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Car today, gone tomorrow: The ephemeral car in low-income, immigrant and minority families

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Abstract Most transportation research in the United States uses cross-sectional, "snapshot" data to understand levels of car access. Might this cross-sectional approach mask considerable variation over time and within households? We use a panel dataset, the Panel Study of Income Dynamics (PSID), for the years 1999–2011 to test this question. We find that for most families, being "carless" is a temporary condition. While 13 % of families in the US are carless in any given year, only 5 % of families are carless for all seven waves of data we examine in the PSID. We also find that poor families, immigrants, and people of color (particularly, blacks) are considerably more likely to transition into and out car ownership frequently and are less likely to have a car in any survey year than are non-poor families, the US-born, and whites.

Keywords Car ownership · Panel data · Poverty · Immigration

Introduction

In most transportation research, automobile access is seen as a snapshot; some people have a car and others do not. But does this snapshot approach mask variation in car ownership over time? We use seven waves of the Panel Study of Income Dynamics (the PSID),

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spanning 1999–2011, to examine levels of automobile access in groups that have particularly low automobile access: poor families, immigrants, and people of color.

The aim of this paper is to explore the nature of "carless" families within demographic groups and across time, rather than to explain the motivations for families gaining or giving up cars. As others have found, we observe large differences in access ownership across population groups. However, we also find that families' access to cars varies considerably *across time*, with many families transitioning into and out of car ownership. This longitudinal perspective can potentially reframe scholars' and practitioners' understanding of zero-car households by highlighting that very few families in the US remain carless for very long; even long-term poor families are likely to own a car during some survey waves.

In the next section, we provide a brief summary of research on household auto ownership with a focus on longitudinal data, populations of special interest, and studies that elaborate on the standard model of auto ownership. Next, we describe the PSID data we employ in this analysis. We then describe and synthesize our findings. We conclude with a discussion of the implications of our findings for research and practice.

Household automobile ownership

There is a large body of research on household auto ownership using a variety of complex statistical models. Transportation researchers use these models to understand household consumption and travel behavior. Governments, transportation planners and researchers use aggregate, disaggregate, cross-sectional and panel analyses to estimate travel demand and environmental emissions, and car manufacturers and oil producers use them to predict demand for their products (de Jong et al. 2004; Train 1993). Disaggregate cross-sectional studies have consistently found that income, automobile purchase costs, the number of workers and "the availability and ease of travel on public transit are significantly related to the household level of auto ownership" (Train 1993, p. 115).

Panel datasets provide a significant advantage by allowing researchers to examine changes within households over time. While aggregate studies of auto ownership have found (at least until recently) increasing levels of auto ownership in many contexts, these studies conceal the large numbers of households who actually decrease their car ownership (Axhausen 1995; Goodwin 1988, 1997). Over a ten-year period in the UK, 15 % of surveyed households decreased and 21 % increased the number of cars they owned (Goodwin 1993). Others report that 7.6 % of households decrease the number of autos while 8.2 % increase between any 2 years (also using data from the UK though a decade later) (Dargay and Hanly 2007; see Table 3). Together, panel research suggests that changes in auto ownership are associated with life-cycle changes, aging, and income and car ownership in the previous panel waves (Dargay and Hanly 2007; Goodwin 1997; Nolan 2010; Oakil et al. 2013; Woldeamanuel et al. 2009).

Research on auto ownership using panel data is largely absent in the US context. Existing studies of auto ownership have been conducted with data from Great Britain (Axhausen 1995; Dargay and Hanly 2007; Goodwin 1993), Ireland (Nolan 2010), the Netherlands (Goodwin 1989; Kitamura 2009), Germany (Woldeamanuel et al. 2009) and Australia (Hensher 1986). Although transportation researchers have used panel data from the US (e.g., Krizek 2003), to our knowledge, none have examined auto ownership changes within households over time.

Additionally, researchers have examined how auto ownership varies among populations of particular social and policy interest. Low-income households have much lower access to autos than more affluent households, and they subsequently travel less (Blumenberg and Pierce 2012). However, auto ownership is increasing among these families (Blumenberg and Thomas 2014). For those low-income households who do own cars, the costs of auto ownership represent a higher share of their total household budget than for more affluent households (Rice 2004). For low-income households, access to cars translates to jobs and higher earnings (Baum 2009; Blumenberg and Manville 2004; Gurley and Bruce 2005; Ong 2002). Similarly, African-American households have lower levels of car access, particularly when they live in more racially segregated metropolitan areas (Berube et al. 2008). Immigrants to the US also own autos at lower rates than US-born persons, and because immigrants generally live in larger households, they often face greater competition for the use of these cars (Blumenberg and Smart 2011; Tal and Handy 2010). However, auto ownership is not the same as access to cars. Even in households with no cars, over a third of all trips are made in cars, either as a passenger or driver (Pucher and Renne 2003). A recent focus group of immigrants in California describes how access to cars varied across a number of dimensions, not just whether a household owns a car, but also access to social networks, reliability of the vehicles, gender, and so forth (Lovejoy and Handy 2008).

We add to this body of research by using panel data from the US context. Our study examines car ownership for three demographic groups: poor families, immigrant families, and families headed by a person of color. The panel nature of our data sheds light on the volatility of car ownership for many families in the US, particularly for low-income and black families. Our study highlights that the "carless" families often found in cross-sectional studies miss an important point: the overwhelming majority of zero-car families are carless only for a short while.

Research approach

We use the PSID to analyze the changes in automobile access within and across families over time. The PSID began as part of President Johnson's War on Poverty and is "the world's longest-running housing panel survey" (McGonagle et al. 2012, p. 268). Since 1968, the Institute for Social Research (ISR) at the University of Michigan has been collecting economic and demographic data on the same families and their descendants who start their own families (Becketti et al. 1988). The ISR has surveyed these families annually from 1968 through 1997 and biennially since 1997. The first wave included approximately 18,000 individuals living in 5000 families and just over a third were part of an oversample of low-income families. ISR has periodically refreshed the PSID sample to ensure that the sample is representative of the changing demographics of the US population. In 1990, a new sample was added including 2043 Latino families. In 1997, 511 immigrant families (arriving in the US after 1968) were added (McGonagle et al. 2012). The most recent waves of the PSID include responses from roughly 22,000 individuals living in 9000 families.

The PSID survey includes a number of transportation-related questions. From 1968 through 1986 and again from 1999 through 2011, the survey has included questions about family auto ownership, which we use as a proxy for access to automobiles. From 1968 through 1986, the PSID collected data on the commute trip (duration, distance and mode). More recently, the transportation related questions have shifted and become more limited,

focusing on expenditures related to auto purchases and maintenance, parking, and public transportation as well as attributes about vehicles owned by the families. Yet only a handful of researchers have used the PSID to examine transportation-related research questions (Hill 1981; Hunt et al. 2004; Paleti et al. 2011; Simonsohn 2006).

Our analysis uses seven waves of PSID data, from 1999 biennially through 2011. Our unit of analysis is the family, the unit the PSID uses to collect transportation data. We track the family "head" across survey waves and add new families to the dataset when they break off from an existing family (e.g., separations, divorces and children moving out). Similarly, we drop families when they leave the survey due to nonparticipation, a move abroad, or death. Over the PSID's long tenure, there has been significant attrition of the original sample, particularly among low-income and minority respondents (Fitzgerald 2011). However, other research on health outcomes using PSID data suggests that the survey is still representative if survey weights are used (Fitzgerald 2011). We use these survey weights in our analysis.

We focus our analysis on changes in auto ownership within families over time, concentrating on three dimensions of socioeconomic difference. First, we examine differences in auto ownership between families in poverty and other families. We include two poverty categories, families that were in poverty in any year and those who are in poverty during at least half of the survey waves we analyze. This latter group we call the "long-term poor." We define a family as living in poverty if the total family income is less than the Census Needs Standard, which varies by family size, composition and year.

Second, we analyze how auto ownership varies by nativity. We define immigrant families as those where the family head and/or spouse or partner was born abroad. In cases where we have information on the year of arrival for the foreign-born, we assign the family level year of arrival as the person who arrived first in the US.

Third, we examine auto ownership across racial and ethnic groups. These include non-Hispanic white, non-Hispanic black, non-Hispanic Asian and Hispanics of any race. Race and ethnicity information is only available for the family head and his or her married or unmarried partner. We assign each family the race and ethnicity of the family head, an admittedly imperfect measure of the family's racial and ethnic identity.

We employ a straightforward research approach, presenting descriptive statistics of car ownership for the poor, immigrants, and people of color. We compare these groups to their non-poor, US-born and white counterparts, and highlight differences. Our aim is to explore both the total number of cars owned by a family and the ratio of cars to adults in the family, a measure of competition for car use. Additionally, we use the longitudinal nature of the dataset to explore the permanence—or ephemeral nature—of car ownership in these families. Our focus is not to examine motivations and "trigger events" for gaining or losing access to a car, though we do find that the differences between racial/ethnic groups and between immigrants and the US-born remain when we restrict the analysis to non-poor families.

Table 1 summarizes the number of families by poverty status, nativity and race/ethnicity and includes basic information on auto ownership and income. It presents data on the first wave and the final wave of our dataset; data for all seven waves are provided in the Appendix. After excluding families without information on car ownership, our sample includes 7493 families in 1999 and 9690 in 2011. Because ISR has not refreshed the PSID sample since the addition of an immigrant sample in 1997 and 1999, the growth in the number of families in the sample is due to family segmentation over time. As a result, we cannot compare immigrant families in the sample to more recent arrivals. We can only follow these immigrants over time.

Table 1 Sample characteristics, 1999 and 2011 PSID

	Sample size		Mean number of cars in family		Mean car-to-adult ratio in family		Median family income (2011 $s)	
	1999	2011	1999	2011	1999	2011	1999	2011
All families	7493	9690	1.64	1.59	0.95	0.94	$55,614	$49,529
Poverty								
Families not in poverty	90 %	88 %	1.73	1.71	0.99	1.00	$62,100	$56,300
Families in poverty	10 %	12 %	0.80	0.72	0.57	0.52	$8848	$8500
Nativity								
US-born families	91 %	90 %	1.67	1.61	0.97	0.96	$57,205	$50,006
Foreign-born families	9 %	10 %	1.36	1.46	0.67	0.74	$41,896	$41,719
Race/ethnicity								
Non-Hispanic white	77 %	72 %	1.76	1.69	1.02	1.01	$62,238	$55,380
Non-Hispanic black	13 %	15 %	1.02	1.11	0.63	0.75	$37,260	$31,520
Non-Hispanic Asian	2 %	2 %	1.57	1.54	0.87	0.80	$65,357	$82,000
Hispanic, any race	5 %	9 %	1.34	1.58	0.68	0.81	$38,640	$39,000

We only include cases with information on auto ownership in the family

Auto ownership decreased slightly between 1999 and 2011 in the full sample and inflation-adjusted incomes have decreased for most groups over the 12 years. The number of families in poverty increased from 10 to 12 % and these families own slightly fewer cars in 2011 compared with 1999. Auto ownership and family incomes increased among immigrants in the sample. Among non-Hispanic black families, incomes declined sharply while auto ownership rates nevertheless increased. This contrasts with non-Hispanic white families, whose auto ownership declined with declining incomes. Non-Hispanic Asian families had the largest income gains, although cars per adults decreased slightly in these households. Hispanic families increased both auto ownership and incomes from 1999 to 2011. These data are provided wave-by-wave in the Appendix.

Drawing on the full range of PSID data, from 1968 through 2011, we observe that the ratio of cars to adults steadily increased during the 1970s through 2000, and leveled off during the mid-aughts, consistent with other research (see also Millard-Ball and Schipper 2011). Figure 1 charts the mean ratio of cars to adults in each family in the PSID for the two eras when the survey collected information on the number of cars owned by each family. The PSID collected this information annually from 1968 through 1986 (excluding 1973 and 1974) and then again from 1999 through 2011 biennially. We use a dashed line to indicate the years for which no data on car ownership were available.

In addition to charting the trend for the full sample, we also compared the cars-to-adult ratio for families by poverty status and for white- and black-headed families, revealing that poor and black families have significantly lower rates of car ownership compared with families above poverty and white families. While the gap between black and white families may be closing, the gap in auto ownership between poor and non-poor families is growing. In 1999, white-headed families had 1.62 times as many cars per adult compared to black-headed families. By 2011, that had shrunk to 1.35 times as many. Non-poor families had

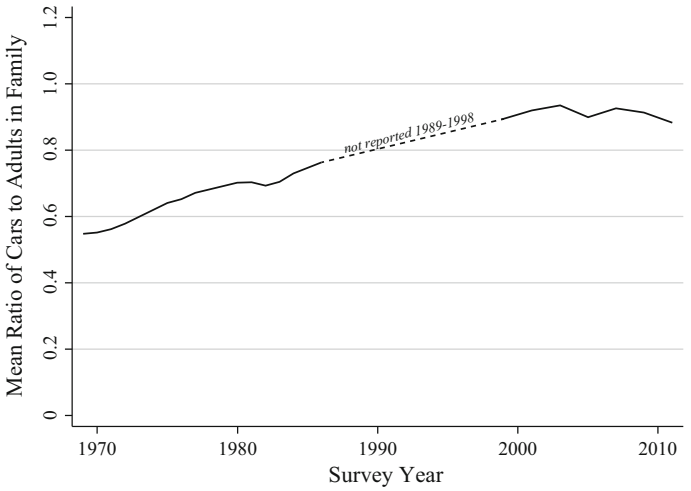

Fig. 1 Mean number of cars per adult 1969–1986 and 1999–2011 PSID

1.74 times as many cars per adult compared to poor families in 1999, but by 2011 that gap had grown to 1.92 times as many (see "Appendix").

Auto ownership over time

How stable is car ownership over time within families? We first explore the changes in auto ownership that all families in the PSID make from year to year. Table 2 summarizes the relationship between the number of cars a family owns in one period and the number of cars owned in the next period. Across the seven waves of the survey, 62 % of families retain the same number of cars from the previous period, while 21 % decrease the number of cars they own (indicated by the red cells in Table 2) and 17 % increase (the green cells in Table 2). The most frequent transitions in car ownership are from two cars to one car (7 % of all families) and from one car to two cars (6 %). These findings suggest greater

Table 2 Change in car ownership levels from period T to period T + 1, 1999–2011 PSID

Number of Cars Two Years Ago	Number of Cars This Year: 0	1	2	3	4+	Total
0	8%	2%	1%	0%	0%	11%
1	3%	24%	6%	1%	0%	34%
2	1%	7%	22%	4%	1%	35%
3	0%	2%	4%	5%	2%	13%
4+	0%	1%	1%	2%	3%	6%
Total	12%	36%	34%	12%	6%	100%

Total percent of households not changing the number of cars = 62%

Total percent of households changing the number of cars = 38%

Of which: *Decrease: 21%*

Increase:17%

fluctuation in auto ownership levels compared with earlier research based in the UK (Dargay and Hanly 2007).

However, changes in the number of cars in a family can represent two distinct cases: a change in the composition of the family (an adult child moves out, and takes a car) or true "downsizing" of a family's fleet of cars. Figure 2 further displays changes in the ratio of cars to adults in the family between surveys. We find that families in the PSID were more likely to gain cars relative to adults leading up to the 2001 and 2003 surveys. Leading up to the 2005 survey, the trend reversed, with more families giving up cars than gaining cars, relative to the number of adults in the family. These changes may be due to the rapid rise in gasoline prices in the United States during 2004 and 2005. Families were again more likely to gain cars relative to the number of adults leading up to the 2007 survey. In the final two waves the trend again reversed itself, with more families shedding cars relative to the number of adults. In all survey waves, the majority of families remained at the same level of car access, ranging from 60 to 63 % of families.

Car ownership levels vary by poverty status, nativity, and race/ethnicity. Figure 3 shows the ratio of cars to adults in the family unit, grouped into four categories: those with zero cars, those with less than one car per adult, those with an equal number of cars and adults, and those with more cars than adults. Here, we use the seven panel waves from 1999 to 2011; thus, the figure shows a typical "snapshot" of auto ownership for any given year in this time span. We separately examined these ratios for each of the seven waves of data and found little variation across time, although all groups experienced a slight decline in auto ownership in recent waves.

In this cross-sectional analysis, we find what prior research has shown: poor, foreign-born and non-white families are all considerably less likely to have an automobile than non-poor, US-born, or white families. Even when these families do have cars, they are likely to have fewer cars than adults. Poor families are particularly likely to have no car (45 % do not), as are families headed by a black individual (30 %). Similarly, immigrants have considerably lower levels of car ownership than those who are US-born.

The PSID estimates of zero-car families in our study years, from a low of 11.4 % in 2003 to a high of 13.4 % in 2011, are consistently higher than the estimate of zero car households from the American Community Survey, at 8.8 % of households in the 2005-2009 5-Year Estimates. The higher estimates of carlessness in the PSID are likely due to the differences in the unit of observation and the wording of the questions in the two

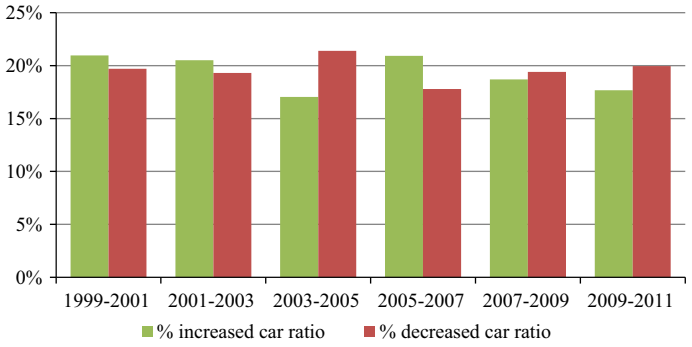

Fig. 2 Percentage of families increasing or decreasing the ratio of cars to adults in the family between two successive panel waves, 1999–2011 PSID

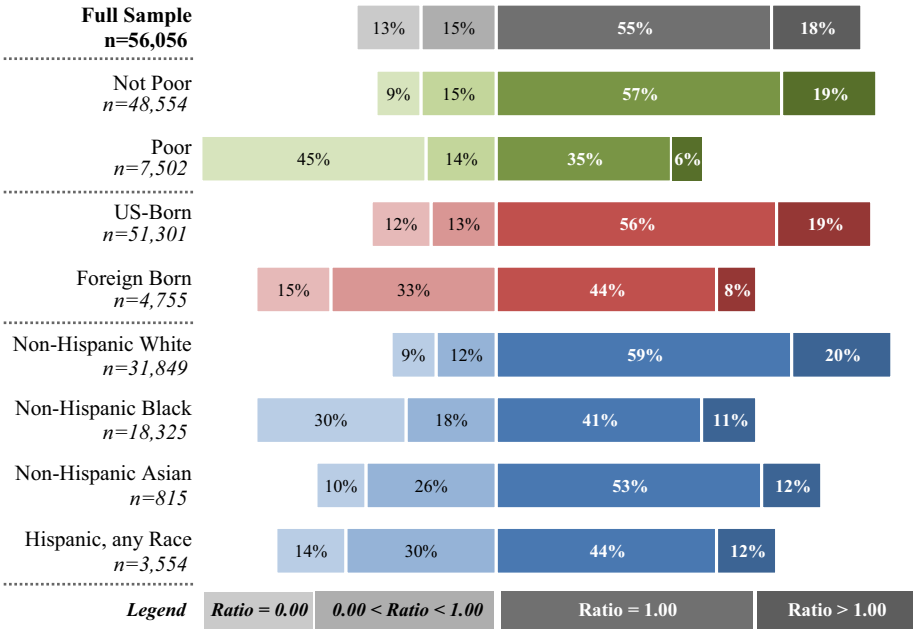

Fig. 3 Ratio of cars to adults in the family in a typical year, 1999–2011 PSID, Ns indicate number of family-years

surveys. The PSID is a survey of families while the ACS surveys households. Further, the two surveys ask slightly different questions about access to automobiles. The PSID is more restrictive, asking whether the family "*own[s] or lease[s]* a car or other vehicle for *personal* use" [authors' italics] (Institute for Social Research 2013, page 49) while the ACS asks the number of vehicles "kept at home for use by members of this household (United States Census Bureau 2010, page 5)." Thus, borrowed cars (such as from a parent or roommate) present in the ACS but absent in the PSID could account for some of the gap.

Might such a snapshot picture of car ownership mask variation over time, particularly differences by poverty, nativity and race/ethnicity? The panel nature of the PSID allows us to examine whether zero-car families are likely to remain car-free over time, or whether lacking a car is usually a temporary phenomenon. Looking across the 12 years, we find that very few families in the PSID remain carless across all seven waves spanning these years. Only 5 % of families never have a car during any of the seven waves, while 23 % had a car for some (but not all) waves, and 72 % had a car in all seven waves of the PSID. These numbers suggest a greater churn into and out of carlessness than a cross-sectional look at the PSID or Census data would provide, in which 9–13 % of families have no car in any given year. Figure 4 shows the stability of car ownership over time by these three patterns of car ownership by poverty status, nativity and race/ethnicity.

Poor families and families with a non-Hispanic black head-of-family were the most likely to transition into and out of car ownership. Among families living below the poverty line in more than half of the survey waves, 26 % remained carless in all seven waves. A slightly smaller share (23 %) had a car during all seven waves. Poor families' car ownership fluctuated, with 46 % of poor families—and 51 % of long-term poor families—transitioning to or from carlessness at least once during the seven waves. These differences

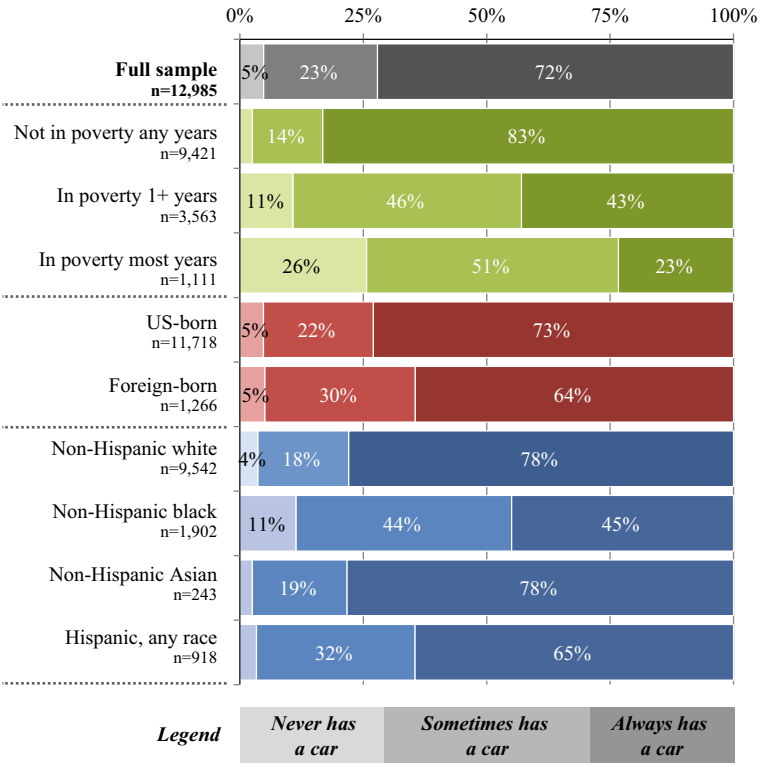

Fig. 4 Stability of car ownership within the family over seven survey waves, Ns indicate number of families

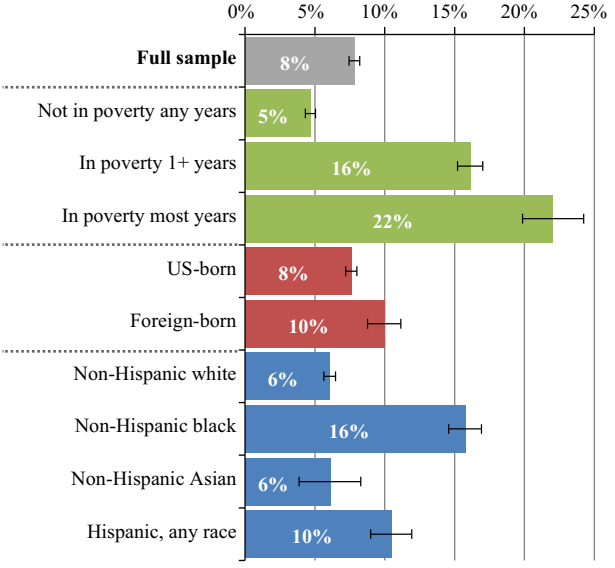

Fig. 5 Probability of family switching into or out of car ownership, 1999-2011 PSID (*error bars* indicate 95 % confidence interval), Ns indicate number of families

are statistically significant using a Kruskal–Wallis rank test. Families headed by black individuals also show a high propensity to have a car for some, but not all, years of the survey (the differences by race and ethnicity are also statistically significant). As expected, foreign-born families also transition in and out of auto ownership at higher rates than US-born families, although these differences are not statistically significant.

The higher prevalence of poverty among immigrants and black-headed families may explain part of these differences. To address this, we separately analyzed the share of families transitioning into and out of car ownership for families that are never in poverty in any of the survey waves. We find that the differences remain statistically significant, although they are somewhat muted (results not shown here). Among families not in poverty, we find that black families are twice as likely as white families (27 % vs. 13 %) to transition into and out of car ownership over the survey waves. Immigrant families not in poverty are also more likely than non-poor US-born families (22 % vs. 13 %) to experience fluctuation in car availability. A more detailed analysis of the motivations for transitions into and out of car ownership is needed, and a worthy goal of further study.

Figure 5 further illustrates the variability in car availability across time. It shows the estimated probability of a family transitioning to or from carlessness between two waves of the PSID survey. Again, we see that poor families, immigrant families, and Hispanic and non-Hispanic black families are more likely to move into and out of carlessness than are non-poor, US-born, or white families. Compared with families who are never in poverty, those who are in poverty in one or more wave are more than three times more likely to transition into or out of car ownership between two waves of the survey. And families who are in poverty in more than half of the panel waves are more than four times as likely to make this transition compared with families who are never in poverty. Further, these differences are statistically significant (based on a test of the equality of proportions). Non-

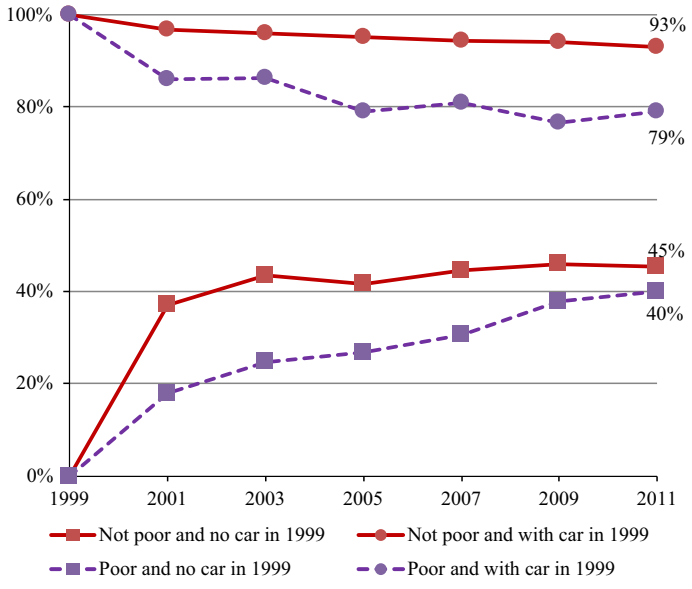

Fig. 6 Probability of family having one or more cars, by poverty status in 1999 and car ownership in 1999, 1999–2011 PSID

Hispanic black and Hispanic families are also statistically significantly more likely to switch into or out of car ownership compared with non-Hispanic white families. The differences between non-Hispanic white and non-Hispanic Asian families are not statistically significant.

As above, we separately examined the differences by immigration status and race for households who were never poor in any of the seven waves of the survey. Again, we find statistically significant, although somewhat muted, differences. Among the families never in poverty, immigrants are more likely (7 %) to transition into and out of car ownership than are the US-born (4 %), and black families (9 %) are considerably more likely than white families (4 %) to gain or lose access to a car between two successive waves.

Given one's car ownership status in 1999, how likely are families to have a car in later waves of the PSID? Figure 6 shows the probability that carless and car-owning families in 1999 will have a car in subsequent waves, disaggregated by poverty status in 1999. Overwhelmingly, car-owning families that were above the poverty line in 1999 were car owners in subsequent waves, with a 93 % chance of having one or more cars in 2011. Poor families with a car in 1999 were somewhat more likely to become carless, although the majority (79 %) owned a car in subsequent waves. Of those without a car in 1999, nearly half had a car in 2011, though poor families' rates of car ownership grew more slowly than did non-poor families'. These figures mask some further "churn"; of the nearly 40 % of 1999's non-poor carless households who had gained a car by 2001, some later reverted to being car-free.

When we examined these trends by race (not presented here), we found that Hispanic families that were carless in 1999 showed the most rapid increase in car ownership over time (to nearly 60 % car ownership in 2011), while black carless families showed the slowest increase (to 45 %). All racial/ethnic groups with a car in 1999 retained car ownership at roughly the same rates, with approximately 90 % retention over the 12 years

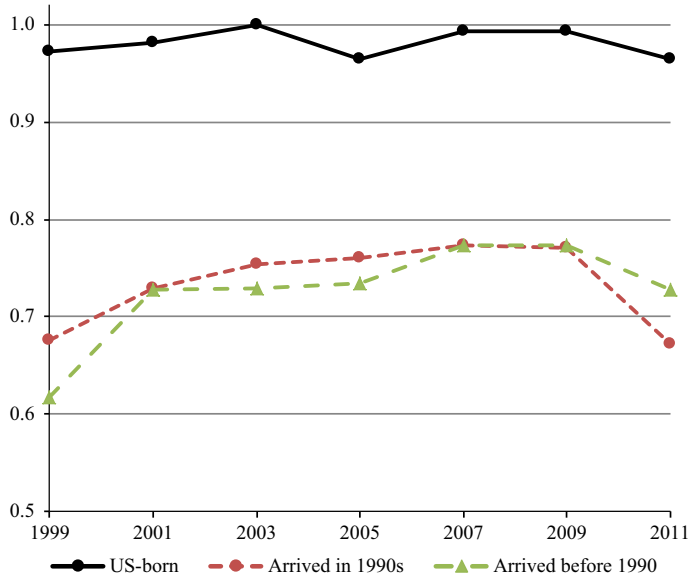

Fig. 7 Cars-to-adults ratio by nativity and arrival cohort, 1999–2011 PSID

included in our study. Nativity played less of a role; rates of retention and gains in cars were nearly indistinguishable from those of the US-born.

Finally, we used the PSID to examine immigrants' acquisition of cars as they settle in the US. Previous research using cross-sectional data finds that recent arrivals to the US have lower rates of car ownership, but immigrants who have been in the US five or more years are about as likely as US-born families to own at least one car (Blumenberg and Smart 2011). However, immigrants' larger families often mean more competition for cars, and the ratio of cars to adults remains lower than that of the US-born even after many years in the US (Tal and Handy 2010).

Our analysis using the PSID suggests that immigrants on the whole have considerably lower access to cars compared with the US-born, with ratios of cars to adults ranging from roughly 0.6 to 0.8 cars per adult compared with almost one car for every adult among the US-born. In Fig. 7, we compare immigrants who arrived in the US during the 1990s with immigrants who arrived earlier. (Because the PSID sample has not been refreshed since 1999, and only asked about year of arrival in 1997 and 1999, we have no information on immigrant families who arrived after 1997.) Unlike other studies, we find that the duration of stay in the US makes little difference. We urge some caution when interpreting these results because they may be a manifestation of other differences between immigrants and US-born families in the survey, such as their socio-economic background, residential location, employment status, and so forth.

While this paper provides new analysis on family-level changes in auto ownership, there are several limitations. First, the immigrant sample includes only a small number of recent arrivals to the US, precluding a detailed analysis of the changes in auto ownership during these crucial settlement years (Blumenberg and Smart 2011). Additionally, panel surveys are a series of snapshots in time, and they can miss changes that occur between panel waves (Kitamura et al. 2003). Hence, we have no information on families that change their level of car ownership multiple times in the period between the biennial surveys; some likely lose and subsequently gain a car during the two-year window, and we would see them as having made "no change." Thus, the share of families who experience "car today, gone tomorrow" is likely even greater than our estimates.

Discussion

Snapshot pictures of car ownership tell only one part of the story. While 13 % of families in the PSID have no car at any given moment, our panel analysis presents new evidence that, for most of these families, living without a car is a fleeting experience. Only 5 % of families in the PSID had no car in all seven waves of the study from 1999 to 2011.

Auto ownership is more ephemeral for some groups than for others. About half of black and poor families (both short-term and long-term poor) transitioned into or out of car ownership during the survey period. This is more than twice the rate of non-Hispanic white families. Of course, the observed differences may be due to a number of interrelated factors. Some of these differences may be due to variations in income, location, life cycle, employment status and so forth. This article documents that car ownership is ephemeral for many, and that this ephemerality is greater within specific demographic groups. Future research can uncover the relationships that exist among a number of possible correlated variables and test hypotheses that might explain these differences.

Transportation planners, researchers, and politicians should be cautious when crafting policies for carless households and "transit dependent" populations. Previous research has shown that carless households use cars for a third of their trips (Pucher and Renne 2003). To this, we would add that many of today's carless families are likely to acquire a car within a short time; almost a third of the families without a car in 1999 had a car two years later. These findings suggest at least two options for policy interventions aimed at improving transportation access for these families.

In most places in the US, even the poorest families choose to own a car, although their access to those cars may be short-lived. Living without a car is burdensome for most Americans due to land-use configurations and inadequate transit service; gaining and subsequently losing access to a vehicle may add additional costs, imperil employment, and further burden poor and disadvantaged families. This fluid view of car ownership adds another dimension to our understanding of transportation's role in disadvantage and social exclusion of marginalized populations (Blumenberg and Thomas 2014; Currie et al. 2007; Lucas 2004). Policy interventions aimed at helping poor families obtain a car might serve to strengthen the family's economic outlook, but simply providing assistance with car acquisition may not be enough; these families may need additional help to keep the car once they have it.

For transit agencies and policymakers interested in increasing transit usage, our findings suggest something important. Many transit debates focus on "captive riders" (those without a car) and "choice riders" who have a car. To this we would add a third group: families for whom the grasp on car ownership is tenuous. Focusing on ways to improve service for these riders—disproportionately the poor, people of color, and immigrants—could make transit a more feasible option for these families. This could increase transit ridership and alleviate the financial burdens of car ownership, both worthy goals.

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Appendix

	Sample size						
	1999	2001	2003	2005	2007	2009	2011
All families	7493	7887	8346	8718	8941	9308	9690
Poverty							
Families not in poverty	90 %	92 %	90 %	90 %	90 %	89 %	88 %
Families in poverty	10 %	8 %	10 %	10 %	10 %	11 %	12 %
Nativity							
US-born families	91 %	92 %	90 %	90 %	90 %	89 %	90 %
Foreign-born families	9 %	8 %	9 %	9 %	10 %	10 %	10 %

	Sample size						
	1999	2001	2003	2005	2007	2009	2011
Race/ethnicity							
Non-Hispanic white	77 %	77 %	77 %	75 %	74 %	73 %	72 %
Non-Hispanic black	13 %	13 %	13 %	14 %	14 %	15 %	15 %
Non-Hispanic Asian	2 %	2 %	2 %	2 %	2 %	2 %	2 %
Hispanic, any race	5 %	5 %	5 %	8 %	8 %	9 %	9 %

We only include cases with information on auto ownership in the family

Beginning in the 2005 survey, PSID changed the way they ask race and ethnicity questions, adding a new question about Hispanicity (Latino status). This likely resulted in the increase in Latino respondents between 2003 and 2005

	Mean number of cars in family						
	1999	2001	2003	2005	2007	2009	2011
All families	1.64	1.67	1.69	1.63	1.68	1.65	1.59
Poverty							
Families not in poverty	1.73	1.76	1.79	1.74	1.78	1.76	1.71
Families in poverty	0.80	0.79	0.78	0.69	0.77	0.75	0.72
Nativity							
US-born families	1.67	1.69	1.71	1.64	1.69	1.66	1.61
Foreign-born families	1.36	1.52	1.54	1.52	1.58	1.57	1.46
Race/ethnicity							
Non-Hispanic white	1.76	1.77	1.79	1.73	1.77	1.76	1.69
Non-Hispanic black	1.02	1.15	1.16	1.11	1.15	1.13	1.11
Non-Hispanic Asian	1.57	1.71	1.66	1.63	1.72	1.61	1.54
Hispanic, any race	1.34	1.59	1.61	1.60	1.69	1.68	1.58

	Mean car-to-adult ratio in family						
	1999	2001	2003	2005	2007	2009	2011
All families	0.95	0.96	0.98	0.94	0.97	0.97	0.94
Poverty							
Families not in poverty	0.99	1.00	1.03	1.00	1.02	1.02	1.00
Families in poverty	0.57	0.57	0.56	0.48	0.55	0.55	0.52
Nativity							
US-born families	0.97	0.98	1.01	0.96	0.99	0.99	0.96
Foreign-born families	0.67	0.76	0.76	0.75	0.78	0.78	0.74
Race/ethnicity							
Non-Hispanic white	1.02	1.02	1.04	1.01	1.04	1.04	1.01
Non-Hispanic black	0.63	0.69	0.73	0.70	0.74	0.74	0.75
Non-Hispanic Asian	0.87	0.93	0.90	0.88	0.91	0.88	0.80
Hispanic, any race	0.68	0.81	0.81	0.82	0.84	0.84	0.81

	Median family income (2011 $s)						
	1999	2001	2003	2005	2007	2009	2011
All families	$55,614	$57,058	$54,250	$54,024	$55,149	$52,936	$49,529
Poverty							
Families not in poverty	$62,100	$61,701	$60,304	$60,690	$61,040	$59,280	$56,300
Families in poverty	$8848	$8646	$9180	$8925	$8481	$9023	$8500
Nativity							
US-born families	$57,205	$58,410	$55,330	$54,740	$56,000	$53,285	$50,006
Foreign-born families	$41,896	$45,850	$45,360	$49,147	$48,020	$48,233	$41,719
Race/ethnicity							
Non-Hispanic white	$62,238	$62,225	$59,750	$59,582	$59,808	$58,240	$55,380
Non-Hispanic black	$37,260	$37,990	$35,000	$34,397	$33,600	$31,954	$31,520
Non-Hispanic Asian	$65,357	$94,975	$81,625	$86,394	$84,000	$71,812	$82,000
Hispanic, any race	$38,640	$38,016	$38,750	$44,037	$47,040	$45,760	$39,000

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