

# Mobility under the COVID-19 Pandemic: Asymmetric Effects across Gender and Age

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*Discussion by Stephen J. Redding*

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  - Regression discontinuity design (event studies)
  - Local projections (multivariate regressions)

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- Uses anonymized Vodafone data for Italy Portugal and Spain to examine the heterogeneous impact of lockdowns on mobility
- Two different empirical specifications
  - Regression discontinuity design (event studies)
  - Local projections (multivariate regressions)
- Main empirical findings
  - Lockdowns greater impact on the mobility of women
  - Especially true for school closures
  - Lockdowns great impact on the mobility of younger people
  - COVID-19 infections reduce mobility more for young people

# Empirical Challenges

- Key empirical challenges
  - Government lockdowns are endogenous to infections
  - Even in the absence of lockdowns, mobility may change through endogenous behavioral responses to the threat of infection
  - Government lockdowns potentially correlated with these endogenous behavioral responses

# Empirical Challenges

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  - Government lockdowns are endogenous to infections
  - Even in the absence of lockdowns, mobility may change through endogenous behavioral responses to the threat of infection
  - Government lockdowns potentially correlated with these endogenous behavioral responses
- Main approaches to these empirical challenges
  - Narrow window of time around the introduction of lockdown in regression discontinuity design
  - Exploit the national nature of lockdowns in regions with relatively low levels of infections
  - Exploit school closures in advance of lockdowns to explore mechanisms for heterogeneous effects
  - Wide range of controls and robustness tests in the local projection specifications

# Comments and Suggestions

- ① Inequality, ethnicity and mobility
- ② Occupational structure and mobility
- ③ Implications of mobility
- ④ Opportunities of big data smartphone data
- ⑤ Minor comments



# Inequality and Ethnicity

- *New York Times*, April 2020

## Location Data Says It All: Staying at Home During Coronavirus Is a Luxury

By Jennifer Valentino-DeVries, Denise Lu and Gabriel J.X. Dance April 3, 2020



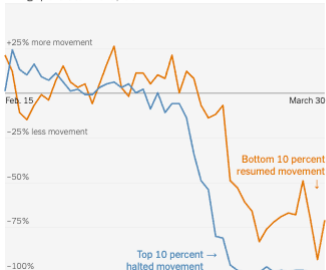
"I just really want people to understand that it's hard right now to go to work and live for other people," said Adarra Benjamin, a health worker in Chicago who is proud to be essential but worried about getting ill from the virus. Joshua Lott for The New York Times

# Inequality and Ethnicity

- Does the Vodafone data allow exploration of other dimensions of mobility?
  - Income
  - Ethnicity
  - Essential workers (occupations)
  - Age and gender are salient dimension of heterogeneity but there are other salient dimensions

## Change in movement in metro areas with high income disparity

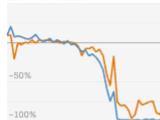
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Washington



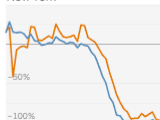
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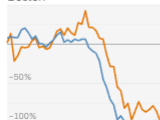
San Jose, Calif.



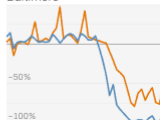
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Boston



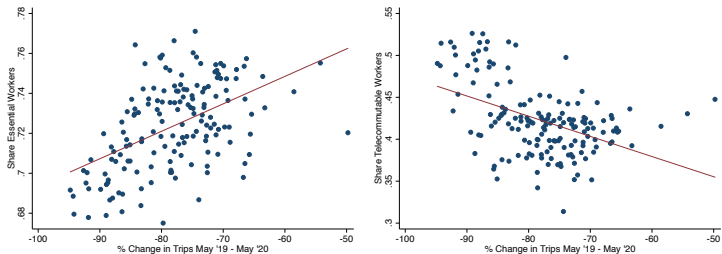
Baltimore



# Remote Working and Mobility

- Other potential sources of variation in mobility
- Glaeser, Gorbach and Redding (2020) use ability to remote work and essential worker status as instruments for mobility

Figure A2: A visual first stage  
Travel Change and Instruments in NYC



(a) %  $\Delta$  in Trips vs. *ShareEssential<sub>i</sub>*

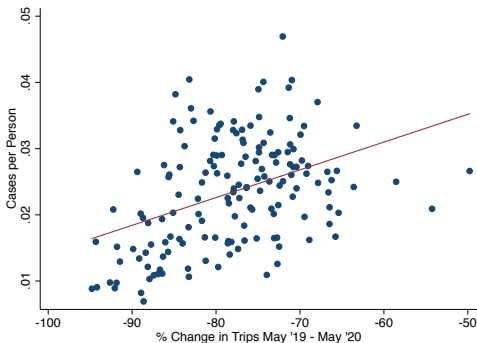
(b) %  $\Delta$  in Trips vs. *ShareTelework<sub>i</sub>*

Source: % Change in trips from SafeGraph Weekly Patterns Data, using visitors traveling from home. % Change in trips calculated between May 13-19, 2019 and May 4-10, 2020. Share Essential workers calculated from DE and MN 4-digit NAICS essential industries. Share Telework created at the zip level using data from Dingel and Neiman (2020) weighted by local neighborhood employment composition.

## Implications of Mobility

- Paper could explore further the epidemiological or economic consequences of heterogeneous effects on mobility
  - Infections and deaths
  - Income
  - Labor force participation

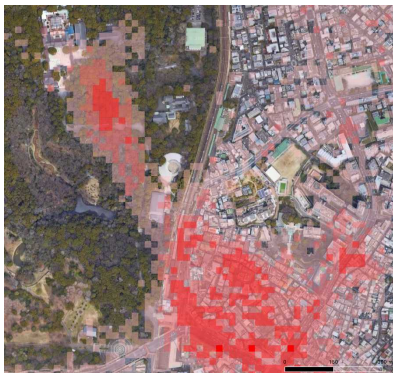
Figure A1: Correlation between Travel Change and COVID-19 Cases per Capita in NYC



Source: Cases per capita from NYC Health Department, available at <https://www1.nyc.gov/site/doh/covid/covid-19-data.page>. % Change in trips from SafeGraph Weekly Patterns Data, using visitors traveling from home. % Change in trips calculated between May 13-19, 2019 and May 4-10, 2020.

## Big Data Smartphone Data

- How have spatial patterns of mobility changed?
- Smartphone data revolutionizes the measurement of mobility

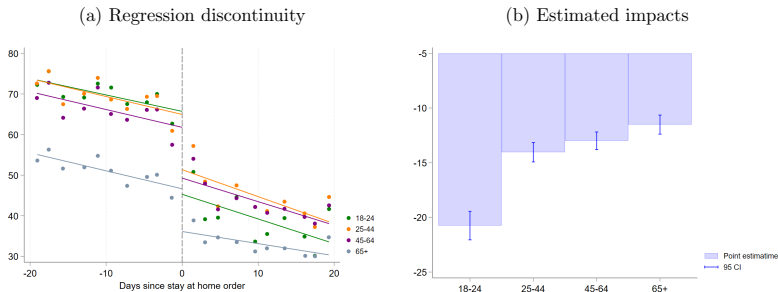


- Miyauchi, Kentaro and Redding (2020) uses Japanese smartphone data to quantify consumption access
- Understanding how mobility has changed by occupation and location is central for longer-run economic implications

## Minor Comments

- What is the right functional form for heterogeneous effects (e.g. percent versus percentage point)?
- Percent leaving home bounded below by zero

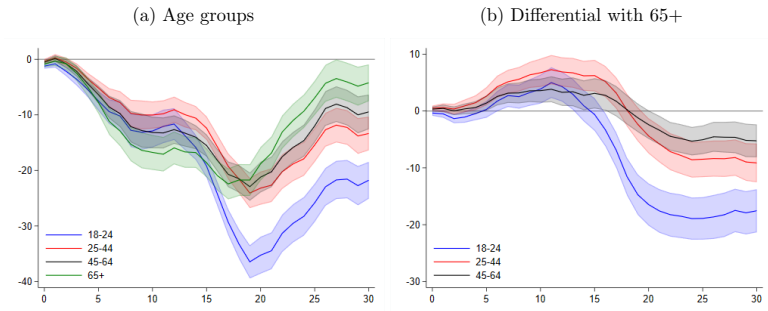
Figure 7: Impact of a Stay-at-home Orders on mobility, by Age  
(Percent of people leaving home in a day)



## Minor Comments

- Understanding the dynamic time path of responses
  - For the first ten days, similar mobility decline for all age groups
  - Younger cohorts stronger drop in mobility thereafter

Figure 8: Impact of a Full Lockdown on Mobility, by Age Group (Percent)



## Conclusions

- Enjoyed reading this interesting and insightful paper
- Great data and convincing empirical specifications
- Encourage the authors to explore further
  - Other potential dimensions of heterogeneity
  - Rich potential to measure changing spatial patterns of mobility using smartphone data
  - Explore further the epidemiological and economic implications of changing mobility