The Transportation Security Index: Measuring a predictor of wellbeing and program access

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Presentation Agenda

• Why focus on transportation?
• Transportation: more than car ownership
• Current measures
• Toward a new measure
  – Cognitive interviews
  – Survey
  – Long form Transportation Security Index (TSI)
• Next steps
Why Transportation?
OUT
OF
REACH

SCOTT W. ALLARD

Place, Poverty, and the New American Welfare State

"An enormous contribution to a debate that needs to be shaken up."
—R. J. Dunne Jr.
Transportation:
More than car ownership
Defining transportation insecurity

*Transportation insecurity*: a condition in which one is unable to regularly move from place to place in a safe and timely manner because one lacks material, economic or social resources
Current Measures of Transportation Access are Limited
Car/No Car

Do you or anyone else in your family living there own or lease a car or other vehicle for personal use? (PSID)
Gravity Scores
Commute Time
A new measure is needed

- We need to measure transportation insecurity at the individual level to determine its effects on well-being and program access
- Existing measures are not sufficient
- But variation in geography and individual circumstance makes it difficult to construct a precise measure that can be administered easily
Toward a new measure
Inspiration: Food Security

• “The food that we bought just didn’t last, and we didn’t have money to get more.” Was that often, sometimes, or never true for your household in the last 12 months?

• In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?
Goal: 3-5 easily replicable items that capture one’s level of transportation security regardless of one’s mode of transportation or geographic location.
Theory: Transportation Insecurity manifests in five measurable domains

- Lateness
- Skipped trips
- Time taken
- Social ties strained
- Psycho-social
Types of items

- In the past 30 days, has the following statement ever been true for you: "I worried about inconveniencing family, friends, or neighbors because I needed help with transportation"?

- In the past 30 days, how often have you not been able to leave the house when you wanted to because of a problem with transportation?
Cognitive Interviews
Cognitive interviews

• ~30 potential survey items
• Convenience sampling, n=52

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Cognitive interview results

• Refined wording and rejected some items
• Identified particularly compelling constructs for the transportation insecure
• Identified problem with false positives among transportation secure users of public transit
Survey
Summer Survey Fielding

• Contracted with Knowledge Networks/GfK to administer a survey with their nationally representative panel
• Ten minutes
• Fielded in August 2016
• n = 508 with oversample (n=150) of low-income respondents
Analysis

• Examined correlations and removed redundant and “wonky” items
Analysis

• Examined correlations and removed redundant and “wonky” items
  – Items from UCLA loneliness scale:
    • In the past 30 days, have you felt that you lack companionship because you did not have the transportation you needed?
    • In the past 30 days, have you felt isolated from others because you did not have the transportation you needed?
Analysis

• Examined correlations and removed redundant and “wonky” items
  – Items from UCLA loneliness scale:
    • In the past 30 days, have you felt that you lack companionship because you did not have the transportation you needed?
    • In the past 30 days, have you felt isolated from others because you did not have the transportation you needed?
  – “I usually go places only if it is really important to go.”
Analysis

• Conducted exploratory factor analysis
  – One factor solution (RMSEA=.091)
  – Two factor solution (RMSEA=.063)
Analysis

• Conducted exploratory factor analysis
  – One factor solution (RMSEA=.091)
  – Two factor solution (RMSEA=.063)
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<th>Material-Time and Place</th>
<th>Relational</th>
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<tr>
<td>How often did it take you longer to get somewhere than it would have taken you if you had different transportation?</td>
<td>Do you think that someone did not invite you to something because of problems with transportation?</td>
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<td>How often have you been late getting somewhere because of a problem with transportation?</td>
<td>Have you felt left out because you did not have the transportation you needed?</td>
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<td>How often did you have to arrive someplace early and wait because of the schedule of the bus, train, or person giving you a ride?</td>
<td>Have you felt like friends, family, or neighbors were avoiding you because you needed help with transportation?</td>
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<td>How often have you spent a long time waiting because you did not have the transportation that would allow you to come and go when you wanted?</td>
<td>Have you ever worried about inconveniencing your family, friends, or neighbors because you needed help with transportation?</td>
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<td>How often have you had to reschedule an appointment because of a problem with transportation?</td>
<td>Have you ever felt bad because you did not have the transportation you needed?</td>
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<td>How often have you skipped going someplace because of a problem with transportation?</td>
<td>Have problems with transportation affected your relationships with others?</td>
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<td>How often have you not been able to leave the house when you wanted to because of a problem with transportation?</td>
<td>Have you ever felt embarrassed because you did not have the transportation you needed?</td>
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<td>How often have you worried about whether or not you would be able to get someplace because of a problem with transportation?</td>
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<td>How often did you feel stuck at home because of a problem with transportation?</td>
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Next Steps
Additional analysis

• Reliability analysis
  – Estimate coefficient alpha (scale reliability) for each scale
  – Examine alpha-if-item-deleted for each item to determine whether other items are candidates for deletion (i.e., whether scale reliability improves)

• Validity analysis
  – Examine distributions of scale scores (i.e., simple sums) among various groups (e.g., car/no car)
Winter survey

• N= ~1,000
• Nationally representative
• Compare to existing measures
• Use the TSI as a predictor
• Define short-form TSI
Thanks!

• Research assistance: Bri Gauger, Karina Lopez, Tia Clinton, Shoshana Shapiro
• Consultation and collaboration: Lisa Holland, Joe Grengs
• Funding: Stanford Poverty Center, University of Michigan Center for Diversity and Public Policy, University of Michigan Population Studies Center NIH Pilot Grant, Poverty Solutions at University of Michigan
Example Comparison Measures

• Do you or anyone else in your [household] own or lease a car or other vehicle for personal use? (PSID)

• How many minutes did it usually take you to get from home to work LAST WEEK? (MTO)
Hypothesized/Causes Consequences

• How many hours did you work last week, at all jobs? (CPS)

• People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?
  – Someone who understands your problems
  – Someone to prepare your meals if you were unable to do it yourself
  – Someone to love and make you feel wanted
Cognitive interview results

Refined wording and rejected some items:

• Sometimes people are exposed to very hot or cold temperatures or storms while going places. This might be because they are riding in a car with a broken window, walking long distances, or waiting outside. How often have you been exposed to conditions like these because of the transportation you used IN THE PAST YEAR?
Cognitive interview results

Identified particularly compelling constructs for the transportation insecure:

• It can take time to plan out how to get to the places we need to go. We may need to figure out the schedule of busses or trains, who can give us a ride, or figure out how to come up with the money we need for gas, fare, or to otherwise pay for the ride. Please indicate your level of agreement with the following statement:

  “When I need to get somewhere, I usually spend some time planning out how I will get there.”
Cognitive interview results

Identified problem with false positives among transportation secure users of public transit:

• *In the past 30 days, how often did it take you longer to get somewhere than it would have taken if you had different transportation?*
Selected Demographic Characteristics

- Education
- Race
- Gender
- Children in Household
- Age
- Immigration status
- Disability status
- Household size
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<th>Important to go</th>
<th>Took longer</th>
<th>Waiting</th>
<th>Early</th>
<th>Late</th>
<th>Reschedule</th>
<th>Skipped</th>
<th>Not able to leave house</th>
<th>Stuck</th>
<th>Worried</th>
<th>Felt bad</th>
<th>Isolated</th>
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Important to go: Felt unsafe, Police stop, Left out, Not able to leave house, Skipped
Took longer: Worried, Felt bad, Isolated, Embarrassed, Left out, Lack companionship
Waiting: Backup plan, Stuck
Early: Reschedule, Stuck
Late: Skipped, Stuck
Reschedule: Stuck
Skipped: Stuck
Not able to leave house: Stuck
Stuck: Left out, Stuck
Worried: Reschedule, Stuck
Felt bad: Skipped, Not able to leave house
Isolated: Embarrassed, Left out
Emarrassed: Left out
Left out: Lack companionship
Lack companionship: Did not get invited, Avoiding, Burden
Did not get invited: Burden
Avoiding: Burden
Burden: Relationship effects