent variables: objective socio-demographic and travel characteristics, social attitudes regarding shared mobility and technology adoption, and PSP. The analyses were performed for the two trip purposes: commuting and leisure.

The relative contribution of the set of predictors (socio-demographic and travel characteristics, individual attitudes towards sharing and technology adoption and PSP) was explored by three effect-level regressions stepwise explaining the willingness to adopt TC. Beyond the expected effects of socio-demographic and travel characteristics variables, sharing attitudes and the personal social preferences add significant contribution to the explanation of the willingness to adopt a travel community for both travel purposes. Regarding the PSP, it is interesting to note that age and gender preferences were significant for TCC while the norms of behavior were significant for TCL. This suggests a preliminary indication, although limited evidence in terms of explained variance, of the significant role the PSP on the willingness to adopt SAVs travel communities.

4.2.1. *Exploring the factors influencing the willingness to adopt travel communities*

Table 5 shows the results of multinomial logistic regression and the coefficients and odds ratio for each category of the dependent variable. The dependent variable (willingness to adopt TC) categories include: 1- no willingness to use TC 2- a smaller number of trips than current usage when adopting TC; 3- same number of trips as currently and 4 - travel more with travel communities (base category). The coefficients show the effect of the independent variables on each of the three categories of the dependent variables compared to the individuals who reported they

Table 5
The willingness to adopt stranger based travel communities.

Variable (reverence)	Categories	Unwillingness to use TC				Less amount of travel with TC				Same amount of travel with TC			
		TCC		TCL		TCC		TCL		TCC		TCL	
		B	Odds	B	Odds	B	Odds	B	Odds	B	Odds	B	Odds
Gender (male)	Female	−1.039*	0.354	−0.256	0.774	−1.008*	0.365	−0.35	0.705	−0.437	0.646	−0.13	0.878
Age (65 +)	15–24	−3.23*	0.04	−1.541*	0.214	−0.746	0.474	0.106	1.112	−0.58	0.56	−0.047	0.954
	25–34	−2.482*	0.084	−0.951	0.386	−0.963	0.382	0.517	1.677	−0.651	0.521	0.095	1.1
	35–44	−1.93*	0.145	−0.821	0.44	−0.695	0.499	0.268	1.307	−0.443	0.642	−0.132	0.876
	45–54	−0.752	0.471	−0.396	0.673	0.192	1.211	0.017	1.017	0.563	1.756	0.306	1.359
	55–64	−2.785*	0.062	−0.697	0.498	−1.226*	0.293	0.318	1.374	−0.437	0.646	−0.083	0.92
Income (Low)	Similar to average	1.281*	3.601	0.915*	2.498	1.052*	2.862	0.770*	2.16	0.544	1.723	0.496*	1.642
	Higher than average	0.012	1.012	0.282	1.325	−0.235	0.791	0.705*	2.025	−0.424	0.655	0.362	1.437
Settlement type (Center)	Community village	1.122	3.071	0.551	1.734	1.226*	0.293	0.269	1.308	0.914	2.494	0.395	1.485
	Periphery area	−0.067	0.935	0.809*	2.246	−1.181	0.835	0.488	1.63	−0.197	0.281	0.262	1.3
Frequency (<)	More than 4 trips per week	4.532*	92.933	–	–	3.936*	51.23	–	–	2.535*	12.611	–	–
	More than 2 trips per week	–	–	0.792*	2.207	–	–	2.512*	12.331	–	–	0.863*	2.369
Mode (PT)	Private	0.491	1.634	−0.119	0.888	0.001	1.001	−0.269	0.764	−0.34	0.712	0.751*	2.12
	non-motorized	0.352	1.422	−1.796*	0.166	−0.694	0.5	−0.464	0.628	−1.531*	0.216	0.696	2.006
RS-CP (No)	Yes	−0.261	0.77	−0.82*	0.441	−0.466	0.628	−0.541*	0.582	−0.792*	0.453	−0.408	0.665
Attitudes - Factor Score	Sharing Idea	−1.274*	0.28	−1.137*	0.321	−0.618*	0.539	−0.618*	0.539	0.057	1.059	−0.145	0.865
	Distrust	0.341	1.407	0.181	1.199	0.045	1.046	−0.111	0.895	−0.119	0.888	−0.014	0.986
	Tech productivity	−0.967*	0.38	−0.486*	0.615	−0.696*	0.499	−0.412*	0.662	−0.386*	0.68	−0.102	0.903
Personal Individual Preferences	Preference travel with female	−0.432*	0.649	0.047	1.049	0.939*	2.557	0.003	1.003	0.842*	2.322	0.07	1.072
	Preference travel with no smokers	−0.444	0.642	−0.698	0.498	−0.04	0.961	−0.912*	0.402	0.267	1.306	−0.55	0.577
	Importance travel with people of same age	0.111	1.118	−0.252	0.777	−0.416	0.659	0.234	1.263	−0.763*	0.466	−0.222	0.801
	Importance of quite travel	−0.065	0.937	0.385	1.469	0.036	1.037	0.107	1.113	0.205	1.228	0.539*	1.714
	Importance of common interests	0.428	1.535	0.533	1.704	−0.073	0.93	0.284	1.328	0.171	1.187	0.387	1.472
	Importance of rating system	0.333	1.395	0.24	1.271	0.146	1.157	−0.089	0.915	0.28	1.323	−0.355	0.701
	Intercept	−1.295		−1.636		0.123		−1.367		0.922		0.261	
Model Fitting Criteria	**TCC**	**TCL**											
−2 Log Likelihood													
Intercept Only	2.101.469	2.418.259											
Final	1.645.375	2.045.163											
Chi-Square	456.095	373.096											
Pseudo R-Square													
Cox and Snell	0.403	0.338											
Nagelkerke	0.444	0.363											
McFadden	0.217	0.154											

*p < 0.05.

would travel more than currently when joining travel communities.

Effect of socio demographic characteristics. Women are more likely to travel more than men when joining TCC. This is evident when comparing with 'commuters refusers' category and 'less amount of travel using TC category'. Age is also a significant predictor explaining the willingness to adopt TC. For TCC, findings show that the oldest age group (65 +) and the 45–54 age group tend to reject the idea of TC compared to the other age groups. Both seem to be heavy car users. In contrast, the 15–24 age group is more likely (Odds = 0.04, $p < 0.05$) to belong to the reference category - more travel when joining TC. Regarding income, lower than average appears to be associated with the willingness to travel more when joining both TC for commuting and leisure than individuals with higher income in almost all comparisons. Although travel inequalities fall outside the scope of this study, this finding provides some initial evidence about the latent demand for travel that new forms of mobility can address. In fact, by crossing income with the willingness to adopt TCL (Table 6), about 29 % of respondents who reported income less than average were willing to travel more using TC compared to 16 % of respondents reporting higher income than the average (Chi Square = 27.314, $p < 0.05$).

Table 6
Willingness to adopt TCL by income level.

Stranger Based Travel Community					
		Community refusers	Less travel	Same travel	More travel
*Income	Less than average	12 %	24 %	35 %	29 %
	Average	19 %	29 %	35 %	17 %
	More than average	16 %	34 %	34 %	16 %

*P < 0.05.

Effects of travel characteristics. People who travel more for both purposes are much less likely to belong to the base category (more travel) than people who travel less. This effect is especially noticeable for commute purposes, frequent travelers are substantially more likely to belong to the travel community refusers category (Odds = 92.933, $p < 0.05$), and more likely to belong to people who would travel less with TC (Odds = 51.230$p < 0.05$). This might indicate that TC might be more suitable for people who travel sporadically. Carpool/ridesharing

membership has a significant effect in our model and is especially relevant for the willingness to join TCL, where membership is related to the desire to 'travel more' compared with 'travel community refusers' and with 'less use' categories.

Travel mode affects the willingness to adopt TC. Table 7 shows a cross-tabulation of travel mode and the willingness to join TC (for commuting and leisure). Individuals who currently travel with non-motorized means of transport are willing to travel more with TC for commuting, while individuals who currently travel with public transport are willing to travel more with TC for leisure. It could reflect latent travel demand which can be fulfilled neither by non-motorized means of transport by PT. TC might present a private car-like solution for populations who are less accessible to private vehicles. Car users are less likely to adopt TC as expected.

Individual attitudes towards shared mobility and technology. Positive individual attitudes were noted as a significant predictor increasing the variance explained in the model regarding the willingness to use travel communities for both travel purposes. A higher score of positive attitudes towards shared mobility and pro-technological attitudes are associated with more willingness to adopt TC.

Personal Social Preferences (PSP). The models provide some evidence of the PSP effect on the willingness to adopt TC. The preference to share the trip with women and with passengers of a similar age, show a significant effect on TCC adoption. On the other hand, the importance of rules during the trip (preference for not smokers and the importance of a quiet trip) is relevant for TCL. Individuals who prefer to share the trip with women are less likely to belong to community refusers (odd = 0.649, $p < 0.05$), and are more likely to belong to the less travel (Odds = 2.557, $p < 0.05$) and same amount of travel categories (Odds = 2.322, $p < 0.05$). This may indicate that the possibility to choose the gender of the co-passengers might increase the willingness to share the trip with strangers.

4.2.2. Analysis of the sensitivity to join TC

Respondents were asked about how they would change their number of trips with a TC platform if no group that fully matches their stated preferences is found. Thus, they can join another group which includes people who do not necessarily meet the main community attributes that were important to them.

As in the previous section a multinomial logistic regression model was performed. The dependent variable consists of three categories of people that if their personal preferences are not entirely matched they 1) will be unwilling to join a TC at all; 2) they would perform less travels by TC than they mentioned before; and 3) they would travel at the same amount as they mentioned before, meaning that they are not sensitive about their preferences – this is the reference category for the regression model. Table 8 shows the parameter estimates and odds ratio for all the categories of the model explaining the sensitivity variance of potential users.

For this estimation a factor analysis for the PSP attributes was performed. The idea was to explore commonalities around the PSP items. Based on Eigenvalue criterion, principal component analysis and varimax rotation, two main components were obtained. One component is related to the importance of personal profile sharing the trip including the importance of age, gender, common interest and rating systems. The second component refers to the importance of rules behavior in sharing the trip including no smoking and a quiet trip. All factor loadings are greater than 0.45, indicating high construct validity (Field, 2013).

Effect of socio demographic characteristics. Gender is significant only in the context of commuting trips where women are less likely than men to withdraw using TC of unmatched preferences. However, the two-variable relationship (crosstab in Table 9) shows that there is a higher percentage of women who would travel less if their preferences were not matched. It suggests than men are more sensitive than women under the situation of no matched preferences, but women are more willing than men to adopt TC even if their preferences are not fully answered.

Age presents an interesting trend, where younger age categories are less likely to stop using TC for unmatched preferences (both commuting and leisure) but are more likely to travel less under these circumstances. This finding shows that age is a significant consideration for TC use. In both contexts, commuting and leisure, this trend is observed and especially stressed in the commuting context were all the categories were statistically significant and stable with the trend. Income effects were not found significant. For both travel contexts, individuals who live in the periphery areas are more sensitive for no preference matching (will not travel at the same extent using TC) than individuals who live in the central areas (Odds = 0.364, $p < 0.05$).

Commuter frequent travelers are more likely (Odds = 5.109$p < 0.05$) to forgo the idea of TC if their preferences are not matched, while leisure frequent travelers are more likely to travel less (Odds = 1.562$p < 0.05$) if their preferences are not matched. These findings are coherent with the previous finding indicating that frequent travelers are much less open to take part in TC than sporadic users. For leisure trips, private car users and non-motorized are more likely than public transport users to reduce the amount of travel with TC if their preferences are not matched (Odss = 5.164, $p < 0.05$, Odss = 7.652$p < 0.05$). It could be inferred that frequent travelers, private vehicle and non-motorized users are more sensitive to meeting their preferences, while sporadic travelers and public transport users are more inclined to persist with TC. They find value in this social arrangement.

Individual attitudes towards shared mobility. There is a clear evidence (statistically significant in almost all the categories) that positive attitudes towards sharing and technological oriented individuals are more likely to maintain their travel amount using TC even when their individual preferences are not matched. The opposite is valid for distrust attitude toward sharing. Higher levels of distrust increase the probability to travel less if individual preferences are not matched in the hypothetical suggested system.

Personal Social Preferences (PSP). A clear trend is also observed (almost all the parameters are statistically significant). Personal profile and behavior rules increase the probability of travel less if the individual preferences are not matched. It shows that PSP affect/impact individual's consideration about sharing the trip with strangers.

5. Discussion

The findings of this study show the relevance of socio-demographic factors, travel characteristics, social attitudes, and PSP attributes to the inclination to adopt and use TC in the AV era, with clear implications for pooling schemes and mobility stakeholders interested in the

Table 7
Willingness to adopt TC by travel mode.

Stranger Based Travel Community									
		Community refusers		Less travel		Same travel		More travel	
		TCC	TCL	TCC	TCL	TCC	TCL	TCC	TCL
*Travel mode	Private car	11 %	17 %	41 %	28 %	38 %	35 %	9 %	20 %
	Non-motorized	8 %	18 %	38 %	34 %	29 %	21 %	25 %	27 %
	Public transport	5 %	3 %	35 %	25 %	49 %	40 %	11 %	31 %

*$p < 0.05$.

Table 8
Sensitivity of the willingness to join TC.

Variable (reference)	Categories	Unwillingness to use TC				Less use of TC under preference Violation			
		TCC		TCL		TCC		TCL	
		B	Odds	B	Odds	B	Odds	B	Odds
Gender (male)	Female	−0.591*	0.554	−0.02	0.98	0.16	1.174	0.038	1.039
Age	15–24	−2.667*	0.069	−1.166*	0.312	1.69*	5.419	0.97*	2.639
(65 +)	25–34	−1.739*	0.176	−0.8*	0.45	1.604*	4.975	1.03*	2.801
	35–44	−1.35*	0.259	−0.579	0.56	1.651*	5.214	0.576	1.779
	45–54	−1.063*	0.345	−0.485	0.616	1.203*	3.331	−0.156	0.856
	55–64	−2.128*	0.119	−0.61	0.544	1.045*	2.844	0.176	1.192
Income (Low)	Higher than average	0.331	1.393	0.446	1.563	0.047	1.048	−0.017	0.983
	Similar to average	0.308	1.36	−0.179	0,836	0.399*	1.491	0.154	1.167
Settlement type(Center)	Community villages	−0.072	0.931	0.305	1.356	−0.347	0.707	0.283	1.327
	Periphery areas	−0.138	0.871	0.29	1.336	−0.607*	0.545	−1.01*	0.364
Frequency (<)	More than 3 trips per week	1.631*	5.109	−0.18	0.835	−0.078	0.925	0.446*	1.562
Mode	Private	0.661*	1.937	1,642*	5.164	0.18	1.198	0,434*	1,543
	Non-motorized	1.029	2.799	−2.035*	7,652	0.255	1.291	−0.543	1.721
RS-CP membership (No)	Yes	0.299	1.349	−0.374	0.688	0.252	1.286	0.132	1.141
Attitudes - Factor Score	Sharing Idea (FA)	−0.944*	0.389	−0.717*	0.488	0.01	1.01	0.188*	1.207
	Distrust (FA)	0.574*	1.776	0.325*	1.384	0.355*	1.426	0.315*	1.37
	Tech productivity (FA)	−0.439*	0.644	−0.412*	0.662	−0.194*	0.823	−0.334*	0.716
Personal Individual Preferences	Profile	0.475*	1.608	0.305*	1.356	0.733*	2.081	0.824*	2.279
	Rules	−0.192	0.825	0.299*	1.348	0.407*	1.502	0.316*	1.372
	Intercept	−2.565		−2.295		−2.283		−1.742	
Model Fitting Criteria	TCC	TCL							
−2 Log Likelihood									
Intercept Only	1.584.798	1.783.740							
Final	1.287.763	1.436.315							
Chi-Square	297.035	347.425							
Pseudo R-Square									
Cox and Snell	0.285	0.319							
Nagelkerke	0.342	0.371							
McFadden	0.187	0.195							

*p < 0.05.

Table 9
Travel amount sensitivity by gender.

		Sensitivity		
		No use at all	Less use	Same use
*Gender	Male	12 %	31 %	58 %
	Female	9 %	37 %	54 %

*p < 0.05.

transition to sustainable and inclusive mobility. In particular, the propensity to adopt TC was higher among young, female, low-income PT users and non-frequent car travelers. These findings are partially aligned with other studies exploring the propensity to adopt shared trips in different contexts (Lazarus et al., 2021; Shaheen et al., 2017).

The results show that women are more likely to travel more than men when joining TCC. The sensitivity analyses suggest that women are more willing than men to adopt TCC even if their preferences are not fully met. However, they would travel less if their preferences were not matched. Although the fear of sharing the trip with men represents an acknowledged barrier for women (Morales Sarriera et al., 2017), other studies note that these systems particularly appeal to women (Ayaz et al., 2021; Monchambert, 2020). It could be related to the social construction of the women's role in the household as being responsible for childcare. Ridesharing could be helpful for children's transportation in specific households with limited mobility options for daily mobility and for single-parent families (Gheorghiu & Delhomme, 2018; Malodia & Singla, 2016). On the other hand, Chen et al. (2022) found that men are more likely to use ridesharing than women as they value the instrumental functions and benefits of the pooling systems. Women tend to value the emotional aspects of experiences and enjoyment (Chen et al., 2022). These findings are particularly relevant for the PSP attribute presented to the respondents, where women can choose the gender of their partners to be involved in social interaction with like-minded people, which probably increases their interest in the travel pooled option (Si et al., 2023).

Younger groups are more likely to join TCC than those aged 45—54 and 65+, who are heavy car users. In the AVs literature, numerous surveys studies provide evidence that young people are more open and positively oriented towards the AVs adoption (Harb et al., 2021b; Milakis & Müller, 2021) while other studies found no effects when mediated by other factors, such as personal attitudes are considered (Becker and Axhausen, 2017b; Nordhoff, Van Arem, et al., 2016). In this study, younger age groups are less likely to stop using TC because of unmatched preferences (both commuting and leisure communities). However, they are more likely to travel less under these circumstances, suggesting that the possibility of choosing people of similar age is particularly relevant for them. Income effects were observed where lower-income people are more willing to travel using TC (for both purposes). Low-income travelers are not sensitive to unmatched preferences as income effects were not found significant, suggesting that cost considerations for these individuals are prevalent over other considerations. Studies on carpooling and other pooling modalities found that low-income earners and non-vehicle owners are more likely to adopt ridesharing services with a higher frequency of use. Low-income carpooling users tend to be passengers (similar to the SAVs scenario), different from high-income carpooling users who tend to use the systems as drivers (Shaheen et al., 2017).

These findings provide some evidence of latent demand for AV-shared travel, which could be addressed by new forms of mobility arrangements, in particular for women, young people, and low-income people. These findings support the importance of the development of such shared services that might help overcome mobility constraints derived from social inequalities in disadvantaged areas and among vulnerable social groups (Dill & McNeil, 2021; Lucas, 2019; Roukouni & Correia, 2020).

Not surprisingly, individuals who are members of existing carpooling platforms, have positive attitudes towards shared mobility and are technologically oriented are more willing to adopt TC for both purposes.

The latter finding supports an emerging literature on the importance of personal attitudes regarding the intention to practice and actual behaviour regarding mobility choices (Jing et al., 2019; Rahimi et al., 2020; Menno D. Yap et al., 2016). However, in this study, in addition to the common attitude approach, a new attribute of personal social preference (PSP) is presented regarding joining a pool of potential members for future SAV trips. The models provide some evidence of the PSP effect on the willingness of strangers to join TC, which represents a nuance exploring ridesharing and carpool considerations. The preferences for socio-demographic profile attributes, for instance, for sharing the trip with women and with passengers of a similar age, show a significant positive effect on TCC (commuting) adoption. On the other hand, behavioral rules during the trip (preference for not smokers and the importance of a quiet trip) are significant for TCL (leisure). PSP could represent an extra social value, promoting TC in particular and carpooling/ridesharing in general.

Findings show also that commuting trips are more susceptible to travel communities than leisure trips. Evidence from studies on the willingness to adopt and use pooling options suggests the potential to increase the attractiveness of the systems when digital platforms enable users to schedule the trip in advance, making these trips reliable (Lazarus et al., 2021), although other studies show that digital platforms pose socially inclusive challenges for people with restricted access to ICT platforms (Israel et al., 2023). Also, from the users' perspectives, ridesharing is perceived as an alternative to public transport in off-hours and increases travel options in households with limited car ownership for daily mobility (Huang et al., 2021). In addition, Lavieri et al. (2019), found that the presence of strangers represents a less sensitive barrier for commuting than for leisure trips. However, the time added as a product of the detour represents a significant barrier for both contexts.

In our survey, individuals who are frequent travelers for commute and for leisure are much less willing to use TC. Private vehicle and non-motorized users are more likely to be travel community refusers. While sporadic travelers and public transport users are more inclined to persist with TC and pooling modes in general (Koppelman et al., 1993). They find value in this social arrangement. Nevertheless, looking at the willingness to travel more using TC, there is a difference between commute and leisure trips. For commuting trips, non-motorized users are the most willing to travel more by SAVs using TC, while public transport users are the most willing to travel more for leisure trips. Non-motorized users have various motivations for using this mode of travel. It is shown in the dual findings of them being more likely to be community refusers and the most willing to travel more with TC, on the other hand. These findings might suggest that for some, it is a choice suitable for their travel purpose and personal values, while for others, it is a default option when no other transport modes cater for their travel needs.

Regarding public transport users and their willingness to travel more by TC for leisure trips, it could be understood in the Israeli context that public transport offers limited service during weekends due to national policy involving religious considerations. In the California context, Lazarus et al. (2021), found that share-ride options are particularly relevant when travelling to a restaurant or bar. There is evidence that TC could attract public transport and nonmotorized travelers rather than frequent private car travelers. Thus, TC might present a private car-like solution for populations with less access to private vehicles. It is consistent with the research literature, which found a substitution of public transportation and nonmotorized travel with shared travel (Rayle et al., 2016; Schaller Consulting, 2017). Literature also mentions that shared mobility is mainly adopted by young, well-educated, male, and high-income persons (Clewlow & Mishra, 2017; Shaheen et al., 2017). In contrast, in this study, there is evidence that TC, as a new platform for shared trips, can address the latent demand of people with some socio-economic and access disadvantages, including women and low income. These ambiguous effects of the benefit of shared urban mobility systems need to be assessed in future studies across shared mobility options and in integrative, multi-modal systems (Dill & McNeil, 2021; Roukouni & Correia, 2020).

6. Conclusion, study implications and future directions

In this study a new concept of travel communities (TC) for future SAVs trips was introduced and explored. We analyzed the willingness to join TC from representative data survey of 1009 participants. The respondents were asked about a new form of social arrangement based on the formation of TC for shared AVs in a commuting and leisure context. Although TC is a hypothetical social arrangement for sharing a ride that is far from traveler's current experience, respondents' answers show the relevance of personal and social considerations for adopting innovative ways for travels that are based on shared schemes. The central role of cost and time considerations on the decision-making process of mode choice is well documented (Bansal et al., 2016; Gkartzonikas & Gkritza, 2019; Shabanpour et al., 2018; Steck et al., 2018; Stoiber et al., 2018; Yap et al., 2015). However, in this study these two parameters were not explicitly explored. They were treated as given inherent characteristic of the SAVs travel. The focus of the study was on the potential role of personal and social preferences for joining a pool in the purpose of creating future SAV trips.

Two main conclusions are noted.

1) **TC** is a new idea of social arrangement for shared mobility that was well accepted by most of the participants under certain circumstances and could enhance the adoption of shared mobility based on new business models for future automated transportation systems. It could also address latent demand for improving travel options for people with different constraints accessing transport such as women, young people, sporadic travelers and low-income individuals. TC could present an alternative for public transport competing but also complementing services gaps such as weekends, holydays, and remote areas.
2) The **PSP** attribute might help overcome psychological barriers regarding shared mobility such as the fear to share the trip with strangers and the uncertainty of a trip due to lack of tempo-spatial matching between passengers. The contribution of personal social preferences for choosing travel partners may overcome psychological barriers and add a social value promoting a new kind of social interaction which might increase the interest in TC and shared trips in general.

This approach could be also useful for existing mobility sharing schemes. Planners and stakeholders might take into consideration the relevance of social aspects for the promotion of new forms of mobility based on sharing models. The COVID-19 pandemic and its influence on public transportation and mobility patterns might push forward the idea of travel communities where trust and willingness to travel with preferred persons can be met. In this situation travel communities might be a solution for complying with crowding restrictions and capsule requirements while maintaining individual mobility needs. However, ethical aspects need to be addressed while adopting the TC concept (Moody et al., 2019). Public policy and some regulations might ease concerns regarding potential exclusions of certain groups based on socio-demographic, ethnic, religious, digital access or other individual characteristics (Israel et al., 2023).

Two main limitations could be noted for this study. First, the hypothetical nature of TC carries out uncertainty assessing the real potential of this model. Although participants were provided 'with explanations and a short video, subjective understanding was not available for analysis. Complementary qualitative studies are most relevant in this aspect (Israel et al., 2021). Second, key factors on the decision-making process of mode choice such as costs and time were not directly tested. Sarriera et al. (2017) found that social interactions were relevant to mode choice among dynamic ridesharing users in the United States, although not as

much as traditional factors such as time and cost. In this sense, the interaction between instrumental evaluations and individual and social considerations needs further research (Morales Sarriera et al., 2017). Also, future studies will benefit by investigate in detail the conceptual dimensions and structural relationship between attitudinal aspects and the effect of PSP, controlled by instrumental evaluations, affecting the willingness to share the strip with strangers. Finally, similar studies in other regions with different socio-cultural characteristics and travel behavior patterns are needed to verify the relevance of the findings in this research.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Acheampong, R.A., Cugurullo, F., 2019. Capturing the behavioural determinants behind the adoption of autonomous vehicles: Conceptual frameworks and measurement models to predict public transport, sharing and ownership trends of self-driving cars. Transport. Res. F: Traffic Psychol. Behav. 62, 349–375. https://doi.org/10.1016/j.trf.2019.01.009.

Acheampong, R.A., Cugurullo, F., Gueriau, M., Dusparic, I., 2021. Can autonomous vehicles enable sustainable mobility in future cities? Insights and policy challenges from user preferences over different urban transport options. Cities 112, 103134. https://doi.org/10.1016/j.cities.2021.103134.

Ajzen, I., 1991. The theory of planned behavior. Organ. Behav. Hum. Decis. Process. 50 (2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T.

Amirkiaee, S.Y., Evangelopoulos, N., 2018. Why do people rideshare? An experimental study. Transport. Res. F: Traffic Psychol. Behav. 55, 9–24. https://doi.org/10.1016/j.trf.2018.02.025.

Ashforth, B. E. (1989). Social Identity Theory and the Organization Work-life events theory View project biodata military View project. Doi: 10.2307/258189.

Ayaz, A., Waheed, A., Saleem, H., Abid, M.M., 2021. Travelers' attitude towards carpooling in Islamabad. J. Eng. Appl. Sci. 68 (1), 1–24. https://doi.org/10.1186/S44147-021-00023-X/TABLES/8.

Bansal, P., Kockelman, K.M., Singh, A., 2016. Assessing public opinions of and interest in new vehicle technologies: an Austin perspective. Transportat. Res. Part c: Emerg. Technol. 67, 1–14. https://doi.org/10.1016/j.trc.2016.01.019.

Becker, F., Axhausen, K.W., 2017. Literature review on surveys investigating the acceptance of automated vehicles. Transportation 44 (6), 1293–1306. https://doi.org/10.1007/s11116-017-9808-9.

Chan, N.D., Shaheen, S.A., 2012. Ridesharing in North America: Past, Present, and Future. Transp. Rev. Vol. 32(1, 93–112. https://doi.org/10.1080/01441647.2011.621557.

Chaube, V., Kavanaugh, A. L., & Perez-Quinones, M. A. (2010). Leveraging Social Networks to Embed Trust in Rideshare Programs. *2010 43rd Hawaii International Conference on System Sciences*, 1–8. Doi: 10.1109/HICSS.2010.255.

Chen, A., Wan, J., Lu, Y., 2022. Repairing the trust in ride-sharing after security incidents. Ind. Manag. Data Syst. 122 (1), 118–136. https://doi.org/10.1108/IMDS-10-2020-0623/FULL/XML.

Clewlow, R., & Mishra, G. (2017). *Disruptive transportation: the adoption, utilization, and impact of ride-hailing in the United States*.

Schaller Consulting. (2017). *Unsustainable? The Growth of App-Based Ride Services and Traffic, Travel and the Future of New York City*. 34. https://scholar-google-co-il.ezlibrary.technion.ac.il/scholar?hl=iw&as_sdt=0%2C5&q=UNSUSTAINABLE%3F+The+Growth+of+App-Based+Ride+Services+and+Traffic%2C+Travel+and+the+Future+of+New+York+City&btnG=.

Cui, Y., Makhija, R.S.M.S., Chen, R.B., He, Q., Khani, A., 2021. Understanding and Modeling the Social Preferences for Riders in Rideshare Matching. Transportation 48 (4), 1809–1835. https://doi.org/10.1007/s11116-020-10112-0.

Dijkhuijs, T., Israel, F., & van Lierop, D. (2023). To Share or to Own? Understanding the Willingness to Adopt Shared and Owned Electric Automated Vehicles on Three Continents. *Future Transportation 2023, Vol. 3, Pages 1108-1123*, *3*(3), 1108–1123. Doi: 10.3390/FUTURETRANSP3030061.

Dill, J., McNeil, N., 2021. Are Shared Vehicles Shared by All? A Review of Equity and Vehicle Sharing. J. Plan. Lit. 36 (1), 5–30. https://doi.org/10.1177/0885412220966732.

El Zarwi, F., Vij, A., Walker, J.L., 2017. A discrete choice framework for modeling and forecasting the adoption and diffusion of new transportation services. Transport. Res. Part c: Emerg. Technol. 79, 207–223. https://doi.org/10.1016/j.trc.2017.03.004.

Ferguson, E., 1997. The rise and fall of the American carpool: 1970–1990. Transportation 24 (4), 349–376. https://doi.org/10.1023/A:1004928012320.

Fulton, L., Mason, J., & Meroux, D. (2017). *Three Revolutions in Urban Transportation: How To Achieve the Full Potential of Vehicle Electrification, Automation, and Shared Mobility in Urban Transportation Systems Around the World by 2050*.

Furuhata, M., Dessouky, M., Ordóñez, F., Brunet, M.-E., Wang, X., Koenig, S., 2013. Ridesharing: The state-of-the-art and future directions. Transp. Res. B Methodol. 57, 28–46. https://doi.org/10.1016/J.TRB.2013.08.012.

Furuhata, M., Dessouky, M., Ordóñez, F., Brunet, M.-E., Wang, X., & Koenig, S. (2013b). *Ridesharing: The state-of-the-art and future directions*. Doi: 10.1016/j.trb.2013.08.012.

Gheorghiu, A., Delhomme, P., 2018. For which types of trips do French drivers carpool? Motivations underlying carpooling for different types of trips. TransportationResearch Part a: Policy and Practice 113, 460–475. https://doi.org/10.1016/J.TRA.2018.05.002.

Gkartzonikas, C., Gkritza, K., 2019. What have we learned? A review of stated preference and choice studies on autonomous vehicles. Transportation Research Part c: Emerging Technologies 98, 323–337. https://doi.org/10.1016/j.trc.2018.12.003.

Hamari, J., Sjöklint, M., Ukkonen, A., 2016. The sharing economy: Why people participate in collaborative consumption. J. Assoc. Inf. Sci. Technol. 67 (9), 2047–2059. https://doi.org/10.1002/asi.23552.

Harb, M., Stathopoulos, A., Shiftan, Y., Walker, J.L., 2021. What do we (Not) know about our future with automated vehicles? Transportat. Res. Part c: Emerg. Technol. 123, 102948 https://doi.org/10.1016/j.trc.2020.102948.

Huang, G., Qiao, S., Yeh, A.G.O., 2021. Spatiotemporally heterogeneous willingness to ridesplitting and its relationship with the built environment: A case study in Chengdu, China. Transportat. Res. Part c: Emerg. Technol. 133, 103425 https://doi.org/10.1016/J.TRC.2021.103425.

Israel, F., 2021a. A New Mobility System Based on Technological Change and Societal Transition – The Case of Autonomous Vehicle. Technion - Israel Institute of Technology.

Israel, F., Ettema, D., van Lierop, D., 2023. Mechanisms with equity implications for the (non-) adoption of electric mobility in the early stage of the energy transition. Transp. Rev. 1–25 https://doi.org/10.1080/01441647.2023.2283497.

Israel, F. (2021). *A New Mobility System Based on Technological Change and Societal Transition – The Case of Autonomous Vehicleitle*. Technion - Israel Institute of Technology.

Jie, F., Standing, C., Biermann, S., Standing, S., Le, T., 2021. Factors affecting the adoption of shared mobility systems: Evidence from Australia. Res. Transp. Bus. Manag. 41, 100651 https://doi.org/10.1016/J.RTBM.2021.100651.

Jin, S.T., Kong, H., Wu, R., Sui, D.Z., 2018. Ridesourcing, the sharing economy, and the future of cities. Cities 76, 96–104. https://doi.org/10.1016/j.cities.2018.01.012.

Jing, P., Huang, H., Ran, B., Zhan, F., & Shi, Y. (2019). Exploring the Factors Affecting Mode Choice Intention of Autonomous Vehicle Based on an Extended Theory of Planned Behavior—A Case Study in China. *Sustainability 2019, Vol. 11, Page 1155*, *11* (4), 1155. Doi: 10.3390/SU11041155.

Julagasigorn, P., Banomyong, R., Grant, D.B., Varadejsatitwong, P., 2021. What encourages people to carpool? A conceptual framework of carpooling psychological factors and research propositions. Transport. Res. Interdiscipl. Perspect. 12, 100493 https://doi.org/10.1016/J.TRIP.2021.100493.

Kamargianni, M., Li, W., Matyas, M., Schäfer, A., 2016. A Critical Review of New Mobility Services for Urban Transport. Transp. Res. Procedia 14, 3294–3303. https://doi.org/10.1016/j.trpro.2016.05.277.

Koppelman, F.S., Bhat, C.R., Schofer, J.L., 1993. Market research evaluation of actions to reduce suburban traffic congestion: Commuter travel behavior and response to demand reduction actions. Transp. Res. A Policy Pract. 27 (5), 383–393. https://doi.org/10.1016/0965-8564(93)90034-I.

Lavieri, P. S., & Bhat, C. R. (2019). *Investigating objective and subjective factors influencing the adoption, frequency, and characteristics of ride-hailing trips*. Doi: 10.1016/j.trc.2019.05.037.

Lazarus, J.R., Caicedo, J.D., Bayen, A.M., Shaheen, S.A., 2021. To Pool or Not to Pool? Understanding opportunities, challenges, and equity considerations to expanding the market for pooling. Transp. Res. A Policy Pract. 148, 199–222. https://doi.org/10.1016/J.TRA.2020.10.007.

Legris, P., Ingham, J., Collerette, P., Davis, Venkatesh, V., Morris, M. G., Davis, G. B., Davis, F. D., Sheller, M., Urry, J., Shove, E., Walker, G., Watson, M., Banister, D., Geels, F. W., Shaheen, S. A., Cohen, A. P., Steg, L., Gifford, R., … Rose, J. M. (2016). Are consumers willing to pay to let cars drive for them? Analyzing response to autonomous vehicles. *Research Policy*, *24*(3), 1–23. Doi: 10.1016/j.compenvurbsys.2017.04.006.

Liu, P., Zhang, Y., He, Z., 2019. The effect of population age on the acceptable safety of self-driving vehicles. Reliab. Eng. Syst. Saf. 185, 341–347. https://doi.org/10.1016/j.ress.2019.01.003.

Lucas, K., 2019. A new evolution for transport-related social exclusion research? J. Transp. Geogr. 81 https://doi.org/10.1016/J.JTRANGEO.2019.102529.

Madigan, R., Louw, T., Wilbrink, M., Schieben, A., Merat, N., 2017. What influences the decision to use automated public transport? Using UTAUT to understand public acceptance of automated road transport systems. Transport. Res. F: Traffic Psychol. Behav. 50, 55–64. https://doi.org/10.1016/j.trf.2017.07.007.

Malodia, S., Singla, H., 2016. A study of carpooling behaviour using a stated preference web survey in selected cities of India. Transp. Plan. Technol. 39 (5), 538–550. https://doi.org/10.1080/03081060.2016.1174368.

Milakis, D., Müller, S., 2021. The societal dimension of the automated vehicles transition: Towards a research agenda. Cities 113, 103144. https://doi.org/10.1016/J.CITIES.2021.103144.

Milakis, D., Van Arem, B., Van Wee, B., 2017. Policy and society related implications of automated driving: A review of literature and directions for future research. J. Intellig. Transport. Syst.: Technol., Plann. Operat. 21 (4), 324–348. https://doi.org/10.1080/15472450.2017.1291351.

Miller, S.A., Heard, B.R., 2016. The Environmental Impact of Autonomous Vehicles Depends on Adoption Patterns. Environ. Sci. Technol. 50 (12), 6119–6121. https://doi.org/10.1021/acs.est.6b02490.

Möhlmann, M., 2015. Collaborative consumption: Determinants of satisfaction and the likelihood of using a sharing economy option again. J. Consum. Behav. 14 (3), 193–207. https://doi.org/10.1002/cb.1512.
Monchambert, G., 2020. Why do (or don't) people carpool for long distance trips? A discrete choice experiment in France. Transp. Res. A Policy Pract. 132, 911–931. https://doi.org/10.1016/J.TRA.2019.12.033.
Moody, J., Middleton, S., Zhao, J., 2019. Rider-to-rider discriminatory attitudes and ridesharing behavior. Transport. Res. F: Traffic Psychol. Behav. 62, 258–273. https://doi.org/10.1016/j.trf.2019.01.003.
Morales Sarriera, J., Escovar Álvarez, G., Blynn, K., Alesbury, A., Scully, T., Zhao, J., 2017. To share or not to share: Investigating the social aspects of dynamic ridesharing. Transp. Res. Rec. 2605 (1), 109–117. https://doi.org/10.3141/2605-11.
Neoh, J.G., Chipulu, M., Marshall, A., Tewkesbury, A., 2018. How commuters' motivations to drive relate to propensity to carpool: Evidence from the United Kingdom and the United States. Transp. Res. A Policy Pract. 110, 128–148. https://doi.org/10.1016/J.TRA.2018.02.013.
Nielsen, J.R., Hovmøller, H., Blyth, P.L., Sovacool, B.K., 2015. Of "white crows" and "cash savers:" A qualitative study of travel behavior and perceptions of ridesharing in Denmark. Transp. Res. A Policy Pract. 78, 113–123. https://doi.org/10.1016/j.tra.2015.04.033.
Nieuwenhuijsen, J., Correia, G.H., de, A., Milakis, D., van Arem, B., van Daalen, E., 2018. Towards a quantitative method to analyze the long-term innovation diffusion of automated vehicles technology using system dynamics. Transport. Res. Part c: Emerg. Technol. 86, 300–327. https://doi.org/10.1016/J.TRC.2017.11.016.
Nordhoff, S., Van Arem, B., Happee, R., 2016a. Conceptual model to explain, predict, & improve user acceptance of driverless podlike vehicles. Transp. Res. Rec. 2602, 60–67. https://doi.org/10.3141/2602-08.
Nordhoff, S., van Arem, B., Happee, R., 2016b. Conceptual Model to Explain, Predict, and Improve User Acceptance of Driverless Podlike Vehicles. Transport. Res. Record: J. Transportat. Res. Board 2602 (November), 60–67. https://doi.org/10.3141/2602-08.
Ohnemus, M., Perl, A., 2016. Shared Autonomous Vehicles: Catalyst of New Mobility for the Last Mile? Built Environ. 42 (4), 589–602. https://doi.org/10.2148/benv.42.4.589.
Panagiotopoulos, I., Dimitrakopoulos, G., 2018. An empirical investigation on consumers' intentions towards autonomous driving. Transp. Res.Part c: Emerging Technologies 95, 773–784. https://doi.org/10.1016/j.trc.2018.08.013.
Pudāne, B., Rataj, M., Molin, E.J.E., Mouter, N., van Cranenburgh, S., Chorus, C.G., 2018. How will automated vehicles shape users' daily activities? Insights from focus groups with commuters in the Netherlands. Transp. Res. Part D: Transp. Environ. 1–14 https://doi.org/10.1016/j.trd.2018.11.014.
Rahimi, A., Azimi, G., Jin, X., 2020. Examining human attitudes toward shared mobility options and autonomous vehicles. Transport. Res. F: Traffic Psychol. Behav. 72, 133–154. https://doi.org/10.1016/J.TRF.2020.05.001.
Rayle, L., Dai, D., Chan, N., Cervero, R., Shaheen, S., 2016. Just a better taxi? A survey-based comparison of taxis, transit, and ridesourcing services in San Francisco. Transp. Policy 45, 168–178. https://doi.org/10.1016/j.tranpol.2015.10.004.
Raza, S.A., Khan, K.A., Salam, J., 2023. Impact of environmental triggers on students' behavior to use ride-sharing services: the moderating role of perceived risk. Curr. Psychol. 42 (13), 11329–11343. https://doi.org/10.1007/S12144-021-02405-Z.
Rogers, E. M. (1962a). *Diffusion of innovation*.
Rogers, E. M. (1962b). *Diffusion of innovation*.
Rojas-Rueda, D., Khreis, H., Frumkin, H., Nieuwenhuijsen, M.J., 2020. Autonomous Vehicles and Public Health Article in Annual Review of Public Health April. Annu. Rev. Public Health 41. https://doi.org/10.1146/annurev-publhealth-040119-094035.
Roukouni, A., & Correia, G.H. de A. (2020). Evaluation Methods for the Impacts of Shared Mobility: Classification and Critical Review. *Sustainability 2020, Vol. 12, Page 10504*, *12*(24), 10504. Doi: 10.3390/SU122410504.
Shabanpour, R., Golshani, N., Shamshiripour, A., Mohammadian, A., (Kouros)., 2018. Eliciting preferences for adoption of fully automated vehicles using best-worst analysis. Transport. Res. Part c: Emerg. Technol. 93, 463–478. https://doi.org/10.1016/J.TRC.2018.06.014.
Shaheen, S., Cohen, A., 2019. Shared ride services in North America: definitions, impacts, and the future of pooling. Transport Rev. 39 (4), 427–442. https://doi.org/10.1080/01441647.2018.1497728.
Shaheen, S., Cohen, A., & Zohdy, I. (2016). *Shared mobility: current practices and guiding principles*.
Shaheen, S., Stocker, A., Mundler, M., 2017. Online and App-Based Carpooling in France: Analyzing Users and Practices—A Study of BlaBlaCar. Lecture Not. Mobility 181–196. https://doi.org/10.1007/978-3-319-51602-8_12/TABLES/4.
Si, H., Shi, J., Hua, W., Cheng, L., De Vos, J., Li, W., 2023. What influences people to choose ridesharing? An overview of the literature. Transp. Rev. 43 (6), 1211–1236. https://doi.org/10.1080/01441647.2023.2208290.
Singleton, P.A., 2018. May 2). Discussing the "positive utilities" of autonomous vehicles: will travellers really use their time productively? Transp. Rev. 1–16. https://doi.org/10.1080/01441647.2018.1470584.
Soteropoulos, A., Berger, M., Ciari, F., 2019. Impacts of automated vehicles on travel behaviour and land use: an international review of modelling studies. Transp. Rev. 39 (1), 29–49. https://doi.org/10.1080/01441647.2018.1523253.
Steck, F., Kolarova, V., Bahamonde-Birke, F., Trommer, S., & Lenz, B. (2018). How Autonomous Driving May Affect the Value of Travel Time Savings for Commuting: *Https://Doi.Org/10.1177/0361198118757980*, *2672*(46), 11–20. https://doi.org/10.1177/0361198118757980.
Stocker, A., & Shaheen, S. (2018). *Shared Automated Mobility: Early Exploration and Potential Impacts* (pp. 125–139). Springer, Cham. https://doi.org/10.1007/978-3-319-60934-8_12.
Stoiber, T., Schubert, I., Hoerler, R., Burger, P., 2018. Will consumers prefer shared and pooled-use autonomous vehicles? A stated choice experiment with Swiss households. Transp. Res. D 1–18. https://doi.org/10.1016/j.trd.2018.12.019.
Tajfel, H., 1979. Individuals and groups in social psychology*. Br. J. Soc. Clin. Psychol. 18 (2), 183–190. https://doi.org/10.1111/J.2044-8260.1979.TB00324.X.
Talebian, A., Mishra, S., 2018. Predicting the adoption of connected autonomous vehicles: A new approach based on the theory of diffusion of innovations. Transport. Res. Part c: Emerg. Technol. 95, 363–380. https://doi.org/10.1016/j.trc.2018.06.005.
Thomopoulos, N., Givoni, M., 2015. The autonomous car—a blessing or a curse for the future of low carbon mobility? An exploration of likely vs. desirable outcomes. Europ. J. Futur. Res. 3 (1), 14. https://doi.org/10.1007/s40309-015-0071-z.
Wang, Y., Kutadinata, R., Winter, S., 2018. The evolutionary interaction between taxi-sharing behaviours and social networks. Transp. Res. A 119, 170–180. https://doi.org/10.1016/j.tra.2018.10.043.
Wang, Y., Gu, J., Wang, S., Wang, J., 2019. Understanding consumers' willingness to use ride-sharing services: The roles of perceived value and perceived risk. Transport. Res. Part c: Emerg. Technol. 105, 504–519. https://doi.org/10.1016/J.TRC.2019.05.044.
Wang, Y., Wang, S., Wang, J., Wei, J., Wang, C., 2020. An empirical study of consumers' intention to use ride-sharing services: using an extended technology acceptance model. Transportation 47, 397–415. https://doi.org/10.1007/s11116-018-9893-4.
Wen, J., Chen, Y.X., Nassir, N., Zhao, J., 2018. Transit-oriented autonomous vehicle operation with integrated demand-supply interaction. Transport. Res. Part c: Emerg. Technol. 97, 216–234. https://doi.org/10.1016/j.trc.2018.10.018.
Wu, J., Liao, H., Wang, J.W., Chen, T., 2019. The role of environmental concern in the public acceptance of autonomous electric vehicles: A survey from China. Transport. Res. F: Traffic Psychol. Behav. 60, 37–46. https://doi.org/10.1016/j.trf.2018.09.029.
Yap, M.D., Correia, G., Van Arem, B., 2015. Valuation of travel attributes for using automated vehicles as egress transport of multimodal train trips. Transp. Res. Procedia 10, 462–471. https://doi.org/10.1016/j.trpro.2015.09.096.
Yap, M.D., Correia, G., van Arem, B., 2016. Preferences of travellers for using automated vehicles as last mile public transport of multimodal train trips. Transp. Res. A Policy Pract. 94, 1–16. https://doi.org/10.1016/j.tra.2016.09.003.
Zhang, W., Guhathakurta, S., 2018. Residential Location Choice in the Era of Shared Autonomous Vehicles. J. Plan. Educ. Res. 0739456X1877606 https://doi.org/10.1177/0739456X18776062.
Zhang, T., Tao, D., Qu, X., Zhang, X., Lin, R., Zhang, W., 2019. The roles of initial trust and perceived risk in public's acceptance of automated vehicles. Transp. Res. CEmerging Technologies 98, 207–220. https://doi.org/10.1016/j.trc.2018.11.018.