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Public opinion on Autonomous Flying Vehicles in Greece: a stated preference approach

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Background

- Although the notion of a "Flying Vehicle" has long-seemed nearer to science fiction than science fact, recent technological advances are slowly bringing these capabilities closer to reality

- The surmised advantages of an Autonomous Flying Vehicle network are many, as it effectively combines ideal characteristics of both planes and cars

- Regardless of their superior transportation capabilities, the widespread adoption of Autonomous Flying Vehicles will be predominantly shaped by public perception

Scope

- The objective of the present study is the investigation of Greek travelers' acceptance of Autonomous Flying Vehicles, as well as the identification of the most significant factors affecting that decision

Data Collection

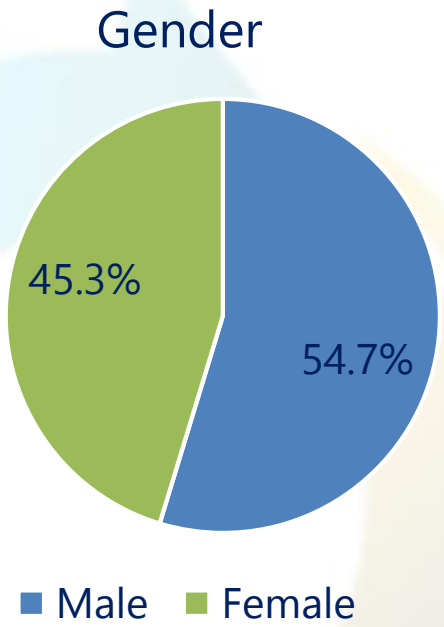
Stated preference method

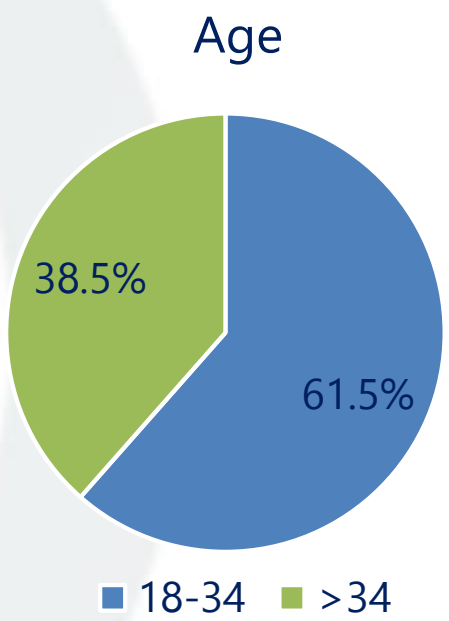
- The online survey data were collected from a sample of 193 participants

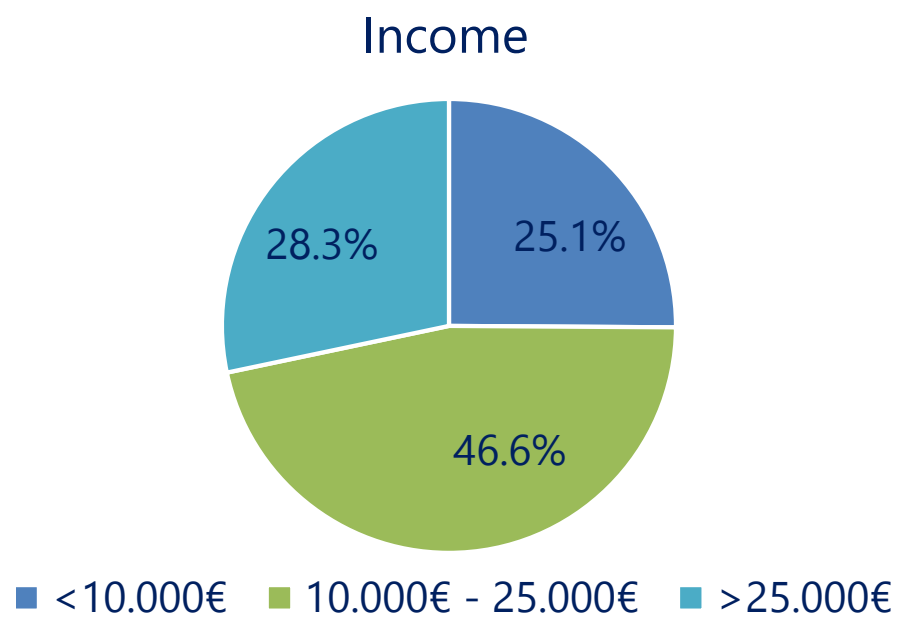
Questionnaire design

- 1st part: mobility and driving behavior habits of the participants
- 2nd part: opinions on AFV, advantages - disadvantages
- 3rd part: 8 scenarios, 3 parameters: time, cost, comfort, 3 alternatives: AFV, car, taxi
- 4th part: Demographic characteristics

Descriptive statistics







Methodology

Selection of logistic regression models

- **Multinomial model**: travel mode choice among AFV, car, taxi
- **Binary model**: future use of AFV
- **Utility function**: $U_{in} = a_0 + a_1 x_1 + a_2 x_2 + \cdots + a_n x_n + \varepsilon_{in}$
- **Probability** of choosing each alternative:

$$P_i = \frac{e^{U_i}}{1 + e^{U_j}}$$

Results (1/2)

Multinomial Logistic Model for transport mode choice

Independent Variables	Taxi			AFV		
	B	P-value	Odds Ratio	B	P-value	Odds Ratio
Constant				2.268	0.003	
time	-0.081	<0.001	0.92	-0.081	<0.001	0.92
cost	-0.104	<0.001	0.9	-0.104	<0.001	0.9
comfort	-0.393	<0.001	0.68	-0.393	<0.001	0.68
Use of AFV (yes=1)	-2.588	0.02	0.08			
Would wait till feel comfortable before using AFV (yes=1)				-0.522	0.008	0.59
Household of 2 persons (yes=1)				-0.683	0.001	0.51
Household of 3 persons (yes=1)	-0.566	0.028	0.57	-0.83	<0.001	0.44
Household of 4 persons (yes=1)	-0.58	0.012	0.56	-0.595	0.004	0.55
"Not so important" option in the question "How important is comfort during your travel?"				-1.096	0.042	0.33
"Important" option in the question "How important is comfort during your travel?"				-2.157	<0.001	0.12
"Quite important" option in the question "How important is comfort during your travel?"				-1.932	<0.001	0.14
" Very important" option in the question "How important is comfort during your travel?"	-1.392	0.033	0	-1.645	0.001	0.19
AFV less safe than traditional means of transport				-0.82	<0.001	0.44
Age group >55 (yes=1. otherwise=0)				-0.883	0.005	0.41
McFadden R^2	0.204					

Results (2/2)

Binary Logistic Model for Autonomous Flying Vehicle use

Independent Variables	Binary Logistic Model		
	B	P-value	Odds Ratio
Constant	-0.021	0.987	0.98
"Disagree" with the statement "New technology causes more problems than it solves"	2.909	<0.001	18.34
"Neither agree nor disagree" with the statement "New technology causes more problems than it solves"	1.102	0.007	3.01
"Neither agree nor disagree" with the statement "I often use new technological products. even though they are expensive"	2.245	<0.001	9.44
"I agree" with the statement "I rarely use new technological products. if they are expensive"	2.158	<0.001	8.65
"I agree" with the sentence "I often use new technological products. even though they are expensive"	3.569	<0.001	35.48
"Less" to the question "Would you travel more. the same or less with a AFV?"	-3.886	<0.001	0.02
"I would be worried" to the question "What would you do when inside a AFV?"	-0.843	0.003	0.43
Age group 25-34 (yes=1, otherwise=0)	-0.728	0.044	0.48
Age group 35-54 (yes=1, otherwise=0)	-2.260	<0.001	0.10
"Combination of different means" to the question "What are the main means of transport that you use?"	-0.793	0.041	0.45
"None of the above" option in the question "What are the main means of transport that you use?"	-1.180	0.005	0.31
"Important" option in the question "How important is the parameter of duration during your travel?"	2.816	<0.001	16.71
"Quite Important" option in the question "How important is duration during your travel?"	4.305	<0.001	74.07
"Very Important" option in the question "How important is duration during your travel?"	2.619	0.002	13.72
Annual income 10.000-25.000 (yes=1)	1.224	<0.001	3.40
Hosmer and Lemeshow test	0.20		

Conclusions (1/2)

- The results indicate that the probability of choosing to travel by AFV depends largely on the cost, time and comfort
- The faster and the lower-cost the trip, the more likely the respondents to choose an AFV over the other means of transport
- The respondents who state to be enthusiastic about AFVs, seem to be more willing to use them in the future

Conclusions (2/2)

- The more important the respondents consider the travel time of their trips, the more likely they are to choose an AFV
- Respondents over 55 years old have a lower preference for AFVs, while younger people seem to be much more positive about them
- Family income plays a significant role in the selection of AFVs with those whose family income is in average levels to be more likely to choose an AFV

Future Research

- Technological progress in autonomous flying vehicle development is rapidly accelerating across the world, reaching an increasingly wider audience over time; more research is needed through:
  - Continuous assessment of public perception toward several aspects related to flying vehicles
  - Expansion of the sample of the survey
  - Targeting specific geographical areas and population groups

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