Do Younger Generations Drive Less?

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Abstract

There are longstanding debates about the differences between generations. This includes claims that preferences for urban areas, ride-hailing and green lifestyles make younger generations less likely to own cars and drive when compared to prior generations. Using data from almost four decades of national travel surveys I find large observed differences in driving habits and vehicle ownership between Millennials and prior generations. Once certain socioeconomic and demographic factors are controlled for these differences largely disappear. However, it does appear that younger generations drive less in urban areas, with some evidence they substitute to greater use of trains and bikes.

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1 Introduction

Much has been written about the changing preferences of younger generations, with Millenials and Gen Z no exception. Studies and survey evidence have shown that Millenials are more likely than older generations to be living at home with their parents or delaying getting married and starting a family (Astone and Peters, 2014, 2015; Fry, 2015; Amanda Barroso and Bennett, 2020; Kurz, Li and Vine, 2018). They are also less likely than older generations to engage in prosocial activities like charitable giving (Koczanski and Rosen, 2019). Recent evidence suggests that as Millenials age their political attitudes are not becoming more conservative, representing a break with past generations (Burn-Murdoch, 2022). These kinds of generational shifts in preferences may be in part shaped by the economic environment that different cohorts have grown up in (Cotofan et al., 2021).

One area where it has been suggested that younger generations may fundamentally differ from prior generations is in their choices about transportation and driving. A preference for urban living, public transport, ride-hailing apps and making greener choices have all been raised as reasons why Millenials and Gen Z might be in the process of leaving behind the car-centered lives of their predecessors (Buchholz and Buchholz, 2012; Badger, 2013; Caelainn Barr and Jones, 2016; Dias, 2019; Eliot, 2019). If so, this could have important implications for policy decision about transportation systems, congestion, urban planning and the environment.

However, the precise role of changes in preferences remains unclear, not least because it is difficult to disentangle from the role played by other changes in life circumstances experienced

by younger generations, such as economic conditions and living situations (Chatterjee et al., 2018). A study by Knittel and Murphy (2019) challenges the narrative that Millenials have fundamentally different preferences for driving and vehicle ownership. Using data on the United States they find little difference in preferences between Millennials and prior generations once confounding factors are controlled for.

In this paper I use data for the United Kingdom to examine whether younger generations have different preferences toward driving than older generations. The data comes from surveys spanning 1985 to 2022, allowing me to compare individuals at similar life stages across generations. The findings reveal large average differences between generations in the likelihood that individuals have driving licenses, their vehicle miles travelled and rates of vehicle ownership. A large part of these differences can be explained by demographic factors and endowments that vary across generations. This would seem to suggest that younger generations do not appear to have radically different preferences for driving and vehicle ownership than older generations. Even accounting for endogenous life choices that differ across generations does not alter this core finding.

However, this paper does examines a notable exception - namely that there does appear to be a small divergence in generational driving preferences when looking at urban vs rural areas. Urban Millenials are less likely to drive than urban Baby Boomers. This potentially reflects a more widespread uptake of alternative transportation modes such as public transit and cycling. These findings contribute to the extensive literature exploring the way urban form affects transportation decisions (Bento et al., 2005; Brownstone and Golob, 2009; Duranton and Turner, 2018).

Lastly, this paper uses data from the United Kingdom which is a valuable complement to prior work that has studied the US (Kurz, Li and Vine, 2018; Benjamin Leard and Munnings, 2019; Knittel and Murphy, 2019). The US has particularly high rates of driving, with road passenger miles per capita twice the median for developed countries (OECD, 2023). The UK, by comparison, is approximately at the OECD average. In certain respects the findings for the UK are similar to the US: baseline differences across generation do largely disappear when various demographic factors are accounted for. However, the heterogeneity for urban vs rural areas is a notable point of divergence where it does appear younger generations exhibit preferences that are somewhat less centred on personal driving than has historically been the case.

2 Data

The data used in this study is from the UK's National Travel Survey (Department for Transport, 2022). This is a household survey covering topics related to personal travel and transport policy. Individuals in sampled households are interviewed face-to-face to collect personal information, such as age, gender, working status, car access and driving licence holding. They are also asked to complete a seven day travel diary and provide details of trips undertaken, including purpose, method of travel, time of day and trip length.

The earliest data used here is from the 1985/6 survey, and then annual surveys from 1988 to 2022.[1] This provides observations spanning more than three decades which is critical to

[1]The first NTS survey was commissioned by the Ministry of Transport in 1965. However, the structure of the survey has changed over time and the data is more readily integrated from 1985 onwards.

being able to examine the generational comparisons of interest. Most importantly, gathering observations over this long time period means the sample has overlap between the Baby Boomer and Millenial generations, with observations for 26 to 39 year olds within both cohorts.

For this analysis the different generations are defined as follows. The Greatest generation have birth years between 1901 and 1927. The Silent generation have birth years between 1928 and 1945. Baby Boomers have birth years between 1946 and 1964. Gen X have birth years between 1965 and 1980. Millenials have birth years between 1981 and 1996. Gen Z have birth years between 1997 and 2012.

The main variables used to understand driving and vehicle ownership preferences are: (1) whether an individual has a license; (2) the number of vehicle miles travelled for each individual; and (3) the number of cars in a household. A number of control variables are also used. These include sex, marital status, employment status, number of adults in household, number of children in household, household structure categories, household income quintiles, property type, property tenure type, geographic region and geographic rural/urban categories.

The full dataset contains just over 500,000 observations. For the analysis I restrict the sample to individuals that are 17 years old or older based on the legal driving age in the UK. This reduces the sample to around 400,000 observations.[2] Table 1 provides summary statistics on

[2]I did also consider further restricting the sample to individuals classed as the head of household or household reference person. However, this would entail halving the sample size to around 200,000. Moreover, this would effectively drop an interesting portion of the sample; namely Millenials that still live with their parents or in shared accommodation without family members. Because these characteristics can be adequately captured by the inclusion of certain controls, the less restrictive sample was maintained throughout.

the sample data.

Table 1: Summary Statistics for Key Variables

	N	Mean	Std Dev	Min	Median	Max
License	409461	.7176215	.4501571	0	1	1
Cars	409421	1.176691	.8864161	0	1	9
VMT	409461	5016.937	7280.686	0	2000	175500
Female	409461	.5249487	.4993778	0	1	1
Age	409461	48.82369	18.5477	17	45	88
Married	409461	.5628009	.496041	0	1	1
House-head	409461	.5415632	.4982701	0	1	1
Employed	409461	.5837284	.4929403	0	1	1
House	409461	.8541717	.3529344	0	1	1
High-income	409461	.4047614	.4908464	0	0	1
Children	409461	.3001629	.4583292	0	0	1
Homeowner	409461	.718696	.449636	0	1	1
North	409461	.5345833	.4988032	0	1	1
Rural	409461	.2800071	.4490029	0	0	1
Bus Trips Per Year	321060	55.66393	91.36096	0	1.5	260
Train Trips Per Year	294503	24.21686	52.39311	0	.25	260
Bicycle Trips Per Year	213800	28.64952	66.98185	0	.25	260

Notes: This table contains summary statistics for the key variables used in the analysis. Most categorical demographic variables contain many categories, although they are simplified here for ease of presentation: age becomes a numerical variable using the midpoint of each age category; marital status becomes a dummy for married; head-of-household relation becomes a dummy for head-of-household; employment status becomes a dummy for employed; property type becomes a dummy for house; income quintile becomes a dummy for high-income; household structure becomes a dummy for whether the household has any children; property tenure becomes a dummy for homeowner; geographic region becomes a dummy for living in the north of the UK; and area type becomes a dummy for rural.

In many respects the data used here is similar to that in the US Department of Transportation's National Household Transportation Survey (NHTS) that has been used in other studies (Brownstone and Golob, 2009; Knittel and Murphy, 2019; Zhang and Li, 2022). As well as being broadly comparable, the UK data has a number of benefits. First my sample spans a period that is seven years longer. Second, for almost the entire period the UK data has annual survey waves, while the NHTS is generally conducted every five to six years. Both

features are valuable as they facilitates identifying changing trends in a smoother manner and over a longer time period.

3 Empirical Strategy

The main empirical strategy involves regressing each driving variable of interest on indicator variables for a person's generation. The omitted category is the Baby Boomer generation, and so the resulting coefficients capture how preferences for driving and vehicle ownership differ from Baby Boomers across generations. I then include various controls or limits to the sample depending on the specification.

$$y_{it} = \beta_0 + \beta_1 I_i^{Silent} + \beta_2 I_i^{Greatest} + \beta_3 I_i^{GenX} + \beta_4 I_i^{Millenial} + \beta_5 I_i^{GenZ} + \sum_k^K \beta_k X_{kit} + \epsilon_{it} \tag{1}$$

All specifications control for survey year fixed effects to account for general trends in transportation costs, economic growth, survey specific factors, and so on. A subset of specifications then add a wide range of demographic controls, including sex, age, marital status, household size and structure, income, employment status, household property type, housing tenure, geographic region and urban classification.

Despite including a range of controls, a reasonable concern is that individuals that belong to each generation are still at sufficiently different life stages during our sample period. I

therefore repeat the first two specifications, but now restrict the sample to individuals aged 26 to 39. For these individuals there is common support between Baby Boomers, Gen X and Millenials. This has the benefit of allowing a comparison of individuals of similar ages across generations. One potential limitation though is that this does entail comparing younger Baby Boomers born in the 1960s with older Millenials born in the 1980s. This may tend to attenuate any differences relative to comparing the average individual in each generation.

Beyond the main analysis, I also explore a key sources of heterogeneity and examine the role of endogenous choices. For heterogeneity, I examine whether the observed relationships differ in urban areas relative to rural areas. For endogenous choices, I expand the analysis to see if more fully accounting for the broader decisions that individuals in different generations make has an impact on the overall effect. Further details on these two extensions to the analysis are provided after the main results.

4 Results

4.1 Main Analysis

Table 2 shows the results of the main analysis. The first specification concerns driving licenses and clearly shows that there are indeed large differences across generations. 82% of Baby Boomers have a driving license. By comparison, younger generations are less likely to have a driving license, with a difference of -25% for Millenials. There are also similar declines relative to Baby Boomers for older generations.

Table 2: Results for Relationship Between Driving Habits and Generation

	(1)	(2)	(3)	(4)	(5)	(6)
Greatest	-0.393***	-0.111***	-5298.7***	-958.4***	-0.764***	-0.0540**
	(0.0189)	(0.0169)	(174.8)	(197.3)	(0.0296)	(0.0180)
Silent	-0.128***	-0.0272***	-2580.3***	-461.0***	-0.303***	-0.0396***
	(0.0168)	(0.00760)	(245.7)	(111.0)	(0.0332)	(0.00961)
Baby Boomer	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
Gen X	-0.0420***	-0.0215**	-345.2*	-427.2***	-0.0757***	-0.0310**
	(0.00895)	(0.00722)	(168.3)	(122.2)	(0.0113)	(0.0101)
Millennial	-0.247***	-0.0981***	-2631.9***	-1000.0***	-0.0348	-0.0421*
	(0.0167)	(0.0136)	(203.8)	(192.4)	(0.0221)	(0.0187)
Gen Z	-0.521***	-0.166***	-3682.4***	62.80	0.198***	0.0246
	(0.0338)	(0.0221)	(294.0)	(394.9)	(0.0333)	(0.0279)
Observations	409461	404182	409461	404182	409421	404146
R^2	0.088	0.309	0.070	0.264	0.060	0.400
Dependent Variable	License	License	VMT	VMT	Cars	Cars
Demographic Controls	No	Yes	No	Yes	No	Yes
Ages 26-39	No	No	No	No	No	No
Sample Mean	0.82	0.82	6,491.08	6,520.05	1.31	1.31

Notes: This table shows the regression results with the dependent variable as whether an individual has a driving license. Baby Boomers are the omitted category. All regressions limit the sample to individuals that are 17 years or older. Limits on the sample and any included controls vary by specification as described in the bottom rows. Coefficients on controls are not shown. Sample mean is for the omitted group.

However, it may be the case that much of this difference can be explained by other factors besides the fundamental tastes and preferences of each generation towards driving. For instance, the Baby Boomers in our sample are older than the Millenials and Gen Z individuals. They may also be wealthier than other generations, or be more likely to be married and have children. Other generations may simply have similar preferences for driving conditional on demographics and endowments. Any observed differences could merely be a function of differences in these demographics and endowments. To examine this the second specification now adds controls for important economic and demographic factors. The observed effects are markedly reduced, although still significant. Millenials are now only 10% less likely to have a driving license than Baby Boomers.

The results for vehicle miles travelled largely mirror those for the analysis of driving licenses. The average differences between generations are initially very large, as shown in specification three in Table 2. Baby Boomers drive an average of 6500 miles per year. Millenials drive 2632 miles per year less, which is a 40% reduction. Controlling for demographics closes the gap across all generations, leaving a difference of 1000 miles per year for Millenials, which is a 15% reduction.

For vehicle ownership, Table 2 reveals that Baby Boomers live in households that have an average of 1.31 cars. Older generations live in households with significantly fewer cars. Interestingly, younger generations live in households with similar numbers of cars to Baby Boomers. Millenial households have an average of 0.03 fewer cars, which is a 2% reduction and not statistically significant. Adding in the full set of demographic controls does not make a notable difference.

Notably Gen Z individuals live in households with 0.2 more cars than Baby Boomers, which is a 17% increase. While this may seem strange, what is likely going on here is that the number of cars is measured here at the household level. As such an individual may live in a household with one or more cars even if they do not actually drive. This seems perfectly consistent with the observed effects for younger generations, many of whom may still be living with their parents.

Despite including a range of controls for demographics and endowments, it is plausible that the individuals in the sample may still be at significantly different life stages. As such the results in Table 3 repeat the analysis with the sample now limited to individuals age 26 to 39. This causes the Gen Z generation to drop out as they have no individuals in the sample 26 or older. Similarly the Greatest and Silent generations also drop out as they have no individuals in the sample 39 or younger. Baby Boomers, Gen X and Millenials remain as these are the generations that share common support over this age range.

Compared to the analysis that used the full sample, the remaining generations now exhibit smaller differences relative to Baby Boomers across all three measures of driving habits. After also controlling for demographics the results reveal no statistically significant differences across generations.

4.2 Endogenous Life Choices

One important issue not addressed by the main analysis conducted thus far is endogenous life choices. Some of the demographic and socioeconomic variables being used as controls may

Table 3: Results for Relationship Between Driving Habits and Generation (Ages 26-39)

	(1)	(2)	(3)	(4)	(5)	(6)
Baby Boomer	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
Gen X	-0.0439***	0.0123	-653.9***	-29.01	-0.0572***	-0.0379*
	(0.00482)	(0.00809)	(65.32)	(89.87)	(0.0104)	(0.0146)
Millennial	-0.136***	0.00714	-2009.2***	-209.0	-0.0680***	-0.0391
	(0.00636)	(0.0109)	(76.24)	(172.0)	(0.0137)	(0.0247)
Observations	95951	94854	95951	94854	95939	94843
R^2	0.006	0.224	0.031	0.208	0.005	0.326
Dependent Variable	License	License	VMT	VMT	Cars	Cars
Demographic Controls	No	Yes	No	Yes	No	Yes
Ages 26-39	Yes	Yes	Yes	Yes	Yes	Yes
Sample Mean	0.78	0.79	6,695.32	6,721.85	1.09	1.10

Notes: This table shows the regression results with the dependent variable as an individual's annual vehicle miles travelled. Baby Boomers are the omitted category. All regressions limit the sample to individuals that are 17 years or older. Limits on the sample and any included controls vary by specification as described in the bottom rows. Coefficients on controls are not shown. Sample mean is for the omitted group.

indeed affect driving habits, while also themselves be endogenous choices made by different generations. For instance, there is evidence that younger generations are more likely to still be living at home with their parents, or are delaying getting married and starting a family (Astone and Peters, 2014, 2015; Fry, 2015; Amanda Barroso and Bennett, 2020). Some of these decisions may be due to economic realities beyond their control, but plausibly some of these represent active choices that reflect different preferences to earlier generations. Where this is the case, simply controlling for characteristics like marital status or family structure may result in the earlier analysis prematurely ruling out generational differences in preferences toward driving. To examine this possibility I check the sensitivity of the main analysis to the inclusion of different demographic and socioeconomic controls.

I therefore repeat the original regressions examining the relationship between driving habits

and the generation dummies, but this time I vary which of the demographic and socioeconomic variables are included as controls. The age and sex variables are the most obvious ones to treat as exogenous. For the other controls these can be divided up into family variables (married, head-of-household and children), location variables (north, rural/urban and house type) and economic variables (employed, high income and homeowner).

Table 4 presents the results of this analysis. Here we can see that merely including the age and sex controls, which are plausibly exogenous, is sufficient to entirely eliminate any significant differences that remain from the prior regressions that did not include any demographic controls. In fact these two very basic controls appear to be more important than the combined effect of all the other demographic and socioeconomic control variables. Given that both sex and age can be treated as exogenous here it seems there is not a clear role for endogenous life choices and preferences in providing an alternative path by which younger generations may differ in their driving habits.

4.3 Urban vs Rural

Lastly, it seems plausible that generational effects may still differ when considering the way different groups of people respond to the urban form of their local area. Public transit, biking and ride-sharing services are much more readily available in urban areas. These alternative transportation options have also been associated with new habits taken up by younger generations.

Table 5 repeats the analysis of generational driving habits, but this time interacts the gen-

Table 4: Results for Endogenous Life Choices Analysis (Ages 26-39)

	(1)	(2)	(3)	(4)	(5)	(6)
Baby Boomer	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
Gen X	0.0267***	0.000595	309.1*	-65.43	-0.0340	0.000420
	(0.00639)	(0.00705)	(118.9)	(48.33)	(0.0190)	(0.0113)
Millennial	0.00580	-0.0170*	-62.97	-317.5***	-0.0214	0.0370**
	(0.0113)	(0.00765)	(201.9)	(86.34)	(0.0349)	(0.0132)
Observations	95951	94854	95951	94854	95939	94843
R^2	0.026	0.222	0.073	0.198	0.006	0.326
Dependent Variable	License	License	VMT	VMT	Cars	Cars
Age/Sex Controls	Yes	No	Yes	No	Yes	No
Location Controls	No	Yes	No	Yes	No	Yes
Family Controls	No	Yes	No	Yes	No	Yes
Economic Controls	No	Yes	No	Yes	No	Yes
Ages 26-39	Yes	Yes	Yes	Yes	Yes	Yes
Sample Mean	0.78	0.79	6,695.32	6,721.85	1.09	1.10

Notes: This table shows the regression results for the analysis of endogenous choices. Specifications one to three are results for license, four to six are results for vehicle miles travelled and seven to nine are results for number of cars in the household. Baby Boomers are the omitted category. All regressions limit the sample to individuals that are 17 years or older. Limits on the sample and the categories of variables included as controls vary by specification as described in the bottom rows. Coefficients on controls are not shown. Sample mean is for the omitted group.

eration effects with whether an individual lives in an urban or rural area. Results are shown for the version of the regressions that includes the full set of demographic and socioeconomic controls and limits the analysis to the most comparable 26-39 age group.

Table 5: Results for Urban vs Rural Analysis (Ages 26-39)

	(1)	(2)	(3)	(4)	(5)	(6)
Urban	-0.0551***	-2221.1***	-0.0558	4.068	23.33***	-4.239
	(0.00955)	(261.6)	(0.0280)	(5.210)	(2.292)	(3.078)
Baby Boomer	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
Gen X	0.0129	334.7*	-0.00823	-12.23**	-6.984***	2.813
	(0.00858)	(163.2)	(0.0193)	(3.576)	(1.362)	(2.005)
Millennial	0.0235	255.6	0.0535	-11.55*	-10.23***	1.338
	(0.0123)	(256.5)	(0.0284)	(4.364)	(2.284)	(4.506)
Urban × Baby Boomer	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
Urban × Gen X	-0.000980	-509.3*	-0.0417*	6.647	5.864***	1.929
	(0.00513)	(189.4)	(0.0169)	(4.522)	(1.323)	(2.259)
Urban × Millennial	-0.0207*	-630.4*	-0.121***	6.919	7.676***	12.97***
	(0.00986)	(245.5)	(0.0245)	(5.153)	(1.994)	(3.330)
Observations	94854	94854	94843	75746	68533	53416
R^2	0.224	0.208	0.327	0.203	0.141	0.163
Dependent Variable	License	VMT	Cars	Bus	Train	Bicycle
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Ages 26-39	Yes	Yes	Yes	Yes	Yes	Yes
Sample Mean	0.79	6,721.85	1.10	39.08	17.03	16.19

Notes: This table shows the regression results for the analysis of urban vs rural heterogeneity. Specifications one to three are results for the three main driving variables. Specifications four to seven are for several alternative transport modes. Baby Boomers are the omitted category. All regressions limit the sample to individuals that are 17 years or older. Limits on the sample and any included controls vary by specification as described in the bottom rows. Coefficients on controls are not shown. Sample mean is for the omitted group.

First, Table 5 reveals some evidence that living in an urban area can have implications for generational driving preferences. When allowing for generational effects to differ in urban and rural areas we see three key things. First, all individuals in urban areas drive less (i.e. less likely to have a license and lower vehicle miles travelled) and use alternative transport modes more (i.e. higher number of train trips). Second, when looking within urban areas

I find some limited evidence that urban Millenials drive less than urban Baby Boomers. Third, urban Millenials appear to be substituting to increased use of alternative transport modes (i.e. more train and bike trips).

Importantly, 70% of all individuals, and more than 80% of Millenials and Gen Z, live in urban areas. Urban areas are also where externalities from congestion and pollution are most acute. As such the additional reduction in urban driving from younger generations, and greater use of alternative transport modes, is of particular interest.

5 Conclusion

There are large average differences between generations in the likelihood that individuals have driving licenses, their vehicle miles travelled and rates of vehicle ownership. This paper shows that a large part of these differences can be explained by variations in other demographic factors that vary across generations. The implication is that younger generations do not appear to have radically different preferences for driving and vehicle ownership than older generations. In fact, any meaningful differences seem to disappear entirely when comparing a narrower group of 26 to 39 year old Baby Boomers with Millenials of the same age. Accounting for potential endogenous life choices made by different generations does not change this core observation.

However, this paper uncovers one interesting exception as there does still appear to be small divergences in generational driving preferences when looking at urban vs rural areas. Millenials in urban areas drive less than urban Baby Boomers, with some evidence they

substitute towards trains and bikes.

These results have important implications when considering public policies aimed at tackling social problems associated with driving, such as congestion or air pollution. There are also potential implications for the impact of ride-hailing and automated driving. This was not possible to directly address using the data in this study, and so remains an important area for further research.

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