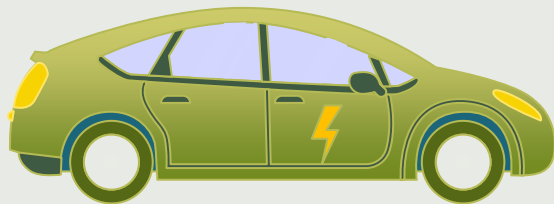# Predictors of Electric Vehicle Adoption Intent in Rideshare Drivers Relative to Commuters

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Background

- Costs, functional qualities, etc., as well as psychological factors (what the vehicle signals) have been shown to predict EV adoption in the general public

- Rideshare drivers have been neglected in past research

Methods

Rideshare Sample: n = 136

Commuter Sample: n = 378

Recruited in LA through Rideshare Apps

Recruited through Prolific

- ○ Similar surveys for both groups
- ○ Measures:
  - • EV adoption intent
  - • Instrumental & Symbolic attribute perceptions

Instrumental Attributes

α = 0.61 ☹

○ Characteristics of a vehicle regarding its functional and logistical properties e.g.,

$ costs (purchase, charging, maintenance)

🚗 range anxiety

difficulty of charging

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
If I owned an EV, I would often be worried about running out of charge	○	○	○	○	○	○	○

Symbolic Attributes

α = 0.92 ☺

○ Characteristics of a vehicle that signal to onlookers that the driver is

♡ socially responsible

🍃 environmentally responsible

💻 technologically savvy

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Driving an EV means that I care about the environment	○	○	○	○	○	○	○

Hypotheses

Instrumental attribute perceptions will have a stronger influence on EV adoption intent for rideshare drivers than for commuters

Symbolic attribute perceptions will have a weaker influence on EV adoption intent for rideshare drivers than for commuters
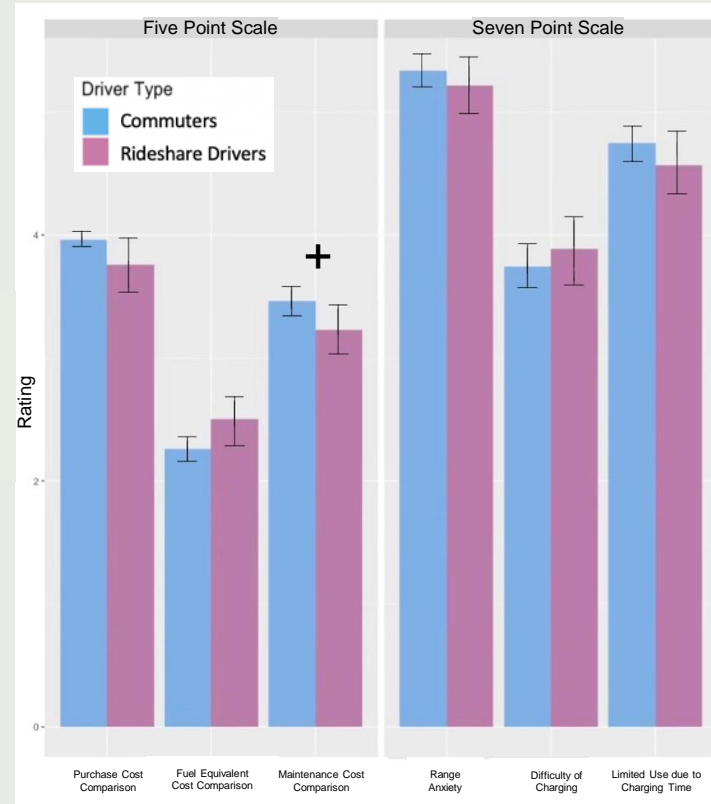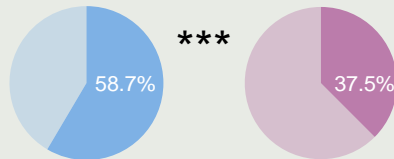
Results

- ○ Significant difference in access to charging spot

- ○ Marginal difference in maintenance cost comparison perceptions

% with access to charging spot

***

58.7%

37.5%

Results ⚡

○ Group difference in purchase cost perception on EV adoption intent

○ No other interaction terms were significant. This **partially supports** for our hypothesis

Instrumental Attribute Perception and Driver Type Interaction Regression

Model	Unstandardized			
	B	Standard Error	t	p
(Constant)	3.445	0.981	3.514	<0.001
Driver Type	1.967	0.682	2.884	0.004
Instrumental Attributes & Interactions				
Purchase Cost Comparison [a]	0.536	0.206	2.605	0.009
Purchase Cost*Driver Type	-0.299	0.144	-2.082	0.038
Fuel Equivalent Cost Comparison [a]	-0.045	0.157	-0.288	0.773
Fuel Equivalent*Driver Type	-0.027	0.110	-0.245	0.807
Maintenance Cost Comparison [a]	-0.304	0.168	-1.811	0.071
Maintenance Cost*Driver Type	0.102	0.127	0.803	0.422
Range Anxiety [a]	-0.205	0.134	-1.536	0.125
Range Anxiety*Driver Type	0.050	0.097	0.512	0.609
Difficulty of Charging [a]	0.008	0.109	0.077	0.939
Difficulty Charging*Driver Type	-0.114	0.080	-1.424	0.155
Limited Use Due to Charging Time [a]	-0.038	0.129	-0.292	0.770
Limited Use*Driver Type	-0.089	0.092	-0.966	0.334
Spot/Outlet Accessibility [b]	0.191	0.362	0.527	0.598
Spot/Outlet*Driver Type	0.049	0.274	0.178	0.859
F (15)	10.079			
R²	0.233			

Dependent variable: EV Adoption intent; [a] Lower scores = more favorable towards EVs.
Driver Type coding: Commuters = 1; Rideshare Drivers = [b] 0=no, 1=yes.

Results

o **Further supporting this hypothesis,** more variance in EV adoption intent was accounted for by instrumental attribute perceptions for rideshare drivers compared to commuters

Exploratory Multiple Regression Results for Each Sample

Model	Rideshare Drivers			Commuters		
	Unstandardized			Unstandardized		
	B	Standard Error	p	B	Standard Error	p
(Constant)	7.380	0.514	<0.001	5.412	0.415	<0.001
Instrumental Attributes						
Purchase Cost Comparison [a]	-0.062	0.109	0.569	0.237	0.087	0.007
Fuel Equivalent Cost Comparison [a]	-0.099	0.084	0.240	-0.072	0.066	0.271
Maintenance Cost Comparison [a]	-0.101	0.103	0.328	-0.203	0.065	0.002
Range Anxiety [a]	-0.106	0.077	0.170	-0.155	0.054	0.004
Difficulty of Charging [a]	-0.220	0.064	<0.001	-0.106	0.044	0.016
Limited Use Due to Charging Time [a]	-0.216	0.072	0.003	-0.127	0.053	0.017
Spot/Outlet Accessibility [b]	0.289	0.223	0.197	0.240	0.139	0.086
R^2		0.324			0.177	

Dependent variable: EV Adoption intent; [a] Lower scores = more favorable towards EVs. [b] 0=no, 1=yes.
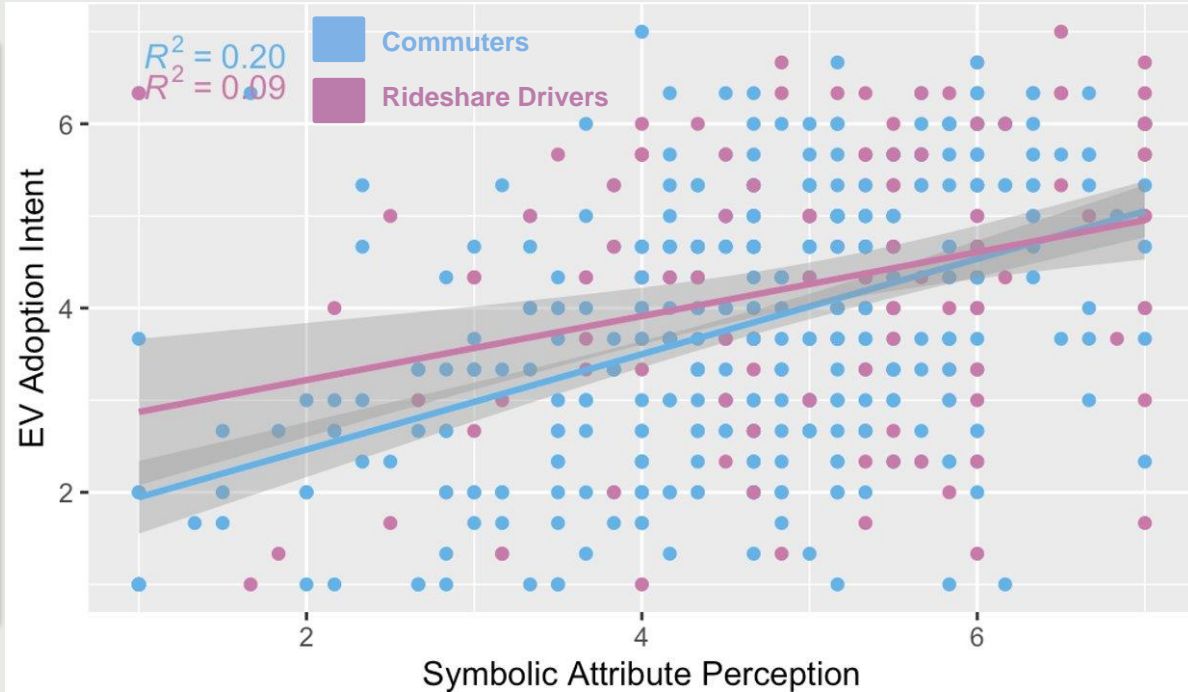
Results

- ○ Significant group difference in symbolic attribute perceptions

- ○ In other words, rideshare drivers perceived EVs as signaling social, environmental, and technological status to a higher degree than did commuters
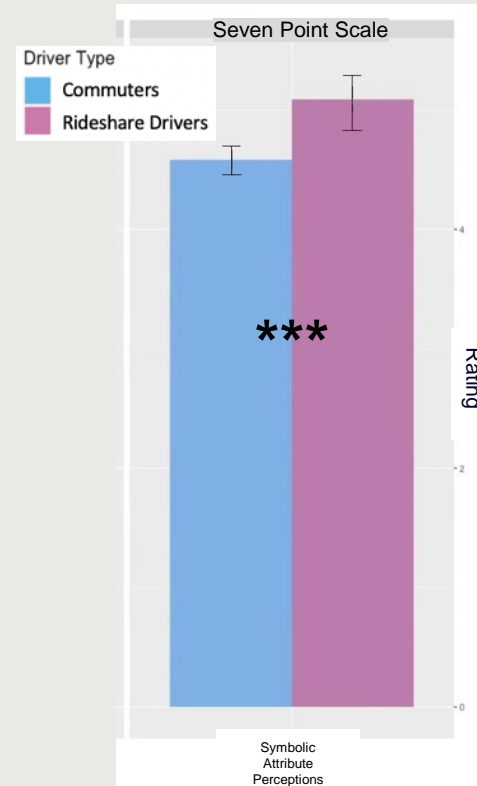
Results

○ Symbolic attribute perceptions influenced EV adoption for both groups (β - 0.63, p < 0.001), but more variance accounted for by symbolic attributes in commuter population

Results

○ Group difference in impact of symbolic attribute perceptions on EV adoption intent, **supporting our hypothesis**

Results of Multiple Regression Model Predicting Electric Vehicle Adoption Intent

Model	Unstandardized			
	B	Standard Error	t	p
(Constant)	2.308	0.737	3.133	0.002
Driver Type	1.284	0.498	2.577	0.010
Symbolic Attributes	0.632	0.130	4.853	<0.001
Driver Type x Symbolic Attributes	-0.194	0.097	-1.996	0.046
Instrumental Attributes				
Purchase Cost Comparison [a]	0.100	0.063	1.595	0.111
Fuel Equivalent Cost Comparison [a]	-0.052	0.048	-1.081	0.280
Maintenance Cost Comparison [a]	-0.127	0.051	-2.483	0.013
Range Anxiety [a]	-0.118	0.041	-2.864	0.004
Difficulty of Charging [a]	-0.122	0.034	-3.623	<0.001
Limited Use Due to Charging Time [a]	-0.145	0.040	-3.630	<0.001
Spot/Outlet Accessibility [b]	0.234	0.110	2.140	0.033
F (10)		24.813		<0.001
R^2		0.330		<0.001

Dependent variable: EV Adoption intent; [a] Lower scores = more favorable towards EVs. [b] 0=no, 1=yes. Driver Type coding: Commuters = 1; Rideshare Drivers = 2. All responses were given on 1 (lower) to 7 (higher) response scales, except for Purchase Cost Comparison, Fuel Equivalent Cost Comparison and Maintenance Cost Comparison. These three items were measured on a 1-5 scale ranging from 1 = much less, to 5 = much more.

Summary

Instrumental attributes rated relatively similarly, but more predictive of EV adoption intent for rideshare drivers

Symbolic attributes rated more highly by rideshare drivers, but are more predictive of EV adoption intent for commuters

What does all this mean ?

- o Reducing barriers to EV acquisition by subsidizing EVs or exploring rental models

- o Identification of ways to increase charging accessibility for rideshare drivers

- o Maintenance cost educational campaigns

References

Thank You!