Abstract Title Page

Title: Methods for Analyzing Data from a Randomized Control Trial with a Nationally Representative Sample.

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Abstract Body

Limit 4 pages single-spaced.

Background / Context:

Description of prior research and its intellectual context.

Access to Head Start has been shown to improve children's preschool experiences and school readiness on selected factors through the end of 1st grade. Two more years of follow-up, through the end of 3rd grade, can now be examined to determine whether these effects continue into the middle elementary grades. The statistical design and impact analysis methodology for the Head Start Impact Study (HSIS) has been lauded as exemplary for a large scale social experiment, and analytic strategies continue to evolve through three rounds of analysis covering six years of sample follow-up (U.S. Department of Health and Human Services, 2005, 2010).

Purpose / Objective / Research Question / Focus of Study:

Description of the focus of the research.

Based on a randomized admission lottery in hundreds of local sites, the HSIS provides a platform for measuring Head Start's impacts—both short term and long term—on a nationally representative sample of participants without selection bias, providing internally and externally valid impact estimates for the overall Head Start participant population and for subsets of participants of particular policy interest. The proposed presentation will describe the study's path-breaking design and innovative analytic methods and share what the study team has learned about the sustained effects of Head Start as children complete 3rd grade. It will also explain the methods and sample used to determine these impacts.

Setting:

Description of the research location.

(May not be applicable for Methods submissions)

The HSIS includes a nationally representative sample of 4,667 three- and four-year-old children in 383 centers nationwide. The evaluation has followed sample children through the end of 3rd grade, with rich data available across many outcomes over multiple years. All newly-entering children in the fall of 2002 entered the admission lottery and were divided in a 6:4 ratio into treatment group members admitted to Head Start and control group members who were excluded.

Population / Participants / Subjects:

Description of the participants in the study: who, how many, key features, or characteristics.

(May not be applicable for Methods submissions)

Intervention / Program / Practice:

Description of the intervention, program, or practice, including details of administration and duration.

(May not be applicable for Methods submissions)

Head Start provides developmentally-focused pre-school education to children from disadvantaged families with the aim of ensuring their Kindergarten readiness in cognitive, behavioral and social domains.

Significance / Novelty of study:

Description of what is missing in previous work and the contribution the study makes.

Unlike any prior research project, the HSIS randomized children applying for Head Start entry in 2001 into treatment and control groups to ensure unbiased impact estimation. Treatment group members were granted access to Head Start in the first year while members of the control group were not.

Statistical, Measurement, or Econometric Model:
Description of the proposed new methods or novel applications of existing methods.
A method of computing impacts, developed in earlier reports for lower grade levels, is refined and reapplied here and emphasis placed on academic and developmental outcomes of particular importance to children in 3rd grade. Several major statistical issues are given in-depth treatment at the cutting edge of randomized control trial (RCT) impact analysis methods: crossovers from the control group into Head Start, lagged collection of background data in interviews and child assessments conducted several weeks after program entry, controlling the family-wise error rate when tests for program impacts are conducted on dozens of outcomes in four different years, interpretation of thousands of subgroup impact estimates (also in a multiple-comparison-controlled analytic framework), repeated-measures trend analysis, and many state-of-the-art measurement and psychometric components.

Usefulness / Applicability of Method:
Demonstration of the usefulness of the proposed methods using hypothetical or real data.
Each of the analytic issues just noted has challenged RCT impact analysts in studies beyond the HSIS over the last decade, and many methodological innovations of the HSIS have been presented to the field in conferences and publications (e.g., Bell et al. 2003). Some have already proven their robustness to other applications beyond the HSIS, and much more of this "methods knowledge" transfer seems likely in the future. The proposed presentation will point out these spillover benefits of the HSIS research, concentrating particularly on methods of experimental impact analysis with strong salience to educational interventions of interest to SREE.

Research Design:
Description of the research design (e.g., qualitative case study, quasi-experimental design, secondary analysis, analytic essay, randomized field trial).
(May not be applicable for Methods submissions)

Data Collection and Analysis:
Description of the methods for collecting and analyzing data.
(May not be applicable for Methods submissions)

Findings / Results:
Description of the main findings with specific details.
(May not be applicable for Methods submissions)

Conclusions:
Description of conclusions, recommendations, and limitations based on findings.
The foundation of random assignment both empowers and challenges methodological development when seeking to measure program effectiveness without bias and with balanced interpretation as to the strength of the statistical data and measurement tools used. Throughout its 12-year course, the HSIS has sought to capitalize on its experimental design, larger representative sample, and vast rich data elements. This caldron of ingredients has yielded a

number of analytic advances of interest to other researchers focused on measuring the effectiveness of educational interventions. Findings on effectiveness through 3rd grade will also hold strong interest to the SREE research community. The extraordinarily high follow-up rates (i.e., low data collection attrition) achieved by the study over six years make these impact estimates particularly compelling and the policy ramifications of the study highly germane to national debates about the direction of the federal Head Start program

Appendices

Not included in page count.

Appendix A. References

References are to be in APA version 6 format.

Bell, Stephen, Michael Puma, Gary Shapiro, Ronna Cook, and Michael Lopez (November, 2003) *Random Assignment for Impact Analysis in a Statistically Representative Set of Sites: Issues from the National Head Start Impact Study*. Proceedings of the ASA Joint Statistical Meetings.

U.S. Department of Health and Human Services, Administration for Children, Youth, and Families. (January, 2010). *Head Start Impact Study: Final Report*. Washington, DC: Author.

U.S. Department of Health and Human Services, Administration for Children, Youth, and Families. (January, 2005). *Head Start Impact Study: First Year Impacts*. Washington, DC: Author.