

The Effect of Attitudes on Women's Willingness to Share Autonomous Vehicles

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Background

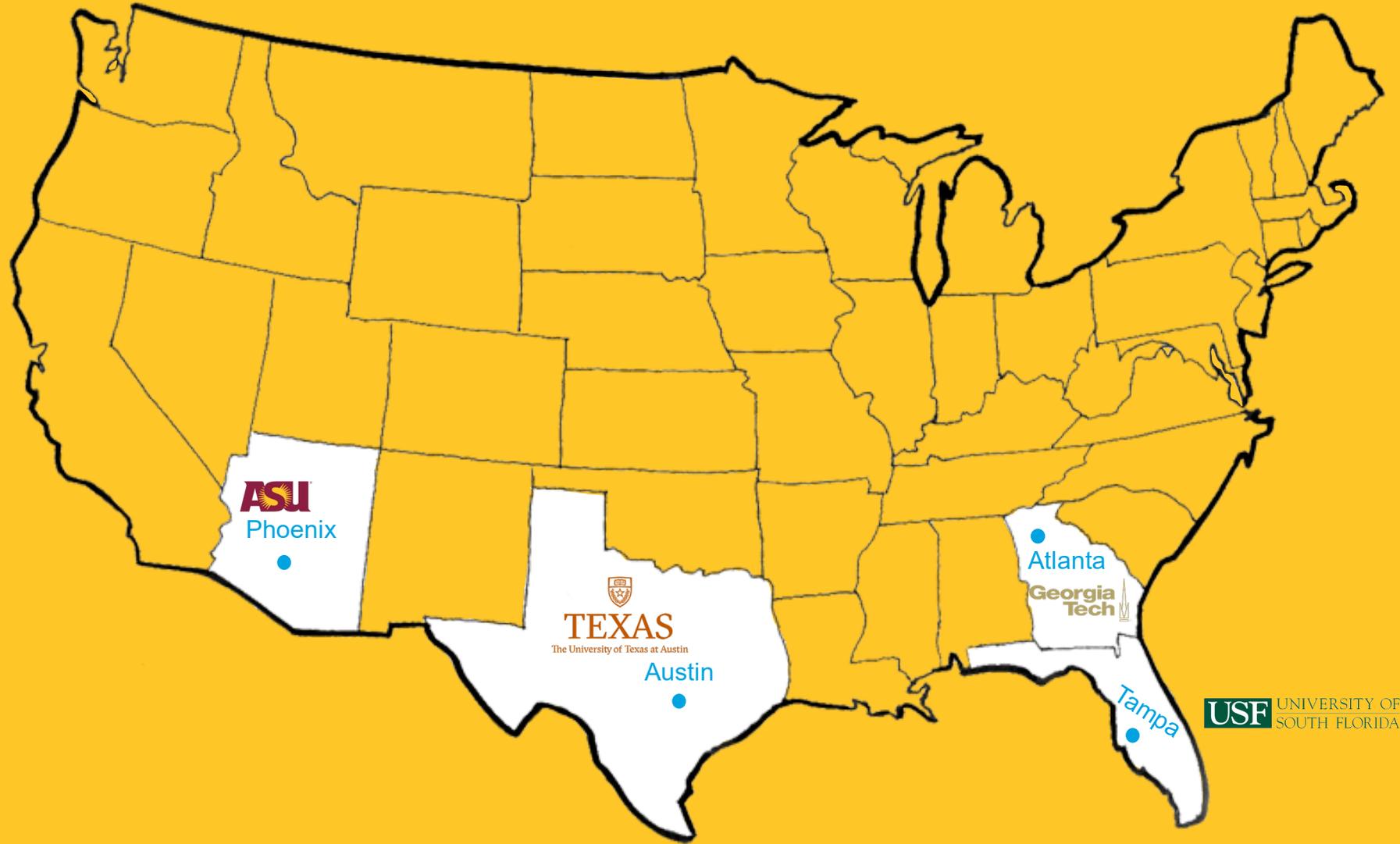
- Transformative changes in transportation ...
- People's **attitudes towards and perceptions of** these technologies and services need to be measured
- Men and women may perceive new technologies differently
- **Gender differences** in willingness to adopt automated mobility needs to be understood



Study Purpose

Provide a better understanding of gender differences in adoption of AVs and new shared mobility services.

Survey Metro Areas



Survey Instrument



Attitudes
and
Preferences



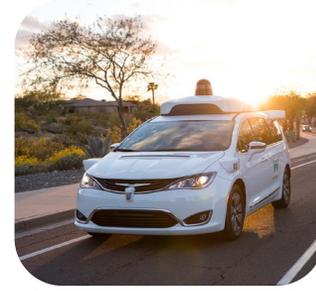
Household
Vehicles
and
Residential
Preferences



Current
Travel
Patterns



Mobility on
Demand



Autonomous
Vehicles



Background
Information

Survey Deployment

- Greater Phoenix Metropolitan Area
- Pilot Survey in Fall 2018 (262 responses)
- Full Survey in Summer 2019 (1071 responses)
- Random address-based sample
- Target size: 1,000 respondents per Metro Area
 - 50,000 e-mail invitations (2.0% response rate)
 - 10,000 postal invitations (2.1% response rate)
- Online instrument only
- Rewards: \$10 for each of the first 250 respondents

987 Complete/Clean Responses

Unique Aspects of the Survey

- **Comprehensive: AV + Ride-hailing** in same survey
- **Attitudes:** Extensive set of attitudinal statements
- **Range of Possible Impacts:**
 - Residential location (long term)
 - Vehicle ownership (medium term)
 - Travel patterns (short term)
- **Stated preference choice scenarios**

SURVEY RESULTS

Phoenix Metropolitan Area

Summer 2019

Sample Size = 987

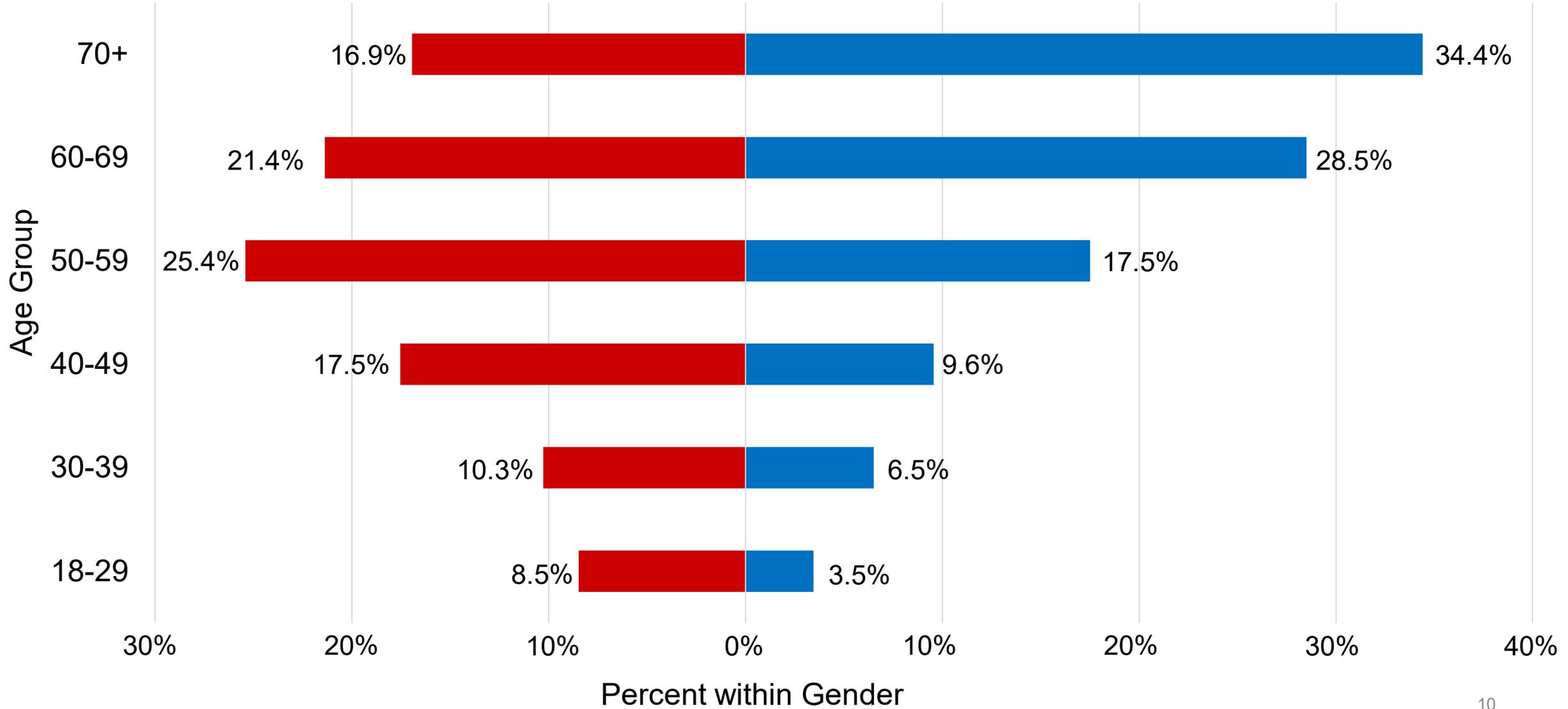
Socioeconomics by Gender

Phoenix Metropolitan Area
Summer 2019

Gender / Age

Female (N=496)

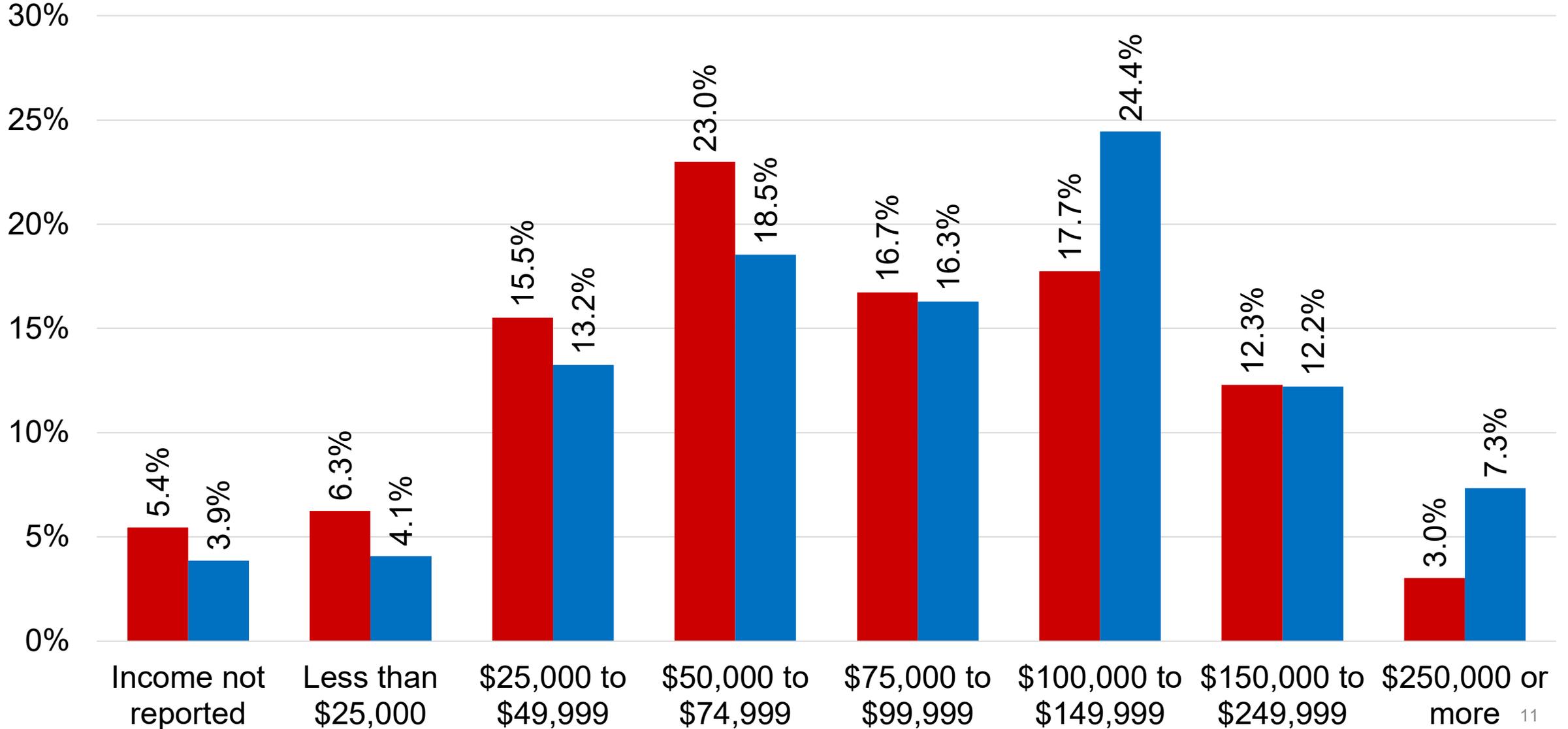
Male (N=491)



Gender / Income

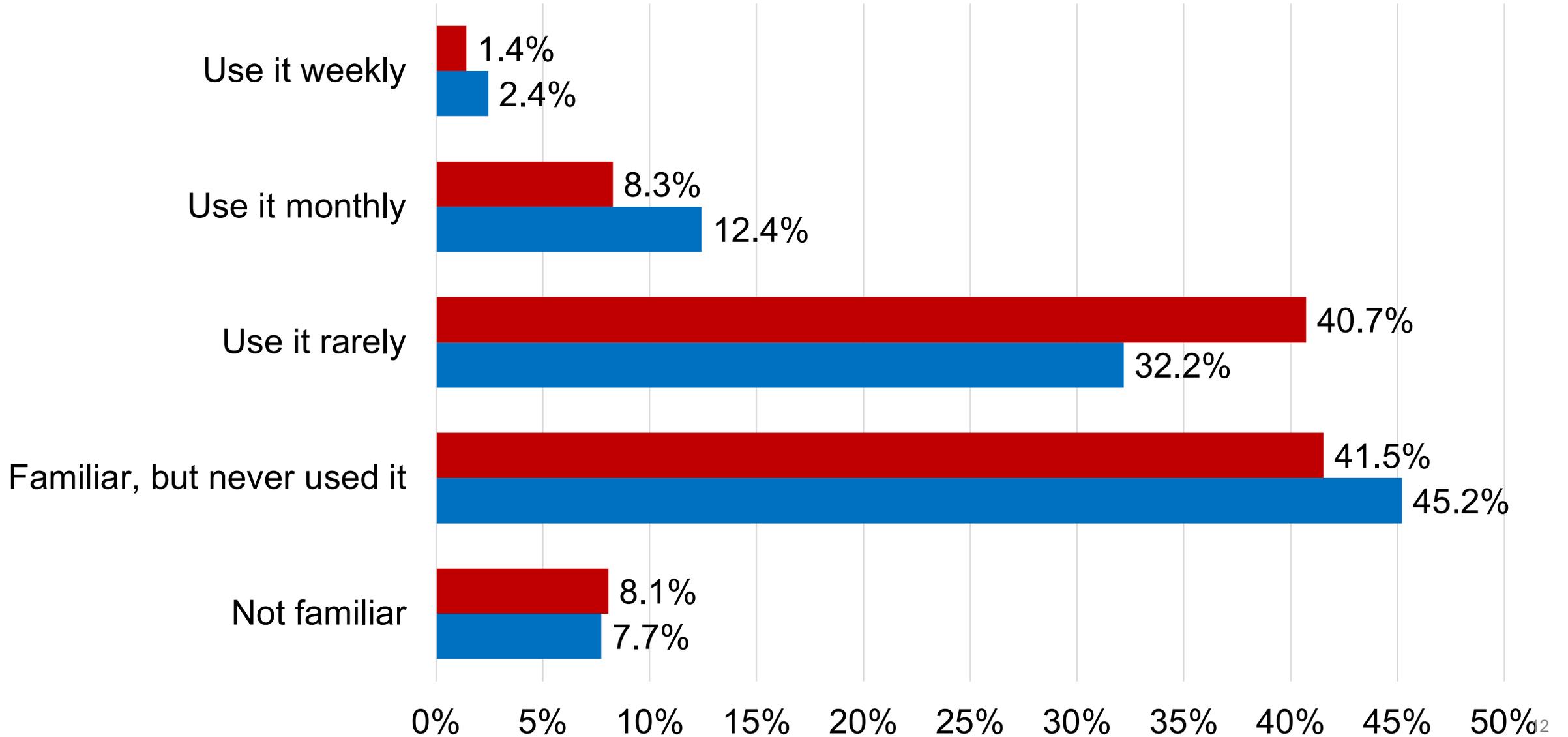
■ Female (N=496)

■ Male (N=491)

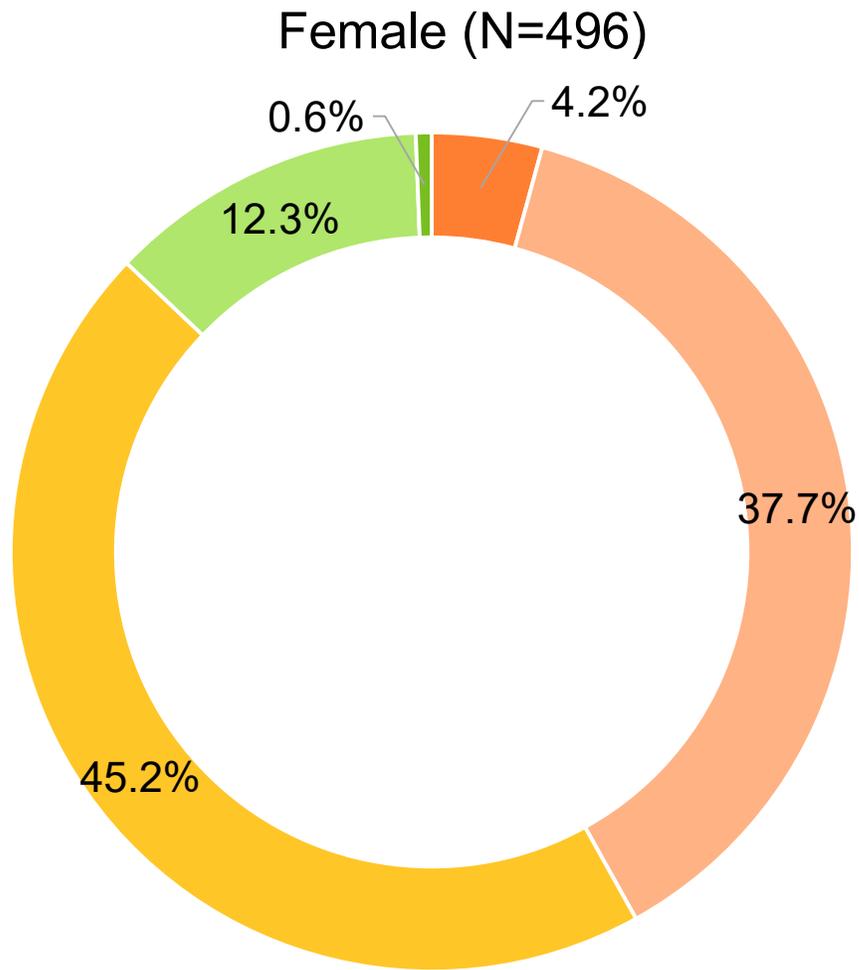


Gender / Frequency of Ridehailing Use (e.g., Uber or Lyft)

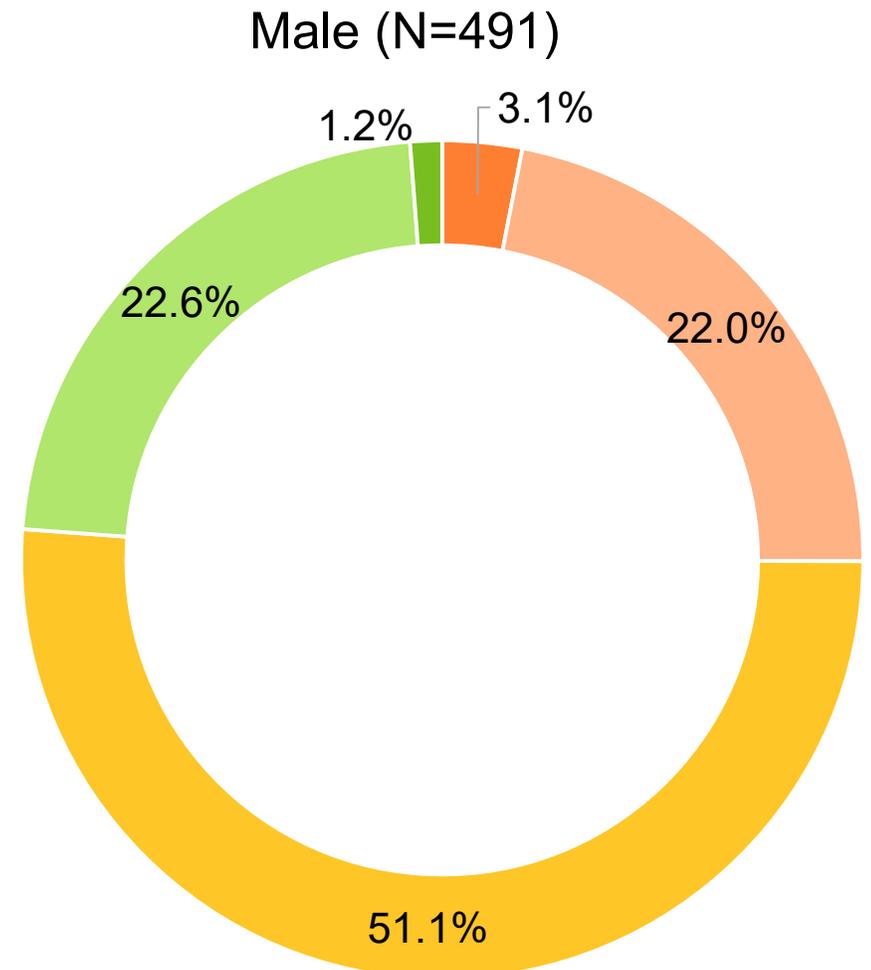
■ Female (N=496) ■ Male (N=491)



Gender / Familiarity with Autonomous Vehicles



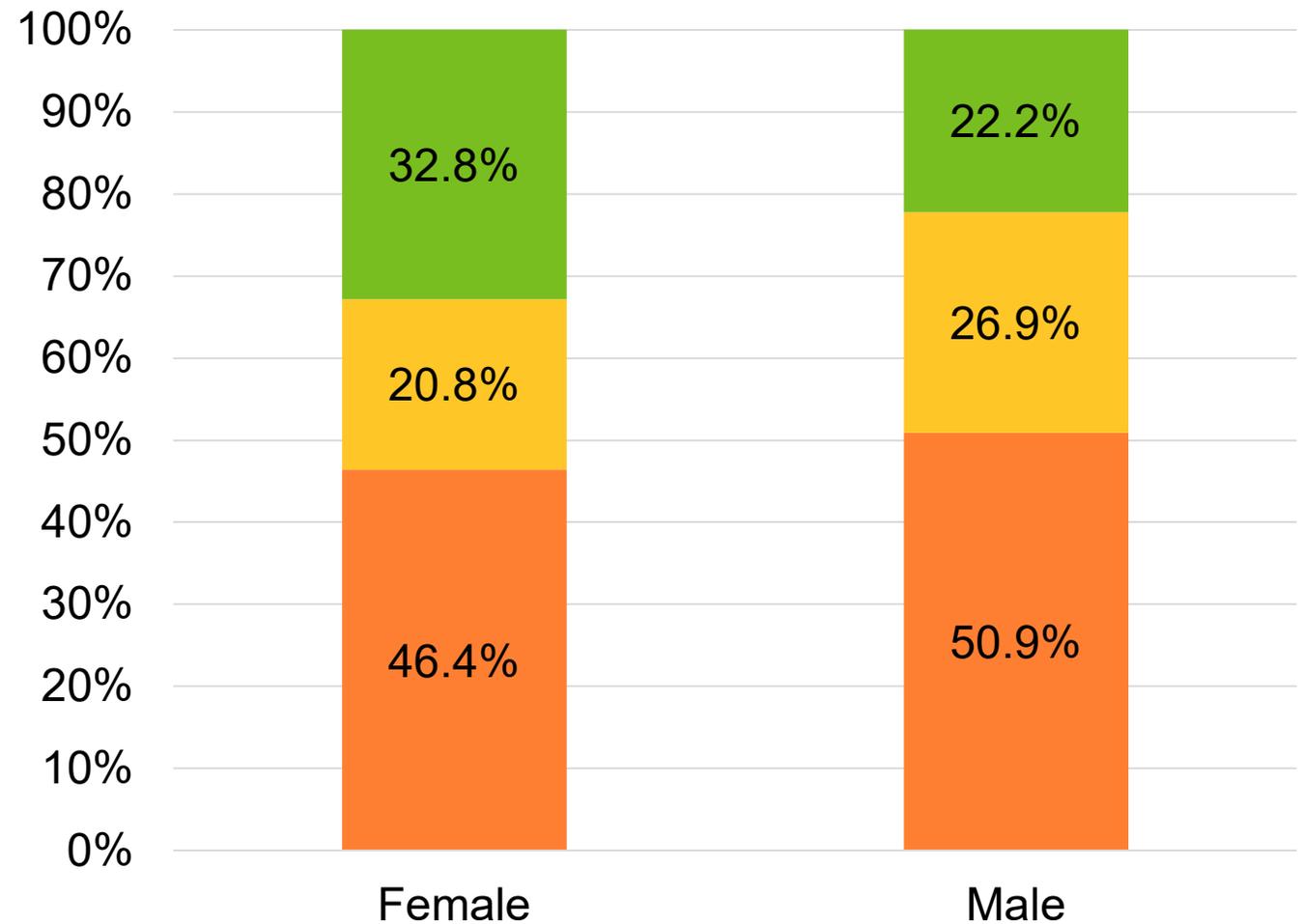
- Never heard of AVs
- Don't know much about them
- Somewhat familiar
- Very familiar
- Actually taken a ride in an AV



Attitudes by Gender

Phoenix Metropolitan Area
Summer 2019

I feel uncomfortable around people I do not know.



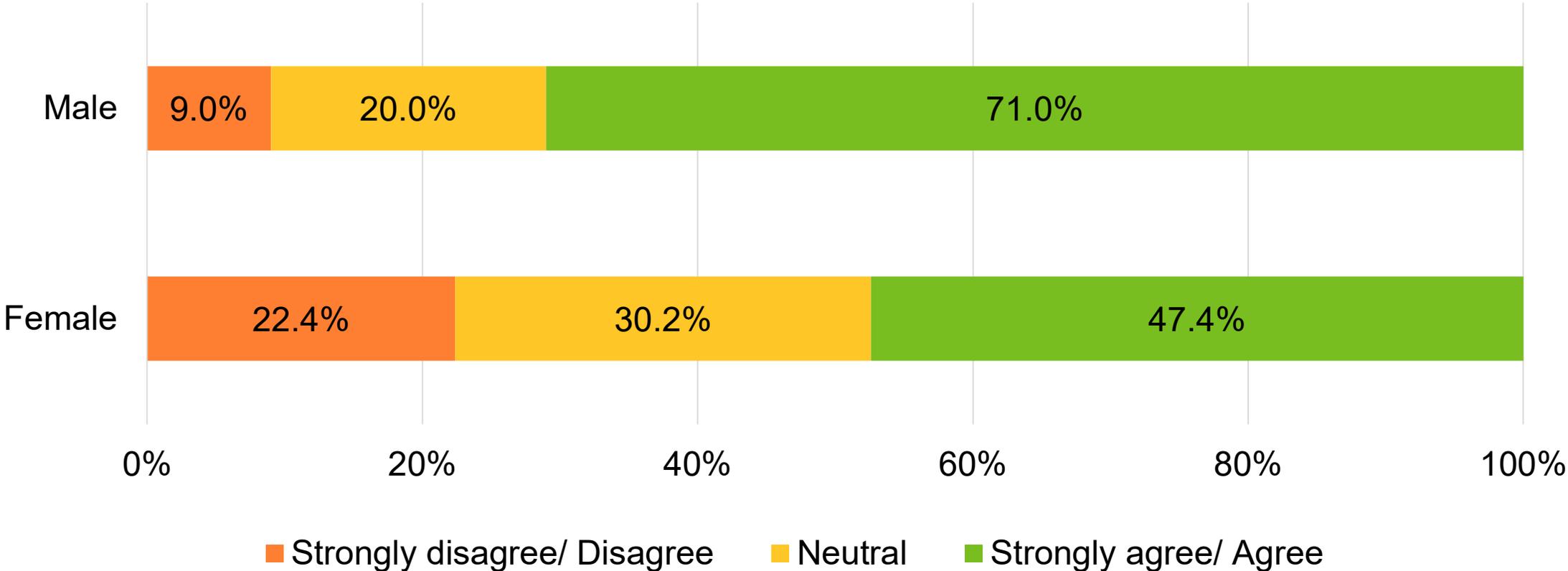
- Strongly agree/ Agree
- Neutral
- Strongly disagree/ Disagree

($\chi^2 = 15.108, df=2$)**

* $N_{\text{Female}} = 496, N_{\text{Male}} = 491$

** Distributions are significantly different at the 95% confidence level.

When traveling in a vehicle, I prefer to be driver rather than a passenger.

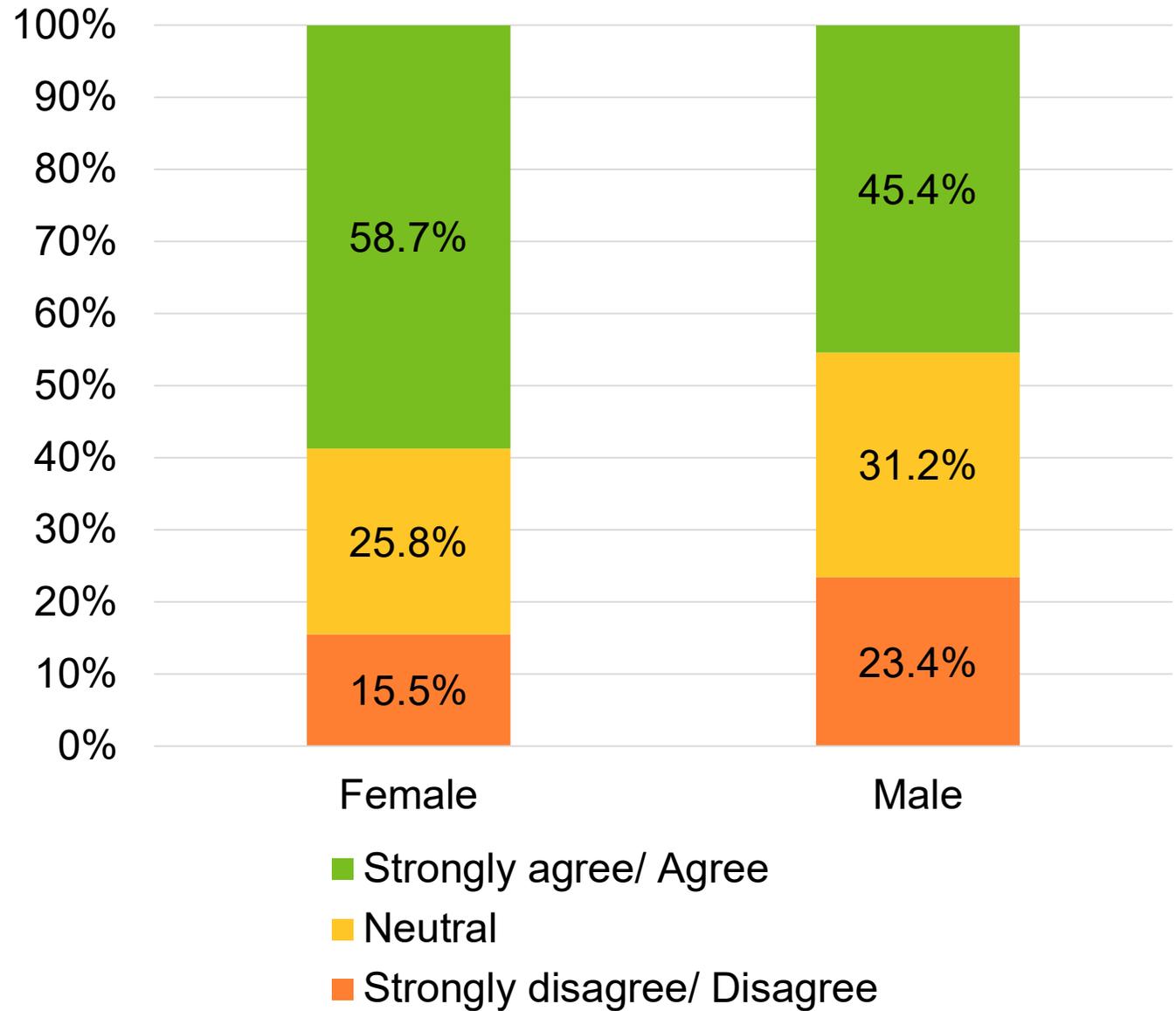


$(\chi^2= 62.094, df=2)**$

* $N_{Female} = 496, N_{Male} = 491$

** Distributions are significantly different at the 95% confidence level.

For shared ridehailing (e.g., uberPOOL, Lyft Share), traveling with unfamiliar passengers makes me feel uncomfortable.

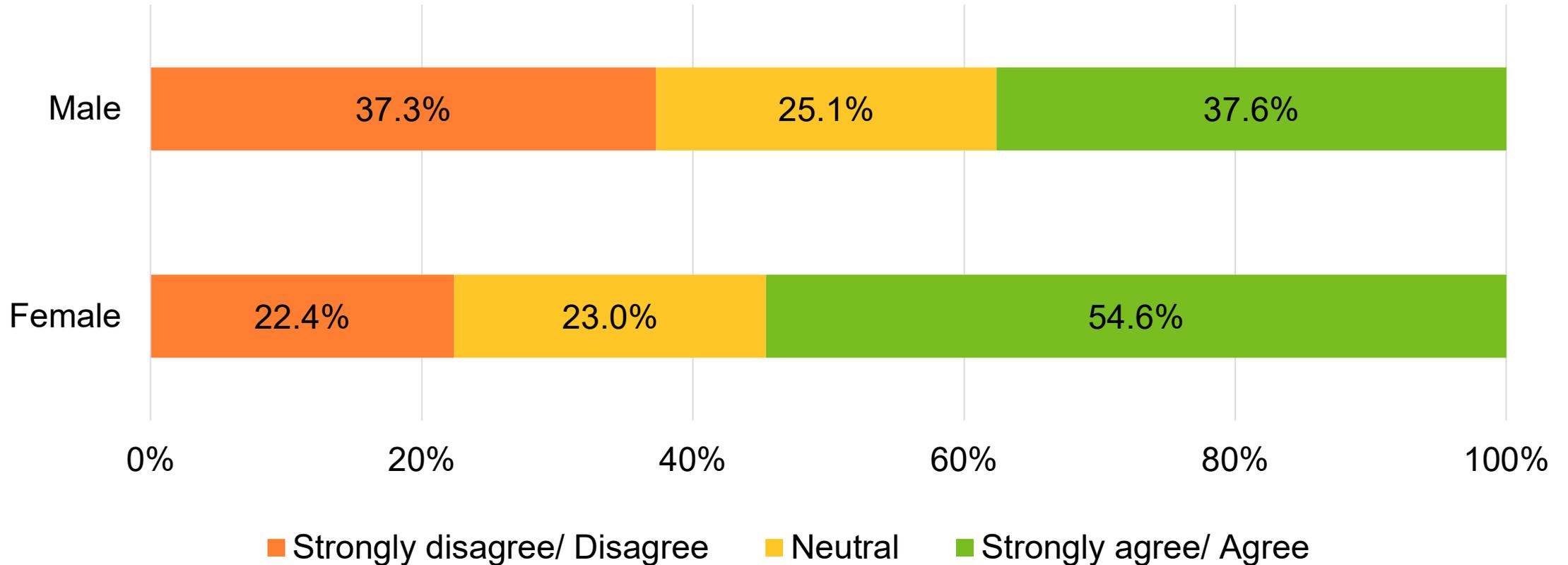


$(\chi^2= 18.716, df=2)**$

* $N_{Female} = 496, N_{Male} = 491$

** Distributions are significantly different at the 95% confidence level.

Traveling with a driver I do not know makes me feel uncomfortable.



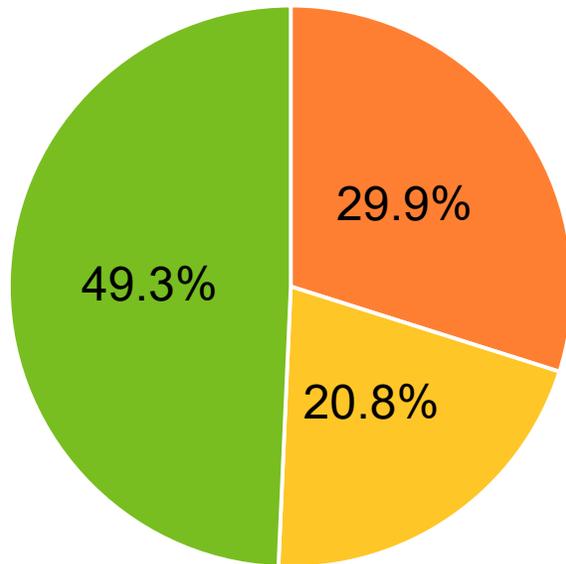
($\chi^2= 34.169, df=2$)**

* $N_{\text{Female}} = 496, N_{\text{Male}} = 491$

** Distributions are significantly different at the 95% confidence level.

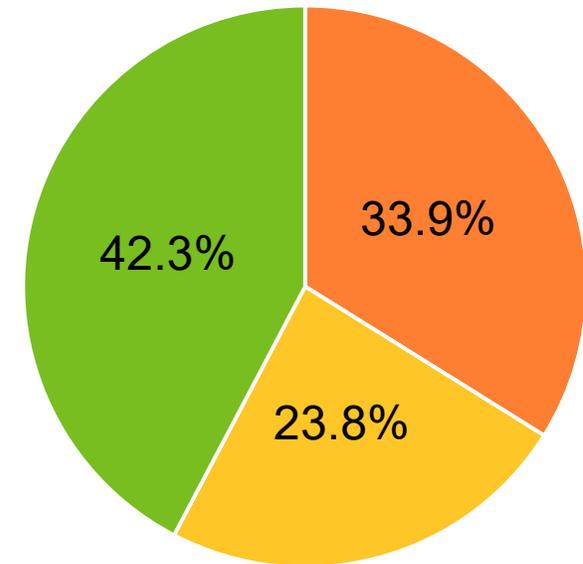
I would use AV ridehailing services **alone** or with coworkers, friends, or family.

Male



- Strongly disagree/ Disagree
- Neutral
- Strongly agree/ Agree

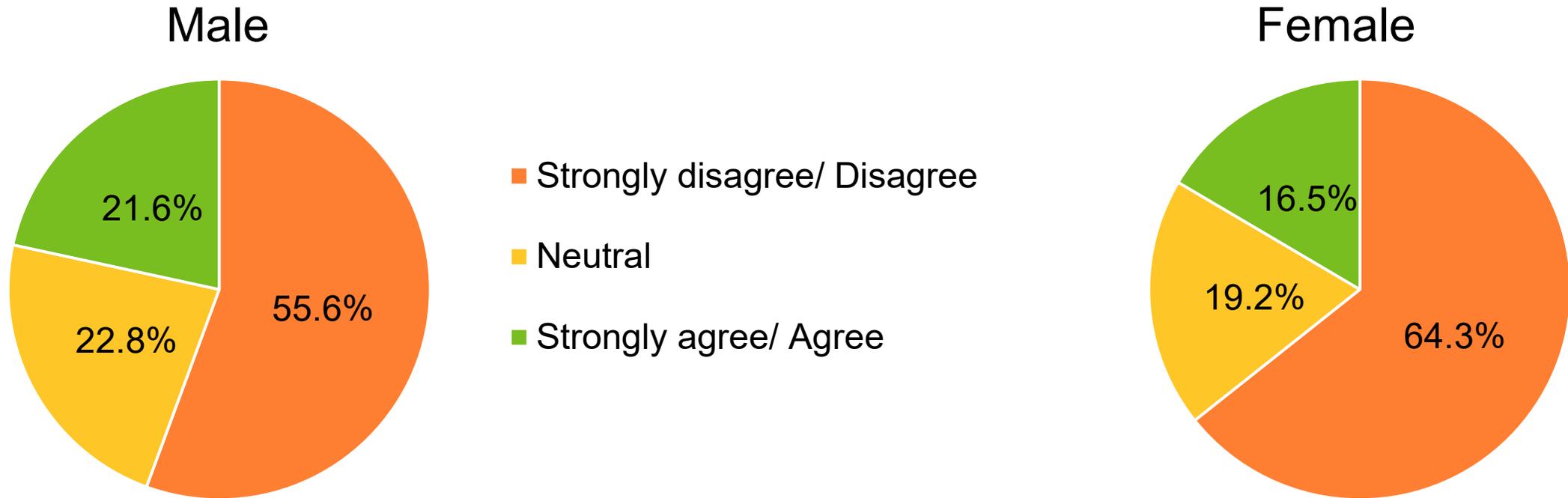
Female



($\chi^2 = 4.804$, $df = 2$)

* $N_{\text{Female}} = 496$, $N_{\text{Male}} = 491$

I would use AV ridehailing services with other passengers I don't know.

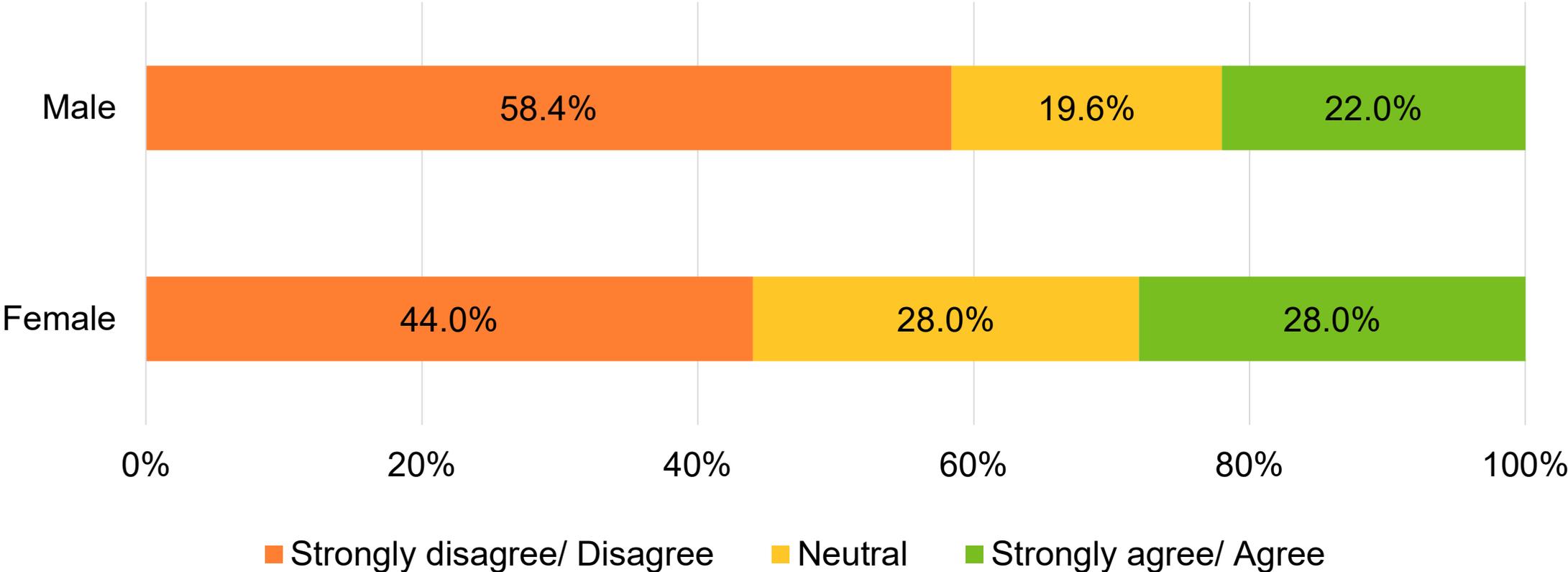


($\chi^2 = 8.009$, $df=2$)**

* $N_{\text{Female}} = 496$, $N_{\text{Male}} = 491$

** Distributions are significantly different at the 95% confidence level.

I will never ride in an AV.



($\chi^2= 21.162, df=2$)**

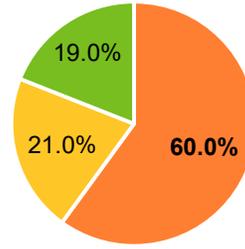
* $N_{Female} = 496, N_{Male} = 491$

** Distributions are significantly different at the 95% confidence level.

The Effect of Attitudes on Women's Willingness to Share AVs

**Phoenix Metropolitan Area
Summer 2019**

All Respondents (N=987)

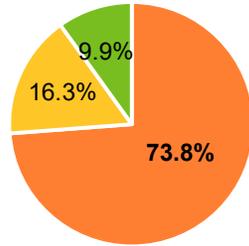


I would use AV ridehailing services with other passengers I don't know:

- Strongly disagree/ Disagree
- Neutral
- Strongly agree/ Agree

For **shared ridehailing** (e.g., uberPOOL, Lyft Share), traveling with unfamiliar passengers makes me feel **uncomfortable**.
(Adj. P-value=0.000, $\chi^2=160.061$, df=4)

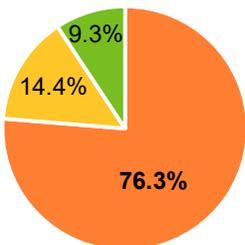
Strongly agree/Agree (N=514)



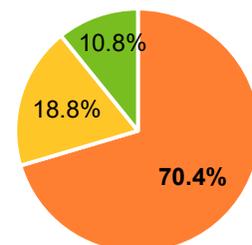
Gender

(Adj. P-value=0.306, $\chi^2=2.370$, df=2)

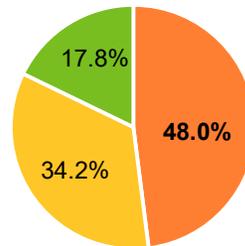
Female (N=291)



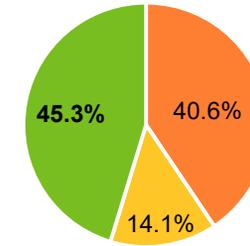
Male (N=223)



Neutral (N=281)



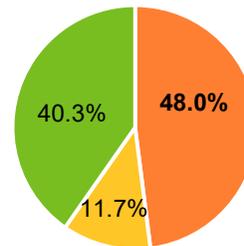
Strongly disagree/Disagree (N=192)



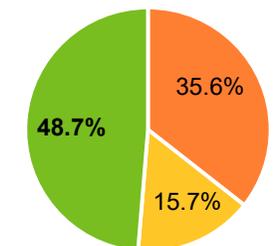
Gender

(Adj. P-value=0.084, $\chi^2=4.958$, df=2)

Female (N=77)



Male (N=115)



- There are significant **gender differences** in willingness to share AV rides.
- Even when women and men have the **same attitude** towards riding with strangers, **women are less likely to adopt AV-based ridesharing services.**
- Develop **safety protocols** and **targeted campaigns** for enhancing women's willingness to share AV rides.
- **Special services** such as **female-only services** might enhance automated mobility acceptance for women.

Further Research

- **Control for other socioeconomic variables** (e.g., age, income, education).
- **Understand the magnitude of gender and attitude effects** in explaining AV adoption.
- **Expand the analysis to other aspects** related to adoption of and adaptation to automated mobility (e.g., vehicle ownership).

Thank you!

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