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The role of gender and age in autonomous mobility: general attitude, awareness and media preference in the context of Czech Republic

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ABSTRACT: *One of the long-term goals of autonomous mobility is to achieve mobility for non-drivers or those with difficult access to mobility: for seniors, women, children or other groups of people who are not able to drive a car. However, previous surveys revealed that respondents in these subpopulations were rather reluctant to use connected and automated vehicles (CAVs). This discrepancy brings a paradox in the context of autonomous mobility because one of the main benefits of autonomous mobility is its use by groups that currently reject it the most. One of the reasons for this refusal may lie in the amount of available information on CAVs. Thus, this study focuses on the general attitude, the level of awareness and the preferred ways of new information obtaining on CAVs. Firstly, focus groups revealed preferred media channels for obtaining new information on CAVs. Consequently, a survey was conducted on perceptions and attitudes related to CAVs among the general population in the Czech Republic. Overall, 59 professional inquirers personally interviewed 1116 persons older than 15 years via computer (CAPI). Respondents were selected through the multistage probabilistic sampling procedure, based on the list of address points in the Czech Republic. In the sample, there were 573 (51%) women, the average age was 51 years (SD = 17 years). The results show that, on average, women declared more neutral and negatives attitude towards CAV in comparison to men regardless of age. Furthermore, men declared higher CAV awareness than women in all age groups. As for the preferred information channels, young men mostly chose internet or a "trial as a driver on the circuit". On the other hand, seniors declared the lowest willingness to receive new information about CAVs. However, if they wish to receive information on CAVs, they prefer TV or a "Trial during a social event at my neighbourhood". Results of this study are thus consistent with findings of previous studies as they all identify the importance of gender and age when it comes to the attitude on CAVs.*

KEYWORDS: *Connected and automated vehicles, CAVs, attitude, media, gender, age*

1. INTRODUCTION

Concerns related to the sharing of traffic space with Connected and automated vehicles (CAVs) have been increasingly discussed in recent years in various media types for experts and public (Boagey, 2016; Burt, 2016; Bomey, 2016; Murray, 2016; Spector & Dugan, 2016; Boudette, 2017; Bomey, 2017; Schoettle & Sivak, 2015; Dixit, Chand & Nair, 2016; Favaró et al., 2017). Specifically, these concerns have been part of the ongoing debate over ethical, economic or legal aspects of CAVs (Nyholm & Smids, 2016; Faulhaber et al. 2019; Evans, 2008; Havelke & Nida-Rumelin, 2015), the debate that already shapes the future of implementing CAVs. The dynamic between concerns of public and experts regarding CAVs and measures suggested or applied by policymakers or other stakeholders is fueled by the amount and nature of information available on CAVs (Smith & Anderson, 2017).

Since the nature of implementation of the CAVs relates to the way in which different social or economic groups of a population come in touch with the topic, it is essential to understand what channels serve as sources of information.

From the demographic perspective, the most sizeable group of expected future users of CAVs could be found among the so-called millennium generation (Vitale, J., Craig, A.G.,Pingitore, G., Robinson, R., Schmith, S. & Gangula, B., 2017). Members of this generation, also known as the Y generation, were born between 1980 and 2000 and grew up accompanied with technology and devices such as internet, computers, mobile phones, etc., and were thus ex-

posed to them to a greater degree than the previous generations (Microsoft, 2009). It is thus understood that members of this generation, the internet is the primary source of information (Junco & Mastrodicasa, 2007; Berk, 2009).

In the first years of surveying public opinions on CAVs, Millenials were the most welcoming group when it comes to CAVs. At the same time, due to their exposure to the internet with its high volume of news as well as their varying credibility, Millenials are increasingly exposed to reports of negative incidents of CAVs, such as traffic accidents. Consequently, the percentage of millennial drivers who are too afraid to ride in a CAV has increased from 49% to 64% since the end of 2017. This change represents the highest increase compared to other generations (Stepp, 2018).

Willingness to use CAVs among young people could be considered as one of the key indicators of the future adoption of CAVs – not only in terms of the extent of this adoption but also in terms of its form. For example, in a number of countries (e.g. United Kingdom, Norway, United States of America or Japan) there is the decreasing trend in the given driver's licences or car ownership in households (e.g. Delbosc & Currie, 2013; Mc Donald, 2015; Delbosc, Mc Donald, Stokes, Lucas, Circella & Lee, 2019). As a result, the Y generation could be more willing to use alternative forms of shared transport, such as carsharing or carpooling. And it is the willingness to share that affects the required decline in traffic density after the introduction of AV, as opposed to its increase due to the possibility of independent driverless movement (Litman & Todd, 2017).

At the same time, seniors, who could benefit in terms of increase of their mobility, seem to be somewhat reluctant when it comes to the idea of using CAVs (eg. Power, 2012; Power, 2013; Missel, 2014; Kyriakidis, M., Happee, R. & De Winter, J.C.F., 2015; Becker & Axhausen, 2017).

In addition, surveys mapping public opinion on CAVs identified other significant socio-demographic factors than age associated with the degree of awareness regarding CAVs and related concerns. Among different variables such as place of residence (eg. Smith & Anderson, 2017; Nielsen & Haustein, 2018; Missel, 2014) or level of education (eg. Smith & Anderson, 2017), gender is the dominant one (Power, 2012; Power, 2013; Casley, S. V., Jardim, A. S., & Quartulli, A. M., 2013; Missel, 2014; Payre, W., Cestac, J. & Delhomme, P., 2014; Hohenberger, C., Spörrle, M., & Welpe, I. M., 2016; Nordhoff, S., van Arem, B. & Happee, R., 2016; Zmud, J., Sener,I.N. & Wagner, J., 2016; Becker & Axhausen, 2017; Haboucha, C. J., Ishaq, R., & Shiftan, Y., 2017; Lavieri, P., S., Garikapati, V.M., Bhat, C.R., Pendyla, R.M., Astroza, S. & Dias, F.F., 2017; Lee, C., Ward, C., Raue, M., D'Ambrosio, L. & Coughlin, J.F., 2017), gender represents the most important factor related to attitude towards CAVs.

Specifically, a sizeable survey (Schoettle & Sivak, 2014) of public opinion in the USA, UK and Australia revealed that women were more likely to express concern connected to CAV than men. Women in the survey also felt that expected benefits of CAV such as improvements in traffic safety will likely not come into reality, whereas the majority of men felt perceived the same expected benefits as achievable. The follow-up survey of public opinion in these countries revealed that women rather did not prefer to have automation technologies installed in their vehicles. Also, another sizeable survey summarizing attitudes from 105 countries (40 countries with at least 25 respondents) conducted by Kyriakidis et al. (2015) found that men were willing to pay more for automation than women.

In addition, women showed more concerns when being asked to imagine riding a semi-autonomous vehicle ("Not at all concerned" were only 11% of women in comparison to 22% of men). The same gender-based pattern was present in concern for riding completely autonomous vehicles as there were 40% of "Very concerned "40% women, but only 31% of men with the same level of concerns (Schoettle & Sivak, 2015). According to a study conducted by American Automobile Association (AAA, 2017) in 2016, women (81%) were more likely than men (67%) to be afraid to allow a CAV operate independently while being inside the CAV.

Overall, men were more likely than women to trust semi-autonomous vehicle technology. In the AAA survey in 2017, women were more likely to be afraid to ride in a self-driving vehicle (85%) than men (69%). Women were also less likely to feel less safe (42%) when it comes to sharing the road with a self-driving vehicle in comparison to men (51%). Another survey done by Pew Research Center (2017) of Americans´attitudes toward driverless vehicles revealed that 63% of women (in contrast to only 44% of men) express some level of worry about development of driverless vehicles and they were less enthusiastic about it (46% of men and 34% of women are

at least somewhat enthusiastic). Charness, N., Yoon J. S., Souders, D., Stothart C. & Yehnert, C. (2018) found that men held more positive attitudes towards CAV as they were less concerned when it comes to CAVs, but also showed higher willingness to relinquish driving control and stated to be more eager to adopt CAVs.

Furthermore, although both genders generally felt negative about placing their children in an autonomonous vehicle unaccompanied, men showed a greater inclination towards using CAVs to transport kids than women who were significantly more against the idea (Hand & Lee 2018).

Put together, surveys focused on the preferences and concerns about CAV quite consistently show that women (Power, 2012; Power, 2013; Casley et al. 2013; Missel, 2014; Nordhoff et al., 2016; Zmud et al., 2016; Becker & Axhausen, 2017; Lavieri et al., 2017; Lee et al., 2017) and seniors (eg. Power, 2012; Power, 2013; Missel, 2014; Kyriakidis et al., 2015; Becker & Axhausen, 2017) declare the lowest preference rate and the highest fear of CAVs onset.

At the same time, one of the long-term goals of autonomous mobility is to achieve mobility for non-drivers: for seniors, women, children or other groups of people who are not able to drive a car. This discrepancy brings a paradox in the context of autonomous mobility because one of the main benefits of autonomous mobility is its use by groups that currently reject it most.

This paradox returns us to the importance of the information as well as media channels through which information on CAVs is delivered to the general public. Despite numerous studies have been focused on awareness regarding CAVs, only limited attention has been given to the nature of information on CAVs that different groups of population encounter. Thus, the presented study aims to extend current knowledge on CAVs by identifying preferred media channels – both "traditional" such as press, TV or radio, as well as "alternative" such as "Trial as a driver". Additionally, since the previous studies identified an important role of gender and age, this study seeks to provide insights for different genders and age groups. Exploration in this area not only increases knowledge on the acceptance of CAVs, but also provides relevant insights for stakeholders in the attempt to solve the situation in which those groups of a population that could benefit from CAVs are the groups that currently reject it the most.

2. METHODS

2.1 Sampling and design

The study began with the two focus groups interviews on media channels used for obtaining information on CAVs. In the two focus groups interview, conducted in May 2018, six men (M = 47, SD = 15.1, min = 29, and max = 66 years) and six women (M = 42, SD = 13, min = 28, and max = 61 years) participated.

Analyzed topics for focus groups interview were preferred media for obtaining information about CAV and alternative ways for obtaining information about CAV. The specific goal was to understand the topic more deeply and to reveal the specifics of the Czech context. Participants of the focus groups had a high level of consensus within and also between both groups. Focus groups' audio recordings were rewritten, and the obtained text was analyzed by interpretative phenomenological analysis (IPA; e.g. Elliott, Fischer & Rennie, 1999; Smith et al., 2007; Hefferon & Gil-Rodriguez, 2011). Following this analysis, categories of media channels (press, radio, TV, internet, information flyers) and alternative information channels (information portal, trial as a driver, trial as a cyclist/pedestrian, trial at my neighborhood, school events for children) were formulated. These categories have been transformed into questionnaire items.

The follow-up survey then proceeded between July and October 2018. Interviewing was conducted at randomly selected addresses across the Czech Republic, by 70 professionally trained interviewers. The final sample size included 1 116 respondents (Men = 543, 48.7%; Women = 573, 51; 3%). The interviewers assisted respondents in passing through an electronic questionnaire (CAPI). Table 1 provides more detailed information regarding the socio-demography of the participants in the main study.

2.2 Method

The interview itself focused on issues associated with CAVs or related topics such as attitudes towards new technology in general or respondent's travel behaviour. In order to achieve comparability of the results, the used methods were adopted from the ongoing research in this area (e.g. Schoettle & Sivak, 2014; Cyganski, Fraedrich, & Lenz, 2014; Zmud et al., 2016).

Moreover, items on the media channels used as well as preferred when it comes to informing on CAVs were extracted from the focus groups described in the previous section. The obtained texts were then pro-

Table 1 – Socio-demography of the sample.

Variables	Category	Sample (n = 1 065)
Gender	Men	542 (51%)
	Women	523 (49%)
Age (in years)	M (SD)	51 (17)
	Median	51
	Range	15 – 94
Achieved level of education	Primary	123 (11%)
	Vocational	367 (33%)
	High school	442 (40%)
	College	140 (16%)
Household gross monthly income*	Less than 361 EUR	22 (3%)
	361-590 EUR	135 (19%)
	591-865 EUR	124 (17%)
	866-1 180 EUR	196 (27%)
	1 181-1 966 EUR	191 (26%)
	More than 1 967 EUR	61 (8%)

*For a reference, the monthly average gross income for individuals was 29 504 CZK or circa 1 180 EUR (Czech Statistical Office, 2018).

cessed via interpretative phenomenological analysis (IPA; e.g. Elliott, Fischer & Rennie, 1999; Smith et al., 2007; Hefferon & Gil-Rodriguez, 2011). Outputs from the focus groups, in combination with the literature review, resulted in the final version of the questionnaire administered to respondents in the follow-up survey. The goal of this activity was to identify traditional as well as alternative channels through which different groups of a population could be approached when communicating about CAVs.

If it is not stated differently, by the term autonomous or self-driving vehicles, we mean the high level of automation. In other words, level four according to the classification of the Society of Automotive Engineers (SAE; Smith, 2013).

The interview began with a brief description of what is meant by CAVs in the context of this survey, where it was aligned with the level four defined by SAE (Smith, 2013), to standardize the intended meaning of CAVs among participants.

Firstly, respondents were asked "Have you ever heard about autonomous vehicles before participating in this survey?" along with "Yes", "No" and "I don't know" as the response alternatives. The follow-up question "How much do you think you know about connected and automated vehicles?" allowed respondents to chose one of the four answering alternatives: "I encountered the topic", "I know a few things regarding the topic", "I am quite well informed about the topic", and "I work as an expert in this area".

Moreover, respondents were asked about their general attitude towards CAVs: "What is your general opinion regarding autonomous vehicles? Even if you had never heard of autonomous vehicles before participating in this survey, please give us your opinion based on the description you just read." and could choose from following answers: "Very negative", "Rather negative", "Neither negative nor positive", "Rather positive", and "Very positive".

In their answers, the Czech respondents also had to express their concerns ("How concerned are you about the following issues related to autonomous vehicles?") related to specific aspects of using autonomous vehicles (e.g. "Data privacy"). The answering scale was the following: "Not at all concerned", "Slightly concerned", "Moderately concerned", and "Very concerned".

Based on the results of the focus groups, respondents were also asked about current and preferred ways of new information about CAV implementation obtaining. There were these offered options: "Press", "Radio", "TV", "Internet", "Information flyers", and "Not interested". In addition, respondents were asked about preferred alternative ways of new infor-

mation about CAV implementation obtaining. Offered options here were: "Information portal", "Trial as a driver on the test circuit", "Trial as a cyclist/pedestrian on the test circuit", "Trial during a social event at my neighbourhood", "School events for children", and "Not interested".

2.3 Data analysis

The data were analysed via statistical package R (version 3.5.1.; R Core Team, 2018) and imported to R via the readxl package (version 1.2.0; Wickham & Bryan, 2018). The dplyr package (version 0.7.8; Wickham, François, Henry, & Müller, 2018) was used for data wrangling. The lsr package (version 1.8.12; Navarro, 2015) was used to calculate statistical tests.

3. RESULTS

When it comes to the answer on the item "Have you ever heard about autonomous vehicles?", men were more likely to answer "Yes" rather than "No" in comparison to women. This conclusion applies to the sample in general comparison in the sample ($\chi^2(1) = 65.64$, $p < .001$, Cramer's $V = .25$), but

Table 2. Awareness and general attitude towards autonomous vehicles.

Age group	Gender	Have you ever heard about autonomous vehicles?		How much do you think you know about connected and automated vehicles?		What is your general opinion regarding autonomous vehicles?	
15-29 years	Men	No	12 (18%)	I encountered the topic	17 (33%)	Negative	14 (20%)
		Yes	52 (79%)	I know a few things regarding the topic	30 (58%)	Neutral	19 (28%)
		Don't know	2 (3%)	I am quite well informed about the topic	5 (10%)	Positive	34 (50%)
	Women	No	28 (41%)	I encountered the topic	20 (62%)	Negative	20 (29%)
		Yes	32 (47%)	I know a few things regarding the topic	8 (25%)	Neutral	29 (43%)
		Don't know	8 (12%)	I am quite well informed about the topic	4 (12%)	Positive	19 (28%)
30-59 years	Men	No	52 (19%)	I encountered the topic	80 (39%)	Negative	90 (32%)
		Yes	205 (75%)	I know a few things regarding the topic	94 (46%)	Neutral	96 (35%)
		Don't know	16 (6%)	I am quite well informed about the topic	29 (14%)	Positive	88 (32%)
	Women	No	119 (39%)	I encountered the topic	103 (64%)	Negative	132 (43%)
		Yes	164 (53%)	I know a few things regarding the topic	54 (33%)	Neutral	132 (43%)
		Don't know	26 (8%)	I am quite well informed about the topic	5 (3%)	Positive	45 (15%)
60 years and older	Men	No	64 (32%)	I encountered the topic	64 (50%)	Negative	101 (50%)
		Yes	129 (64%)	I know a few things regarding the topic	54 (42%)	Neutral	64 (32%)
		Don't know	9 (4%)	I am quite well informed about the topic	11 (9%)	Positive	37 (18%)
	Women	No	115 (59%)	I encountered the topic	49 (68%)	Negative	112 (57%)
		Yes	73 (37%)	I know a few things regarding the topic	21 (29%)	Neutral	66 (34%)
		Don't know	7 (4%)	I am quite well informed about the topic	2 (3%)	Positive	18 (10%)

Note: n = 1116.

also the youngest ($\chi^2(1) = 9.8$, $p = .02$, Cramer's $V = .28$), the middle ($\chi^2(1) = 28.62$, $p < .001$, Cramer's $V = .23$) and the oldest ($\chi^2(1) = 28.88$, $p < .001$, Cramer's $V = .28$) generations. The biggest difference was found among the youngest and the oldest generations. However, despite not being negligible, the size of this difference was small to medium.

Interestingly, albeit men declared – subjectively speaking – more awareness related to CAVs than women ($\chi^2(2) = 35.33$, $p < .001$, Cramer's $V = .23$), this difference was not observed among the youngest ($\chi^2(1) = 7.37$, $p = .08$, Cramer's $V = .31$) and the oldest ($\chi^2(1) = 3.92$, $p = .57$, Cramer's $V = .14$) generations. In other words, for respondents between 15 and 29 years as well as for those of 60 years and older, women declared subjective knowledge of the topic similarly as men did. Only in respondents between 30 and 59 year, there was a statistical difference between women and men ($\chi^2(2) = 26.37$, $p < .001$, Cramer's $V = .27$). However, this difference again was not substantial.

As for the general attitude towards CAVs, there was the same pattern as in the subjective knowledge related to CAVs. In other words, the youngest ($\chi^2(3) = 7.97$, $p = .56$, Cramer's $V = .25$) and the oldest ($\chi^2(3) = 5.58$, $p = 1.0$, Cramer's $V = .12$) groups of respondents showed no statistical nor substantial difference when evaluating CAVs. At the same time, men in the middle generation tended to be more positive regarding CAVs than women ($\chi^2(4) = 25.55$, $p < .001$, Cramer's $V = .21$). This result projected also to the comparison in the whole sample ($\chi^2(4) = 36.94$, $p < .001$, Cramer's $V = .18$).

When it comes to the media channels through which respondents in the sample wanted to be informed about CAVs, there were similar opinions across the sample as well as significant differences between age groups and genders. For instance, television was the most widely accepted source of information for women and men, old and young. On the other hand, younger respondents and especially younger men dominantly preferred the internet as their source of information on CAVs. Also, women from the oldest age group were not interested in the topic in 35% of cases (i.e. 69) persons. In comparison, only 10% of the youngest men (i.e. 7) showed the same disinterest.

Respondents who were, subjectively speaking, more likely to be informed about the topic of CAVs, were also statistically more likely to read press ($\chi^2(2) = 20.89$, $p < .001$, Cramer's $V = .18$) and even more likely to use the internet ($\chi^2(2) = 51.12$, $p < .001$, Cramer's $V = .29$). On the other hand, watching TV ($\chi^2(2) = .46$, $p = .79$, Cramer's $V = .03$) did not relate to the subjectively declared awareness of the CAVs.

Table 3. Through which of the following media channels would you prefer to receive information about connected and automated vehicles?

			Press		Radio		TV		Internet		Information flyers		Not interested	
Age group	**Gender**	**Answer**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
15-29 years	Men	No	42	63	45	67	23	34	7	10	46	69	60	90
		Yes	25	37	22	33	44	66	60	90	21	31	7	10
	Women	No	42	63	40	59	25	37	19	28	45	66	56	82
		Yes	25	37	28	41	43	63	49	72	23	34	12	18
30-59 years	Men	No	168	62	171	63	106	39	97	35	172	63	226	83
		Yes	105	38	102	37	168	61	177	65	101	37	46	17
	Women	No	193	63	202	66	124	40	124	40	223	72	231	75
		Yes	115	37	105	34	184	60	184	60	85	28	78	25
60 years and older	Men	No	131	66	134	67	74	37	129	64	161	80	152	76
		Yes	69	34	66	33	127	63	72	36	39	20	49	24
	Women	No	137	70	147	75	97	49	159	81	160	82	127	65
		Yes	59	30	49	25	99	51	37	19	36	18	69	35

Note: N = 1116.

Table 4. Through which of the following alternative information channels would you prefer to receive information about connected and automated vehicles?

			Information portal		Trial as a driver		Trial as a cyclist/ pedestrian		Trial at my neighborhood		School events for children		Not interested	
Age group	**Gender**	**Answer**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
15-29 years	Men	No	32	48	17	25	29	43	32	48	48	72	61	91
		Yes	35	52	50	75	38	57	35	52	19	28	6	9
	Women	No	38	56	28	41	28	41	37	54	49	72	53	78
		Yes	30	44	40	59	40	59	31	46	19	28	15	22
30-59 years	Men	No	146	54	108	40	143	53	144	53	194	71	219	80
		Yes	126	46	165	60	129	47	128	47	78	29	54	20
	Women	No	193	63	166	54	180	58	178	58	223	72	215	70
		Yes	115	37	142	46	128	42	130	42	85	28	94	30
60 years and older	Men	No	138	69	134	67	144	72	126	63	164	82	144	71
		Yes	62	31	66	33	56	28	74	37	36	18	58	29
	Women	No	161	82	166	85	166	85	157	80	175	89	115	59
		Yes	35	18	30	15	30	15	39	20	21	11	81	41

Note: N = 1116.

As for the "alternative" channels of informing about CAVs, generally speaking, the least preferred alternative was "school events for children". This pattern was even more significant among the oldest women. On the other hand, experience with CAVs in the form of the trial was the most popular choice, especially among younger men. Also, older respondents often agreed specifically upon experience with CAVs from a pedestrian or a cyclist point of view. Preference of the different versions of trials was then followed by the preference for the objective and independent information channel. Again, the younger the respondents were, the less likely they were to declare that they are not interested in receiving more information on CAVs.

4. DISCUSSION

One of the main goals of this study was the focus on and further analyze the paradox in the context of autonomous mobility, where the groups of people that would benefit from the autonomous mobility the most are also the groups that declare the lowest willingness to adopt this technology (Power, 2012; Power, 2013; Casley et al. 2013; Missel, 2014; Nordhoff et al., 2016; Zmud et al., 2016; Becker & Axhausen, 2017; Lavieri et al. , 2017; Lee et al., 2017). Results of this study corroborate previous research in this area as **women declared significantly higher degree of negative attitudes towards CAV than men.** In a more detailed view of the presented data, 46% of women declare negative attitudes (17% very negative, 29% rather negative) towards CAV, but only 38% of men (14% very negative, 24% rather negative). This corresponds to the opposite distribution of positive attitudes towards CAV among men (4% very positive, 25% rather positive) and women (2% very positive, 12% rather positive). Therefore, data from the Czech Republic show the trend found in other countries.

This general trend was found in all age groups (young, middle-aged and seniors), although for some groups the differences are not significant, the prevailing trend shows that older respondents tended to declare higher levels of negative attitudes towards CAVs. Among young women, 29% of respondents declare negative attitudes (22% rather negative, 7% very negative), while among middle-aged woman 43% declare negative attitudes (32% rather negative, 11% very negative), and finally among elderly woman declare negative attitudes 57% (29% very negative, 28% rather negative).

The same trend was found among men, although their general attitude towards CAV is more positive

in general. Among young men, 20% declare negative attitude (13% rather negative, 7% very negative), while among middle-aged men 32% declare negative attitude (24% rather negative, 8% very negative) and finally again largest proportion 50% of elderly men declare negative attitude (27% rather negative, 23% very negative). Thus, even in this aspect, respondents from the Czech Republic demonstrate the trend recorded in other countries.

Moreover, women declared significantly higher degree of neutral attitudes compared to men (40% women vs 33% men) in all age categories (28% men vs 43% women among younger; 35% men vs 43% women among middle-age and 32% men vs 34% women among the oldest age group). Thus, a higher proportion of negative or neutral attitudes towards CAV can be expected among women and seniors.

As for the reasons behind this trend, the results of this study do not provide a straightforward explanation. However, if we take into account other studies in this area, for example, the study by AAA (2016) revealed that among drivers twice as many women as men (23% women compared to 12% men) cited "feeling the technology is too complicated to use" as a reason for not wanting the technology in their next vehicle. Another possible explanation brings the level of familiarity and the level of awareness about the CAV into the picture. It has been proved that if a person was more and better informed about autonomous car development, this person was more likely to have more positive attitudes towards CAVs (e.g. König & Neumayr 2017). Also, those respondents who were more familiar with autonomous or semi-autonomous technology trust it more (e.g. Carlson et al. 2014). In the presented study, women declared (subjectively speaking) less awareness regarding CAVs than men. Finally, perhaps there is a third variable underlining both tendencies, i.e. higher levels of optimism among men when it comes to their capacities to successfully manage "problem" from the technological domain.

Interestingly, the general attitude towards CAVs could develop and change, even during a relatively short period. Because of the constant flow of new information on CAVs, some groups in a population may **find it difficult to adopt an attitude consistent in time. This conclusion applies especially to Millenials. Taken from the other perspective, members of different groups in the population might find difficult to form a consistent attitude towards this topic since they lack relevant information sources and, ultimately, enough information to form such attitude**. For example, the study by AAA (2016) revealed that women declared more often (compared to men) as a reason for not wanting semi-autonomous technology in their next vehicle that they did not know enough about it (56% women compared to 44% men). In the presented study, more than one-third of respondents have not yet heard about CAVs (35%) or are unable to respond (6%). Additionally, **men declared a higher level of familiarity with the CAV topic in all age groups** (for the young respondents it was 79% men vs 47% women; for middle-aged 75% men vs 53% women; and for seniors 64 % of men vs 37% women) and higher level of awareness regarding CAVs. As for the item "How much do you think you know about connected and automated vehicles?", young and middle-aged men had most often declared "I know a few things regarding the topic" (58% of young; 46% of middle-aged), while for young and middle-aged women it was "I encountered the topic" (62% young; 64% middle-aged).

Again, we can only hypothesize about the reasons for the lower awareness of women and seniors. However, one of the possible explanations could be the **declared willingness to receive new information via various types of media** and alternative ways of information. In the question "Through which of the following media channels would you prefer to receive information about connected and automated vehicles?", women of all age groups declared significantly higher degree of "Not interested" response than men (18% young women vs. 10% young men; 25% middle-age women vs. 17% middle-age men and 35% elderly women vs. 24% elderly men). In contrast, m**en declared higher willingness to receive new information via various types of media, especially via the internet** (preferences among young: 90% internet, 66% television; preferences among middle age: 65% internet, 61% television), only the male seniors prefered TV (preferences among elderly: 63% television, 36% internet). Young women declared higher willingness to receive new information via the internet (72%) and television (63%), middle-age woman preferred internet and TV on the same level (60%) and older women preferred TV (51%) or press (30). However, 35% of older women were not interested in the topic of CAV at all.

From the perspective of age, the internet was found to be the most preferred source of information for young respondents of both genders. Thus, this finding is consistent with the above media behaviour

of Millenials in previous studies (e.g. Junco, Mastrodicasa, 2007; Berk, 2009). To sum up, the highest willingness to receive new information on CAVs was declared by young men, who preferred the internet or TV as the media channels.

In the light of the findings on preferred media channels, it should be added that in the Czech Republic, the new information about CAVs was possible to obtain almost exclusively via the internet at the time when the survey in this study took place. Therefore, respondents who prefer the internet as a source of information had the opportunity to obtain more information about CAV during our survey.

The survey also explored alternative ways of obtaining new information, as those were identified as relevant in the qualitative pre-research. **Men declare a higher willingness to receive new information about CAV via alternative ways of informing themselves, regardless of the specific source or channel** here too. Conversely, 41% of the elderly women stated no interest in receiving new information on CAVs through any of the alternative information channels, whereas only 10% of the young men did the same. Specifically, young (75% men, 59% women) as well as middle-aged (60% men and 46% women) respondents **preferred option "Trial as a driver on the test circuit"**, while elderly men and women prefer option **"Trial during a social event at my neighbourhood".** Their answer may reflect the importance of the social dimension regarding the implementation of CAVs.

5. CONCLUSION

In conclusion, women in this survey in all age groups declared a more neutral and negative attitude towards CAV than men. The declared familiarity of men with the topic of CAV and the awareness regarding CAVs declared by them were higher than among women. Again, this difference was present in all of the analysed age groups. Moreover, young men showed the highest willingness to receive new information about CAV. As for the preferred information channels, young men mostly chose internet or a "trial as a driver on the circuit". On the other hand, elderly women declared the lowest willingness to receive new information about CAV. However, if they wish to receive information on CAVs, they prefer TV or a "Trial during a social event at my neighbourhood". Results of this study are thus consistent with findings of previous studies as they all identify the importance of gender and age when it comes to the attitude on CAVs.

Based on findings in this study the "paradox of acceptance" (those who should benefit from CAVs at most at the same time show the most negative attitudes) should be the aim of further research. Women and seniors are perhaps more vulnerable to negative information or news connected with CAVs and more insecure in a situation with low level of information. The question which lies ahead is whether better-informed women (especially senior) will have a more positive attitude or whether the negative feelings are of different or deeper nature. As the CAVs technology is primarily business-driven and not people's needs-driven it may show that CAVs do not fit the real needs of the presumed target group.

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