Unpacking Household Budgeting Strategies through a Transportation Lens

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Abstract

This is where we will put our abstract.

Plain Language Summary

This is a plain language summary

1 Introduction

Households juggle how to allocate their budgets: whether to invest in a reliable car, pay for quality childcare, secure housing in a good school district, or set money aside for leisure. These everyday choices shape how families live and move, reflecting the trade-offs they make to balance competing priorities. Transportation often sits at the center of these decisions, not only because it can be a significant expense, but also because choosing to buy and maintain a car versus relying on public transit represents a long-term commitment and a broader lifestyle choice. Its relative weight compared to housing, childcare, and other spending varies widely across families. The relationship between household budgeting and mobility is shaped not only by causal direction but also by how families prioritize and weight different needs. On one hand, mobility resources such as car ownership can structure the household budget: households with no or only one vehicle may spend far less on transportation, freeing up income for other essential or discretionary categories. On the other hand, underlying family structures and preferences can drive budget allocation choices that, in turn, shape transportation behavior. Larger families may prioritize childcare or invest in higher-quality housing in areas with better schools, limiting what remains for transportation. Others may emphasize frugality across all categories or deliberately substitute toward lower-cost transit options. Understanding both the direction of influence and the weight assigned to different budget categories is critical for transportation planning and policy, as these dynamics reveal how families navigate competing priorities under varying demographic and mobility contexts.

The purpose of this research is to explore how household budgets are structured around transportation decisions and how this impacts other spending categories. Using the Consumer Expenditure Survey (CEX), we will perform a Latent Class Analysis (LCA) to find groupings based on a household's transportation expenses. Theses groupings can help us find groups of spenders with similar patterns to help us predict transportation expenses based on the household's characteristics.

2 Literature Review

Family Choices and Activity Patterns Family Transportation Choices Family Spending and Budgets Family Transportation Budgets

The literature that relates to our study can be

2.1 Family Choices and Activity Patterns

There have been many studies done on the choices and activities of families (Rachel B. Copperman & Bhat, 2007b; Leung et al., 2019; Sener et al., 2008; Sener & Bhat, 2007).

Paleti et al. (2011) performed a study where they wanted to characterize the activity patterns of children after school. Their data were gathered from the Child Development Supplement to the Panel Study of Income Dynamics which has household demographics and time-use diaries for children. They looked at travel patterns using combinations of three activity-travel scenarios: staying at school, going home from school, and going somewhere else after school. They further identified specific after-school activities (e.g. Organized activities at school, recreation at the home of someone else, meals at restaurants, etc.) to use in a multiple discrete-continuous extreme value (MDCEV) model. The MDCEV is a type of discrete choice model

that works when multiple options can be chosen, and was used to find predictors of children's participation in the different after school activities. In their analysis, they found that 57.7% of children in the survey participated in at least one out-of-home activity after school. They also found that children's activities were connected to household income, family dynamics, environment, and other things. For example, children in households with higher income were more likely to participate in activities after school. Children with no siblings along with children having a working primary caregiver were more likely to stay at school or go somewhere besides home directly after school. Children living close to a large city were less likely to go somewhere after school, go home, and then go back out. The findings of this study show the variety of factors that might affect a family's activity, and therefore transportation, patterns.

Another study on family choices was done by Bernardo et al. (2015). They used the American Time Use Survey and a Multiple Discrete Continuous Nested Extreme Value (MDCNEV) model to examine the activities of duel-earner households[1]. The variables they used relate to household demographics, respondent demographics, couple characteristics, and day of the week. Findings indicated that women are more likely to participate in out-of-home maintenance, shopping, and social activities than men. They also found that respondents with higher education and with children are more likely to work from home. One key finding of this study is that couples with children are much less likely to participate in out-of-home, non-work activities.

2.2 Family Transportation Choices

Many studies exploring household choices have focused on their connection to and effects on transportation (Amirnazmiafshar & Diana, 2022; Rachel B. Copperman & Bhat, 2007a; Lu et al., 2022; Souche, 2010).

McCarthy et al. (2017) is a literature review with some good findings, but I don't know if I should site the literature review or if I should find individual papers from the review to talk about.

A unique study to understand the effects of transportation study was done by Nicholas Klein (2024). In order to understand how access to a car can effect a family in the United States, he interviewed 30 people in Maryland and Virginia who received a subsidized car. To main findings of this study relate to travel behavior changes and access to opportunities. The people interviewed generally changed their travel behavior in similar ways after receiving a car. Before receiving the car, they would rely on public transit and others for transportation, but after receiving a car, they made many trips in their own cars, including some trips that they had to forgo before having a car. Another general conclusion Klein makes is that people had more access to opportunities after receiving a car. They had easier access to more potential jobs, but some also mentioned the ability to get more hours at the their current jobs. With less reliance on public transit, many respondents spend more time with their families at the beginning and end of the day.

Bilgin et al. (2025) talks about this…

McCarthy et al. (2017) - many factores influence decisions about mode choice when traveling with young children.

Bilgin et al. (2025) - Suggests that households are less likely to acquire a car in the presence of ridesourcing, but car disposal is mainly driven by household compositions and residential relocation factors.

[1] This is just me making sure I understand how to put a footnote here.

2.3 Family Spending and Budgets

Another set of studies focuses on household budgets and household spending patterns (Fontes & Fan, 2006; Nayga, 1998; Sabelhaus et al., 2013; Skinner, 1985).

Hargunani et al. (2024) said this…

Hargunani et al. (2024) - The data analysis reveals distinct spending, saving, and investment patterns among married couples, with a clear prioritization towards ensuring the well-being and future security of their families."

- spending on kids

These four studies were focused on budget choices and spending related to children.

Lino et al. (2017) - Many observations on the expenditures of children

Osborne et al. (2021) - Regardless of the method of calculation, we find that it is nearly impossible for two minimum wage earners to meet the basic costs of raising children in Texas, especially when child care is included

Hastings (2022) - Both sociodemographic and economic factors play a substantial role in these differences, and the racial and ethnic gaps in parental investments of money are nearly eliminated when both are accounted for

Duncan et al. (2023) - The more income, the more spending on kids.

2.4 Family Transportation Expenses and Budgets

There have been many studies on family budgets and transportation expenses (Blumenberg, 2003; Choo et al., 2007; Ferdous et al., 2010; Haas et al., 2008; Hong et al., 2005; Morris & Wigan, 1979; Thakuriah (Vonu) & Liao, 2006).

Thakuriah & Liao (2005) - For vehicle-owning households, of every additional dollar that households spend, 18 cents is spent on vehicles after controlling for socioeconomic, demographic, life cycle, and other factors relating to households.

Deka (2015) - More housing costs = more transportation costs, people the take transit spend less on transportation

Mattson (2020) Mattson & Peterson (2019) - single family homes spend more on transportation, higher income is correlated with higher transportation costs. - denser areas are more likely to use transit to commute. People in single-family homes tend to spend more money on transportation

Molloy et al. (2024) - "Captive Riders" have less spending allocated to transportation than captive drivers.

Bureau of Transportation Statistics (2024) - Lots of summaries

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