Energy Policy for the Poor:
An Assessment of Subsidized Weatherization Programs to Reduce Residential Energy Usage

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Study Objectives

- Evaluate the takeup and impact of a policy designed to improve the infrastructure of American households
- Produce new dataset on a Low-Income Population
  - Energy usage (monthly meter data)
  - Experimental and survey measures of preferences
  - Attitudes about conservation (“green” activities)
  - Physical attributes of housing and neighborhood
  - Participation in ARRA-funded weatherization

Energy Policy

- Texas Weatheriztion Assistance Program (WAP).
  - Run through the City of Dallas Department of Housing
  - Publicized through announcements at community meetings, posted flyers and public service announcements.
  - http://www.tdhca.state.tx.us/community-affairs/wap/index.htm
- ARRA provided states funding to offer more weatherization assistance (18 months in 2009-10)
- We collected baseline data before the implementation of the program. (Thanks to SCISIP)
- As follow-up, we hoped to test different mechanisms for offering the program in the Fair Park area.
  - The city would not let us do that, or pay for it
  - Limited our study to takeup.

More on WAP

- "…Designed to help low income customers control their energy costs through installation of weatherization materials and education. The program goal is to reduce the energy cost burden of low income households through energy efficiency."
- Eligible activities:
  - Energy audit (a review of your home's energy efficiency, which identifies where air leaks may be occurring, inefficient appliances, etc.)
  - Installation of DOE-approved weatherization measures
  - Consists of caulking; weather-stripping; adding ceiling, wall, and floor insulation; patching holes in the building envelope; duct work, and tune-up, **repair or replacement of energy inefficient heating and cooling systems.**
  - The weatherization measures to be installed must meet specific energy-savings goals.

Study Area: Fair Park Neighborhood

- Fair Park – South Dallas Neighborhood 9 census tracts, with approximately 26,000 residents
  - African American (70%*)
  - Hispanic (26%*)
  - Median household income is $19,939*

- 1960 total population over 40,000; 83% African American
  - Depopulation of the area due to the rise of a mobile middle-class of African-Americans

- The 277 acre Fair Park is a National Historic Landmark
  - Built for 1936 Texas Centennial Exposition
  - One of the most important sites in the world for Art Deco architecture

Larger Goal: Understand neighborhood change and how change impacts the behavior of residents.

Data Components

- Built Environment Survey—physical condition of parcels and phase blocks; 100% neighborhood sample (N=11,552)
- Commercial Survey—location of food sources, beer/liquor stores, financial services and pharmacies
- Economic Experiments: Feasibility Study – classic experimental protocols, conducted at community center, survey
- Brief Household Survey—geographically weighted sample; conducted door-to-door (Phases 1 and 3) (N=1460)
- Detailed Household Survey—selected from participants in the brief survey; conducted at field research station (Phases 2 and 4) (N-496)
- Economic Experiments—sample randomly selected from participants in the detailed survey; conducted at field research station (Phases 2 and 4) (n=202)
- Physical Activity Objective Measures—sample randomly selected form participants in the detailed survey (Phases 2 and 4)
- **Energy Usage Survey and Experiments—expanded sample focusing on homeowners**

Sessions conducted in neighborhood

The field research station located near the main intersection in the neighborhood.

Transportation was provided when requested.

Instructions via laminated poster and verbal script

Protocol and Design

All materials in booklets
Concrete, intuitive representation

- Survey (including GSS and trust in institutions)
- Experimental design with four activities:
  - Risk Preferences (Eckel and Grossman 2002)
  - Time Preferences
  - Trust (Baseline vs. Treatments)
    - Trust game "in the room"
    - Trust game with a neighbor not in the room
    - Trust game played with a public official (city government employee)

Household Survey Measures

- Demographics
- Time Usage
- Crime/Safety Perceptions
- Finance
- Health
- Children
- Neighborhood Perceptions
- Perceptions of self
- Housing
- Social Capital/Trust
- Transportation

Phase 1 and 2 touch on all of these areas, with much more detail provided in Phase 2.

Incentivized Preference Measures and Experiments

- Risk preference: choose one from six gambles (increase in expected value and variance), Eckel and Grossman (2008)
- Time preference: $50 dollars tomorrow or a larger amount of money in six months from tomorrow – 7 decisions
- Trust preference/experiment: Trust with someone inside/outside the room – How much you want to send out of your $30

Energy Usage Component

- Energy Survey (N=260)
- Energy Experiments (N=153)
- Energy usage data:
  - Consent to obtain energy usage data from utility companies
  - Meter data: N=200, T=18 months).
- The study identified a number of households eligible for the subsidy program.

“Green” Activities

Participants were asked how often they engage in the following activities:

- Recycling
- Using car less
- Composting
- Use energy efficient appliances
- Use CFLs
- Water conservation activities
- Use reusable shopping bags

Results: Green Activities and Preferences

- Spearman Correlation Coefficients:
- People who participate in “Green” activities are:
  - More patient (0.0753),
  - More trusting (0.0216)
  - More risk tolerant (0.0644)
  - More likely to contribute to the public good (0.0365).

- All correlations are statistically significant at 90% level.

Descriptive Regressions of Usage

- Seasons explain 15% of variation in monthly KWH usage
- Home size, age, fireplace and existence of central air explain another 17%
- Green behaviors are generally negative and significant
- Of the experimental measures, more risk tolerance is associated with less energy usage.
- Most of the variation is in factors affecting housing value
  - Endogenous: working on this
- (Always use individual-level random effect)

Estimating Takeup: New wave of data 2012

- Collected in spring and summer 2012
- Household survey plus experiments repeated
- Effort to recruit more homeowners
- N=233 homeowners
- Data are partially coded/entered (survey only, not usage or experiments)
- Allows estimate of takeup of energy policy

Preliminary results

- Current wave of data (2012).
- Of 233 homeowners, 16 (6.9%) took up weatherization.
- Probit regressions with preliminary data:
  - Participate in average billing: 23% more likely to take up the policy
  - Age (proxied by enrolment in Medicare): 4.9% more likely
  - Prior participant in our study: 6.8% (!)

Conclusion

- Green activities are consistently related to preferences: patience, trust, willingness to accept risk and cooperation.
- Controlling for home characteristics, energy usage is related to green activities and risk tolerance.
- Policy to subsidize energy audit and weatherizing of low-income households:
  - Takeup = 6.9%
  - Preliminary correlates: participation in averaging, age (Medicare), prior participant in our study

Thank you!

FOR MORE INFORMATION ON THE FAIR PARK NEIGHBORHOOD STUDY:

HTTP://WWW.UTDALLAS.EDU/NCRI/THE-FAIR-PARK-NEIGHBORHOOD-STUDY