Child Care & Early Education
RESEARCH CONNECTIONS

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Head Start Impact Study (HSIS) Bibliography

This bibliography lists resources in the *Research Connections* collection related to the Head Start Impact Study and is intended as a reference tool for researchers and policymakers. It is divided into sections for data sets and guides; official reports; studies using HSIS data; summaries, analyses, and commentaries; and instruments. Within each section resources are listed alphabetically by author and then by year and title.

NCCP ICPSR OPRE

Data Sets and Guides

Akmon, D., & Ciarico, J. (2017). *Head Start Impact Study Center Analysis File overview*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.
This webinar provides an overview of the Head Start Impact Study (HSIS) and information about access to the data and the use of the Virtual Data Enclave (VDE). Presenters introduce the new Center Analysis File, along with its risk disclosure analysis and data masking process. It also reviews its variables and data sources, and provides file resources such as the user's guide, codebook, and reports.

Akmon, D., Ciarico, J., Broene, P., & Madden, K. (2017). *Working with the Head Start Impact Study Center Analysis File*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.
This webinar provides a review of and tips for using the Center Analysis File. Presenters discuss using the weights and merging the Center Analysis File with other Head Start Impact Study (HSIS) restricted use files. They also share examples of producing statistics using the Center Analysis and other HSIS data.

Foundation for Child Development. (2013). *Head Start Impact Study (HSIS), 2002-2006: Resource guide*. New York: Foundation for Child Development.
This resource guide provides a brief overview of the Head Start Impact Study (HSIS), 2002-2006 and specific instructions for obtaining the restricted-use HSIS datasets. HSIS users should refer to the User Guide, which provides greater detail on the topics discussed.

Roach, J., Brooks, J., Heid, C., & Cook, R. (2011). *Head Start Impact Study online training and Q&A*. New York: Child Care & Early Education Research Connections.
This webinar describes the research questions, study design, and instruments used by the Head Start Impact Study. It then provides a walk-through of the study's data files and their use.

United States. Department of Health and Human Services, & United States. Administration for Children and Families. Office of Planning, Research and Evaluation. (2010). *Head Start Impact Study (HSIS), 2002-2006*. United States Department of Health and Human Services. Administration for Children and Families. Office of Planning, Research and Evaluation. Head Start Impact Study (HSIS), 2002-2006 [United States] [Computer file]. ICPSR29462-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor].
The Head Start Impact Study is a national, longitudinal study that involves approximately 5,000 three and four year old preschool children across 84 nationally representative grantee/delegate agencies aimed at determining how Head Start affects the school readiness of children participating in the program as compared to children not enrolled in Head Start and under which conditions Head Start works best and for which children.

United States. Department of Health and Human Services, & United States. Administration for Children and Families. Office of Planning, Research and Evaluation. (2014). *Third Grade Follow-up to the Head Start Impact Study (HSIS), 2007-2008*. Puma, Michael, Stephen Bell, Ronna Cook, and Camilla Heid. Third Grade Follow-up to the Head

Start Impact Study (HSIS), 2007-2008, United States. ICPSR35003-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2014-03-20. doi:10.3886/ICPSR35003.v1.
The Head Start Impact Study is a national, longitudinal study that involves approximately 5,000 three and four year old preschool children across 84 nationally representative grantee/delegate agencies aimed at determining how Head Start affects the school readiness of children participating in the program as compared to children not enrolled in Head Start and under which conditions Head Start works best and for which children. Third Grade Follow-up data was collected through parent interviews and child assessments in the spring of 2007 and spring of 2008. Data collection included child assessments, parent interviews, teacher surveys, and teacher-child ratings (similar to the original HSIS study). In addition, school principal survey data was collected. Outcome measures were developed in four domains: child cognitive development, child social-emotional development, health, and parenting practices.

Official Reports

Peck, L., & Bell, S. (2014). *The role of program quality in determining Head Start's impact on child development* (OPRE Report 2014-10). Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
The Head Start Impact Study (HSIS) has shown that having access to Head Start improves children's preschool experiences and school readiness in certain areas, though few of those advantages persisting through third grade (Puma et al., 2012). Scholars and practitioners alike have wondered whether impacts might be larger or more persistent for children who participate in high quality Head Start as opposed to lower quality Head Start. In response, this report examines the vital policy question: To what extent does variation in the quality of children's Head Start experiences affect children's development? The HSIS experimental evaluation, which involved a nationally representative sample and included rich data at baseline, about programs and across several years of follow-up, provides an ideal source for analyzing the answer to this question. Further informed by experts in the field, this report uses measures of quality based on the ECERS, Arnett, and teacher reports to capture three distinct dimensions of the Head Start setting: (1) "resources," which are the physical characteristics available in the program; (2) the "interactions" between teacher and child; and (3) children's "exposure" to academic activities in the classroom. (author abstract)

Puma, M., Bell, S., Cook, R., & Heid, C. (2010). *Head Start Impact Study final report*. Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
This study measures the effects of Head Start enrollment on multiple school readiness outcomes of a nationally-representative sample of nearly 5,000 low-income children. This randomized and controlled trial compares the cognitive and social-emotional development, as well as select academic, literacy, health, and behavior-related outcomes of groups of children either attending Head Start or not attending Head Start. Follow-up data was collected at either kindergarten or 1st grade from of cohorts of children who experienced a year of Head Start either at either age 3 or age 4. Analysis revealed that access to Head Start has benefits for both cohorts in the cognitive, health, and behavioral areas. Social-emotional

benefits occurred for 3-year-olds only. Overall, however, the benefits of access to Head Start at age four tend to fade by first grade except in select sub-groups of children.

Puma, M., Bell, S., Cook, R., & Heid, C. (2010). *Head Start Impact Study final report [Executive summary]*. Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
A summary of a longitudinal study of the effect of Head Start participation on both children's school readiness and the practices of parents, based on data collected from more than 4,600 applicants, randomly assigned to either Head Start or alternate programs, from a nationally representative sample of 378 Head Start centers.

Puma, M., Bell, S., Cook, R., & Heid, C. (2010). *Head Start Impact Study technical report*. Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
A description of the methodology and surveys used in the Head Start impact study, with a focus on sample design, data collection methods, sampling weights, and measures for children's outcomes and development.

Puma, M., Bell, S., Cook, R., Heid, C., Broene, P., Jenkins, F., Mashburn, A. J., & Downer, J. T. (2012). *Third Grade Follow-Up to the Head Start Impact Study: Final report* (OPRE Report 2012-45). Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
This report presents the findings of a follow-up to the Head Start Impact Study. In an effort to examine longer term effects of both early and late Head Start participation on a variety of children's outcomes, this study compares select grade-school age measures from the original randomized and controlled groups of children through the end of third grade. Findings revealed that, while there were initial benefits from Head Start program participation, by the end of third grade very few impacts were found in either cohort in the areas of cognitive development, social-emotional development, health, or behavior.

Puma, M., Bell, S., Cook, R., Heid, C., Broene, P., Jenkins, F., Mashburn, A. J., & Downer, J. T. (2012). *Third Grade Follow-Up to the Head Start Impact Study: Final report [Executive summary]* (OPRE Report 2012-45b). Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
A summary of a longitudinal study through the end of third grade of the effects of Head Start participation on parenting practices and on children's cognitive development, socioemotional development, and health, based on data collected for 4,667 randomly-assigned Head Start applicants from a nationally representative sample of 84 Head Start grantees.

Puma, M., Bell, S., Cook, R., Heid, C., & Lopez, M. (2005). *Head Start Impact Study: First year findings*. Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
Preliminary first year findings from the Head Start Impact Study, a congressionally-mandated longitudinal controlled analysis of Head Start programs' impact on the development, learning skills, and school readiness of low income 3- and 4-year-old children, conducted across 23 states and 84 randomly selected Head Start agencies, using a sample of

5,000 children and based on data collected from parent interviews, child assessments, teacher surveys, interviews with center directors and other care providers, direct observations of the quality of care settings, and care provider ratings of children.

Puma, M., Bell, S., Cook, R., Heid, C., & Lopez, M. (2005). *Head Start Impact Study: First year findings: Executive summary*. Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
A summary of preliminary first year findings from the Head Start Impact Study, a congressionally-mandated longitudinal controlled analysis of Head Start programs' impact on the development, learning skills, and school readiness of low income 3- and 4-year-old children, conducted across 23 states and 84 randomly selected Head Start agencies, using a sample of 5,000 children and based on data collected from parent interviews, child assessments, teacher surveys, interviews with center directors and other care providers, direct observations of the quality of care settings, and care provider ratings of children.

Puma, M., Bell, S., Shapiro, G., Broene, P., Cook, R., Friedman, J., & Heid, C. (2001). *Building futures: The Head Start impact study: Research design plan*. Washington, DC: Administration for Children and Families, Office of Planning, Research and Evaluation.
A report describing the sampling, data collection, and analytical techniques to be used in the Head Start impact evaluation.

United States. Administration for Children and Families. Office of Planning, Research and Evaluation. (2002). *National Head Start impact research: Report to Congress*. Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
A study of the impact and outcomes of Head Start on the school readiness of children participating in the program.

United States. Administration for Children and Families. Office of Planning, Research and Evaluation. (2003). *Building futures: The Head Start Impact Study: Interim report*. Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
A report describing the purpose and progress of the Head Start Impact Study

United States. Administration for Children and Families. Office of Planning, Research and Evaluation. (2003). *Building futures: The Head Start Impact Study: Interim report [Executive summary]*. Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation.
A summary of the Head Start Impact Study progress report, a longitudinal study evaluating the impact of the Head Start intervention on children's developmental outcomes from the time of their enrollment in Head Start until their first grade year.

Studies Using HSIS Data

Ansari, A., Purtell, K. M., & Gershoff, E. (2016). Parenting gains in Head Start as a function of initial parenting skill. *Journal of Marriage and Family*, 78(5), 1195-1207.

Using data from the Head Start Impact Study (n = 3,696), this article examines whether one year of Head Start differentially benefited parents as a function of their initial parenting behaviors. Four outcomes are examined, namely, parents' rates of engaging in cognitive stimulation, reading to their child, and spanking, as well as their depressive symptoms. In general, most parents demonstrated improvements in their reading practices and cognitive stimulation regardless of their parenting behaviors at baseline. However, depressive symptoms and spanking behavior showed improvements only among parents who began the Head Start program with the most depressive symptoms and the most frequent spanking, respectively. These findings suggest that treatment-induced changes in parenting can vary by parents' incoming attributes and that heterogeneity of effects should be considered. Implications for Head Start and other parenting interventions are discussed. (author abstract)

Auger, A. (2014). *Child care and community services: Characteristics of service use and effects on parenting and the home environment*. (Unpublished doctoral dissertation). University of California, Irvine, CA.
My dissertation provides three independent studies that, taken together, examine the different mechanisms through which the center-based care environment interacts with parents to provide services and parental involvement activities, and how comprehensive parent components impact the home environment or are associated with child development. The specific research questions answered in this dissertation are: (1) To what extent are parents utilizing services and supports offered or referred by center-based early childhood programs? (2) What characteristics of parents predict usage of supports and services offered through center-based early childhood programs and the community? (3) What characteristics of parents predict parental involvement in children's center-based early childhood programs? (4) To what extent is parental involvement in center-based early childhood programs associated with children's school readiness skills and later development? (5) To what extent is parents' participation in center-based early childhood programs associated with parenting practices? (6) To what extent do the services and supports provided or referred to parents from center-based early childhood programs affect the home environment and parenting practices? (author abstract)

Balke, P. (2015). Head Start and parental mental health: Differentiated impacts of Head Start by cohort and comparison group. *Michigan Journal of Public Affairs*, 12, 5-21.
The burden of childcare can affect parental mental health, an important determinant of early childhood environmental quality. This is especially true for low-income households. Head Start provides free and public childcare for low-income families that can potentially ameliorate the burdens of childcare by improving parental health. This paper uses random assignment under the Head Start Impact Study to test for Head Start's causal impact on parental mental health. Head Start's impact is found to differ across cohorts, with positive results found only for the three-year-old cohort in 2003, the first year of the study and this cohort's only year in the program. Further, this paper examines differences in childcare-seeking behavior to identify changes between cohorts and across time, and identifies contamination of the control group as a possible explanation for these mixed results. (author abstract)

Bell, S., & Peck, L. (2013). Using symmetric predication of endogenous subgroups for

causal inferences about program effects under robust assumptions: Part two of a method note in three parts. *American Journal of Evaluation*, 34(3), 413-426.
To answer "what works?" questions about policy interventions based on an experimental design, Peck (2003) proposes to use baseline characteristics to symmetrically divide treatment and control group members into subgroups defined by endogenously determined postrandom assignment events. Symmetric prediction of these subgroups in both experimental arms ensures the internal validity of the subgroup impacts estimates but leaves the external validity of the findings in doubt. A final step of the procedure solves for impacts on actual subgroups using a system of equations that is underidentified without further assumptions. We address these assumptions by first extending the methodology to encompass three rather than two endogenous subgroups and then proposing plausible assumptions for deriving impacts for actual endogenous subgroups. We also consider how the first-stage prediction process can be structured to better support the accuracy of the assumptions. (author abstract)

Bell, S., Puma, M., Cook, R., & Heid, C. (2013). *Methods for analyzing data from a randomized control trial with a nationally representative sample*. Presentation at the Society for Research on Educational Effectiveness Spring 2013 Conference, Washington, DC.
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. (author abstract)

Bernardy, P. M. (2012). *Head Start: Assessing common explanations for the apparent disappearance of initial positive effects*. (Unpublished doctoral dissertation). George Mason University, Fairfax, VA.
Experimental design evaluations have consistently found children given access to early childhood services through the federal Head Start program experience better academic and social outcomes relative to comparable peers by the end of their participation, but this early advantage is not sustained through the early elementary grades. However, two studies of the long-term impact of Head Start have found the program to produce improved rates of high school completion. Given these seemingly contradictory findings, this research uses data from a recent nationally representative random assignment study of this program to examine whether there is evidence of enduring effects of Head Start participation: (1) when controlling for within-child variation; (2) for learning skills not previously analyzed in published reports; (3) for children with higher quality Head Start experiences; (4) for children with higher quality early elementary school experiences; and (5) compared to a counterfactual of no preschool participation. No evidence of initial positive effects enduring into kindergarten or first grade is found. (author abstract)

Bernstein, S. (2012). *Child care choice: Parental processes and consequences for*

***research*. (Unpublished doctoral dissertation). Northwestern University, Evanston, IL.**
This dissertation approaches parents' child care choice processes from two perspectives, using mixed methods. The first study used qualitative data to examine how low-income parents make their employment and child care decisions while balancing their roles as nurturer and provider. Child age, parents' job characteristics, resources and resource management, and immigration status emerge as four major factors in parents' employment and care decisions. Additionally, the study highlights the role better information and dissemination could play in helping families manage these choices. The second study examined potential mediators for cognitive impacts seen in nonurban children in the National Head Start Impact Study's 3-year-old cohort. This study finds no evidence that the availability of alternative formal-care options explain the impacts for this group. There is some indication that nonurban children's higher quality post-Head Start schooling could mediate impacts, but problems with missing data mean these findings must be treated with much caution. Better geographic identifiers, and attention to children's developmental trajectories across outcome domains, are two promising paths forward in trying to better understand the end of first-grade cognitive impacts for nonurban 3-year-old cohort children. (author abstract)

Bitler, M., Hoynes, H., & Domina, T. (2014). *Experimental evidence on distributional effects of Head Start* (NBER Working Paper No. 20434). Cambridge, MA: National Bureau of Economic Research.
This study provides the first comprehensive analysis of the distributional effects of Head Start, using the first national randomized experiment of the Head Start program (the Head Start Impact Study). We examine program effects on cognitive and non-cognitive outcomes and explore the heterogeneous effects of the program through 1st grade by estimating quantile treatment effects under endogeneity (IV-QTE) as well as various types of subgroup mean treatment effects and two-stage least squares treatment effects. We find that (the experimentally manipulated) Head Start attendance leads to large and statistically significant gains in cognitive achievement during the pre-school period and that the gains are largest at the bottom of the distribution. Once the children enter elementary school, the cognitive gains fade out for the full population, but importantly, cognitive gains persist through 1st grade for some Spanish speakers. These results provide strong evidence in favor of a compensatory model of the educational process. Additionally, our findings of large effects at the bottom are consistent with an interpretation that the relatively large gains in the well-studied Perry Preschool Program are in part due to the low baseline skills in the Perry study population. We find no evidence that the counterfactual care setting plays a large role in explaining the differences between the HSIS and Perry findings. (author abstract)

Bloom, H. S., & Weiland, C. (2014). *To what extent do Head Start's effects on children's language, literacy, mathematics, and socio-emotional skills vary across individuals, subgroups, and centers?*. Presentation at the Society for Research on Educational Effectiveness Spring 2014 Conference, Washington, DC.
In the current study, we use data for the first follow-up year of the Head Start Head Start Impact Study to examine variation in Head Start's impacts on children. Specifically, we examine whether there is statistically significant variation in Head Start's impacts on children's cognitive and socio-emotional outcomes across individual children, subgroups of

children, and Head Start centers. To do so, we use a new and innovative methodology for estimating sources of variation in program impacts (Bloom, 2012; Bloom, Raudenbush, & Weiss, 2013). (author abstract)

Bloom, H. S., & Weiland, C. (2015). *Quantifying variation in Head Start effects on young children's cognitive and socio-emotional skills using data from the National Head Start Impact Study*. New York: MDRC.
This paper uses data from the Head Start Impact Study (HSIS), a nationally representative multi-site randomized trial, to quantify variation in effects of Head Start during 2002-2003 on children's cognitive and socio-emotional outcomes relative to the effects of other local alternatives, including parent care. We find that (1) treatment and control group differences in child care and educational settings varied substantially across Head Start centers (program sites); (2) Head Start exhibited a compensatory pattern of program effects that reduced disparities in cognitive outcomes among program-eligible children; (3) Head Start produced a striking pattern of sub-group effects that indicates it substantially compensated dual language learners and Spanish-speaking children with low pretest scores (two highly overlapping groups) for their limited prior exposure to English; and (4) Head Start centers ranged from much more effective to much less effective than their local alternatives, including parent care. (author abstract)

Burchinal, M., Zaslow, M., & Tarullo, L. B. (2016). Quality thresholds, features, and dosage in early care and education: Secondary data analyses of child outcomes [Special issue]. *Monographs of the Society for Research in Child Development*, 81(2).
A special issue of the journal Monographs of the Society for Research in Child Development, focusing on the relationship between children's development and quality levels, quality features, and the extent of children's exposure to early care and education, based on secondary data analyses of eight large-scale studies of preschool children

Chor, E. (2014). *Early childhood education: The interplay between government, market, and family*. (Unpublished doctoral dissertation). University of Chicago, Chicago, IL.
This dissertation examines the impact of government intervention in early childhood education on the child care market, children's cognitive and socioemotional development, and familial relations. Experimental and quasi-experimental analyses reveal substantial effects of public preschool provision on the demand for and quality of childcare, child well-being, and family processes. The first two chapters capitalize on a natural experiment wherein the Australian state of Queensland eliminated its provision of universal preschool in 2007 in order to fund a new kindergarten year, while the other states continued to provide preschool for four-year-olds, allowing for difference-in-difference estimates of the effects of universal preschool. The Longitudinal Study of Australian Children (LSAC) provides rich, longitudinal data that permit the examination of these effects. In "Public Preschool and Families' Child Care Decisions: A Natural Experiment in Australia," I measure the impact of universal preschool provision on children's participation in non-parental care as well as on the characteristics of care used: type, stability, and intensity. I find that the loss of universal preschool is associated with a decrease in the use of formal and non-parental care. I also find an associated decrease in the utilization of multiple care arrangements but no change in the intensity of care use. Finally, I find that the loss of universal preschool is associated with an increase in informal care usage and private preschool attendance but a decrease in local

government provision, indicating that public preschool provision crowds out informal child care and private preschool participation but that state and local government preschool provision are complementary. In "The Impact of Universal Preschool on Family Behavior and Child Outcomes in Australia," Sandra Black, Paul Devereux, Ariel Kalil, and I measure the effects of public preschool provision on child development outcomes and explore mechanisms by which such effects might be generated. We find that universal preschool improves children's cognitive and socioemotional outcomes, likely through its impacts on formal care quality and parenting. The final chapter, entitled "Head Start's Intergenerational Potential: Do Program Impacts Vary by Mother's Head Start Participation?" further explores the multigenerational effects of public preschool provision. In this paper, I ask whether the effect of Head Start differs for the children of former program participants, as compared to the children of non-participants, and find using experimental Head Start Impact Study data that the children of mothers who participated in Head Start receive larger programmatic effects on their cognitive test scores. I try to determine the source of this difference by exploring several potential channels, and find that mothers' daily literacy practices improve by more if they participated in Head Start as children, suggesting that the improved parenting practices of these mothers drive the larger treatment effect on their children's cognitive skills. These findings indicate that first- and second-generation Head Start participation are complementary. (author abstract)

Chor, E. (2014). *Head Start's intergenerational potential: Do program impacts vary by mother's Head Start participation?*. In Early childhood education: The interplay between government, market, and family (pp. 116-172). (Unpublished doctoral dissertation). University of Chicago, Chicago, IL.
To date, the federal Head Start program has enrolled more than 31 million children from birth to age five, at an annual cost of nearly eight billion dollars. Given the magnitude of the Head Start program, its effects on children and their families are of obvious policy interest. In this paper, I seek to understand Head Start's effects on a specific group of enrollees: dual-generation Head Start participants. I ask whether the effect of Head Start differs for the three- and four-year-old children of former program participants, as compared to the children of non-participants, and find using experimental Head Start Impact Study data that the children of mothers who participated in Head Start receive larger programmatic effects on their cognitive test scores. I then try to determine the source of this difference by exploring several potential channels: sociodemographic characteristics, baseline cognitive differences, program "buy-in," and changes in maternal employment, maternal education, and parenting practices. I find that mothers' daily literacy practices improve by more if they participated in the program as a child than if they did not, suggesting that the improved parenting practices of former participant mothers drive the larger treatment effect on their children's cognitive skills. I also find evidence suggesting that this is a Head Start-specific phenomenon, not generalizable to other types of preschool. Overall, my findings indicate that first- and second-generation Head Start participation are complementary. (author abstract)

Chor, E. (2016). Multigenerational Head Start participation: An unexpected marker of progress. *Child Development*, , 1-16.
One-quarter of the Head Start population has a mother who participated in the program as a child. This study uses experimental Head Start Impact Study (HSIS) data on 3- and 4-year-

olds (N = 2,849) to describe multigenerational Head Start families and their program experiences. In sharp contrast to full-sample HSIS findings, Head Start has large, positive impacts on cognitive and socioemotional development through third grade among the children of former participant mothers, including improved mathematics skills and reductions in withdrawn and aggressive behavior. Evidence suggests that differences in program impacts between single- and multigenerational Head Start families are driven largely by differences in family resources and home learning environments. (author abstract)

Connors, M. C. (2015). *Learning at scale: How can policy support early care and education quality?*. (Unpublished doctoral dissertation). New York University, New York, NY.

Specifically, this dissertation first develops a heuristic theoretical model that describes the pathways from policy intervention, through high quality ECE, to young children's learning and development and then tests components of this model using data from the national Head Start Impact Study (HSIS; Puma et al., 2010). To test elements of this theory of change, the empirical papers in this set of work examine 1) mediating pathways within ECE programs through which external policies may be associated with classroom quality and 2) state policies' associations with children's access to formal and high quality ECE. This research helps to fill a critical knowledge gap and expand the field's understanding of which policy levers may be most reliably related to improvements in quality within ECE programs. (author abstract)

Connors, M. C. (2015). *Paper 2: Pathways to quality: From internal program supports to early educators' practice*. In Learning at scale: How can policy support early care and education quality? (pp. 76-126). (Unpublished doctoral dissertation). New York University, New York, NY.

Early care and education (ECE) classroom quality is a critical support for children's learning and development. Evidence suggests that ECE program-level support for teachers' learning may be particularly important for ensuring high quality classrooms. Yet little is known about how such supports operate outside of resource-intensive research studies and interventions. This study uses structural equation modeling to explore several mediating pathways through which "naturally-occurring" program-level supports for professional development may be related to improved classroom quality. Results reveal a pattern of indirect associations of programs' support for mentoring with gains in both structural and interactional aspects of classroom quality the following year via teachers' participation in mentoring. Improvements in classroom quality were not similarly associated with programs' support for degree attainment nor did they operate via teachers' participation in a degree program, beliefs about teaching and learning, or job satisfaction. (author abstract)

Connors, M. C., & Friedman-Krauss, A. (2017). Varying states of Head Start: Impacts of a federal program across state policy contexts. *Journal of Research on Educational Effectiveness*, , 1-29.

Classroom quality is critical for young children's learning, yet evidence suggests that the quality of early care and education (ECE) classrooms varies widely, even within federally administered Head Start. This study uses data from the nationally representative Head Start

Impact Study to examine variation in children's access to formal and high-quality ECE by policy characteristics that demonstrate a state's commitment and approach to regulating ECE quality. Findings support existing evidence of the impact of randomization to Head Start on children's access to formal and high-quality ECE, and expand our understanding of the ways in which these impacts vary. Overall, we find that stronger state child care licensing regulations and other indicators of a child-friendly policy climate are associated with a smaller contrast between the Head Start versus control groups' access to both formal and high-quality ECE. This study also offers initial evidence that state regulations targeting the quality of an ECE program's professional environment may be particularly important for access to high-quality classrooms. (author abstract)

Connors, M. C., Friedman-Krauss, A., Morris, P. A., Page, L. C., & Feller, A. (2014). *The role of classroom quality in explaining Head Start impacts*. Presentation at the Society for Research on Educational Effectiveness Spring 2014 Conference, Washington, DC.
This study seeks to answer the question: Are impacts on Head Start classroom quality associated with impacts of Head Start on children's learning and development? This study employs a variety of descriptive and quasi-experimental methods to explore the role of classroom quality as a mediator or mechanism of Head Start impacts. (author abstract)

Connors, M. C., Morris, P. A., & Friedman-Krauss, A. (2015). *Does access to high quality early education vary by state policy context?*. Presentation at the Society for Research on Educational Effectiveness Spring 2015 Conference, Washington, DC.
In this study, we leverage state policy variation and the random assignment design of the HSIS to address the following research questions: (1) Are state policy characteristics associated with variation in children's likelihood to enroll in formal and high quality ECE within the control group? (2) Are state policy characteristics similarly associated with variation in children's likelihood to enroll in formal and high quality ECE within the Head Start group? (3) Are state policy characteristics similarly associated with variation in Head Start impacts on children's enrollment in formal ECE and high quality ECE? (4) Which state policy characteristics are most strongly related to children's enrollment in formal and high quality ECE and to Head Start's impact on this behavior? (author abstract)

Connors, M. C., Morris, P. A., & Friedman-Krauss, A. (2015). *Paper 3: Varying states of Head Start: Impacts of a federal program across state policy contexts*. In Learning at scale: How can policy support early care and education quality? (pp. 127-188). (Unpublished doctoral dissertation). New York University, New York, NY.
Classroom quality is critical for young children's learning, yet evidence suggests that the quality of early care and education (ECE) classrooms varies widely, even within the federally-administered Head Start program. This study uses data from the nationally-representative Head Start Impact Study to examine variation in children's access to formal and high quality ECE by policy characteristics that demonstrate a state's commitment and approach to regulating ECE quality. Findings support existing evidence of the impact of randomization to Head Start on children's access to formal and high quality ECE, and expand our understanding of the ways in which these impacts vary. We find that stronger child care licensing regulations and other indicators of a child-friendly policy climate are associated with a smaller contrast between the Head Start versus control groups' access to both formal and high quality ECE. This study also offers initial evidence that state regulations targeting

the quality of an ECE program's professional environment may be particularly critical for high quality classrooms. (author abstract)

Cooper, B., & Lanza, S. T. (2014). Who benefits most from Head Start?: Using latent class moderation to examine differential treatment effects. *Child Development*. Advance online publication.
Head Start (HS) is the largest federally funded preschool program for disadvantaged children. Research has shown relatively small impacts on cognitive and social skills; therefore, some have questioned its effectiveness. Using data from the Head Start Impact Study (3-year-old cohort; N = 2,449), latent class analysis was used to (a) identify subgroups of children defined by baseline characteristics of their home environment and caregiver and (b) test whether the effects of HS on cognitive, and behavioral and relationship skills over 2 years differed across subgroups. The results suggest that the effectiveness of HS varies quite substantially. For some children there appears to be a significant, and in some cases, long-term, positive impact. For others there is little to no effect. (author abstract)

Ding, P., Feller, A., & Miratrix, L. W. (2015). *Methods for modeling and decomposing treatment effect variation in large-scale randomized trials*. Presentation at the Society for Research on Educational Effectiveness Spring 2015 Conference, Washington, DC.
The goal of this work is to create a framework that (1) provides applied researchers with a set of practical tools and (2) clearly lays out all the relevant assumptions for assessing treatment effect variation. We build this from the ground up, laying out a randomization-based framework for characterizing and understanding treatment effect heterogeneity in a range of settings, including observational studies. Following a long tradition in statistics, we use potential outcomes (Rubin, 1974; Neyman, 1923 [1990]) as the building blocks of this framework, allowing us to clearly separate the quantities of interest from the estimation methods. We decompose overall treatment effect heterogeneity into two components, the systematic component, impact variation explained by covariates, and the idiosyncratic component, impact variation not explained by covariates. (author abstract)

Ding, P., Feller, A., & Miratrix, L. W. (2016). Randomization inference for treatment effect variation. *Journal of the Royal Statistical Society. Series B, Statistical Methodology*, 78(3), 655-671.
Applied researchers are increasingly interested in whether and how treatment effects vary in randomized evaluations, especially variation that is not explained by observed covariates. We propose a model-free approach for testing for the presence of such unexplained variation. To use this randomization-based approach, we must address the fact that the average treatment effect, which is generally the object of interest in randomized experiments, actually acts as a nuisance parameter in this setting. We explore potential solutions and advocate for a method that guarantees valid tests in finite samples despite this nuisance. We also show how this method readily extends to testing for heterogeneity beyond a given model, which can be useful for assessing the sufficiency of a given scientific theory. We finally apply our method to the National Head Start impact study, which is a large-scale randomized evaluation of a Federal preschool programme, finding that there is indeed significant unexplained treatment effect variation. (author abstract)

Duncan, G. J., Jenkins, J., Watts, T. W., Magnuson, K. A., Clements, D. H., Sarama, J.,

Wolfe, C. B., & et al. (2015). *Preventing preschool fadeout through instructional intervention in kindergarten and first grade*. Presentation at the Society for Research on Educational Effectiveness Spring 2015 Conference, Washington, DC.
In the current study, we investigate two salient approaches available to policymakers that may improve preschool participants' instructional experiences in elementary school. The first involves advanced and challenging instruction in kindergarten and first grade, because children who attend preschool will hypothetically benefit more from advanced content. The other involves some type of professional support in which preschool teachers interact with their kindergarten and first grade counterparts to develop a seamless transition from one grade to the next. We use two experimental studies of preschool interventions and children's elementary school environments to examine whether the quality of instructional content or providing professional development supports to early grade teachers moderate the impacts of two well-known programs on children's cognitive skills: Head Start and Building Blocks. (author abstract)

Feller, A., Grindal, T., Miratrix, L. W., & Page, L. C. (2014). *Compared to what? Estimating causal effects for latent subgroups to understand variation in the impacts of Head Start by alternate child care setting*. Presentation at the Society for Research on Educational Effectiveness Spring 2014 Conference, Washington, DC.
In this paper, we extend the main HSIS findings to examine whether the offer of Head Start was differentially beneficial for students grouped by the care setting they would have received absent the offer of Head Start. In order to do so, we develop a novel methodological approach that connects principal stratification as an analytic framework with a hierarchical random effects model and Bayesian estimation strategies to stratify children into latent subgroups defined by the pair of child care settings each child would experience under the randomized offer of Head Start and under no such offer. That is, we assign students to a subgroup defined not only by the care type we observe them to have taken up but also by the care type they would have taken up under the counterfactual experimental condition. By examining treatment-control differences in outcomes only for those children who, for example, would enroll in Head Start if offered the opportunity, but who otherwise would be cared for by a parent, we are able to able to estimate the causal impact of Head Start across the alternate care-type settings. Our analyses will focus on outcomes such as such as performance on the Peabody Picture Vocabulary Test and the Woodcock-Johnson III assessments gathered for several years after the initial HSIS randomization. (author abstract)

Feller, A., Grindal, T., Miratrix, L. W., & Page, L. C. (2014). *Compared to what?: Variation in the impacts of early childhood education by alternative care-type settings*. Rochester, NY: Social Science Research Network.
Early childhood education research often compares a group of children who receive the intervention of interest to a group of children who receive care in a range of different care settings. In this paper, we estimate differential impacts of an early childhood intervention by alternative care setting, using data from the Head Start Impact Study, a large-scale randomized evaluation. To do so, we utilize the principal stratification framework, a generalization of the instrumental variables approach, to estimate separate impacts for two types of Compliers: those children who would otherwise be in other center-based care when assigned to control and those who would otherwise be in home-based care. We find strong,

positive short-term effects of Head Start on receptive vocabulary for those Compliers who would otherwise be in home-based care. By contrast, we find no meaningful impact of Head Start on vocabulary for those Compliers who would otherwise be in other center-based care. Our findings suggest that alternative care type is a potentially important source of variation in early childhood education interventions. (author abstract)

Feller, A., Grindal, T., Miratrix, L. W., & Page, L. C. (2016). Compared to what?: Variation in the impacts of early childhood education by alternative care type. *Annals of Applied Statistics*, 10(3), 1245-1285.
Early childhood education research often compares a group of children who receive the intervention of interest to a group of children who receive care in a range of different care settings. In this paper, we estimate differential impacts of an early childhood intervention by alternative care type, using data from the Head Start Impact Study, a large-scale randomized evaluation. To do so, we utilize a Bayesian principal stratification framework to estimate separate impacts for two types of Compliers: those children who would otherwise be in other center-based care when assigned to control and those who would otherwise be in home-based care. We find strong, positive short-term effects of Head Start on receptive vocabulary for those Compliers who would otherwise be in home-based care. By contrast, we find no meaningful impact of Head Start on vocabulary for those Compliers who would otherwise be in other center-based care. Our findings suggest that alternative care type is a potentially important source of variation in early childhood education interventions. (author abstract)

Feller, A., Mealli, F., & Miratrix, L. W. (2017). Principal score methods: Assumptions, extensions, and practical considerations. *Journal of Educational and Behavioral Statistics*, 42(6), 726-758.
Researchers addressing posttreatment complications in randomized trials often turn to principal stratification to define relevant assumptions and quantities of interest. One approach for the subsequent estimation of causal effects in this framework is to use methods based on the "principal score," the conditional probability of belonging to a certain principal stratum given covariates. These methods typically assume that stratum membership is as good as randomly assigned, given these covariates. We clarify the key assumption in this context, known as principal ignorability, and argue that versions of this assumption are quite strong in practice. We describe these concepts in terms of both one- and two-sided noncompliance and propose a novel approach for researchers to "mix and match" principal ignorability assumptions with alternative assumptions, such as the exclusion restriction. Finally, we apply these ideas to randomized evaluations of a job training program and an early childhood education program. Overall, applied researchers should acknowledge that principal score methods, while useful tools, rely on assumptions that are typically hard to justify in practice. (author abstract)

Feller, A., & Miratrix, L. W. (2015). *Examining the foundations of methods that assess treatment effect heterogeneity across intermediate outcomes*. Presentation at the Society for Research on Educational Effectiveness Spring 2015 Conference, Washington, DC.
The goal of this study is to better understand how methods for estimating treatment effects of latent groups operate. In particular, we identify where violations of assumptions can lead to biased estimates, and explore how covariates can be critical in the estimation process. For

each set of approaches, we first review the assumptions necessary for identification and discuss practical issues that arise in estimation. We then examine how covariates allow for improved estimation, and determine the conditions necessary for using covariates to identify causal effects in latent groups. We then compare the different methods using simulation studies built from datasets constructed by imputing missing class membership and potential outcomes from real-world studies. This allows for examining the performance of the different techniques under a variety of plausible circumstances. We finally apply these methods to two common data sets that represent the type of data increasingly available to researchers, the JOBS II study and the Head Start Impact Study (HSIS), and compare the resulting treatment effect estimates to each other and some plausible baseline values. (author abstract)

Friedman-Krauss, A., Connors, M. C., & Morris, P. A. (2013). *Estimating impacts of treatment random assignment on classroom quality in the Head Start Impact Study: The problem of missing data*. Presentation at the Society for Research on Educational Effectiveness Spring 2013 Conference, Washington, DC.
Results from the original analysis of the classroom quality data from the Head Start Impact Study (U.S. Department of Health and Human Services, 2010) show that randomization to Head Start lead to improvement in the quality of care children received. However, these results are obfuscated by the way in which missing data were handled. The apparent improvements in classroom quality may be due to greater access to formal care settings, greater access to higher quality formal care settings, or more likely to a combination of the two. Purpose / Objective / Research Question / Focus of Study: Description of the focus of the research. To address this problem, the primary objectives of this research are to address the challenges faced when estimating impacts of treatment random assignment on classroom quality within the Head Start Impact Study, to explore how different solutions influence the impact estimates, and to offer methodological solutions. That is, the goal of this research is to be able to accurately answer the following questions: What are the impacts of random assignment to Head Start on measures of classroom quality? Do children who are randomly assigned to Head Start receive higher/better quality care than children who are randomly assigned to the control group? However, there are several challenges to answering these questions accurately. The largest threat to estimating unbiased impacts is missing data on the dependent variable, classroom quality. We expect that missing data on classroom quality are endogenous to treatment random assignment. (author abstract)

Friedman-Krauss, A., Connors, M. C., & Morris, P. A. (2014). *Is more time in Head Start always better for children? The moderating role of classroom quality*. Presentation at the Society for Research on Educational Effectiveness Spring 2014 Conference, Washington, DC.
The current study expands on previous research by using quasi-experimental methods that leverage the experimental context of the Head Start Impact Study (HSIS; Puma et al., 2010) to understand the extent to which Head Start classroom quality moderates the impact of weekly hours in Head Start on children's early language and math skills and externalizing behaviors. We begin by replicating Li and colleagues' (2013) instrumental variables (IV) analysis assessing the effects of weekly hours in Head Start on outcomes for children, leveraging the random assignment nature of the HSIS design and the "offer" of differing numbers of hours of Head Start in the treatment condition and zero hours of Head Start in

the control condition. We then extend this work to account for the quality of the Head Start center children attend. We hypothesize that weekly hours in Head Start will be more strongly associated with outcomes for children enrolled in high quality programs as compared with children enrolled in low quality programs. In contrast to previous research that used samples of children enrolled in child care, the current study relies on a sample of children enrolled in educationally focused Head Start programs. (author abstract)

Friedman-Krauss, A., Connors, M. C., & Morris, P. A. (2017). Unpacking the treatment contrast in the Head Start Impact Study: To what extent does assignment to treatment affect quality of care?. *Journal of Research on Educational Effectiveness*, 10(1), 68-95.
Attending high-quality early childhood care and education (ECCE) is associated with higher cognitive and social-emotional skills, especially for children growing up in poverty, but access to high-quality ECCE is limited. This study capitalizes on the random assignment design of the Head Start Impact Study to better understand whether the randomized offer to attend Head Start, a free comprehensive child development program for low-income and at-risk children, raises the quality of ECCE in which children enroll. Multinomial logistic regression was used to isolate the intent-to-treat impacts of random assignment to Head Start on ECCE quality from impacts on enrollment in formal ECCE. Results indicate that children randomly assigned to receive Head Start (treatment), compared to children in the control group, were more likely to enroll in high-quality and, to a lesser extent, low-quality ECCE. Treatment impacts were largest at the high end of the quality distribution, were driven by increased enrollment in Head Start, and differed for 3- and 4-year-olds. These results highlight the important role of Head Start in providing high-quality ECCE for low-income children. (author abstract)

Gelber, A. M., & Isen, A. (2011). *Children's schooling and parents' investment in children: Evidence from the Head Start Impact Study* (NBER Working Paper Series No. 17704). Cambridge, MA: National Bureau of Economic Research.
Parents may have important effects on their children, but little work in economics explores whether children's schooling opportunities crowd out or encourage parents' investment in children. We analyze data from the Head Start Impact Study, which granted randomly-chosen preschool-aged children the opportunity to attend Head Start. We find that Head Start causes a substantial increase in parents' involvement with their children--such as time spent reading to children, math activities, or days spent with children by fathers who do not live with their children--both during and after the period when their children are potentially enrolled in Head Start. We discuss a variety of mechanisms that are consistent with our findings, including a simple model we present in which Head Start impacts parent involvement in part because parents perceive their involvement to be complementary with child schooling in the production of child qualities. (author abstract)

Gelber, A. M., & Isen, A. (2013). Children's schooling and parents' behavior: Evidence from the Head Start Impact Study. *Journal of Public Economics*, 101, 25-38.
Parents may have important effects on their children, but little work in economics explores whether children's schooling opportunities crowd out or encourage parents' investment in children. We analyze data from the Head Start Impact Study, which granted randomly chosen preschool-aged children the opportunity to attend Head Start. We find that Head Start causes a substantial increase in parents' involvement with their children--such as time

spent reading to children, math activities, or days spent with children by fathers who do not live with their children--both during and after the period when their children are potentially enrolled in Head Start. (author abstract)

Gershoff, E., Ansari, A., Purtell, K. M., & Sexton, H. R. (2016). Changes in parents' spanking and reading as mechanisms for Head Start impacts on children. *Journal of Family Psychology*, 30(4), 480-491.
This study examined whether Head Start, the nation's main two-generation program for low-income families, benefits children in part through positive changes in parents' use of spanking and reading to children. Data were drawn from the 3-year-old cohort of the national evaluation of the Head Start program known as the Head Start Impact Study (N = 2,063). Results indicated that Head Start had small, indirect effects on children's spelling ability at Age 4 and their aggression at Age 4 through an increase in parents' reading to their children. Taken together, the results suggest that parents play a role in sustaining positive benefits of the Head Start program for children's behavior and literacy skills, one that could be enhanced with a greater emphasis on parent involvement and education. (author abstract)

Gibbs, C., Ludwig, J., & Miller, D. L. (2011). *Does Head Start do any lasting good?* (NBER Working Paper Series No. 17452). Cambridge, MA: National Bureau of Economic Research.
Head Start is a federal early childhood intervention designed to reduce disparities in preschool outcomes. The first randomized experimental study of Head Start, the National Head Start Impact Study (NHSIS), found impacts on academic outcomes of .15 to .3 standard deviations measured at the end of the program year, although the estimated impacts were no longer significant when measured at the end of kindergarten or first grade. Assessments that Head Start is ineffective based on the NHSIS results are in our view premature, given our currently limited understanding of how and why early childhood education improves long-term life chances. Many of the specific changes to Head Start that have been proposed could potentially wind up doing more harm than good. (author abstract)

Greenfader, C., & Miller, E. B. (2014). The role of access to Head Start and quality ratings for Spanish-speaking Dual Language Learners' (DLLs) participation in early childhood education. *Early Childhood Research Quarterly*, 29(3), 378-388.
Data from the Head Start Impact Study (N = 4442) were used to test for differences between Spanish-speaking Dual Language Learners (DLLs) and monolingual English-speaking children in: (1) Head Start attendance rates when randomly assigned admission; and (2) quality ratings of other early childhood education (ECE) programs attended when not randomly assigned admission to Head Start. Logistic regressions showed that Spanish-speaking DLL children randomly assigned a spot in Head Start were more likely than monolingual-English learners to attend. Further, Spanish-speaking DLLs not randomly assigned a spot in Head Start were more likely to attend higher-quality ECE centers than non-DLL children. Policy implications are discussed, suggesting that, if given access, Spanish-speaking DLL families will take advantage of quality ECE programs. (author abstract)

Griffen, A. S., & Todd, P. E. (2017). Assessing the performance of nonexperimental estimators for evaluating Head Start. *Journal of Labor Economics*, 35(S1), S7-S63.
This paper uses experimental data from the Head Start Impact Study (HSIS) combined with

nonexperimental data from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) to study the performance of nonexperimental estimators for evaluating Head Start program impacts. The estimators studied include parametric cross-section and difference-in-differences regression estimators and nonparametric cross-section and difference-in-differences matching estimators. The estimators are used to generate program impacts on cognitive achievement test scores, child health measures, parenting behaviors, and parent labor market outcomes. Some of the estimators closely reproduce the experimental results, but a priori it would be difficult to know whether the estimator works well for any particular outcome. Pre-program exogeneity tests eliminate some outcomes and estimators with the worst biases, but estimators/outcomes with substantial biases pass the tests. The difference-in-differences matching estimator exhibits the best performance in terms of low bias values and capturing the pattern of statistically significant treatment effects. However, the variation in bias is greater across outcomes examined than across methods. (author abstract)

Harding, J. F. (2015). Increases in maternal education and low-income children's cognitive and behavioral outcomes. *Developmental Psychology*, 51(5), 583-599.
Although the strong link between maternal education and children's outcomes is one of the most well-established findings in developmental psychology (Reardon, 2011; Sirin, 2005), less is known about how young, low-income children are influenced by their mothers completing additional education. In this research, longitudinal data from the Head Start Impact Study were used to explore the associations between increases in maternal education and Head Start eligible children's cognitive skills and behavioral problems in 1st grade. Propensity score weighting was used to identify a balanced comparison group of 1,362 children whose mothers did not increase their education between baseline (when children were aged 3 or 4) and children's kindergarten year, who are similar on numerous covariates to the 262 children whose mothers did increase their education. Propensity-score weighted regression analyses indicated that increases in maternal education were positively associated with children's standardized cognitive scores, but also with higher teacher-reported externalizing behavioral problems in 1st grade. The increases in externalizing behavioral problems were larger for children whose mothers had less than a college degree at baseline. (author abstract)

Harding, J. F., & Morris, P. A. (2015). *Understanding how participation in education changes mothers' parenting practices*. Presentation at the Society for Research on Educational Effectiveness Spring 2015 Conference, Washington, DC.
This research will explore whether low-income mothers' participation in education influences a constellation of different parenting practices that are related to young children's academic outcomes. Importantly, understanding whether maternal participation in education influences mothers' parenting practices can illuminate a pathway by which increases in maternal education may have long-lasting influence on children's academic outcomes. (author abstract)

Harding, J. F., Morris, P. A., & Hill, J. (2016). Understanding associations between low-income mothers' participation in education and parenting. *Journal of Research on Educational Effectiveness*, , 1-28.
Maternal education is one of the strongest predictors of children's academic outcomes. One

possible explanation for this is that more highly educated mothers more frequently engage in parenting practices that may promote children's later cognitive development; however, most of this evidence is correlational. This study uses Head Start Impact Study data (N = 1,953) to explore whether low-income mothers' participation in education affects their parenting practices and beliefs. Principal scores, which predict maternal educational participation based on covariates, were used for analysis. Principal score matching was used to identify mothers who we predicted participated in education because their children were randomly assigned to Head Start. We compared these mothers' outcomes to those of mothers we predicted would have participated in education if they were assigned to Head Start. For these mothers, participation in maternal education was associated with children watching fewer hours of TV, having more types of printed media at home, and more frequent participation in cultural activities, but it was not associated with a host of other parenting outcomes. Changing parenting is one potential pathway by which maternal educational participation may influence children's later academic outcomes. (author abstract)

Irwin, C. W., Madura, J. P., Bamat, D., & McDermott, P. A. (2016). *Patterns of classroom quality in Head Start and center-based early childhood education programs*. (REL 2017-199). Washington, DC: Regional Educational Laboratory Northeast & Islands.
The main purpose of this study was to determine whether early childhood classrooms can be grouped based on their scores on multiple measures of quality. The study team also examined the number of classroom quality groups that exist and the percentage of classrooms that fall within each classroom quality group. This study employs a methodological approach that has not previously been used to synthesize measures of classroom quality. This approach, known as latent class analysis, allowed the study team to uncover hidden patterns of classroom quality in data collected from programs serving Head Start-eligible children across the country. In addition to informing practitioners about what quality looks like in these settings, the findings allow for the categorization of classrooms across multiple classroom quality dimensions. This is more useful for informing practitioners than the traditional way of measuring quality along a single continuum--eliminating the need for users to come up with their own cut scores for these measures. A second purpose of the study was to explore the extent to which each measure contributes to the identification of classroom quality groups. (author abstract)

Irwin, C. W., Madura, J. P., Bamat, D., & McDermott, P. A. (2017). *Stated briefly: Patterns of classroom quality in Head Start and center-based early childhood education programs*. (REL 2017-208). Washington, DC: Regional Educational Laboratory Northeast & Islands.
This study used latent class analysis with data from the 2002/03 Head Start Impact Study to determine whether early childhood classrooms can be sorted into classroom quality groups based on their scores on multiple measures of quality, how many classroom quality groups could be identified, and what percentages of classrooms fall within each classroom quality group. Based on the 13 measures examined, Head Start and center-based early childhood classrooms could be grouped into three distinct classroom quality groups: good, fair, and poor. Classroom quality measures determined by independent observers distinguish classroom quality groups better than self-reported measures do. (author abstract)

Isen, A., & Gelber, A. M. (2013). *Children's schooling and parents' behavior: Evidence from*

***the Head Start Impact Study*. In Essays on labor and public economics (pp. 136-207). (Unpublished doctoral dissertation). University of Pennsylvania, Philadelphia, PA.**
There are few papers in the economics literature that examine the relationship between schooling and parent inputs. In a developing country context, Pop-Eleches and Urquiola (2012) and Das et al. (2011) find evidence consistent with substitutability between parent and schooling inputs. Our analysis builds on studies that have empirically examined aspects of HS and its impact on children. HHS (2010) investigates data from the HSIS, focusing primarily on the impact of HS on children's cognitive and non-cognitive test scores. As we describe later, HHS (2010) also investigates certain measures of parent involvement with their children but finds very limited evidence that parent involvement was impacted. The HSIS collected a rich set of data that are not analyzed in HHS (2010) but that we analyze in this study; these data show a strong impact of HS on a wide variety of parent involvement outcomes. Relative to HHS (2010), we investigate the impact of HS on an order of magnitude more parent outcomes; using data on more outcomes reveals that many outcomes HHS (2010) does not explore are significantly affected by HS enrollment. We explore the mechanisms through which the effect on parent involvement may operate, including by documenting the positive cross-program correlation between effects on cognitive scores and effects on parent involvement. Finally, we place our results in a possible theoretical context. (author abstract)

Jenkins, J., Watts, T. W., Magnuson, K. A., Clements, D. H., Sarama, J., Wolfe, C. B., & Spitler, M. (2015). *Preventing preschool fadeout through instructional intervention in kindergarten and first grade*. Irvine, CA: Irvine Network on Interventions in Development.
Little research has focused on why short-term gains from preschool may disappear and the conditions under which gains from preschool might be sustained into elementary school. We investigate whether two aspects of the elementary school environment may help to sustain the academic gains made during preschool using two random assignment preschool studies: 1) whether advanced and challenging instruction in kindergarten and first grade; 2) professional supports in which preschool teachers interact with their kindergarten and first grade counterparts to coordinate instruction and transition. We also assess whether the child's home learning environment moderates the persistence of preschool effects. We did not find any evidence to support the hypothesis that better instructional quality mitigates the fadeout of preschool treatment effects during elementary school. However, we did find some evidence that when the preschool intervention was coupled with teacher professional supports in kindergarten and first grade, this all but eliminated the fadeout of effects observed between kindergarten and first grade. We also did not find that factors in the home environment, parents education and home learning activities, help to sustain the gains made during preschool. Future research should investigate aligned preschool-elementary school curricular approaches to sustain the benefits of ECE programs for low-income children. (author abstract)

Jenkins, J., Watts, T. W., Magnuson, K. A., Gershoff, E., Clements, D. H., Sarama, J., & Duncan, G. J. (2016). *Do high quality kindergarten and first grade classrooms mitigate preschool fadeout?*. Irvine, CA: Irvine Network on Interventions in Development.
Prior research shows that short-term treatment effects from preschool may disappear, but little research has considered which environmental conditions might sustain the academic advantages from preschool into elementary school. Using two random-assignment studies,

we investigate whether two features of the elementary school environment help to sustain preschool academic gains: 1) exposure to advanced and high-quality instruction in kindergarten and first grade; 2) professional supports to coordinate curricular instruction and transition. Across both studies, our measures of instruction did not moderate fadeout from preschool. However, results indicated that targeted teacher professional supports substantially mitigated fadeout between kindergarten and first grade. Future research should investigate whether aligned preschool-elementary school curricular approaches can sustain the benefits of preschool programs for low-income children. (author abstract)

Kamat, V. (2017). *Identification with latent choice sets: The case of the Head Start Impact Study*. Unpublished manuscript.
This paper studies identification of program effects in settings with latent choice sets. Here, by latent choice sets, I mean the unobserved heterogeneity that arises when the choice set from which the agent selects treatment is heterogeneous and unobserved by the researcher. The analysis is developed in the context of the Head Start Impact Study, a social experiment designed to evaluate preschools as part of Head Start, the largest early childhood education program in the United States. In this setting, resource constraints limit preschool slots to only a few eligible children through an assignment mechanism that is not observed in the data, which in turn introduces unobserved heterogeneity in the child's choice set of care settings. I propose a nonparametric model that explicitly accounts for latent choice sets in the care setting enrollment decision. In this model, I study various parameters that evaluate Head Start in terms of policies that mandate enrollment and also those that allow voluntary enrollment into Head Start. I show that the identified set for these parameters given the information provided by the study and by various institutional details of the setting can be constructed using a linear programming method. Applying the developed analysis, I find that a significant proportion of children voluntarily enroll into Head Start if provided access and that Head Start is effective in terms of improving short-term test scores across multiple policy dimensions. (author abstract)

Kline, P., & Walters, C. R. (2015). *Evaluating public programs with close substitutes: The case of Head Start*. (NBER Working Paper No. 21658). Cambridge, MA: National Bureau of Economic Research.
This paper empirically evaluates the cost-effectiveness of Head Start, the largest early-childhood education program in the United States. Using data from the Head Start Impact Study (HSIS), we show that Head Start draws roughly a third of its participants from competing preschool programs that receive public funds. This both attenuates measured experimental impacts on test scores and reduces the program's net budgetary costs. A calibration exercise indicates that accounting for the public savings associated with reduced enrollment in other subsidized preschools substantially increases estimates of Head Start's rate of return, defined as the after-tax lifetime earnings generated by an extra dollar of public spending. Control function estimation of a semi-parametric selection model reveals substantial heterogeneity in Head Start's test score impacts with respect to counterfactual care alternatives as well as observed and unobserved child characteristics. Head Start is about as effective at raising test scores as competing preschools and its impacts are greater on children from families less likely to participate in the program. Expanding Head Start to new populations is therefore likely to boost the program's rate of return, provided that the proposed technology for increasing enrollment is not too costly. (author abstract)

Kline, P., & Walters, C. R. (2016). Evaluating public programs with close substitutes: The case of Head Start. *Quarterly Journal of Economics*, 131(4), 1795-1848.
We use data from the Head Start Impact Study (HSIS) to evaluate the cost-effectiveness of Head Start, the largest early childhood education program in the United States. Head Start draws roughly a third of its participants from competing preschool programs, many of which receive public funds. We show that accounting for the fiscal impacts of such program substitution pushes estimates of Head Start's benefit-cost ratio well above one under a wide range of assumptions on the structure of the market for preschool services and the dollar value of test score gains. To parse the program's test score impacts relative to home care and competing preschools, we selection-correct test scores in each care environment using excluded interactions between experimental assignments and household characteristics. We find that Head Start generates larger test score gains for children who would not otherwise attend preschool and for children who are less likely to participate in the program. (author abstract)

Lee, K. (2016). Head Start's impact on cognitive outcomes for children in foster care. *Child Abuse Review*, 25(2), 128-141.
Using the Head Start Impact Study data, this secondary data analysis examines Head Start's impact on cognitive outcomes for children in foster care. Out of 4442 children, 162 children in foster care were selected to examine the following study questions. (1) Do children in foster care who enrol in Head Start have different child and family characteristics than those who do not participate in Head Start? (2) Do children in foster care who participate in Head Start have higher reading and math scores at ages five to six? (3) Do child and family characteristics moderate Head Start's impact on reading and math scores of children in foster care at ages five to six? There was no main Head Start impact on reading and math scores for children in foster care. However, Head Start impact was found for the child's gender and the caregiver's age. Girls who participated in Head Start obtained higher reading and math scores than boys. Children cared for by older caregivers had higher math scores than those cared for by younger caregivers. Baseline variables such as ethnicity, special needs status and cognitive skills prior to Head Start enrolment were directly associated with math and reading scores at ages five to six. (author abstract)

Lee, K., Calkins, A., & Shin, T. (2016). Head Start impact on social-emotional outcomes for children with disabilities. *Research on Social Work Practice*, 26(7), 790-802.
Objective: Using the Head Start Impact Study data, this study examines Head Start's impacts on social-emotional outcomes for children with disabilities. Method: Among 4,442 children, 570 children were reported to have disabilities. Ordinary least squares regression was used to determine whether the number of disabilities, having an individualized education plan (IEP), and receiving Supplemental Security Income (SSI) affect social-emotional outcomes for children with disabilities and whether Head Start's impact differs depending on these factors. Results: Children with multiple disabilities, an IEP, and SSI had lower social-emotional scores. Head Start impact was found for the following subgroups: children with no disabilities, children who never received an IEP, children living in a higher income household, and Black children. Conclusions: Head Start should identify potential disabilities early and support the provision of adequate services to increase social-emotional outcomes for children with disabilities. (author abstract)

Lee, K., Clinton, M., Rispoli, K. M., & Lee, J. (2017). Individualized education programmes and parental behaviours for children with disabilities: Moderation effects of Head Start on children's developmental outcomes. *Child & Family Social Work*, 22(2), 1000-1014.
This study examined associations among Head Start attendance, individualized education programmes (IEPs), parental behaviours and child outcomes in a sample of five-hundred and seventy 3- to 4-year-old children with disabilities. Home language, number of disabilities and Head Start enrollment were associated with having an IEP. Parents of children with IEPs and those who participated in Head Start used more social services, while social support was more prevalent for parents of non-Head Start children with IEPs. For all children, frequent parental book reading, greater number of books in the home and greater perceived social support among parents were associated with favourable cognitive and social-emotional outcomes. Greater social service use was adversely associated with reading scores only for non-Head Start children. Findings highlight the need for inclusive IEP policies and Head Start programmes for parents regarding access to special education supports for children who demonstrate developmental concerns. Participation in Head Start may buffer negative effects of social service use on children's reading skill development, although more research is needed to uncover the specific mechanisms responsible for this association. (author abstract)

Lee, K., & Lee, J. (2016). Parental book reading and social-emotional outcomes for Head Start children in foster care. *Social Work in Public Health*, 31(5), 408-418.
This study examines the associations between parental book reading and social-emotional outcomes for Head Start children in foster care. Despite no main Head Start impact on parental book reading, subgroup effects were found. Foster parents in Head Start provided more book reading for children with disabilities but less for children with low preacademic scores. Head Start enhanced social-emotional outcomes for children in foster care. The positive impacts of Head Start on children's social-emotional outcomes were greater when parents read books frequently. Head Start should include more foster families and provided parenting skills to enhance social-emotional outcomes for children in foster care. (author abstract)

Lee, K., & Ludington, B. (2016). Head Start's impact on socio-emotional outcomes for children who have experienced violence or neighborhood crime. *Journal of Family Violence*, 31(4), 499-513.
Using Head Start Impact Study Data, this study examines Head Start's impact on socio-emotional outcomes for children who have experienced violence or crime. The children were divided into two groups: children who had ever experienced violence or crime and those who had not. The baseline characteristics for children, effects of violence on children, and the moderation effects of Head Start were examined. Child and family risk factors were associated with more experience of violence or crime, which negatively affected their socio-emotional outcomes. This was more prevalent for children living in rural areas and for White children. Enrollment in Head Start was positively associated with children's socio-emotional outcomes, with greater impact on those who had ever experienced violence or crime. (author abstract)

Lee, K., & Rispoli, K. M. (2016). Effects of individualized education programs on cognitive

outcomes for children with disabilities in Head Start programs. *Journal of Social Service Research*, 42(4), 533-547.
This study investigated the impact of Head Start, disability status, and receipt of an Individualized Education Program (IEP) on early language, literacy, and mathematics skills for low-income children with language, cognitive, emotional/behavioral, sensory, and physical disabilities. Secondary analysis of data was performed on a sample of children with disabilities (N = 570) drawn from the Head Start Impact Study, a nationally representative study of approximately 5,000 children randomly assigned to Head Start or non-Head Start programs. Results of ordinary least squares regression analyses indicated that Head Start participation enhanced outcomes for children with multiple disabilities; language, literacy, and mathematics skills at age 5-6 years were higher for these children compared to non-Head Start attendees. Head Start children with disabilities were more likely to have an IEP, though IEP receipt was associated with lower language, literacy, and mathematics scores among all children. There is a need to ensure that Head Start, and programs similar to Head Start, are more widely available to provide comprehensive, quality early childhood programming to children with cumulative risk factors (low income, multiple disabilities). Future research should clarify why IEP receipt was associated with poorer cognitive outcomes. (author abstract)

Lee, K., & Rispoli, K. M. (2017). Racial disparities in perceived social support and social service use: Associations with maternal depression and Head Start participation. *Journal of Community Psychology*, 45(8), 1080-1093.
Using the Head Start Impact Study data, this study examined racial disparities in maternal perceptions of social support and social service receipt, and their associations with depression. Associations between Head Start participation and these variables were also studied. A total of 3,269 mothers were included (n=971 Black, 1,086 Hispanic, and 1,212 White). Compared to White mothers, Hispanic mothers indicated perceiving less assistance from social supports. Black and Hispanic mothers were less likely to use social services and reported lower levels of depression than White mothers. Head Start mothers perceived more helpfulness from social supports than non-Head Start mothers. Head Start, however, was not associated with social service use or maternal depression. Results suggest Head Start participation may be related to greater ability to reap benefits from relationships with friends and family among low-income mothers. (author abstract)

Li, W. (2013). *Center-based early childhood education: Curriculum, implementation, and intensity*. (Unpublished doctoral dissertation). University of California, Irvine, Irvine, CA.
This dissertation aimed to link quality and quantity of center-based education with child outcomes. The first study focused on curriculum and compared the ability of different types of curricula in promoting children's cognitive and academic outcomes. This study synthesized 44 studies in the past several decades and compared child outcomes of curricula that targeted general domains and those of curricula that targeted at more specific domains. The second study focused on curricula implementation quality. This chapter utilized data from the study of the Preschool Curriculum Evaluation Research (PCER) to relate implementation quality of literacy curricula to child literacy outcomes. Results from propensity score matching approach showed that children in classrooms that had implemented literacy curricula with high fidelity scored .2 standard deviations higher in language outcomes than those in classrooms that had implemented literacy curricula with low fidelity as well as those

in classrooms that had implemented curricula targeting general domains. The last empirical study focused on dosage effects. This chapter estimated effects of Head Start hours on child cognitive outcomes using data from the National Head Start Impact Study (HSIS). An instrumental variable (IV) approach was conducted to eliminate selection bias due to unobserved family backgrounds that affected both Head Start hours and child outcomes. (author abstract)

Li, W., Farkas, G., Duncan, G. J., Vandell, D., & Burchinal, M. (2013). *Effects of Head Start hours on children's cognitive, pre-academic, and behavioral outcomes: An instrumental variable analysis*. Presentation at the Society for Research on Educational Effectiveness Spring 2013 Conference, Washington, DC.
Background / Context: Children from low-income families benefit remarkably from exposure to compensatory education that began with Head Start in 1965 and aimed to improve school readiness skills by design (Farran, 2007; Scarr & Weinberg, 1986). While empirical evidence has supported more instructional time in elementary and secondary schools for low-income students (Abdulkadiroglu, Angrist, Dynarski, Kane, & Pathak, 2011; Angrist, Dynarsky, Kane, Pathak, & Walters, 2010; Dobbie & Fryer, 2011; Hoxby, Muraka, & Kang, 2009; Patall, Cooper, & Allen, 2010), little is known that whether increasing quantity of Head Start could also benefit low-income children. Also largely unexamined is how Head Start quantity effects differ for different age groups. Research Question: (1) Does the amount of daily exposure to Head Start impact cognitive, pre-academic, and social outcomes? (2) Does the impact vary by age? (author abstract)

Light, J. (2015). *Understanding the impact: The effects of Head Start on mothers' labor-force participation*. (Unpublished bachelor's honors thesis). University of Michigan, Ann Arbor, MI.
The United States Department of Health and Human Services emphasizes a holistic approach to early childhood education and family development in its Head Start programming for low-income families. Head Start, since its inception, has been the subject of rigorous evaluation and analysis. Nearly all of the analysis, however, has focused on children's cognitive and social development. In this paper, I assess the role Head Start plays in parents' labor-force decisions. Using data from the Head Start Impact Study (HSIS), a randomized longitudinal study of first-time Head Start applicants, I develop and estimate a model for the labor-force participation of low-income mothers with access to Head Start. I observe increased labor-force participation rates among HSIS mothers randomly assigned access to Head Start for both cohorts, which dissipate when the child reaches kindergarten age. The positive labor-force outcomes were most pronounced among subgroups of mothers with the greatest relative economic disadvantage before Head Start, while the most well-off subgroups decreased their labor force participation after receiving access to Head Start. (author abstract)

Lipscomb, S., Pratt, M. E., Schmitt, S. A., Pears, K., & Kim, H. K. (2013). School readiness in children living in non-parental care: Impacts of Head Start. *Journal of Applied Developmental Psychology*, 34(1), 28-37.
The current study examines the effects of Head Start on the development of school readiness outcomes for children living in non-parental care. Data were obtained from the Head Start Impact Study, a randomized controlled trial of Head Start conducted with a nationally

representative sample of Head Start programs and families. The sample included 253 children living in non-parental care (defined as a primary caregiver who self-identified as someone other than a biological, adoptive, or step-parent), who experienced elevated rates of child and family risk factors. Results revealed modest direct short-term and indirect longer-term impacts of Head Start on school readiness outcomes (increased pre-academic skills, more positive teacher-child relationships, and reductions in behavior problems) for children living in non-parental care. Limitations of this study and directions for future research are discussed. (author abstract)

Lipscomb, S., Schmitt, S. A., Pratt, M. E., Acock, A. C., & Pears, K. (2014). Living in non-parental care moderates effects of prekindergarten experiences on externalizing behavior problems in school. *Children and Youth Services Review*, 40, 41-50.
The current study examines the effects of prekindergarten quality and quantity on externalizing behavior problems for children living in non-parental care, compared to other children from socioeconomically at-risk backgrounds. Data were obtained from the Head Start Impact Study. Non-parental care was defined as a primary caregiver other than a biological, adoptive, or step-parent. The sample included 3029 children who attended center-based prekindergarten. Teacher-child conflict and more hours of prekindergarten predicted increased externalizing behavior problems for the full sample. Teacher-child closeness and overall process quality were only associated with externalizing behavior for children in non-parental care. Findings are discussed within a goodness-of-fit perspective in which the vulnerabilities of children in non-parental care explain how they respond to their prekindergarten experiences. (author abstract)

Mackintosh, B. B. (n.d.). *A matter of perspective: An exploratory study of the relationship between the early math skills and social competence of children from low-income families*. (Unpublished doctoral dissertation). Harvard University, Cambridge MA.
The U.S. is calling for expansion of preschool to help close the well-documented income-based achievement gap. Children from low-income families often enter kindergarten academically behind their higher income peers and recent findings indicate gaps in social-emotional aspects of school readiness as well, illustrating how early these gaps emerge and raising questions about cross-domain relationships. Therefore, this two-study dissertation explores the relationship between children's social competence and their early math development. Study 1 uses longitudinal growth modeling to explore within and cross-domain relationships between children's a) interpersonal, social problem-solving skills and b) early math skills during a preschool year. Participants (N=76) were recruited from a MA preschool serving mostly children from low-income and minority families. Results show that children have positive, linear math learning trajectories that vary by age when not accounting for children's social competence. Children's development of flexibility in social problem-solving is associated with changes in the rates at which children learn math skills across a preschool year, controlling for baseline child demographics with no evidence of differential learning trajectories by age other than observed differences in math skills at preschool entry. Children's adaptive social problem-solving strategies show positive non-linear growth trajectories. Importantly, these adaptive problem-solving strategies from the previous time period have the potential (p =.12) to positively predict children's growth in early math skills during the preschool year. Study 2 draws a subsample (N=3485) from the Head Start Impact Study, (U.S. DHHS, 2010) a large, nationally representative study of Head Start, to

investigate the potential mediating role of children's social competence on early math skills for children randomly assigned to Head Start. Results from a confirmatory factor analysis indicated good model fit for the latent construct with positive social skills and teacher-child relationships as indicators of social competence. Moreover, children's social competence was positively related to math achievement during the Head Start year. Taken together, results from these studies suggest that children's social competence may play an important role in promoting children's early math skills and may warrant more attention in preschool curricula especially as greater attention is paid to increasing implementation of challenging, developmentally-focused math curricula. (author abstract)

Mashburn, A. J., & Downer, J. T. (2013). *Methods that examine the extent to which the quality of children's experiences in elementary school moderate the long-term impacts of Head Start*. Presentation at the Society for Research on Educational Effectiveness Spring 2013 Conference, Washington, DC.
The second goal of the HSIS is to identify the circumstances under which Head Start achieves its greatest impacts, and one possible explanation for the largely non-significant effects at the end of kindergarten and first grade has to do with the quality of children's experiences in elementary school. For example, under conditions of high quality experiences in elementary school, the early advantages for children in Head Start may be diminished because children in the control group "catch up". Alternatively, low quality experiences in elementary school may have a stronger negative impact on development for those children in Head Start compared to children in the control group, thereby, detracting from the prior gains attributed to Head Start. The purpose of this presentation is to describe the methods used to examine the extent to which the impacts of Head Start on children's cognitive and social-emotional outcomes at kindergarten, first grade, and third grade may be moderated by the quality of children's experiences during elementary school. (author abstract)

McCoy, D., Connors, M. C., Morris, P. A., Yoshikawa, H., & Friedman-Krauss, A. (2015). Neighborhood economic disadvantage and children's cognitive and social-emotional development: Exploring Head Start classroom quality as a mediating mechanism. *Early Childhood Research Quarterly*, 32(3), 150-159.
Past research has shown robust relationships between neighborhood socioeconomic disadvantage and children's school achievement and social-emotional outcomes, yet the mechanisms for explaining these relationships are poorly understood. The present study uses data from 1904 Head Start participants enrolled in the Head Start Impact Study to examine the role that classroom structural and relational quality play in explaining the association between neighborhood poverty and children's developmental gains over the preschool year. Results suggest that neighborhood poverty is directly related to lower levels of classroom quality, and lower gains in early literacy and math scores. Indirect relationships were also found between neighborhood poverty and children's social-emotional outcomes (i.e., approaches to learning and behavior problems) via differences in the physical resources and negative student-teacher relationships within classrooms. These findings highlight the need for policy initiatives to consider community characteristics as potential predictors of disparities in classroom quality and children's cognitive and social-emotional development in Head Start. (author abstract)

McCoy, D., Morris, P. A., Connors, M. C., Gomez, C. J., & Yoshikawa, H. (2016). Differential

effectiveness of Head Start in urban and rural communities. *Journal of Applied Developmental Psychology*, 43, 29-42.
Recent research suggests that Head Start may be differentially effective in improving low-income children's early language and literacy skills based on a number of individual- and family-level characteristics. Using data from the Head Start Impact Study (n = 3503; 50% male, 63% treatment group), the present study extends this work to consider program impact variation based on centers' location in urban versus rural communities. Results indicate that Head Start is more effective in increasing children's receptive vocabulary (as measured by the PPVT) in urban areas and their oral comprehension (as measured by the Woodcock-Johnson Oral Comprehension task) in rural areas. Additional analyses suggest that related characteristics of the center -- including concentration of dual language learners and provision of transportation services -- may underlie these associations. Implications for research on program evaluation and policy are discussed. (author abstract)

McCoy, D., Yoshikawa, H., Ziol-Guest, K. M., Duncan, G. J., Schindler, H. S., Magnuson, K. A., Yang, R., & et al. (2017). Impacts of early childhood education on medium- and long-term educational outcomes. *Educational Researcher*, 46(8), 474-487.
Despite calls to expand early childhood education (ECE) in the United States, questions remain regarding its medium- and long-term impacts on educational outcomes. We use meta-analysis of 22 high-quality experimental and quasi-experimental studies conducted between 1960 and 2016 to find that on average, participation in ECE leads to statistically significant reductions in special education placement (d = 0.33 SD, 8.1 percentage points) and grade retention (d = 0.26 SD, 8.3 percentage points) and increases in high school graduation rates (d = 0.24 SD, 11.4 percentage points). These results support ECE's utility for reducing education-related expenditures and promoting child well-being. (author abstract)

McDermott, P. A., Rovine, M. J., Watkins, M. W., Chao, J. L., Irwin, C. W., & Reyes, R. (2017). Latent national subpopulations of early education classroom disengagement of children from underresourced families. *Journal of School Psychology*, 65, 69-82.
This research examined the latent developmental patterns for early classroom disengagement among children from some of the most underresourced families in the nation. Based on standardized teacher observations from the Head Start Impact Study, a nationally representative sample of children (N=1377) was assessed for manifestations of reticent/withdrawn and low energy behavior over four years spanning prekindergarten through first grade. For each form of disengagement, latent growth mixture modeling revealed three distinct subpopulations of change patterns featuring a dominant class associated with generally good classroom adjustment, a medial class that varied close to the population average over time, and a more extreme class (about 10% of the population) whose adjustment was relatively marginal and sometimes reached problematic levels. Whereas reticent/withdrawn behavior ordinarily subsided over time, low energy behavior increased. More extreme low energy behaviors tended to dissipate through schooling and extreme reticence/withdrawal became more accentuated, with both types associated with later academic and social problems. Attendant risk and protective factors are identified and mitigating assessment and prevention measures are discussed. (author abstract)

McDermott, P., Watkins, M. W., Rovine, M. J., & Rikoon, S. H. (2013). Assessing changes in socioemotional adjustment across early school transitions: New national scales for

children at risk. *Journal of School Psychology*, 51(1), 97-115.
This article reports the development and evidence for validity and application of the Adjustment Scales for Early Transition in Schooling (ASETS). Based on primary analyses of data from the Head Start Impact Study, a nationally representative sample (N=3077) of randomly selected children from low-income households is configured to inform developmental-transitional stability and change in socioemotional adjustment. Longitudinal exploratory and confirmatory factor analysis of the ASETS revealed behavioral dimensions of Aggression, Attention Seeking, Reticence/Withdrawal, Low Energy, and higher-order dimensions of Overactivity and Underactivity. Each dimension was vertically equated through IRT, with Bayesian scoring across 2 years of prekindergarten, kindergarten, and 1st grade. Multilevel modeling provides evidence for concurrent validity, assessment of future risk, and detection of differential growth trajectories across the 4 years of early school transition. (author abstract)

McDermott, P., Watkins, M. W., Rovine, M. J., & Rikoon, S. H. (2014). Informing context and change in young children's sociobehavioral development - the national Adjustment Scales for Early Transition in Schooling (ASETS). *Early Childhood Research Quarterly*, 29(3), 255-267.
This article recounts the design and validity evidence for contextually-specific measures of early childhood social and behavioral adjustment within school using the Adjustment Scales for Early Transition in Schooling (ASETS). Through primary analyses of data from the Head Start Impact Study, a representative nationwide sample (N = 3077) of randomly selected children from low-income families was used to inform developmental-transitional stability and change in adjustment across numerous school contexts. Longitudinal exploratory and confirmatory factor analyses yielded reliable and temporally continuous behavioral dimensions assessing the pervasiveness of Peer, Learning, and Teacher Context Problems. Each context dimension was equated vertically through IRT, with Bayesian scoring across two years spanning prekindergarten through 1st grade. Multilevel modeling provided support for the concurrent validity of ASETS contextual scales and their ability to assess future risk of academic and behavioral problems. ASETS scales are also shown to reveal differential, contextually-based, change trajectories across four years of early school transition. (author abstract)

Miller, E. B. (2016). Child care enrollment decisions among dual language learner families: The role of Spanish language instruction in the child care setting. *Early Childhood Research Quarterly*, 36(3), 223-232.
Data from the Head Start Impact Study (N = 1141) and the Head Start Family and Child Experiences Survey, 2009 Cohort (N = 825) were used to describe child care enrollment decisions among Spanish-speaking Dual Language Learner (DLL) families. In particular, logistic regression models tested which child, family, and institutional characteristics predicted enrollment in early care and education (ECE) settings that used Spanish for instruction versus enrollment in settings that did not use Spanish. Results showed that whether the child's first language was exclusively Spanish and whether other DLL families previously attended the ECE arrangement strongly predicted whether that child enrolled. Policy implications for Head Start-eligible Spanish-speaking DLLs are discussed. (author abstract)

Miller, E. B. (2016). *Spanish instruction in Head Start and dual language learners' achievement*. Presentation at the Society for Research on Educational Effectiveness Spring 2016 Conference, Washington, DC.

The purpose of the current study is to determine whether Spanish language instruction is associated with school readiness skills for Head Start-eligible Spanish-speaking DLL children. It examines the relationship between Spanish instruction used by caregivers in Head Start settings and DLL children's subsequent English language academic achievement, as this may prove essential for their kindergarten readiness. (author abstract)

Miller, E. B. (2016). *Use of Spanish in Head Start and dual language learners' academic achievement: A mixed-methods study*. (Unpublished doctoral dissertation). University of California, Irvine, CA.

The number of Spanish-speaking Dual Language Learners (DLLs) is growing rapidly in the U.S., representing an increasing share of Head Start participants. The recent experimental Head Start Impact Study (HSIS) found that Spanish-speaking DLLs benefitted more from assignment to Head Start on some academic outcomes than monolingual-English speakers, and this dissertation aimed to understand whether classroom use of Spanish played a role in these impacts. Specifically, this mixed-methods dissertation sought to answer: 1) What child, family, and institutional factors are associated with enrollment in early care environments that use Spanish for instruction?; 2) Are there main effects of Spanish language instruction on Spanish-speaking DLL children's English academic school readiness skills?; and 3) Does Head Start differentially benefit Spanish-speaking DLL children instructed in Spanish? These research questions were answered using the two largest, nationally representative samples of Head Start children - the HSIS and the Head Start Family and Child Experiences Survey (FACES, 2009 Cohort). Results showed that whether children's first language was exclusively Spanish and whether other DLL families previously attended the ECE arrangement predicted whether DLL children enrolled in centers that used Spanish for instruction. Further, DLL children instructed in Spanish had higher English receptive vocabulary skills at the end of Head Start than those not instructed, with children who attended Head Start and instructed in Spanish having the highest scores. Using the results from these secondary data analyses, classroom observations were then conducted at four local Head Start sites to answer: 4) How is Spanish used in local Head Start classrooms, for what purposes, and how may the use of Spanish possibly contribute to DLL children's school readiness? Results showed that in accordance with Head Start's "whole child" model of development, Spanish was used to promote English oral language skills in academic, socio-emotional, and health domains as well as to strengthen the home-school partnership. Taken together, the results of this mixed-methods dissertation imply that Head Start should continue targeting their resources in ways that support the home language such as bilingual teacher and staff hiring, classroom language supports, and curriculum decisions that stress the importance of both languages. (author abstract)

Miller, E. B. (2017). Spanish instruction in Head Start and dual language learners' academic achievement. *Journal of Applied Developmental Psychology*, 52, 159-169.

Data from the Head Start Impact Study (N = 1141) and the Head Start Family and Child Experiences Survey, 2009 Cohort (N = 825) were used to investigate whether Spanish instruction in Head Start differentially increased Spanish-speaking Dual Language Learners' (DLLs) academic achievement. Although hypothesized that Spanish instruction would be

beneficial for DLLs' early literacy and math skills, results from residualized growth models showed there were no such positive associations. Somewhat surprisingly, DLL children instructed in Spanish had higher English receptive vocabulary skills at the end of the Head Start year than those not instructed, with children randomly assigned to Head Start and instructed in Spanish having the highest scores. Policy implications for Head Start-eligible Spanish-speaking DLLs are discussed. (author abstract)

Miller, E. B., Farkas, G., & Duncan, G. J. (2016). Does Head Start differentially benefit children with risks targeted by the program's service model?. *Early Childhood Research Quarterly*, 34(1), 1-12.
Data from the Head Start Impact Study (N = 3540) were used to test for differential benefits of Head Start after one program year and after kindergarten on pre-academic and behavior outcomes for children at risk in the domains targeted by the program's comprehensive services. Although random assignment to Head Start produced positive treatment main effects on children's pre-academic skills and behavior problems, residualized growth models showed that random assignment to Head Start did not differentially benefit the pre-academic skills of children with risk factors targeted by the Head Start service model. The models showed detrimental impacts of Head Start for maternal-reported behavior problems of high-risk children, but slightly more positive impacts for teacher-reported behavior. Policy implications for Head Start are discussed. (author abstract)

Miller, E. B., Farkas, G., Vandell, D. L., & Duncan, G. (2014). Do the effects of Head Start vary by parental preacademic stimulation? *Child Development*, 85(4), 1385-1400.
Data from the Head Start Impact Study (N = 3,185, age = 3-4 years) were used to determine whether 1 year of Head Start differentially benefited children from homes with high, middle, and low levels of parental preacademic stimulation on three academic outcome domains-early math, early literacy, and receptive vocabulary. Results from residualized growth models showed positive impacts of random assignment to Head Start on all three outcomes, and positive associations between parental preacademic stimulation and academic performance. Two moderated effects were also found. Head start boosted early math skills the most for children receiving low parental preacademic stimulation. Effects of Head Start on early literacy skills were largest for children receiving moderate levels of parental preacademic stimulation. Implications for Head Start are discussed. (author abstract)

Morris, P. A., Connors, M. C., McCoy, D., Gomez, C. J., Yoshikawa, H., & Aber, J. (2014). *Do Head Start impacts vary by neighborhood context?*. Presentation at the Society for Research on Educational Effectiveness Spring 2014 Conference, Washington, DC.
In this paper, we capitalize on the addition of geocodes for Head Start centers in which children were randomly assigned to address questions about the role of neighborhood characteristics in moderating impacts of assignment to the Head Start program. Specifically, we explore the extent to which impacts of assignment to Head Start on outcomes for children vary by the availability of alternative child care options as well as the presence of community crime and neighborhood socioeconomic disadvantage. (author abstract)

Oh, S. S. (2015). *A contributing role of parental investments in early learning to Head Start impacts on children's language and literacy: Examining how mechanisms of program impact differ for Spanish-speaking dual language learners (DLL) and non-DLL*.

(Unpublished doctoral dissertation). Harvard University, Cambridge, MA.
The national Head Start Impact Study (HSIS) estimated the average impact of an offer of Head Start treatment ("Intent-to-Treat," or ITT). The HSIS was an experimental study of a nationally-representative sample of 4,440 preschoolers, across 378 centers, in 22 states, with participating children being randomized to an offer of one year's attendance in the Head-Start Program versus assignment to a control condition, under which no offer was made but families were free to continue with whatever child-care arrangements they favored personally. The impact study found that an offer of one year's attendance in the Head Start program had small impacts on children's language and literacy. Additionally, and most interestingly, the HSIS reported that an offer of program attendance produced larger impacts among Latino Dual Language Learners (DLL,) but the question remains why these particular children benefitted from the program more than did their English-speaking peers. However, the evaluation did not investigate whether changes in parenting practices mediated these program impacts on children's learning. In this thesis, I argue that a study of the key mechanisms through which the program impacted child outcomes remains central to understanding why Head Start improved children's language and literacy. Thus, in my thesis, I have unpacked the mechanisms that mediated these detected effects--through parental practices--using two complementary estimation strategies: [1] multilevel structural-equation modeling and [2] average causal mediation effect estimation, by reanalyzing the original study data. A central aim of my research was to contribute to the body of early childhood research and inform policy directions and program development by: (a) investigating whether ITT effects on early child language outcomes were mediated through parent-child language-and-literacy activities, and (b) conducting multi-group comparisons to test whether the impact of these mediational pathways differed by the child's DLL status. I found that, on average, assignment increased children's vocabulary and reading scores (effect sizes =+.13; e.s.=+.17), respectively. The randomized offer of Head Start also increased the frequency of parent-child language-and-literacy activities (e.s.= +.25). This impact was larger for Latino parents of Spanish-speaking DLL. Additionally, I found statistically significant indirect effects: 14% of the total impact on vocabulary scores and 18% of the total impact on reading scores were mediated through parent-child language-and-literacy activities. In addition, the causal mediation effects of program impact on vocabulary and reading differed by DLL status: 12% of the impact on vocabulary was mediated through parent-child language-and-literacy activities for DLL children, compared with 18% for non-DLL. And for reading, 37% of the impact was mediated through parent-child language-and-literacy activities for DLL children vs. 4% for non-DLL children. I conclude with important directions for how early childhood programs can improve parental investment in early learning for diverse groups of children, and explanations for why mediated effects differed by language status. (author abstract)

Pratt, M. E., Lipscomb, S. T., & Schmitt, S. A. (2015). The effect of Head Start on parenting outcomes for children living in non-parental care. *Journal of Child and Family Studies*, 24(10), 2944-2956.
We examined the effect of Head Start on parenting outcomes for children living in nonparental care, or living with someone other than biological, adoptive, or step-parent. Data came from the Head Start Impact Study, a nationally representative and randomized controlled trial of Head Start-eligible children and families. Parenting outcomes included receipt of supportive services, receipt of home visiting, parental involvement at home and at

school, and frequency of spanking. Regression analyses indicated positive effects of Head Start on receipt of supportive services and home visiting, and on decreases in spanking, as well as marginal effects on greater preschool-based parent involvement (e.g., attending conferences and workshops and classroom volunteering). No effect was detected of Head Start on home-based involvement (i.e., frequency parent-child book reading and enrichment activities). These findings add to an emerging line of research suggesting that early childhood programs, such as Head Start, may be an effective and practical way of supporting non-parental families with preschool-aged children. Findings also identify potential areas for improvement in supporting non-parental families and the need for more research to further understand the role of early care and education in the lives of nonparental families. (author abstract)

Qin, X., & Hong, G. (2014). *Causal mediation analysis in multi-site trials: An application of ratio-of-mediator-probability weighting to the Head Start Impact Study*. In JSM Proceedings, Social Statistics Section (pp. 912-926). Alexandria, VA: American Statistical Association.

This study focuses on developing methods for causal mediation analysis in multisite trials and uses the national Head Start Impact Study as a motivating example. The causal effects of interest, defined in terms of potential outcomes, include the indirect effect of assignment to Head Start programs on child vocabulary learning mediated by a program-induced increase in parent reading to child and the direct effect of Head Start programs. The goal is to reveal not only the prevalent causal mechanism but also how the mechanism may vary across sites. Extending the ratio-of-mediator-probability weighting (RMPW) approach to causal mediation analysis in multi-site trials, we estimate the average direct effect, the average indirect effect, and the between-site variance and covariance of these causal effects. This strategy allows for treatment-by-mediator interaction. It greatly simplifies the outcome model specification and therefore avoids possible model misspecifications. The performance of the approach is assessed across a range of multi-site designs that differ in the number of sites and the sample size per site. We investigate the relative strengths and limitations of the RMPW strategy through simulations. (author abstract)

Resnick, G. (2010). *Project Head Start: Quality and links to child outcomes*. In A. J. Reynolds, A. J. Rolnick, M. M. Englund, & J. A. Temple (Eds.). Childhood programs and practices in the first decade of life: A human capital integration (pp. 121-156). New York: Cambridge University Press.

Whether Head Start is able to reduce the achievement gap and indeed whether it "works" has been a hotly debated topic since its inception, and legislative pressures to demonstrate program performance and accountability are increasing. Evaluation of its effectiveness has had a somewhat checkered past, partly because of changes in program philosophy, debates about the most appropriate and expectable outcomes from the program, and the evaluation methods that can best demonstrate these effects. In particular, several key questions have emerged, broadly stated as follows: 1. What is the quality of Head Start classrooms as early learning environments, how does it compare to other early childhood education settings, and what factors predict variations in quality? 2. Do children make significant gains in their school-readiness skills during the Head Start year and into kindergarten, and are these gains due to their exposure to Head Start? 3. Is program quality related to children's gains during Head Start and into kindergarten? 4. What difference does participation in Head Start make

to key school-readiness outcomes and parental practices for children and parents from low-income families? 5. Under what circumstances does Head Start achieve the greatest impact? What works for which children? Which Head Start services are most related to impact? To answer these key questions, this chapter reviews the state of the national Head Start program, with emphasis on the findings from the Head Start Child and Family Experiences Survey (FACES) and the Head Start Impact Study (HSIS). (author abstract)

Sabol, T. J., & Chase-Lansdale, P. (2015). The influence of low-income children's participation in Head Start on their parents' education and employment. *Journal of Policy Analysis and Management*, 34(1), 136-161.
Head Start is the oldest and largest federally funded preschool program in the United States. From its inception in 1965, Head Start not only provided early childhood education, care, and services for children, but also sought to promote parents' success. However, almost all evaluation studies of Head Start have focused solely on children's cognitive and social outcomes rather than on parents' outcomes. The present study examines whether children's participation in Head Start promotes parents' educational advancement and employment. We use data from the Head Start Impact Study (HSIS), a randomized trial of over 4,000 newly entering three- and four-year-old children. We find that parents of children in the three-year-old cohort (but not the four-year-old cohort), who were randomly assigned to and participated in Head Start, had steeper increases in their own educational attainment by child age six years compared to parents of children in the control group. This pattern is especially strong for parents who had at least some college experience at baseline, as well as for African-American parents. We do not find evidence that Head Start helped parents enter or return to the workforce over time. Results are discussed in the context of using high-quality early childhood education as a platform for improving both child and parent outcomes. (author abstract)

Schmitt, S. A., & Lipscomb, S. T. (2016). Longitudinal associations between residential mobility and early academic skills among low-income children. *Early Childhood Research Quarterly*, 36(3), 190-200.
The present study examines the direct and indirect relations between residential mobility during the year prior to kindergarten and academic skills (math, letter-word identification, and spelling) in the early elementary years for children from low-income families. Data were obtained from the Head Start Impact Study. The sample included 3627 children (50% male) who were eligible for Head Start. At base-line, children were on average a little over 4-years-old ([mean] = 49.12 months, SD = 6.79). The sample was ethnically/racially diverse and had a range of maternal education levels. Residential mobility was conceptualized as either not moving (70% of the sample) or moving one or more times (30% of the sample) during prekindergarten. Data were collected at baseline (fall of 2002) and in the spring of prekindergarten, kindergarten and 1st grade. When controlling for a set of demographic, family, and child covariates, results from three separate path analyses indicated that mobility had consistently negative associations with children's academic skills but that these links were quite small, especially when looking beyond the prekindergarten year. Mobility during prekindergarten had small direct associations with all three skill areas (math, letter-word identification, spelling) at the end of prekindergarten, and significant but even smaller links with two of the three skills at the end of kindergarten and 1st grade. In addition, mobility had small indirect relations with all three skill areas in kindergarten and 1st grade,

mediated through these same skills in prekindergarten and kindergarten. Implications of study findings for supporting low-income families and directions for future research are discussed. (author abstract)

Schmitt, S. A., Pratt, M. E., & Lipscomb, S. T. (2017). Residential mobility predicts behavioral problems for children living in non-parental care during the transition to kindergarten. *Children and Youth Services Review*, 77, 101-109.
The present study examines the extent to which residential mobility during the transition to kindergarten (cumulative moves during prekindergarten and kindergarten) is related to externalizing and internalizing behavior problems for children from low-income families who are living in non-parental care. A second, exploratory aim of this study was to investigate whether family service receipt moderated these relations. Data were obtained from the Head Start Impact Study. The sample included 300 children (53% male) who were eligible for Head Start. Residential mobility was conceptualized as three dichotomous variables: never moved, moved 1-2 times, and moved 3 or more times during the prekindergarten and kindergarten years. Predictor and outcome data were collected in the spring of prekindergarten and kindergarten. Moving three or more times was significantly related to more externalizing and internalizing behavior problems in kindergarten, controlling for family and child covariates, as well as for children's behavior problems in prekindergarten. Receipt of family services moderated the association between moving three or more times and externalizing problems, but not internalizing problems. This relation was in the opposite direction than expected, however, such that children who moved frequently and received more services demonstrated more externalizing problems than their peers. Implications of study findings for supporting highly mobile children living in non-parental care and directions for future research are discussed. (author abstract)

Sherry, T. (2012). *Head Start, home, or other child care centers: What promotes healthy child development?*. In Maternal health and child development programs in the United States and Rwanda: An evaluation of policies to improve quality and efficiency (pp. 38-90). (Unpublished doctoral dissertation). Harvard University, Cambridge, MA.
In this study, I apply methods from the literature on broken experiments to the HSIS, to account for heterogeneity in the care settings of control group children and address two fundamental questions about Head Start: first, what is the incremental benefit of Head Start over home based care? Second, what is the incremental benefit of Head Start over other types of center-based care? I find that Head Start achieves larger and more persistent gains in child development outcomes relative to home based care, and only small, transient gains compared to other non-Head Start centers. Head Start does, however, achieve larger impacts on behavior problems and access to health care than other centers. (author abstract)

Sherry, T. (2012). *Targeting in Head Start: Which strategies improve equity and efficiency?*. In Maternal health and child development programs in the United States and Rwanda: An evaluation of policies to improve quality and efficiency (pp. 91-130). (Unpublished doctoral dissertation). Harvard University, Cambridge, MA .
Using data from the HSIS, this paper examines whether targeting can improve the efficiency of Head Start and assesses the distributional consequences of different targeting strategies. I first assess whether prioritizing enrollment based on a child's likelihood of otherwise

attending home- or center-base care, or based on the age at which a child enters Head Start, affects efficiency and equity. I then examine whether additional child and family characteristics might predict variations in Head Start's impacts by modeling treatment heterogeneity, and simulate the impacts of targeting strategies based on these characteristics on the efficiency and equity of Head Start. I find that targeting in Head Start can significantly raise average program impacts, but that some targeting strategies also have undesirable distributional consequences. Specifically, targeting Head Start enrollment towards entering 4 year-olds who are otherwise likely to receive home-based care achieves the largest efficiency gains, but has the undesirable result of decreasing the enrollment of African American children. Further prioritizing the enrollment of children from the most disadvantaged households, however, can eliminate this racial disparity while also maintaining efficiency gains. (author abstract)

Spencer, M. (2016). *A latent change score modeling approach to investigating developmental relations between phonological awareness and decoding ability in early readers*. (Unpublished doctoral dissertation). Florida State University, Tallahassee, FL.
The present study investigated the dynamic developmental relations between phonological awareness and decoding ability in two groups of 3- and 4-year-old children (N = 2,513) from the Head Start Impact Study (U.S. Department of Health and Human Services, 2002-2006) who were followed through the end of kindergarten. Children were randomly assigned to either receive Head Start or not. Using latent change score modeling methods, I tested several hypotheses regarding developmental influences among these literacy skills: (1) phonological awareness and decoding skills are developmentally correlated but do not influence one another; (2) phonological awareness influences decoding ability; (3) decoding ability influences phonological awareness; or (4) phonological awareness and decoding ability simultaneously influence one another. Results indicated that decoding ability predicted change in phonological awareness for 3- and 4-year-old children. The same trend emerged when the 3- and 4-year-olds were examined separately. Mixture modeling suggested no evidence for more than one latent class for both Head Start participants and controls, indicating an absence of differing developmental trajectories. The implications of these findings are discussed. (author abstract)

Sproul, F. (2012). *Effects of family involvement: Early childhood cognitive outcomes using longitudinal growth curve models*. (Unpublished doctoral dissertation). Temple University, Philadelphia, PA.
Early childhood education and family involvement have been shown to provide a positive impact on students' academic achievement regardless of socioeconomic circumstances and background. They have been regarded as two of the most important protective factors in maximizing outcomes for children at risk, especially those from low-income backgrounds. The overall objective of this study was to examine how family involvement changes over time, whether it predicted cognitive outcomes for preschool populations, and potential variables that mediate the relationship between family involvement and outcomes. Data from the Head Start Impact Study conducted through the Department of Health and Human Services (DHHS) were used to answer the research questions. Exploratory and Confirmatory analysis revealed three dimensions of home involvement based on survey items: involvement related to literacy, numeracy, and family resources. Growth curve models suggested increased levels of involvement as children progressed from preschool to first grade. Higher

levels of involvement for Literacy for observed for children in Head Start during the first data collection follow-up. The types of involvement were significantly related to cognitive scores as measured by the PPVT-III and WJ-III Achievement. Parenting styles acted as a mediator between involvement and cognitive outcomes. Implications for policy and practice related to transition services are discussed. (author abstract)

Stuart, E. A., & Rhodes, A. (2017). Generalizing treatment effect estimates from sample to population: A case study in the difficulties of finding sufficient data. *Evaluation Review*, 41(4), 357-388.

Background: Given increasing concerns about the relevance of research to policy and practice, there is growing interest in assessing and enhancing the external validity of randomized trials: determining how useful a given randomized trial is for informing a policy question for a specific target population. Objectives: This article highlights recent advances in assessing and enhancing external validity, with a focus on the data needed to make ex post statistical adjustments to enhance the applicability of experimental findings to populations potentially different from their study sample. Research design: We use a case study to illustrate how to generalize treatment effect estimates from a randomized trial sample to a target population, in particular comparing the sample of children in a randomized trial of a supplemental program for Head Start centers (the Research-Based, Developmentally Informed study) to the national population of children eligible for Head Start, as represented in the Head Start Impact Study. Results: For this case study, common data elements between the trial sample and population were limited, making reliable generalization from the trial sample to the population challenging. Conclusions: To answer important questions about external validity, more publicly available data are needed. In addition, future studies should make an effort to collect measures similar to those in other data sets. Measure comparability between population data sets and randomized trials that use samples of convenience will greatly enhance the range of research and policy relevant questions that can be answered. (author abstract)

Tang, Y. (2014). *Reducing bias and increasing precision by adding either a pretest measure of the study outcome or a nonequivalent comparison group to the basic regression discontinuity design*. In Reducing bias and increasing precision in nonexperimental studies (pp. 82-112). (Unpublished doctoral dissertation). Northwestern University, Evanston, IL.

This paper raises three questions about CRD designs: first, to what extent do CRD-Pre and CRD-CG reduce bias and increase precision compared to RD? Second, which is better for reducing bias and increasing precision - CRD-Pre or CRD-CG? Third, to what extent are CRD-Pre and CRD-CG as good as the RCT in producing unbiased and precise estimates? To answer these questions, we will first estimate the usual RCT ATE as well as RCT local effects at and above the cutoff. These local effects also serve as benchmarks to compare with RD, CRD-Pre and CRD-CG. Second, we will check if the parallel assumption is met. Our hypothesis is that if the parallel assumption is met, CRD will produce unbiased causal estimates. When it is not met, the estimation of treatment effect is likely to suffer from bias. Third, to compare RD, CRD designs with RCT benchmarks, we propose our own criterion to define how similar the two estimates need to be in order to consider as though they are similar. Fourth, within the limit of our definition of accuracy, we will compare RD, CRD-Pre and CRD-CG estimates with RCT benchmarks to check the accuracy and precision of the estimates, both at and away

from the cutoff. We will separate the results when the CRD parallel assumption is met and when it is not. Lastly, we will compare CRD designs with RD, CRD-Pre with CRD-CG, and CRD designs with RCT to study whether CRD designs improve RD, which CRD design has smaller bias and greater precision, and the performance of CRD designs relative to RCT. (author abstract)

Tang, Y., Cook, T. D., & Kisbu-Sakarya, Y. (2017). Statistical power for the comparative regression discontinuity design with a nonequivalent comparison group. *Psychological Methods*, , 1-19.
In the "sharp" regression discontinuity design (RD), all units scoring on one side of a designated score on an assignment variable receive treatment, whereas those scoring on the other side become controls. Thus the continuous assignment variable and binary treatment indicator are measured on the same scale. Because each must be in the impact model, the resulting multi-collinearity reduces the efficiency of the RD design. However, untreated comparison data can be added along the assignment variable, and a comparative regression discontinuity design (CRD) is then created. When the untreated data come from a non-equivalent comparison group, we call this CRD-CG. Assuming linear functional forms, we show that power in CRD-CG is (a) greater than in basic RD; (b) less sensitive to the location of the cutoff and the distribution of the assignment variable; and that (c) fewer treated units are needed in the basic RD component within the CRD-CG so that savings can result from having fewer treated cases. The theory we develop is used to make numerical predictions about the efficiency of basic RD and CRD-CG relative to each other and to a randomized control trial. Data from the National Head Start Impact study are used to test these predictions. The obtained estimates are closer to the predicted parameters for CRD-CG than for basic RD and are generally quite close to the parameter predictions, supporting the emerging argument that CRD should be the design of choice in many applications for which basic RD is now used. (author abstract)

Tang, Y., Cook, T. D., Kisbu-Sakarya, Y., Hock, H., & Chiang, H. (2017). The comparative regression discontinuity (CRD) design: An overview and demonstration of its performance relative to basic RD and the randomized experiment. *Advances in Econometrics*, 38, 237-279.
Relative to the randomized controlled trial (RCT), the basic regression discontinuity (RD) design suffers from lower statistical power and lesser ability to generalize causal estimates away from the treatment eligibility cutoff. This chapter seeks to mitigate these limitations by adding an untreated outcome comparison function that is measured along all or most of the assignment variable. When added to the usual treated and untreated outcomes observed in the basic RD, a comparative RD (CRD) design results. One version of CRD adds a pretest measure of the study outcome (CRD-Pre); another adds posttest outcomes from a nonequivalent comparison group (CRD-CG). We describe how these designs can be used to identify unbiased causal effects away from the cutoff under the assumption that a common, stable functional form describes how untreated outcomes vary with the assignment variable, both in the basic RD and in the added outcomes data (pretests or a comparison group's posttest). We then create the two CRD designs using data from the National Head Start Impact Study, a large-scale RCT. For both designs, we find that all untreated outcome functions are parallel, which lends support to CRD's identifying assumptions. Our results also indicate that CRD-Pre and CRD-CG both yield impact estimates at the cutoff that have a

similarly small bias as, but are more precise than, the basic RD's impact estimates. In addition, both CRD designs produce estimates of impacts away from the cutoff that have relatively little bias compared to estimates of the same parameter from the RCT design. This common finding appears to be driven by two different mechanisms. In this instance of CRD-CG, potential untreated outcomes were likely independent of the assignment variable from the start. This was not the case with CRD-Pre. However, fitting a model using the observed pretests and untreated posttests to account for the initial dependence generated an accurate prediction of the missing counterfactual. The result was an unbiased causal estimate away from the cutoff, conditional on this successful prediction of the untreated outcomes of the treated. (author abstract)

Tracy, A. (2014). *The effect of Head Start on teacher-child relationships: Mechanisms and moderation by children's problem behavior*. (Unpublished master's thesis). Oregon State University, Corvallis, OR.

Positive teacher-child relationships, characterized by warmth and closeness, are associated with better behavioral and academic outcomes for children in preschool and elementary school (Hamre & Pianta, 2005). Supporting teachers to establish these positive relationships with children is important in all early care and education (ECE) programs. Head Start programs, designed to address the needs of the whole child, including healthy relationships with teachers, may be particularly effective in facilitating positive teacher-child relationships (Zigler & Styfco, 2010). The current study examined the role of Head Start in supporting teachers in establishing more positive and less conflictual relationships with children, including potential mechanisms of influence, and moderation by children's levels of problem behaviors. The study utilized data from the Head Start Impact Study, a nationally representative randomized control trial of 4,442 Head Start-eligible children and families assigned to either Head Start (n= 2,783) or a community control group (n= 1,884; U.S. DHHS, 2010a). No significant direct effect of Head Start on teacher-child closeness was detected. Indirect effects of Head Start on teacher-child relationships mediated through teacher supports and mentoring were only found for children without problem behaviors. Findings from the current study suggest a greater need for professional development efforts, specifically providing strategies effective in managing children with problem behaviors. (author abstract)

Walters, C. R. (2014). *Inputs in the production of early childhood human capital: Evidence from Head Start*. (NBER Working Paper No. 20639). Cambridge, MA: National Bureau of Economic Research.

Studies of small-scale "model" early-childhood programs show that high-quality preschool can have transformative effects on human capital and economic outcomes. Evidence on the Head Start program is more mixed. Inputs and practices vary widely across Head Start centers, however, and little is known about variation in effectiveness within Head Start. This paper uses data from a multi-site randomized evaluation to quantify and explain variation in effectiveness across Head Start childcare centers. I answer two questions: (1) How much do short-run effects vary across Head Start centers? and (2) To what extent do inputs, practices, and child characteristics explain this variation? To answer the first question, I use a selection model with random coefficients to quantify heterogeneity in Head Start effects, accounting for non-compliance with experimental assignments. Estimates of the model show that the cross-center standard deviation of cognitive effects is 0.18 test score standard deviations,

which is larger than typical estimates of variation in teacher or school effectiveness. Next, I assess the role of observed inputs, practices and child characteristics in generating this variation, focusing on inputs commonly cited as central to the success of model programs. My results show that Head Start centers offering full-day service boost cognitive skills more than other centers, while Head Start centers offering frequent home visiting are especially effective at raising non-cognitive skills. Head Start is also more effective for children with less-educated mothers. Centers that draw more children from center-based preschool have smaller effects, suggesting that cross-center differences in effects may be partially due to differences in counterfactual preschool options. Other key inputs, including the High/Scope curriculum, teacher education, and class size, are not associated with increased effectiveness in Head Start. Together, observed inputs explain about one-third of the variation in Head Start effectiveness across experimental sites. (author abstract)

Walters, C. R. (2015). Inputs in the production of early childhood human capital: Evidence from Head Start. *American Economic Journal: Applied Economics*, 7(4), 76-102.
This paper uses data from a randomized evaluation of Head Start to answer two questions: (i) How much do short-run causal effects vary across Head Start centers? and (ii) Do observed inputs explain this variation? I find that the cross-center standard deviation of cognitive effects is 0.18 test score standard deviations, which is larger than typical estimates of variation in teacher or school effectiveness. Centers offering full-day service and home visiting are more effective, while centers that draw more children from center-based preschool have smaller effects. Other key inputs, including the High/Scope curriculum, teacher education, and class size are not correlated with Head Start effectiveness. (author abstract)

Weiss, M. J., Bloom, H. S., Verbitsky-Savitz, N., Gupta, H., Vigil, A. E., & Cullinan, D. (2017). How much do the effects of education and training programs vary across sites?: Evidence from past multisite randomized trials. *Journal of Research on Educational Effectiveness*, 10(4), 843-876.
Multisite trials, in which individuals are randomly assigned to alternative treatment arms within sites, offer an excellent opportunity to estimate the cross-site average effect of treatment assignment (intent to treat or ITT) and the amount by which this impact varies across sites. Although both of these statistics are substantively and methodologically important, only the first has been well studied. To help fill this information gap, we estimate the cross-site standard deviation of ITT effects for a broad range of education and workforce development interventions using data from 16 large multisite randomized controlled trials. We use these findings to explore hypotheses about factors that predict the magnitude of cross-site impact variation, and we consider the implications of this variation for the statistical precision of multisite trials. (author abstract)

Zhai, F., Brooks-Gunn, J., & Waldfogel, J. (2014). Head Start's impact is contingent on alternative type of care in comparison group. *Developmental Psychology*, 50(12), 2572-2586.
Using data (n = 3,790 with 2,119 in the 3-year-old cohort and 1,671 in the 4-year-old cohort) from 353 Head Start centers in the Head Start Impact Study, the only large-scale randomized experiment in Head Start history, this article examined the impact of Head Start on children's cognitive and parent-reported social-behavioral outcomes through first grade contingent on

the child care arrangements used by children who were randomly assigned to the control group (i.e., parental care, relative/nonrelative care, another Head Start program, or other center-based care). A principal score matching approach was adopted to identify children assigned to Head Start who were similar to children in the control group with a specific care arrangement. Overall, the results showed that the effects of Head Start varied substantially contingent on the alternative child care arrangements. Compared with children in parental care and relative/nonrelative care, Head Start participants generally had better cognitive and parent-reported behavioral development, with some benefits of Head Start persisting through first grade; in contrast, few differences were found between Head Start and other center-based care. The results have implications regarding the children for whom Head Start is most beneficial as well as how well Head Start compares with other center-based programs. (author abstract)

Summaries, Analyses, and Commentaries

Burke, L., & Muhlhausen, D. B. (2013). *Head Start impact evaluation report finally released* (Issue Brief No. 3823). Washington, DC: Heritage Foundation.
This issue brief discusses results of the third-grade follow-up to the Head Start Impact Study, outlining impacts on: cognitive development; social-emotional development; child health outcomes; and parent practices. Recommendations to policymakers concerning federal funding and state-subsidized options for private preschool are provided.

Child Trends. (2011). *Research-based responses to key questions about the 2010 Head Start Impact Study* (Early Childhood Highlights Vol. 2, Issue 1, Publication No. 2011-06). Washington, DC: Child Trends.
This document provides background information on the Head Start program and discusses key findings from the Impact Study through a series of a questions and answers. It concludes with commentary on the Impact Study from a research perspective, highlighting key policy and practice considerations relating to supporting developmentally appropriate and effective early childhood interventions, specifically noting that: (1) Head Start's whole-child program model is research-based and developmentally appropriate for promoting school readiness and strengthening families; (2) Starting early with high-quality interventions makes a difference; (3) The Impact Study shows how Head Start is contributing to measurable developmental gains for certain subgroups of disadvantaged children. However, rigorous program improvement is needed to improve Head Start's overall effectiveness in supporting the developmental needs of disadvantaged children and their families; (4) In considering program improvements, decision makers would benefit from a better understanding of factors that contribute to successful transitions from early learning settings to elementary school; (5) Findings from the Impact Study should be considered alongside other research on Head Start and early childhood. (author abstract)

Gibbs, C., Ludwig, J., & Miller, D. L. (2013). *Head Start origins and impacts*. In M. J. Bailey & S. Danziger (Eds.), Legacies of the war on poverty (pp. 39-65). New York: Russell Sage Foundation.
This chapter describes the goals and evolution of the Head Start program since its inception, and argues that despite fifty years of research on the program considerable debate remains

about whether the program generates long-term improvements in the life chances of low-income children. As the research designs and data available to study Head Start have improved, we have seen accumulating evidence that for children participating in Head Start several decades ago, the program has had important long-term impacts on outcomes like schooling attainment and earnings despite fade-out of the program's initial impacts on achievement test scores. A similar pattern has been observed for other early childhood interventions as well. For more recent cohorts of Head Start children, for whom only short-run impacts can be measured, we see similar signs of short-term test score impacts that then dissipate. One common hypothesis is that Head Start and other early interventions have impacts on nonacademic or "social-cognitive" skills that mediate long-term improvements in adult outcomes. Unfortunately, too little is currently known about how this process works to determine whether the children participating in Head Start today will experience the same long-term benefits experienced by previous program participants. Current claims that Head Start does not work may be too pessimistic, or at the very least premature. (author abstract)

Healy, C. (2015). Who benefits most from Head Start programs?. *Chicago Policy Review*.
This document reports on a study and its findings regarding children's cognitive gains and whether they persist long-term based on data from the Head Start Impact Study.

Laosa, L. M. (2006). *Preschool program effects on Hispanic children's cognitive development: Is pre-k preparing Hispanic children to succeed in school?* New Brunswick, NJ: National Institute for Early Education Research.
An examination of the effects of preschool education on the cognitive development of Hispanic children based on research findings from an evaluation of Oklahoma's universal prekindergarten program, the Head Start Impact Study, and the Early Childhood Longitudinal Study, Kindergarten Cohort (ECLS-K).

Ludwig, J., & Phillips, D. A. (2008). Long-term effects of Head Start on low-income children. *Annals of the New York Academy of Sciences*, 1136, 257-268.
A growing body of research suggests that the first few years of life are a particularly promising time to intervene in the lives of low-income children, although the long-term effects on children of the U.S. government's primary early childhood program - Head Start - remains the topic of debate. In this article we review what is known about Head Start and argue that the program is likely to generate benefits to participants and society as a whole that are large enough to justify the program's costs. Although in principle there could be more beneficial ways of deploying Head Start resources, the benefits of such changes remain uncertain and there is some downside risk. (author abstract)

Montialoux, C. (2016). *Revisiting the impact of Head Start*. Berkeley: University of California, Berkeley, Institute for Research on Labor and Employment.
This policy brief discusses new evidence regarding the effectiveness of Head Start. Head Start is the largest federal early intervention and education program in the United States, serving almost one million children in 2015. It was created in 1965 to narrow the gap between disadvantaged and more privileged children as they entered kindergarten, by providing comprehensive programming in preschool to improve children's school readiness. Early studies of Head Start and other pre-school programs found large positive effects on both cognitive and non-cognitive skills. But the first randomized experimental study of Head Start

(the Head Start Impact Study, or HSIS), conducted in 2002, indicated that the program produced smaller benefits that faded out quickly. Some have interpreted this as evidence that Head Start is ineffective. Several recent studies by Berkeley authors, however, have shown that the HSIS data, when interpreted appropriately, indicates that the program has significant benefits. Some of these benefits are persistent. When compared to at-home care, rather than to attending a similar program, attending a Head Start center generates positive effects on children's development. This implies that the social return to Head Start spending is larger than previous analyses of HSIS data suggested. Moreover, the small average effects of Head Start mask significant variation in its benefits across groups of children and across Head Start centers. These new analyses represent an important contribution to the question of under what circumstances and for whom does Head Start work best. (author abstract)

Muhlhausen, D. B., & Lips, D. (2010). *Head Start earns an F: No lasting impact for children by first grade* (Backgrounder No. 2363). Washington, DC: Heritage Foundation.
Recently released results from the Head Start Impact Study indicate that the benefits of participating in Head Start almost completely disappear by first grade. While other studies have previously assessed Head Start's effectiveness, this is the only study that used a rigorous experimental design. Given this strongly negative evaluation, Congress should reconsider spending more than $9 billion per year on a program that produces few positive lasting effects. Furthermore, instead of creating yet another new federal preschool program at a cost of $8 billion, Congress and the Obama Administration should focus on terminating, consolidating, and reforming existing preschool and child care programs to better serve children's needs and to improve efficiency for taxpayers. (author abstract)

National Forum on Early Childhood Policy and Programs. (2010). *Understanding the Head Start Impact Study*. Cambridge, MA: Harvard University, Center on the Developing Child.
The 2010 report of the Head Start Impact Study is an important follow-up evaluation of the only national investigation that attempts to answer the question: What are the program's impacts, as measured at the end of first grade, for children who received Head Start services when they were 3 or 4 years of age? The Impact Study took advantage of the fact that most Head Start centers across the nation have waiting lists of parents wishing to enroll their children in the program. Using a random, lottery-like process, 3-year-olds and 4-year-olds on the waiting list were offered the opportunity to enroll. This resulted in two groups (or experimental "conditions") -- children who were offered the chance to enroll in Head Start and those who were not. Both groups were followed to the end of first grade. Overall, the study was sound scientifically, but there has been considerable debate over what its findings mean. Further analysis of the data will undoubtedly support additional conclusions, but this brief offers a research-based interpretation of the findings presented in the Impact Study itself. (author abstract)

United States. Administration for Children and Families. Office of Planning, Research and Evaluation. (2001). *Building futures: Head Start Impact Study: Frequently asked questions*. Washington, DC: Administration for Children and Families, Office of Planning, Research and Evaluation.
This document addresses 34 frequently asked questions about the Head Start Impact Study.

United States. Administration for Children and Families. Office of Planning, Research and

Evaluation. (2001). *Building futures Head Start Impact Study: Presentation at the National Head Start Association's 28th annual Training Conference, Orlando, Florida, May 16-19, 2001*. Paper presented at the annual National Head Start Association Training Conference, Orlando, FL.
This presentation was made at the National Head Start Association's 28th Annual Training Conference in Florida, 2001. It addresses the design of the Head Start Impact Study, and provides information on data collection sources, measures, and benefits to child care centers' participation in and support of the study.

United States. Administration for Children and Families. Office of Planning, Research and Evaluation. (2002). *Building futures Head Start Impact Study: National Head Start Impact Study [PowerPoint]*. Presentation at Head Start's National Research Conference, Washington, DC.
This presentation at Head Start's National Research Conference in 2002 examines the background and objectives, design, measures, and recruitment aspects of the Head Start Impact Study.

What Works Clearinghouse (Institute of Education Sciences). (2010). *WWC quick review of the report "Head Start Impact Study: Final report"*. Washington, DC: What Works Clearinghouse (Institute of Education Sciences).
The study compared the outcomes of children who were offered enrollment in Head Start to the outcomes of children who were not offered enrollment. School-readiness outcomes, which are the focus of this quick review, were measured using standardized cognitive assessments of language and literacy, pre-writing, and math skills administered at the end of each year through first grade. (author abstract)

Zaslow, M. (2008). An overview of the lessons of the Head Start Impact Study. *Infants and Young Children*, 21(1), 4-17.
The Head Start program has a history of using research to guide its efforts. In this way, Head Start practitioners, policy makers, and researchers comprise a "learning community." The release of the first-year results of the Head Start Impact Study provides an important opportunity for reflection by the learning community, and for identification of strategies to further strengthen the program. This article begins by illustrating how Head Start has responded to previous research. It then underscores some key features of the Head Start Impact Study that set it apart from other important evaluation studies. Within this framework, the article goes on to identify a set of key issues that the first-year results of the Head Start Impact Study pose for the learning community to consider in charting the future course of the program as well as to others focusing on strengthening young children's school readiness. (author abstract)

Zigler, E. F. (2010). *Putting the national Head Start Impact Study into a proper perspective* (NHSA Dialog Briefs Vol. 13 Issue 1). Alexandria, VA: National Head Start Association.
Researchers from across the political spectrum have already analyzed and made interpretations of the National Head Start Impact Study's findings. In this Dialog Brief, Dr. Edward Zigler, one of the founders of Head Start and a child development scholar for over half a century, places the National Head Start Impact Study in proper perspective. Dr. Zigler discusses the study's methodology and the magnitudes of the findings. There are favorable

impacts on parenting practices and child outcomes in the cognitive, socioemotional, and health domains. Next, he puts the study's findings within the context of decades of research on Head Start and other preschool programs. Finally, Dr. Zigler teaches us the real lessons of the National Head Start Impact Study. (author abstract)

Instruments

Child Care & Early Education Research Connections. (2012). *HSIS Instrument Matrix*. New York: Child Care & Early Education Research Connections.
The Head Start Impact Study (HSIS) uses many instruments to collect data. This document provides a complete list of the HSIS instruments indexed in the Research Connections' database. Every instrument is hyperlinked to its corresponding record and "X"s designate which cohorts they were used in. Other alpha characters represent the instruments' availability: OS = obtainable through the original source; RC = obtainable through Research Connections. While all instruments are listed, those instruments that are copyrighted are not available. To access a particular instrument, click on the appropriate link.

Westat, Inc. (2002). *Head Start Impact Study (HSIS) Fall 2002 Parent Interview*. Unpublished instrument.

Westat, Inc. (2003). *Head Start Impact Study (HSIS) Spring 2003 Care Provider Interview*. Unpublished instrument.

Westat, Inc. (2003). *Head Start Impact Study (HSIS) Spring 2003 Center Director Interview*. Unpublished instrument.

Westat, Inc. (2003). *Head Start Impact Study (HSIS) Spring 2003 Parent Interview*. Unpublished instrument.

Westat, Inc. (2003). *Head Start Impact Study (HSIS) Spring 2003 Teacher Survey*. Unpublished instrument.

Westat, Inc. (2004). *Head Start Impact Study (HSIS) Spring 2004 Care Provider Interview*. Unpublished instrument.

Westat, Inc. (2004). *Head Start Impact Study (HSIS) Spring 2004 Center Director Interview*. Unpublished instrument.

Westat, Inc. (2004). *Head Start Impact Study (HSIS) Spring 2004 Parent Interview Cohort A*. Unpublished instrument.

Westat, Inc. (2004). *Head Start Impact Study (HSIS) Spring 2004 Parent Interview Cohort B*. Unpublished instrument.

Westat, Inc. (2004). *Head Start Impact Study (HSIS) Spring 2004 Teacher Survey Cohort A*. Unpublished instrument.

Westat, Inc. (2004). *Head Start Impact Study (HSIS) Spring 2004 Teacher Survey Cohort B*. Unpublished instrument.

Westat, Inc. (2005). *Head Start Impact Study (HSIS) Spring 2005 Parent Interview Data Cohort A*. Unpublished instrument.

Westat, Inc. (2005). *Head Start Impact Study (HSIS) Spring 2005 Parent Interview Data Cohort B*. Unpublished instrument.

Westat, Inc. (2005). *Head Start Impact Study (HSIS) Spring 2005 Teacher Survey First Grade*. Unpublished instrument.

Westat, Inc. (2005). *Head Start Impact Study (HSIS) Spring 2005 Teacher Survey Kindergarten*. Unpublished instrument.

Westat, Inc. (2006). *Head Start Impact Study (HSIS) Spring 2006 Parent Interview Data Cohort A*. Unpublished instrument.

Westat, Inc. (2006). *Head Start Impact Study (HSIS) Spring 2006 Teacher Survey Data First Grade*. Unpublished instrument.

Westat, Inc. (2006). *Head Start Impact Study (HSIS) Spring 2006 Teacher Survey Data Kindergarten*. Unpublished instrument.

Westat, Inc.. (2007). *Head Start Impact Study (HSIS) Spring 2007/2008 Principal Interview Third Grade*. Unpublished instrument.

Westat, Inc.. (2007). *Head Start Impact Study (HSIS) Spring 2007/2008 Teacher's Child Report Third Grade*. Unpublished instrument.

Westat, Inc.. (2007). *Head Start Impact Study (HSIS) Spring 2007/2008 Teacher Survey Third Grade*. Unpublished instrument.

Westat, Inc.. (2007). *Head Start Impact Study (HSIS) Spring 2007/2008 Parent Interview Third Grade*. Unpublished instrument.

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