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The Housing and Children's Healthy Development Study

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Motivations and Objectives

A family's decision about where to live determines not only the characteristics of their dwelling (for example, size, physical adequacy, and cost) but also other aspects of their residential context including whether the neighborhood is safe and whether children will have access to high-quality resources including schools, suitable neighborhood playmates, and role models. Children's home, neighborhood, schools, peers, role models, and family define the residential context, both physical and social, in which they grow up. Their social and physical environment strongly influence children's development.

Because lower income families usually have limited choices about where to live, they face difficult tradeoffs among these different residential features. For example, if parents prize quality schools and low crime rates, they may opt for an expensive apartment that requires them to work additional hours, thereby being less available to their children. This, in turn, may stress the parents to the point of becoming harsh and punitive with their children. It may even prompt another move in search of more affordable housing. All three effects of the parents' tradeoffs—increased work hours, harsh parenting, and moving—could have deleterious consequences for children's

development. This example makes clear that if we are to understand the family's decision, the dynamics it puts into play, and ultimately, the consequences for children, we need to know more than the quality of schools and the crime rate. The Housing and Children's Healthy Development (HCHD) Study was designed to advance our understanding of the contribution of children's residential context to their well-being. Insights into low-income parents' location decisions and tradeoffs; what effects these decisions have on children's cognitive, social, emotional and health outcomes; and how these effects occur hold promise for developing more effective policies to foster healthy child development.

The HCHD study emanates from a multi-year research effort of the MacArthur Foundation's "How Housing Matters for Families with Children" ("Housing and Children" for short) Research Network. Following the long tradition of MacArthur research networks, the prominent social scientists and policy experts who comprised the Housing and Children Network developed a consensus about the gaps in this topic area and the best research approach to fill them.[1] The Network identified the need for a new study that would address the very basic questions of whether and how housing affects children's healthy development. It recommended the collection of systematic survey data measuring and tracking children's housing, neighborhoods, families, and schools, along with child and family outcomes. This recommendation addressed the lack of any existing longitudinal data set that measures these domains from a child development perspective. To achieve the goal of estimating causal effects of the child's residential context, the Network recommended a housing voucher experiment. Distinct from the Moving to Opportunity Demonstration, this experiment is not restricted to households living in public housing (Sanbonmatsu et al., 2011); distinct from the natural experiments in Chicago (Jacob, 2004; Jacob et al., 2015), it is being implemented in more than one location.[2]

The remainder of this article describes this major new longitudinal study, its sample design, voucher experiment, protocols, and innovative features. We conclude with the study's current status and plans for the future.

Study Design

The inclusion of a housing voucher experiment required that we conduct the study in particular cities or metropolitan areas served by a public housing authority (PHA). Financial constraints drove the decision to focus on only two study sites, the Cleveland and Dallas metropolitan areas.[3]

[1] Network members were T. Cook (chair), D. Acevedo-Garcia, S. DeLuca, G. Duncan, K. Edin, T. Leventhal, J. Lubell, J. Ludwig, S, Newman, M. Pattillo, and S. Raudenbush. Project officers E. Poethig and I. Kachoris and Vice-President for Housing M. Stegman played a major role in the initiation and success of the Network.

[2] The Welfare to Work Voucher Demonstration (for example, Mills et al., 2006) achieves these goals but did not collect survey data on all domains over time.

[3] More precisely, the Cleveland sample area includes all of Cuyahoga County, which covers Cleveland and its suburbs. This area covers 43 zip codes. The Dallas sample area includes 7 counties encompassing 120 zip codes in and around the city of Dallas. These are roughly equivalent to the metro areas so we refer to the two samples as metro areas for simplicity.

Criteria for Site Selection

The three criteria for selecting the study sites were variation in geographic location, housing market characteristics, and the racial and ethnic mix of the population in the metropolitan area. In addition, the PHA in the site had to use randomization to create their voucher waiting list, be considered a high performer based on HUD's assessment of PHA management and reputation in the field[4], and be committed to participating in the HCHD study.

Samples

The study has a dual-frame sample design consisting of a sample of voucher applicants (the "voucher" sample), and a probability sample of modest and low-income households (the "population" sample). Both samples share three main eligibility criteria: (1) the household has at least one child between the ages of 3 and 10; (2) the child spends at least 3 nights per week on average in this household; and (3) the interview can be conducted in English or Spanish.

Voucher Sample. The voucher sample consists of applicants for housing vouchers who were randomly assigned to the voucher waiting lists in the Cuyahoga Metropolitan Housing Authority (CMHA) and the Dallas Housing Authority (DHA). The treatment group sample was selected from the randomly sorted applicants on the waiting list who were likely to be offered a voucher within approximately 1 year of the start of data collection. The control group was selected from the randomly sorted applicants who are unlikely to be offered a voucher within this time frame. Both housing authorities included a brief description of the HCHD study on their voucher application form. Applicants who did not want to participate in the study checked an "opt out" box and were not contacted. We are aiming for equal sample sizes in the two sites and equal numbers of treatment and control samples. The targets are 848 households and 1,170 children (that is, 424 households in each site comprised of 212 treatment and 212 control households). Data are being collected from the child's primary caregiver and up to two randomly chosen children in the household. We describe the voucher experiment in more detail below.

Population Sample. The population sample design was developed in collaboration with the sampling division of the Survey Research Center (SRC) at the University of Michigan and under the direction of T. Raghunathan, director of SRC.[5] It is a stratified, random sample of households in the Cleveland and Dallas metropolitan areas. The population sample was generated through a multistage procedure. At the first stage, all U.S. Census block groups at each site were stratified into three groups (low, medium, and high) based on their median family income according to the 2015 American Community Survey.[6] Then, block groups were sampled with the goal of oversampling low-income block groups, using a ratio of 3:2:1 for low-income, middle-income, and high-income block groups, respectively. Next, within the selected block groups, households were randomly sampled and screened at the doorstep for the same eligibility criteria as the voucher sample. The target sample sizes are the same as those for the voucher sample, also divided evenly across sites (see exhibit 1).

[4] Based on interviews with knowledgeable observers.

[5] HCHD Study co-principal investigators G. Duncan and S. Raudenbush were also actively involved in the sample design.

[6] Stratification of block groups at the first stage also incorporated the estimated number of eligible households (that is, children ages 3 to 10 and English- or Spanish-speaking) based on multiple data sources.

Exhibit 1

Design of Population Sample

Primary Block Group Strata	Sampling Rate	Number of Households		
		Cleveland	Dallas	Total
Low-income	0.50	217	217	434
Middle-income	0.33	145	145	289
High-income	0.17	72	72	145
Total	1.0	434	434	868

Source: SRC Sampling Group, March 2017

Protocol Development and Pilot Study

Data collection instruments include a combination of established, tested questions (for example, income, expenditures, cognitive achievement, and PROMIS measures of health[7]) and newly-developed questions that address the key issues motivating the study (for example, preferences and tradeoffs; child-relevant housing features; biomarker measures of healthy child development). We sought input from subject experts either individually or, in the case of housing, through a "thinkers' session." The draft protocol underwent multiple iterations. As with all surveys, the final instrument represents a balance between including all essential measures and available funding.

In fall 2016, the draft protocol was pilot tested in Dallas with 50 modest-income households having at least 1 child in the 3 to 10 age range. The protocol was revised based on the pilot experience, and we launched the Wave 1-Baseline field work in late May 2017. We expect this first wave of data collection to continue through approximately September 2018.

Main Protocol. SRC at the University of Michigan is our survey contractor for the HCHD study. SRC's highly trained interviewers are collecting the Wave 1-Baseline data typically in the primary caregiver's home. We are gathering data using multiple methods. Interviewers are conducting personal interviews with primary caregivers, usually mothers, using Computer-Assisted Personal Interviewing (CAPI). Mothers are also completing a short, self-administered questionnaire. Interviewers collect physical measures of mothers and children (for example, height and weight) and, for the voucher sample, blood biomarkers (explained below). In addition, children are administered standardized tests of reading and math achievement and a computerized task evaluating executive functioning, a key component of self-regulation. Interviewers are also collecting systematic observations of the home environment using both established subscales of the Home Observation for Measurement of the Environment, better known as HOME (Caldwell and Bradley, 1984), and other measures; the neighborhood environment defined as the blocks surrounding the households' housing units; and parent-child interactions. Exhibit 2 lists the topics covered.

[7] Patient Reported Outcomes Measurement Information System or PROMIS measures were developed by an NIH committee as part of the NIH Roadmap (https://commonfund.nih.gov/promis/index).

Exhibit 2

Topics Covered in HCHD Study Protocols

Adult Interview and Assessments	Child Interview and Assessments	Additional Assessments and Observations
• Residential mobility, Crowding, privacy, and space • Housing quality • Other housing features • Housing costs • PHA applicant questions • Preferences and tradeoffs • Neighborhood • Neighborhood vignettes • Respondent general information • Employment information • Spouse/partner/other parent information • Household income, assets, and debts • Mental health • Health • Physical measures (height, weight, blood pressure) • Blood spot collection • Challenges to parenting • Family environment and routines • Home Observation for Measurement of the Environment (HOME) • Discipline of child • Child demographics • Child's room • Child's residential background • Child care and preschool • School • Child's behavior • Child health	• Hearts and flowers executive function task • Preschool self-regulation assessment • Woodcock-Johnson (Applied Problems) • Woodcock-Johnson (Letter-Word identification) • Physical measurements (height, weight, waist, hips) • Blood spot collection • Thin-slice observation of cognitive sensitivity/ Lego activity	• Neighborhood observations • Physical environment of home • Square footage of living space in the dwelling (by laser tape)

Innovations

The HCHD study includes a number of innovative protocols worth highlighting.

1. **Biomarker Collection from Mothers and Children:** Interviewers are collecting blood spots from mothers and children in the voucher sample to test for Interleukin 6, a biomarker for infection and inflammation; C-Reactive Protein, a biomarker for stress; and Glycosylated Hemoglobin, a biomarker for blood sugar levels. No study, to our knowledge, has collected blood from children in a home-based setting. Response rates are high, standing at 93.3 percent for mothers and 84.4. percent for children as of mid-May 2018.

2. **Child Time Diary:** A daily diary was developed for the HCHD study to assess how families' use of space in the home promotes or inhibits children's healthy development through daily routines, interactions, and parenting. Parents complete the daily diary over two randomly selected days (one weekday and one weekend day). Although the response rate is only about

35 percent, the daily diary should provide important exploratory information on families' use of space pertaining to parenting.

3. **Interviewer Assessments of Parenting:** To assess the sensitivity of the primary caregiver's parenting, interviewers are observing mothers and children participating in a Lego activity and coding the quality of the parent-child interactions using a "thin slice" or impressionistic approach (Prime et al., 2015). This innovative method of measuring parent-child interactions relies on a short observation period of approximately 5 minutes, requires little reliability training, and has minimal coding demands of approximately 7 minutes per interaction. These features make it efficient and cost-effective for a large, complex study of this sort.

4. **Objective Measurement of Interior Square Footage:** Interviewers are measuring the square footage of living space in the home using an electronic laser tape measure. This approach provides an objective measure of space in the dwelling and will be helpful when analyzing subjective assessments of crowding, privacy, and clutter. As of this writing, interviewers have collected laser tape data from 88 percent of respondents.

The Voucher Experiment

The voucher sample consists of randomly chosen voucher applicants, some of whom will be offered a voucher and others who will not be offered a voucher. This rigorous research design of random variation in who receives a housing voucher supports the examination of the causal effects of housing on children. Some examples of such effects include how the offer and use of a voucher affects parents' choices about where to live; the kinds of housing and neighborhood quality tradeoffs low-income families make; how these choices affect their children's development; the effects of housing on health and other child development outcomes; and how stress, parenting, and stability may transmit the effects of housing and affect children's healthy development.

The PHAs. Located in the Midwest, the Cuyahoga Metropolitan Housing Authority serves all of Cuyahoga County, which includes the city of Cleveland, Ohio and its inner suburbs. It is a relatively soft housing market, with an estimated 2016 rental vacancy rate in the housing market area of about 9 percent.[8] CMHA's portfolio includes 25,729 assisted housing units. This includes 9,284 public housing units, 15,269 Section 8 vouchers, and 1,176 multifamily units that represent several different HUD project-based assisted housing programs. CMHA's tenant population includes 33.4 percent who are part of family households with one or more children younger than 18, 27.4 percent who are households headed by a person 62 years of age or older, and 36.2 percent who are disabled either physically or mentally.[9] The large majority of tenants are Black (89.2 percent), 8.4 percent are White, and 2.4 percent are another race. Roughly 7 percent are Hispanic, and 93 percent are not Hispanic.

Located in the southwest, the Dallas Housing Authority serves the city of Dallas and counties across north Texas. This is a relatively tight rental market, with an estimated 2017 rental vacancy

[8] See https://www.huduser.gov/portal/publications/pdf/ClevelandOH-comp-16.pdf.

[9] Categories are not mutually exclusive.

rate in the housing market area of about 6 percent.[10] DHA's portfolio includes nearly 22,000 assisted housing units—17,000 in which the tenant is using a housing choice voucher, 1,800 multifamily units, and 3,000 public housing units. The geographic area under DHA's purview includes seven counties: Collin, Dallas, Denton, Ellis, Kaufman, Rockwall, and Tarrant. Roughly 50 percent of households are families with one or more children younger than 18 years old, 21 percent are headed by someone 62 years of age or older, and about 24 percent are headed by a non-elderly person who is disabled. The large majority of tenants are Black (85.3 percent), 8.6 percent are White, and the remaining 6.1 percent are other races (including 2 percent who are Asian). In addition, 6.2 percent report being Hispanic while 92.3 percent report being non-Hispanic (1.5 percent declined to report any race).

PHA Liaison. Quadel LLC, a well-known assisted housing consulting firm that has worked with numerous PHAs, has been the liaison between the research team and both CMHA and DHA. Quadel maintains regular communications with each PHA, assisted with the development of the Memorandum of Agreement covering the PHAs' participation in the study and data sharing, oversaw waiting list randomization, helped to develop a protocol to track voucher recipients using administrative data, and continues to assist with general troubleshooting.

Conclusions

At this writing, the Wave 1-Baseline survey data collection of the HCHD Study is nearing completion. Wave 2 is planned to launch 12 months after the Wave 1-Baseline. Our goal is to raise funds for additional waves. Importantly, the HCHD study data will ultimately be released as a public use data set.[11]

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[10] See https://www.huduser.gov/portal/publications/pdf/DallasTX-comp-17.pdf.

[11] Contact S. Newman at sjn@jhu.edu for updates on the status of the HCHD study public use data.

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