

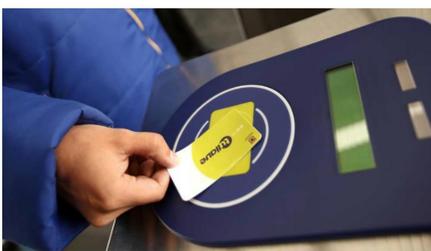
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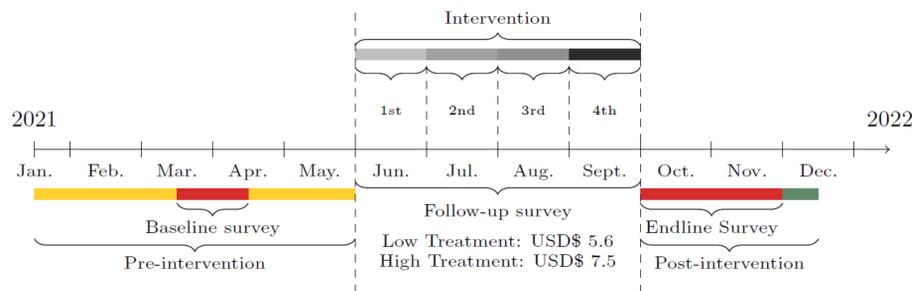
Abstract

We implemented an RCT intervention in Bogotá, Colombia, to provide evidence of the effects of subsidies on public transport. Unlike the current ‘pro-poor’ subsidy scheme that consists of a fare discount, we propose and test a new subsidy scheme based on monthly cash transfers to travel cards. This transfer led to an increase in the number of trips made in the system (+8%) and a net reduction in the users' monthly travel expenses (-17%). The reaction of the users to the transfer differs in systematic ways from the action of a rational economic agent. Specifically, participants of the RCT behave as having a Mental Account Bias. This is evident in trip increases only occurring when nominally coming from the transfer, in the higher-than-expected response to the transfer, and in the reaction to a grocery voucher at the end of the period. The presence of a Mental Account Bias can be leveraged to design policies that increase the use of public transport.

Randomized Field Intervention



Bogotá's Integrated Public Transport System (SITP) is one of the largest systems in Latin America, moving around 3.05 million trips daily. Currently, the system is bus-based (BRT and regular buses). To access the system, users must use a personalized card. Money (not tickets) is charged to the card. The fare value is discounted from the card when a trip starts.



From the universe of approx. 176,000 frequent SITP users, we randomly selected 1,607 people. Half of them (801) were randomly chosen to receive the money transfers on their travel cards: treatment A (399) received a monthly transport voucher of 7.5 USD; treatment B (402) received a voucher of 5.6 USD. Participants in the control group (806) were given an 8 USD grocery voucher at the end of the experiment. We have data for each participant on the number of trips made, as well as the exact time, date, and station of each trip start throughout the analysis period.

Mental Accounts

Mental Account Bias (Thaler 1985, 2005) is a behavioral bias consisting of people assigning separate budgets for different types of goods/services; this can lead to the overconsumption of some types. Recent evidence comes from the US Food Stamp Program (Hastings and Shapiro, 2018), fuel (Hastings and Shapiro, 2013), and tax rebates (Feldman, 2010).

A typical example is people receiving a voucher to spend in a store where regular purchases are made. Under Mental Account Bias, vouchers are used to purchase things they do not usually buy. A rational use implies expending the voucher on the usual purchases liberating money to any desirable use without restricting it to the store selection.

The cash transfer to travel cards in the intervention (see above) was effectively a travel voucher with a face value below the average monthly transport use. This is a situation that can lead to the overconsumption of trips under the presence of Mental Account Bias.

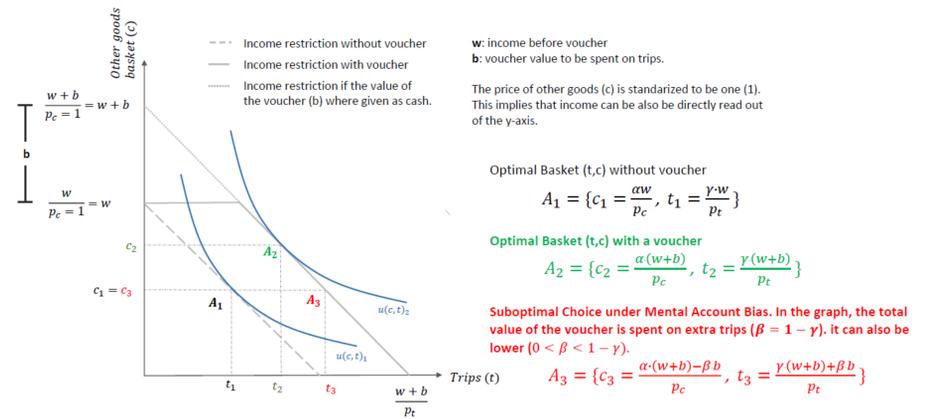
You can use the QR code to reach my website and contact me. I would be happy to meet to discuss this research during ASSA 2023.



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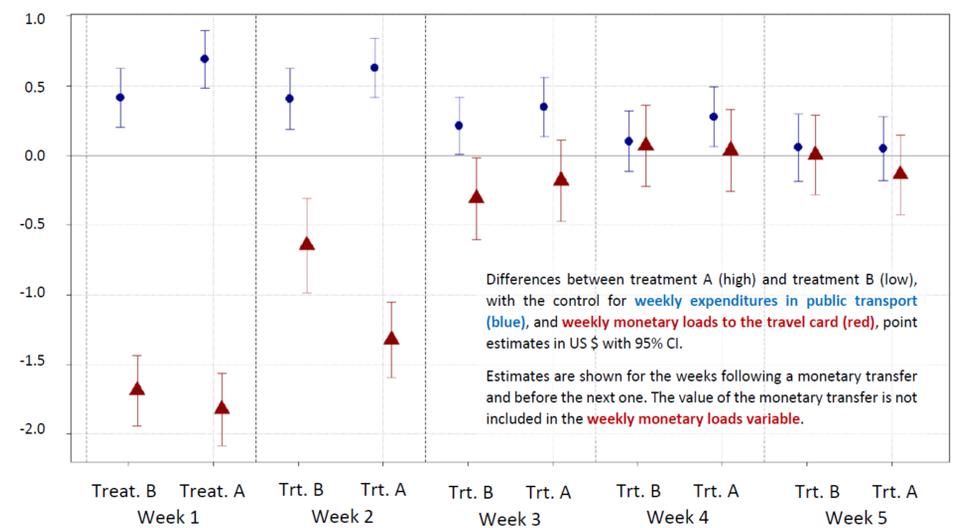
Theory

Farhi and Gabaix (2019) propose a model of vouchers and mental accounts. Using a Cobb-Douglas parametrization ($u(c, t) = c^\alpha t^\gamma$), the parameter $\beta \in [0, 1 - \gamma]$ characterizes the level of Mental Account Bias. The consumption choice is the result of a biased utility maximization (derivation not shown).



Evidence supporting Mental Account Bias in Public Transport

Additional trips are produced only when expenditures are nominally coming from the money transferred to the travel cards. Once the money transfer is spent on trips (approx. 2.5 weeks), participants revert to the usual weekly card charge levels and number of trips. This patterns appears every time a transfer is made.



The increases in trips by income level, do not correspond with the “normal good” nature of public transport

The Marginal Propensity to Consume (MPC) value of the cash transfer is higher than it should be, given the money spent-income ratio on public transport. This excess can be interpreted as a lower bound level of Mental Account Bias, β . (see theory).

	% Public transport Expenditures	Marginal Propensity to Consume out of the Voucher (MPC)	Mental Account Bias (β)
Lower income (below 50 th percentile)	0.17	0.33	0.16**
Higher income (above 50 th percentile)	0.07	0.37	0.30**

After the experiment ended, participants in the control group received a voucher to be redeemed in a local chain grocery store. The value of this voucher is similar to the A treatment. They do not show differences in trips with participants in the treatment who were no longer receiving a money transfer to the travel cards and who did not receive a grocery voucher. Estimations not shown.

Key Point to Take

In most contexts in which mental account bias has been detected (food stamp program, fuel consumption, tax rebates), it seems there is not much space for policy. In contrast, the presence of Mental Account Bias in a public transport setting opens the possibility of policy design that embraces Mental Account Bias as a mechanism to encourage public transport use (e.g., cash transfers to travel cards are more effective than fare discounts).

References

- Thaler, R. (1985). Mental accounting and consumer choice. *Marketing science*, 4(3), 199-214.
Thaler, R. H. (2008). Mental accounting and consumer choice. *Marketing Science*, 27(1), 15-25.
Hastings, J., & Shapiro, J. M. (2018). How are SNAP benefits spent? Evidence from a retail panel. *American Economic Review*, 108(12), 3493-3540.
Hastings, J. S., & Shapiro, J. M. (2013). Fungibility and consumer choice: Evidence from commodity price shocks. *The quarterly journal of economics*, 128(4), 1449-1498.
Feldman, N. E. (2010). Mental accounting effects of income tax shifting. *The Review of Economics and Statistics*, 92(1), 70-86.
Farhi, E., & Gabaix, X. (2020). Optimal taxation with behavioral agents. *American Economic Review*, 110(1), 298-336. (NBER Appendix)