



University
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Might using the Internet while travelling affect car ownership plans of Millennials?

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Introduction

- Travel habits among Millennials (people born between 1980 and 2000) seem to be different from those of previous generations
- They seem to be using cars less than before
- A number of reasons have been suggested
 - Economic constraints
 - Attitudinal differences
 - Different residential location patterns
 - Life cycle factors
 - ICT

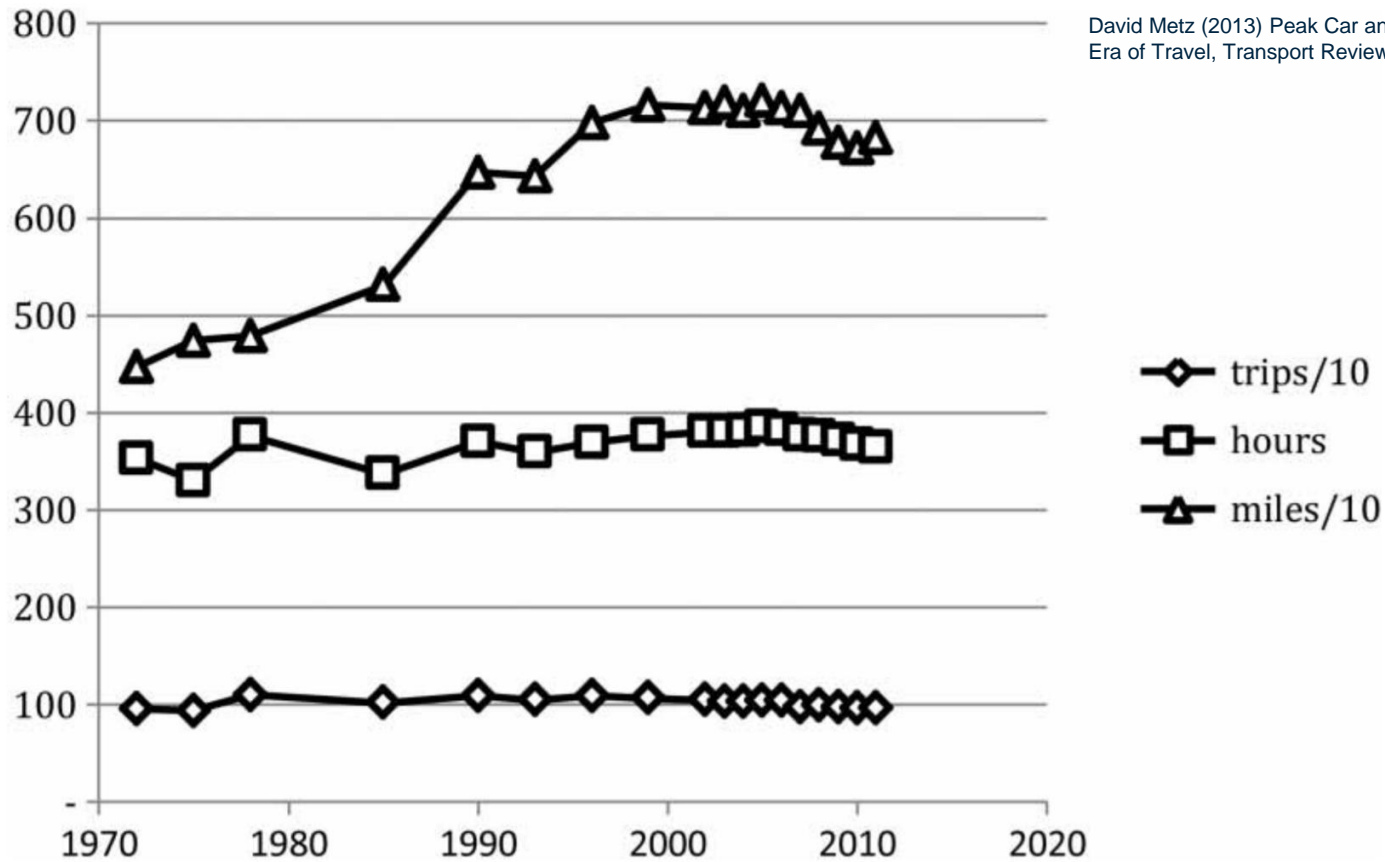


Figure 1. Average travel time (hours per person per year), distance (miles per person per year), and trips (miles per person per year).

Source: NTS (2011, Table NTS 0101).

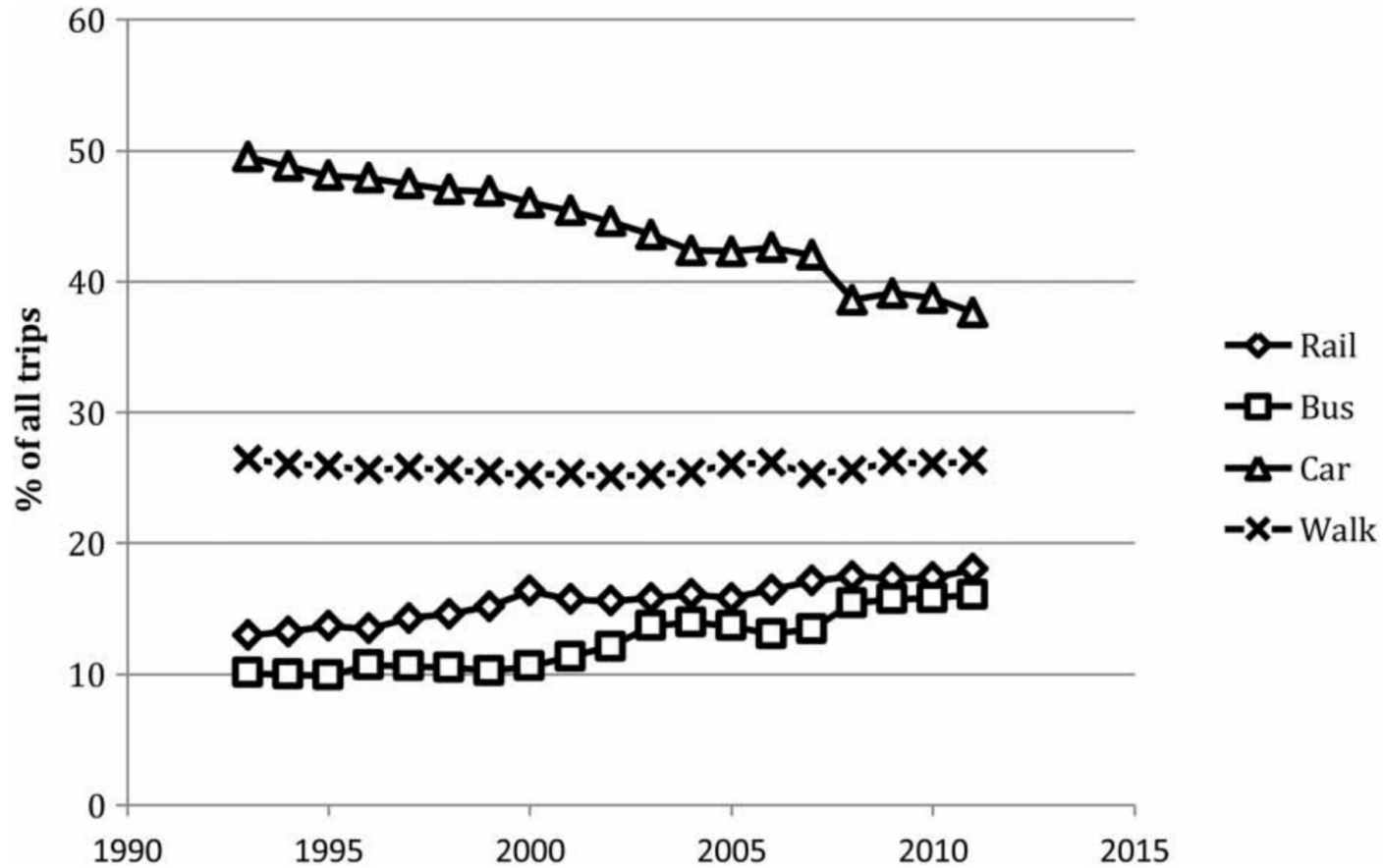


Figure 3. Travel in London: trip-based mode share.

Source: TfL (2012).

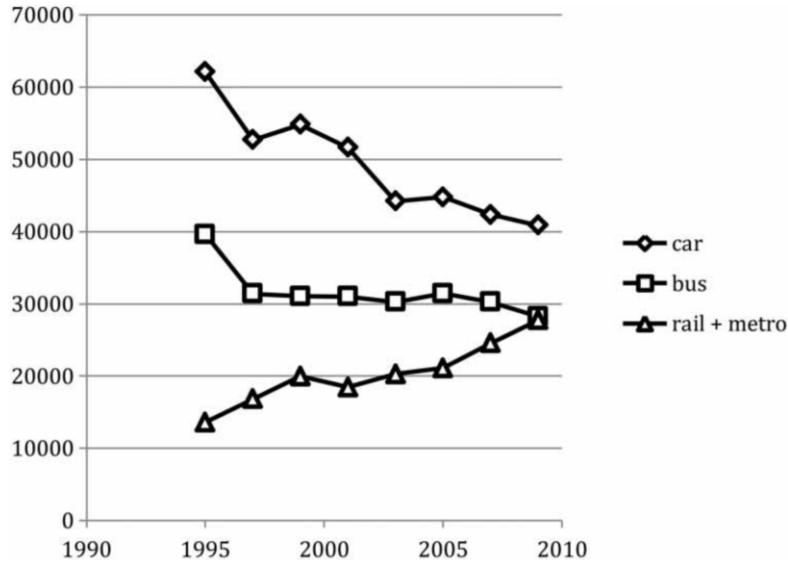


Figure 4. Birmingham City Centre inbound person trips per day, 0730–0930 h.
Source: Birmingham (2010).

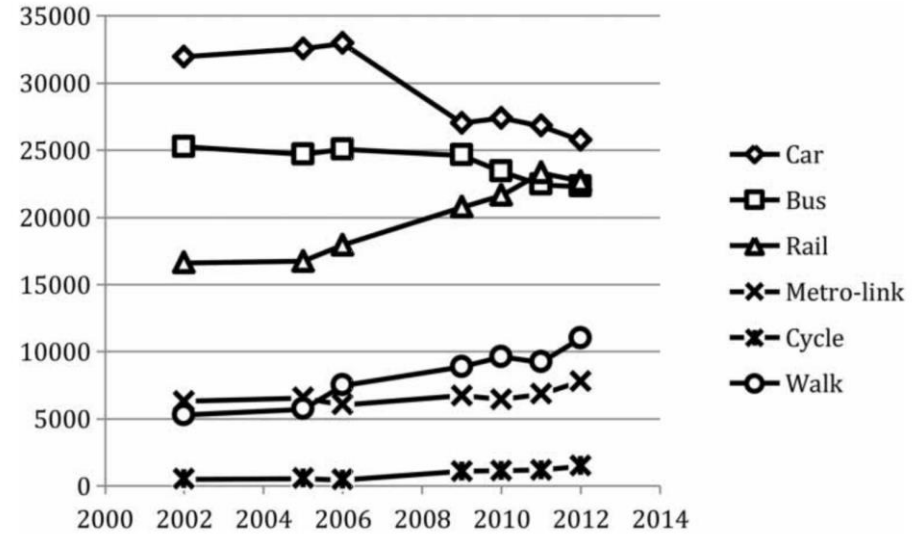
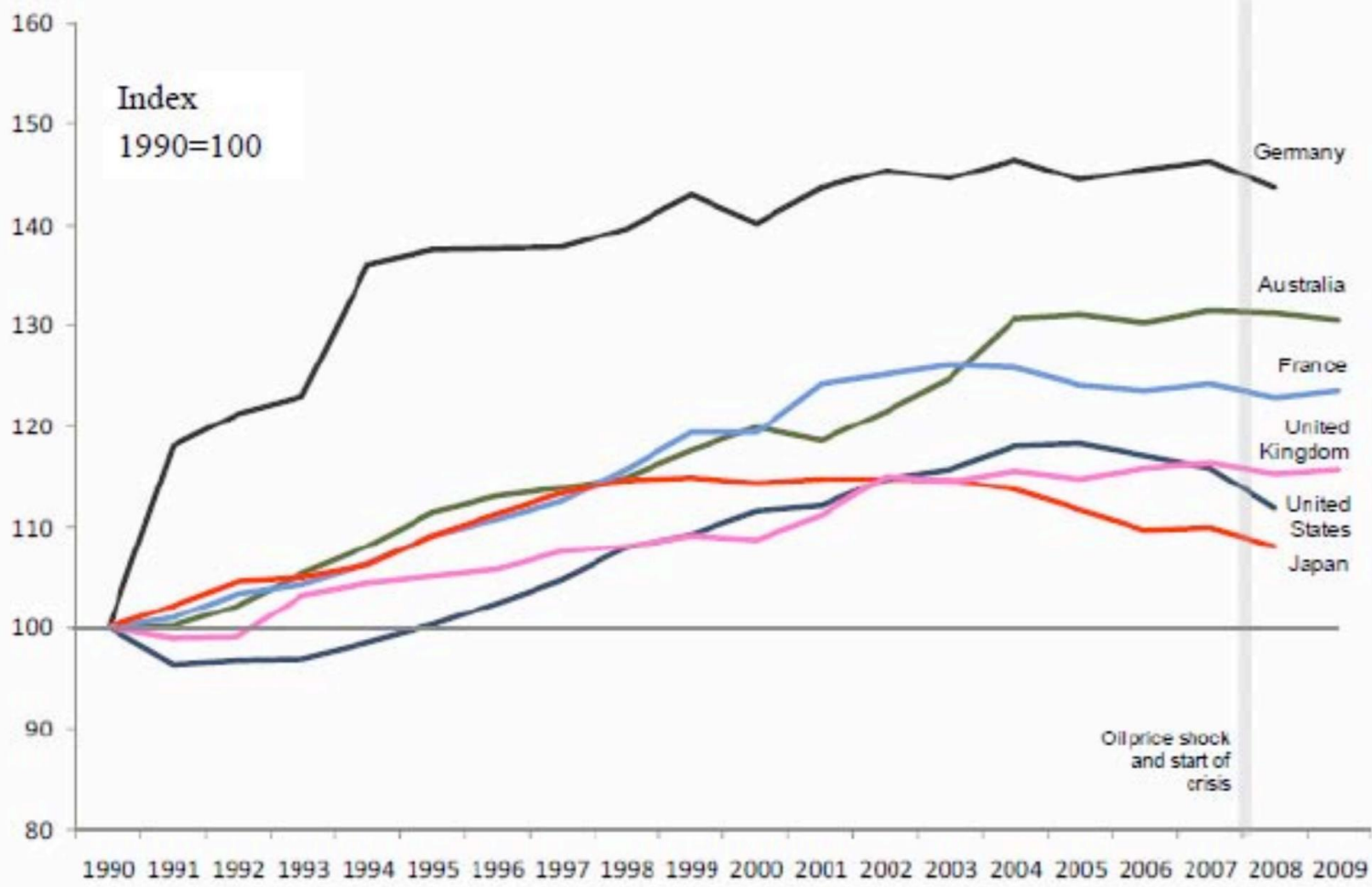


Figure 5. Manchester City Centre inbound trips per day, 0730–0930 h.
Source: HFAS (2012).



Source: International Transport Forum statistics.

Melia, S. (2012) A future beyond the car? Editorial introduction. World Transport Policy and Practice, 17 (4). pp. 3-6. ISSN 1352- 7614



Introduction

- A number of explanations have been suggested
 - Economic constraints
 - Attitudinal differences
 - Different residential location patterns
 - Life cycle factors
 - ICT



- ICT and mobile technologies have changed many aspects of people's lives
- The meaning of travel time has changed; people can now participate in activities on the go
- This may reduce the cost of travel time on modes where mobile use is possible
- People may prefer to be on public transport where they can use their mobile devices



ICT

- Some literature exists on this topic, much of it focusing on Wi-Fi on trains with some considering bus travel
- Improving internet accessibility on transport seems to improve ridership
- What about the people using smartphones?





Data

- Investigating the impact of ICT on transport is hard; in part due to data limitations
- Many factors influence travel behaviour
- We use a unique dataset collected by the Urban Big Data Centre; the integrated Multimedia City Data (iMCD)

- Location: The and Clyde Valley Planning area
- Time: April to November 2015
- Household Survey interviewed a representative sample of adults (2,095 people from 1,508 households)
- The survey includes diverse questions about socio-demographics, literacy, sustainability, ICT use, civic and cultural activities
- A one-day travel diary for all household members over the age of 16 was completed
- Other data, such as GPS and Twitter data was also collected

Variables

- Millennials without a car were asked if they were planning to get on in the next five years
- **People are asked how often they use the internet while travelling (*Never, rarely, sometimes, often*)**
- We know respondent's age, sex, working status, income, household composition
- Information about respondents attitudes to driving and public transport was also collected



Attitudes

- The survey asks how people about their attitudes towards public transport, driving and active travel
 - For me, to drive a car for regular or daily journeys is something I like
 - For me, to use public transport for regular or daily journeys is something I like
- People are asked how much they agree on a five-point scale from Strongly Disagree to Strongly Agree.



Trip generation

- We begin by modelling how many trips people make by public and private transport
- Our hypothesis is that people who use the internet most frequently will make more trips by public transport
- We take the number of trips by mode as our dependent variables and use a negative binomial regression model

	Public transport			Driving		
	Estimate	SE	Pr(> t)	Estimate	SE	Pr(> t)
(Intercept)	-1.44	0.35	0.00 **	-0.40	0.12	0.00 **
Age	-0.21	0.08	0.01 *	0.23	0.03	0.00 **
Age ²	0.21	0.07	0.00 **	0.03	0.03	0.26
Male	-0.28	0.14	0.04 *	-0.18	0.04	0.00 **
Worker	0.57	0.18	0.00 **	0.23	0.06	0.00 **
Number of cars	-0.56	0.11	0.00 **	0.27	0.03	0.00 **
Log (net income)	0.00	0.02	0.99	-0.01	0.01	0.38
Life Cycle (reference: 1 adult no kid)						
2+ adults no kid	-0.11	0.17	0.51	0.07	0.07	0.28
1 adult with kids	-0.07	0.37	0.85	0.13	0.14	0.36
2+ adults with kids	-0.49	0.22	0.03 *	0.24	0.08	0.00 **
Attitudes (Ref: strongly disagree)						
To use public transport is something I like						
Disagree	0.14	0.28	0.62	-0.06	0.07	0.39
Neutral	0.59	0.27	0.03 *	-0.07	0.07	0.31
Agree	0.92	0.24	0.00 **	-0.29	0.07	0.00 **
Strongly agree	1.43	0.27	0.00 **	-0.42	0.09	0.00 **
To drive a car is something I like						
Disagree	-0.03	0.24	0.89	0.43	0.11	0.00 **
Neutral	0.18	0.22	0.42	0.51	0.10	0.00 **
Agree	-0.14	0.20	0.50	0.59	0.09	0.00 **
Strongly agree	-0.74	0.21	0.00 **	0.79	0.08	0.00 **
Internet use while traveling (Ref: Never)						
Rarely	-0.07	0.24	0.76	0.19	0.07	0.01 **
Sometimes	0.01	0.19	0.95	0.08	0.06	0.17
Almost always	0.43	0.22	0.05 *	0.22	0.08	0.00 **

Sample size:
1,445

Results

- Internet users seem more likely to travel, irrespective of which mode we look at
- The effect seems to be stronger when we look at public transport
- Possible reverse causality i.e. people who travel most are more likely to use the internet
- An instrumental variable model we estimated suggested this was not the case



Results

- We tried estimating the same model using only Millennials
- This drastically reduced the sample size, from 1,445 to 375
- The model points in the same direction as the previous model, although the effects are not significant

	Estimate	SE	Pr(> t)	Estimate	SE	Pr(> t)
(Intercept)	-1.37	0.59	0.02 *	-1.12	0.34	0.00 **
Age	-0.15	0.13	0.23	0.07	0.07	0.27
Age ²	-0.01	0.13	0.92	0.04	0.07	0.58
Male	0.15	0.22	0.50	-0.13	0.12	0.27
Worker	0.45	0.30	0.14	0.31	0.17	0.06 .
Number of cars	-0.17	0.14	0.22	0.32	0.06	0.00 **
Log (net income)	-0.03	0.03	0.32	0.02	0.02	0.38
Life Cycle (reference: 1 adult no children)						
2+ adults no children	0.16	0.32	0.61	-0.01	0.19	0.97
1 adult with children	-0.09	0.57	0.87	-0.09	0.29	0.75
2+ adults with children	-0.19	0.37	0.60	0.09	0.20	0.65
Attitudes (Ref: strongly disagree)						
To use public transport is something I like						
Disagree	0.08	0.45	0.87	-0.16	0.17	0.35
Neutral	0.87	0.41	0.03 *	-0.11	0.17	0.53
Agree	1.00	0.40	0.01 *	-0.41	0.17	0.02 *
Strongly agree	1.24	0.46	0.01 **	-0.16	0.23	0.50
To drive a car is something I like						
Disagree	-0.32	0.40	0.42	0.83	0.27	0.00 **
Neutral	0.07	0.36	0.84	0.74	0.25	0.00 **
Agree	-0.19	0.32	0.56	0.80	0.22	0.00 **
Strongly agree	-0.45	0.33	0.18	1.12	0.22	0.00 **
Internet use while traveling (Ref: Never)						
Rarely	0.06	0.38	0.88	0.24	0.20	0.23
Sometimes	-0.03	0.30	0.93	0.09	0.15	0.55
Almost always	0.47	0.31	0.12	0.13	0.16	0.42

Sample size:
375



Car ownership

- Our main variable of interest is whether Millennials without a car plan to get one in the next five years
- The idea is that internet users may be less keen on getting a car
- People responded either Yes, No or Don't Know when asked if they would get a car in the next five years
- We modelled this using a multinomial logistic regression model

	No			Don't Know			
	Estimate	SE	Pr(> t)		Estimate	SE	Pr(> t)
(Intercept)	1.05	0.80	0.19		-1.68	1.19	0.16
Age	0.28	0.22	0.19		0.17	0.26	0.51
<i>Age</i> ²	-0.46	0.21	0.03 *		-0.38	0.27	0.16
Male	0.19	0.36	0.60		-0.38	0.48	0.43
Worker	-0.81	0.43	0.06 .		1.16	0.54	0.03 *
Number of cars	-0.29	0.33	0.39		-0.31	0.40	0.44
Log (net income)	0.01	0.05	0.90		-0.12	0.06	0.04 *
Life Cycle (Ref: 1 adult no children)							
2+ adults no children	0.16	0.51	0.75		-0.13	0.65	0.84
1 adult with children	-0.90	0.72	0.21		-0.68	0.99	0.49
2+ adults with children	-0.18	0.53	0.74		-1.22	0.75	0.10
To use public transport is something I like (Ref: strongly disagree or disagree)							
Neutral	-0.02	0.49	0.96		2.36	0.80	0.00 **
Agree	0.16	0.41	0.71		2.21	0.77	0.00 **
Strongly agree	0.24	0.58	0.68		1.94	0.98	0.05 *
To drive a car is something I like(Ref: strongly disagree)							
Disagree	-0.17	0.51	0.74		1.18	0.73	0.10
Neutral	-1.09	0.54	0.04 *		1.30	0.67	0.05 .
Agree	-0.97	0.47	0.04 *		0.01	0.71	0.99
Strongly agree	-1.21	0.68	0.08 .		-1.19	1.21	0.32
Internet use while traveling (Ref: Never)							
Rarely	0.65	0.60	0.28		-0.24	0.87	0.78
Sometimes	-0.58	0.45	0.20		-0.70	0.54	0.19
Almost always	-0.91	0.49	0.07 .		-1.59	0.65	0.01 *

McFadden's R^2 :
0.18

Sample size:
238



Conclusion

- Internet users seem to be more mobile than other people
- The explanation for this is unclear, but we control for several important variables
- Among the Millennials who don't own cars, the most heavy internet users are more likely to plan to buy a car than people who never use it



Conclusion

- Overall out results come done on the side of the argument which says that in the future Millennials' car ownership rates will catch up with previous generations
- Talk of peak car may be premature

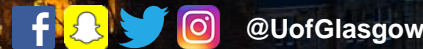


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