

Consumer uptake of digital low-carbon innovations

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SCHOOL OF GEOGRAPHY AND THE ENVIRONMENT

Digital innovations at the edge of mainstream markets can help reduce GHG emissions.



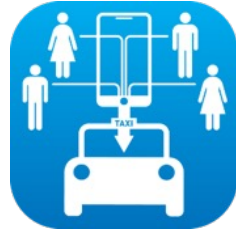
car clubs



P2P car-sharing



ride-sharing



shared ride-hailing



electric vehicles



e-bikes

driving fossil-fuelled cars
(with low occupancy)

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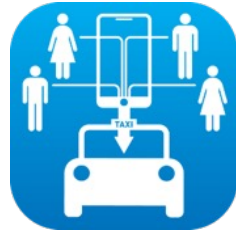
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digital food hubs



meal kits



11th hour apps

doing big (meaty) supermarket food shops



smart heating



smart lighting



smart appliances



PV + storage



P2P electricity

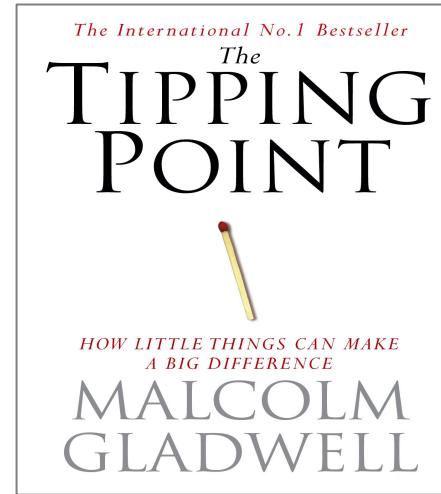
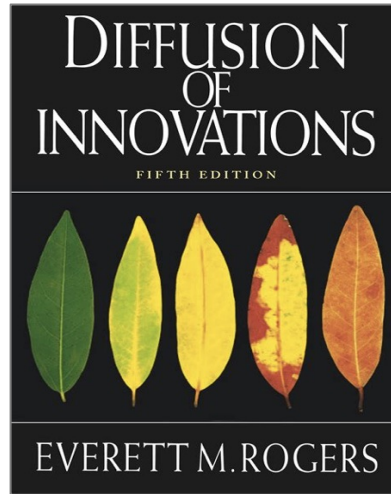
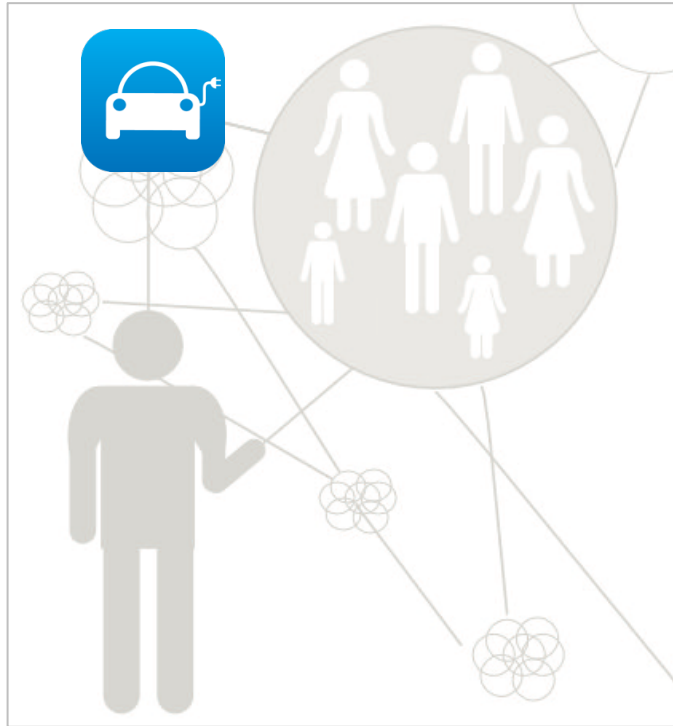


electric vehicle-to-grid

services to power grids

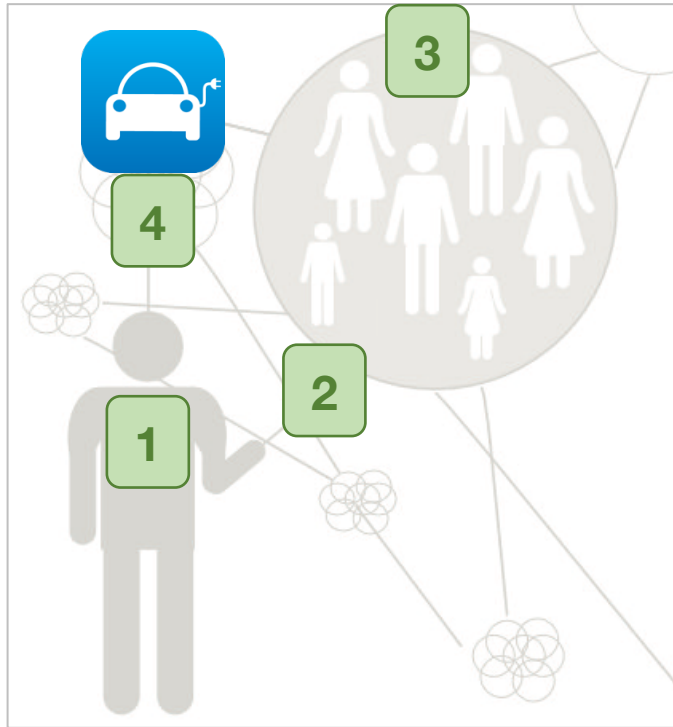
using energy however whenever (supplied centrally)

What drives initial consumer uptake of digital low-carbon innovations?



Diffusion =
Communication over time
about an innovation
among members of a social system

What drives initial consumer uptake of digital low-carbon innovations?



1 People are different (heterogeneity)

e.g., age, income, values, lifestyles

2 Interpersonal exchange

e.g., word of mouth (WoM), peer effects

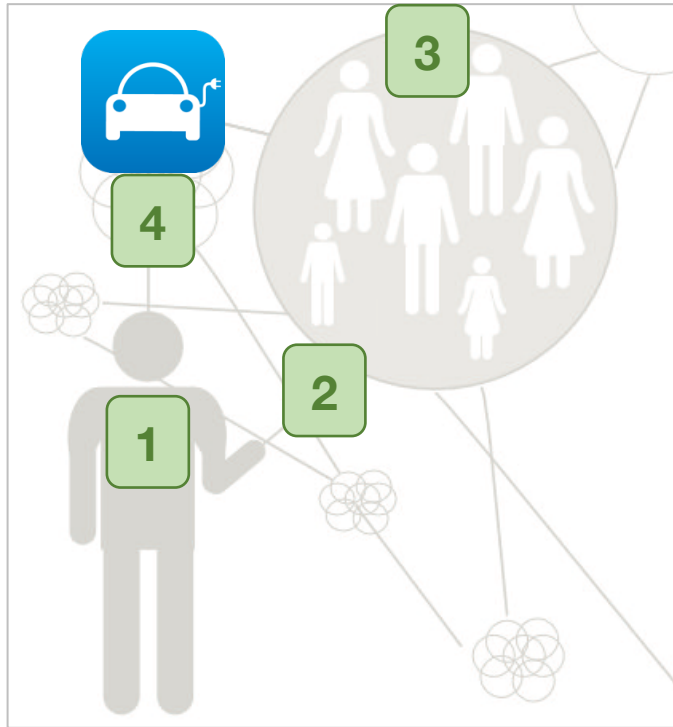
3 Social networks of interaction

e.g., number & diversity of network ties

4 Attributes

e.g., ease of use, compatibility with lifestyles

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Measuring predictors of adoption:

- (1) personal characteristics,
- (2) social influence,
- (3) innovation attributes.

Online questionnaire survey

nationally representative sample:

n=3,014 (UK), Sep-Dec 2019

quotas per innovation of
~100 adopters + ~100 non-adopters

<https://reshare.ukdataservice.ac.uk/854723/>



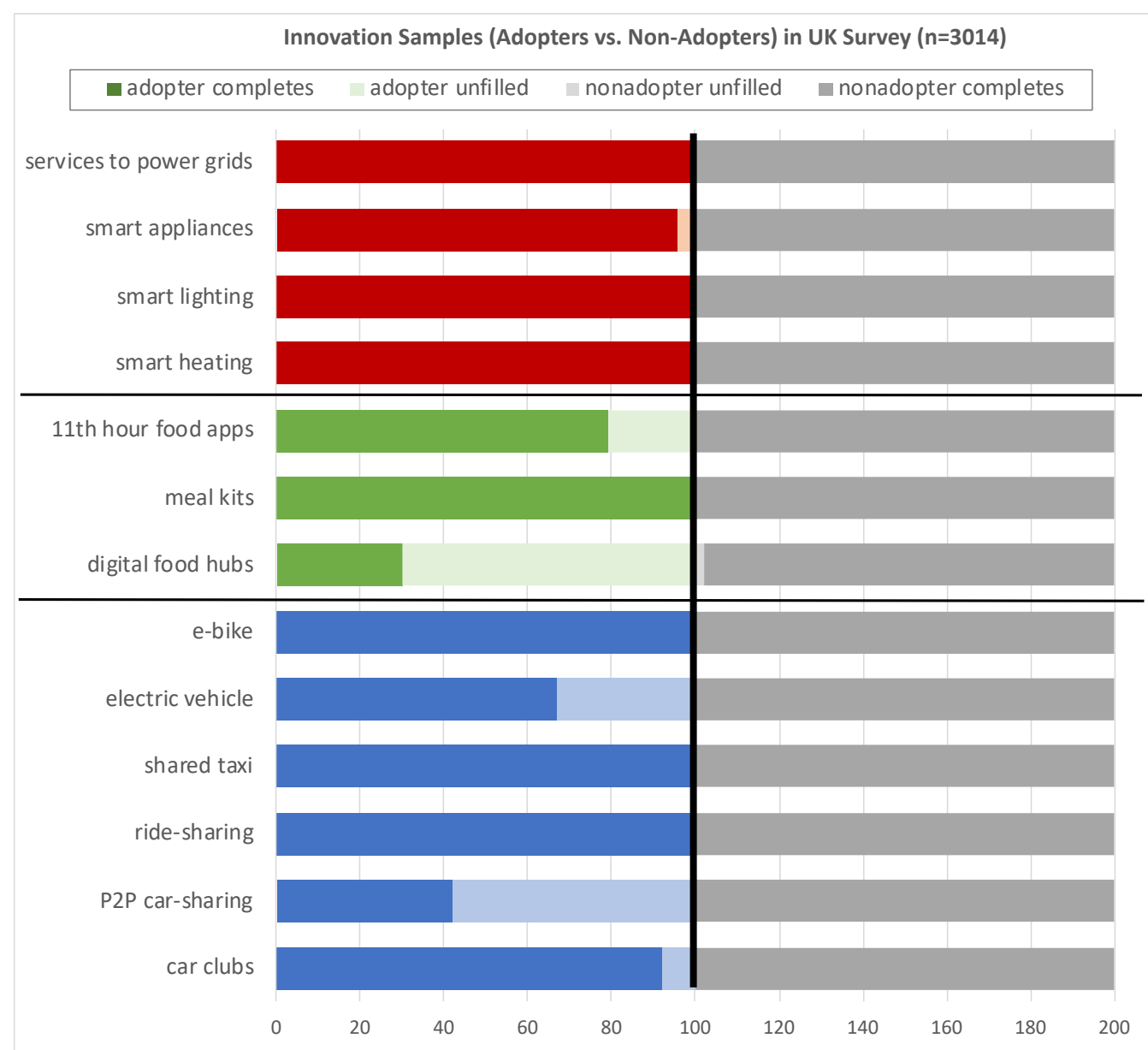
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Logit models test significant predictors of adoption (vs. non-adoption) for each innovation

model coefficients = odds ratios

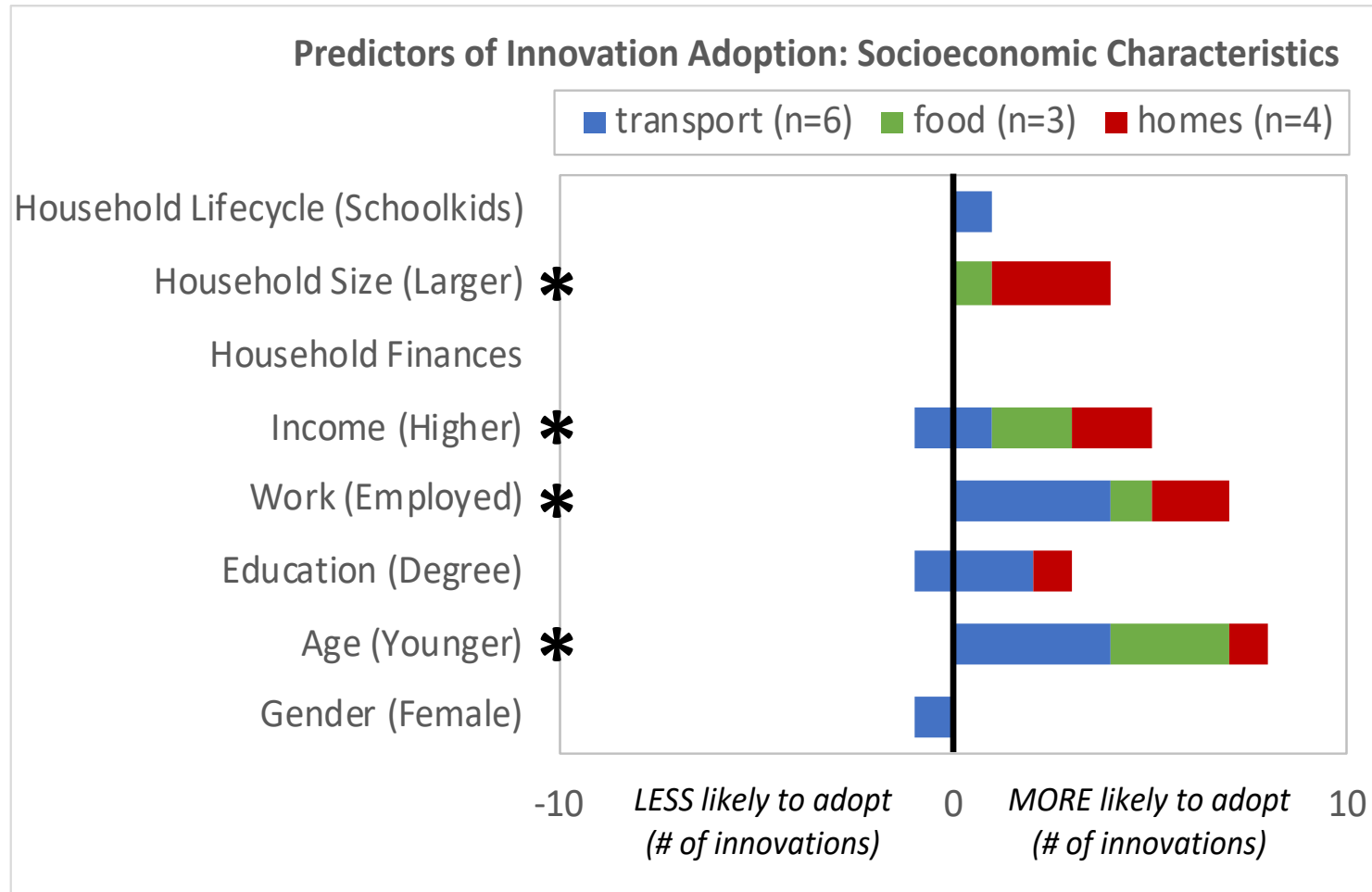
>1 more likely to adopt

<1 less likely to adopt

Blocks of Independent Variables	CAR CLUBS	ONLINE FOOD HUBS	SMART HEATING
SOCIODEMOGRAPHICS CHARACTERISTICS			
Gender (Female)	-	-	-
Age (Over 45)	0.40	0.12	-
Education (Degree)	3.00	-	-
Employment	4.01	-	2.22
Household Income (Low)	-	0.12	0.51
Household Finances (OK)	-	-	-
Household Size (Single)	-	-	0.38
Household Lifecycle (Schoolkids)	-	-	-

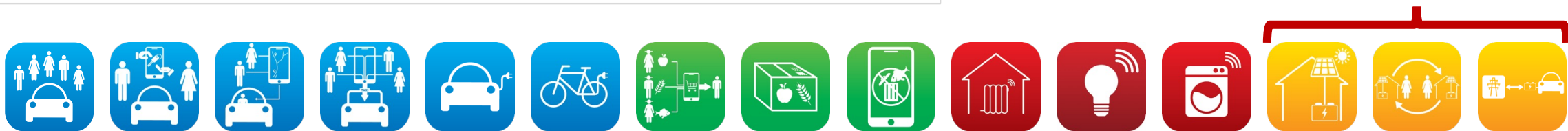


Which significant predictors of adoption are generalisable across (>3) innovations? *Socio-demographics only*

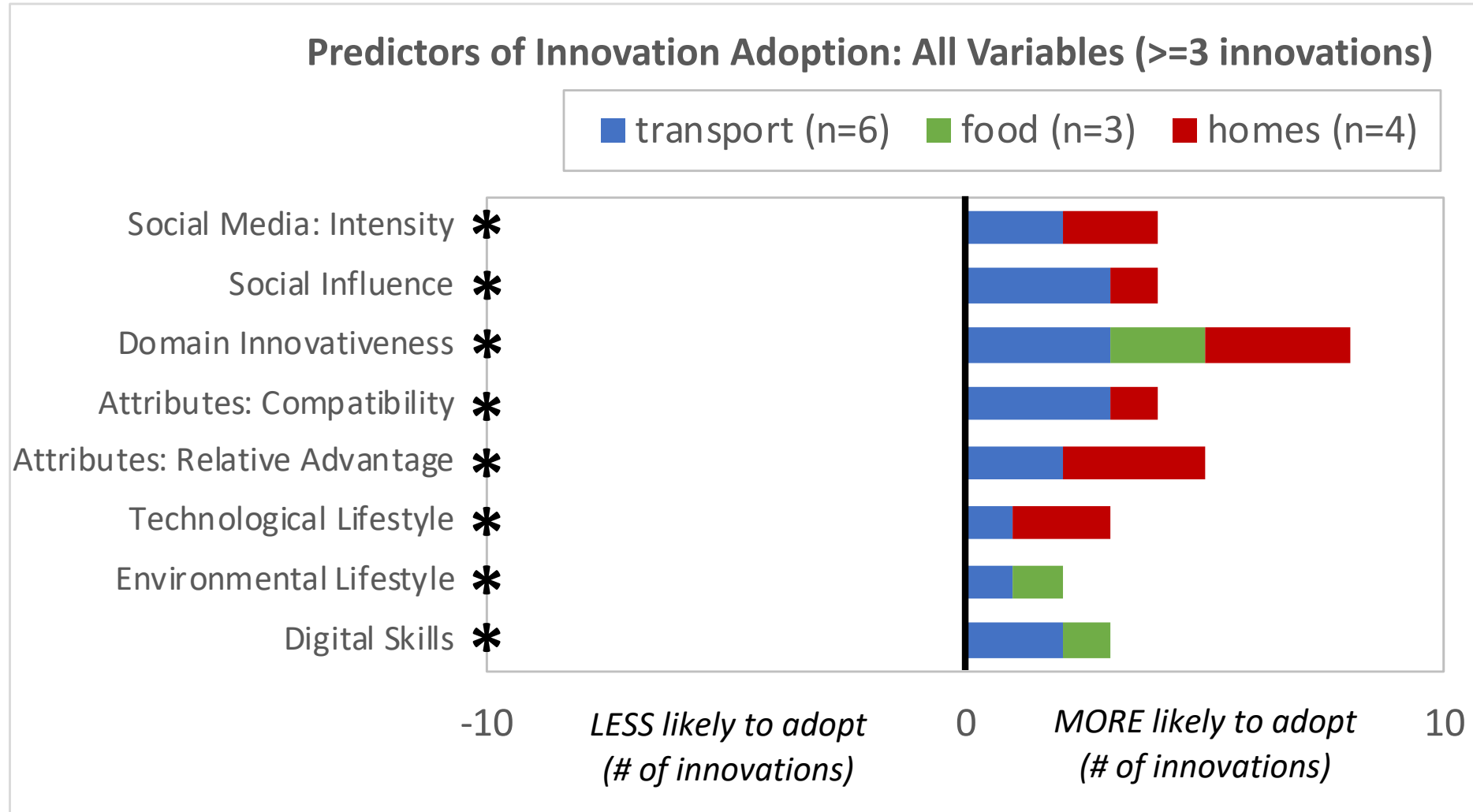


Adopters are more likely to be ...

- ... living in multi-person households
- ... higher income,
- ... more likely to be in employment,
- ... younger.



Which significant predictors of adoption are generalisable across (>3) innovations? *All variables*



Which significant predictors of adoption are generalisable across (>3) innovations? *All variables*

Adopters of digital low-carbon innovations ...

- ... are opinion formers
- ... are more exposed to social influence
- ... have more diverse online presence
- ... value relative advantage and compatibility
- ... have digital skills and tech lifestyles

compared to non-adopters

... with no differences in socioeconomics, personal situation, or social networks



Generalisable predictive models of adoption can inform strategies to stimulate more widespread uptake

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(1) Electronic word-of-mouth
= strongest predictor

(Observability & trialability
less relevant for digital /
usage-based services)

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(2) Innovations have to appeal on 'core' attributes

(Environmental / carbon adopter segment is limited)



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(3) Early-adopter incentives can initiate 'social learning' if experiences are positive

(but could be regressive in the near-term)



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(4) Shared appeal, social communication, or adopter characteristics creates inter-dependencies between adoption dynamics
(but spillover effects are hard to measure)



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