"It's Complicated": Exploring the Relationship Status of In-store and Online Grocery Shopping During the COVID-19 Pandemic

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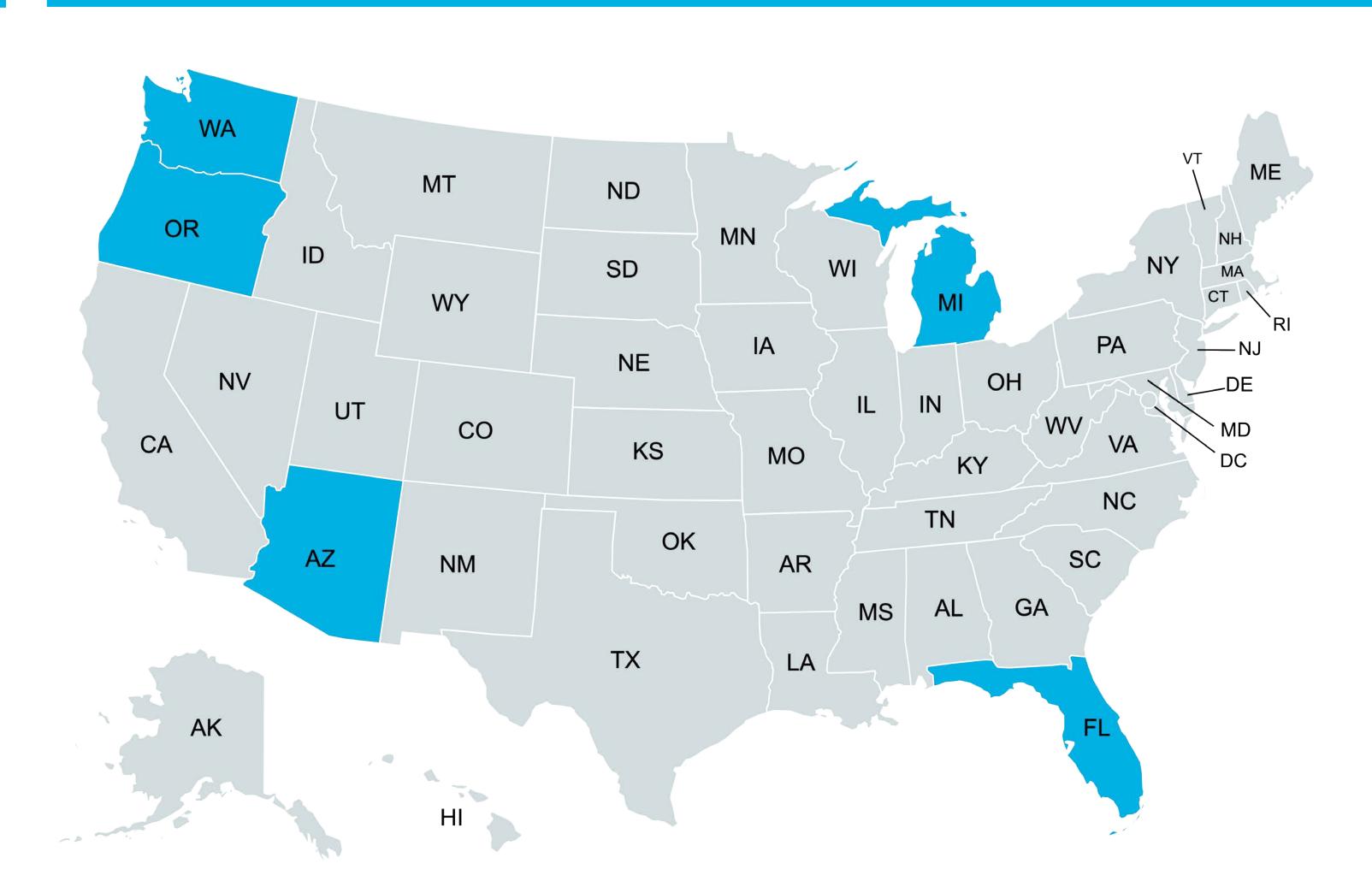
Background

The COVID-19 pandemic drastically impacted travel for in-person shopping, commute trips, global supply chains, and food business operations in 2020. Shopping for food and household items became markedly different as new social distancing and mask guidelines were put in place to mitigate the spread.

40-53% estimated 2020 mores. and grocery, or "e-grocery", shopping based on total sales^{1,2}

The goal of this work is primarily to investigate:

- The complexity of relationships between online and inperson food shopping behaviors during the pandemic
- Which household and individual characteristics contribute to the "stickiness" of e-grocery shopping



This analysis relies on the second of a four-wave online survey (cross-sectional) of general population in five states (AZ, FL, MI, OR, WA) that captured:

- Household characteristics
- Food shopping preferences and behaviors
- Barriers to e-grocery shopping and food access

Methods

Random parameters models:

- Tobit model: weekly in-store grocery shopping trip rates
- Cragg Hurdle model: weekly e-grocery shopping trip rates
- Binary logit: "Stickiness" of e-grocery shopping

Results I

Explanatory variables	Outcome variables in separate models (weekly grocery trip rates)		
(weekly grocery or restaurant trip rates)	Grocery in- store	Grocery online pickup	Grocery online delivery
Grocery in-store		(Mean = 0.171, Std. Dev. = 0.230)	n.s.
Grocery online pickup	+ / - (Mean = 0.103, Std. Dev. = 0.239)		+ (Marg. Eff. = 0.029)
Grocery online delivery	+ / - (Mean = -0.266, Std. Dev. = 0.227)	+ (Marg. Eff. = 0.046)	
Restaurant dine-in	+ / - (Mean = 0.113, Std. Dev. = 0.123)	n.s.	n.s.
Restaurant drive-thru	+ / - (Mean = 0.182, Std. Dev. = 0.119)	(Marg. Eff. = -0.015)	n.s.
Restaurant online pickup	n.s.	+ / - (Mean = 0.164, Std. Dev. = 0.219)	n.s.
Restaurant online delivery	n.s.	n.s.	(Marg. Eff. = 0.035)

n.s. = not significant, and not included in final model specification

How do household and individual characteristics relate to the "stickiness" of e-grocery shopping?



- Remote worker
- Household member is vulnerable to COVID-19
- Knows others who are e-grocery shopping
- All members of household are 65 or older
- Prefers cash when grocery shopping



- Impacts of these complex trip-making relationships on roadway demand, VMT, and emissions are contingent on a number of factors:
 - Travel mode(s)
 - Trip chaining and delivery time frames
 - Parking turnover and idling
 - Reallocation of time, money, or travel savings
- There may well be a gap between the potential of online ordering technologies and their actual performance in providing useful services to those who need them most.

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References

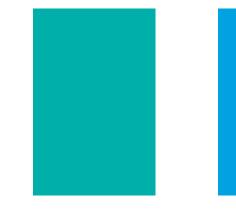
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^{+ / -} indicates a heterogeneous effect due to the parameter being significantly random with normal distribution