Subsidy Utilization and Impact on Early Care and Education of Low-income Children with Special Needs
Project Team: Amanda L. Sullivan, PhD (PI), Amy Susman-Stillman, PhD (Co-PI), Elyse Farnsworth (Research Assistant), A. Jordan Thayer (Research Assistant)
Grant or Contract Number: 90YE0166
Period of Funding: 09/30/2015 through 5/31/2017

Introduction and Purpose.

Special needs are common in early childhood. As many as 15% of infants and young children experience delays and disorders that affect growth and development. These conditions affect not only the child, but the family as well. Of particular concern in the present project were the relations of special needs and early care experiences since special needs may affect family's access to and quality of childcare. Furthermore, poverty can increase risk of special needs, and compound challenges related to early care and education.

The principal objective of this project was to describe the nature and impact of childcare subsidy use by low-income families eligible for subsidies who have children with special needs. Further, a goal was to understand how childcare characteristics influence kindergarten outcomes among subsidy-eligible children with special needs as well as how the early care experiences of low income children with and without special needs differ.

Research Questions.

- Do patterns and predictors of subsidy use among children with disabilities or delays differ from those of typically developing children within the population of subsidy-eligible low-income families?
- Are there differences in care types and quality and predictors thereof between children with special needs and typically-developing children from low-income families who do and do not receive subsidies?
- How are subsidy receipt, care type, and care quality are related to school readiness of children with special needs who come from subsidy-eligible families?

Method.

Research questions were addressed via secondary data analysis of the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B), which includes a nationally-representative sample of approximately 10,700 children born in the United States in 2001 and who attended kindergarten in 2006 or 2007. Descriptive and multivariate analyses were applied to ascertain patterns and predictors of subsidy use, care type and quality, and resultant early education outcomes among young children with special needs and their peers without disabilities.

Data

ECLS-B data were collected using a complex, stratified sampling design that included oversampling of low frequency groups (twins, low birth weight, Asian, Native American). Data were collected at birth, 9-months, 2-years, 4-years, and kindergarten by trained field investigators engaging multiple informants and methods to gather data on how children and families' characteristics and early experiences influenced participants' health, education, and developmental outcomes. Informants included the child's primary caregiver (usually the mother), early care providers, fathers when possible, kindergarten teachers, and the participants. Data were collected via structured interviews, observations, surveys, birth certificate records, and direct child assessment.

Measures

Data from birth certificate records, 9-months, 2-years, 4-years, and kindergarten were used. Measures included data that was collected via record review, parent interview, childcare provider interview, and direct child assessment. Key measures included:

- Subsidy-eligibility – households at 130% of the federal poverty level or below at each time point based on parent-reported household income.
- Subsidy-receipt – parent report that social services paid for some or all of their childcare were considered subsidy-recipients.
- Special needs status – child received early intervention/special education services, had a diagnosed disabling condition (e.g., Down syndrome); or demonstrated cognitive, social-emotional, or motor delays at least 1.5 standard deviations below the mean on standardized measures.
- Childcare type – care arrangement their child participated in most frequently (i.e., parental care, home-based nonparental care, or center-based nonparental care).
- Childcare quality – global quality and caregiver interaction ratings utilizing rating scales completed by trained field investigators during direct observations conducted; child-to-caregiver ratio per teacher report; and number of hours in care per week per parent report.
- School readiness – scale scores for direct child assessment of early reading, math, and communication skills; teacher ratings of impulsive, externalizing, and social skills were indicators of non-cognitive readiness.
- Ecological covariates – child sex (boy or girl), child race/ethnicity (White, Black, Other), mother's age, mother's education level (high school or below, some college or degree), mother's employment status (working full time, working part time, not currently working), parental marital status (married or currently not married), home language (English or other), receipt of other public assistance (health care subsidies or food subsidies), number of siblings living in the home (none, one or more), urbanicity (urban/suburban or rural), and census region (Northeast, Midwest, South, West).

Analytic Sample
The unweighted base analytic sample include 4,050 subsidy-eligible children at 9-months, 3,000 subsidy-eligible children at 2-years, and 2,400 subsidy-eligible children at 4-years of age representing 1.1-1.5 million children in the population at the time. Sample weights applied in the analyses provided population estimates.

Analytic Approach
Three sets of analyses were conducted. The first and second sets of analyses provided nationally-representative descriptive estimates of subsidy receipt, care type, and care quality for eligible children with and without special needs. This was followed by multivariate logistic regression to identify the relations of child and family characteristics to subsidy receipt. We tested for significant differences in the proportion of children with and without disabilities who participated in different care types and care quality ratings for those children who received childcare subsidies. The final set of analyses produced estimates of the effects of subsidies on the cognitive and non-cognitive school readiness. Because subsidies cannot be allocated randomly, estimation of causal effects are difficult to obtain. To approximate randomization, we used propensity score matching, based on an extensive set of child, family, and functional covariates to identify a comparable set of children who did not receive subsidies to use as a mock control group.

Methodological Challenges.
Our project focused on describing the childcare experiences and correlated kindergarten outcomes for subsidy-eligible children with and without special needs. A common challenge when conducting secondary analyses is how to operationalize constructs of interest using the variables available in the dataset. Frequently, a single variable is insufficient to represent a construct of interest, and multiple variables must be manipulated adequately capture a construct. Decisions regarding how to represent a construct of interest using the data available in existing largescale datasets can be challenging because there may be multiple measures available in the dataset that represent the construct and previous researchers may have operationalized a construct using a variety of measures or definitions.

For this project, an important first step was to determine how best to define and measure special needs. When engaged in policy analyses or research of social problems related to policy formulation and interpretation, the definition of special needs is relevant to ensuring the applicability and generalizability of findings.

Colloquially, special needs is often used interchangeably with disability. In federal policy, disability is subject to unique definition under each statute. A sampling is provided below in Box 1. In addition, in health care settings and research, 'special health care needs' may also be referenced. As a consequence, special needs or disability have a slightly different meaning depending on the context in which it is used. In CCDF, disability is defined to correspond with special education law, the Individuals with Disabilities Education Act (IDEA).

<table>
<tr><td colspan="1">Box 1.</td></tr>
<tr><td>Individuals with Disabilities Education Act[i]</td></tr>
<tr><td>(A) In general.--The term `child with a disability' means a child--<br>  (i) with mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance (referred to in this title as `emotional disturbance'), orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities; and
  (ii) who, by reason thereof, needs special education and related services.
(B) Child aged 3 through 9.--The term `child with a disability' for a child aged 3 through 9 (or any subset of that age range, including ages 3 through 5), may, at the discretion of the State and the local educational agency, include a child--
  (i) experiencing developmental delays, as defined by the State and as measured by appropriate diagnostic instruments and procedures, in 1 or more of the following areas: physical development; cognitive development; communication development; social or emotional development; or adaptive development; and
  (ii) who, by reason thereof, needs special education and related services.</td></tr>
<tr><td>Social Security Administration[ii, iii]</td></tr>
<tr><td>The child must have a (medically determinable) physical or mental condition, or a combination of conditions, that result in "marked and severe functional limitations." This means that the condition(s) must very seriously limit your child's activities. The child's condition(s) must have been disabling, or be expected to be disabling, for at least 12 months; or the condition(s) must be expected to result in death. […] Following are some of the conditions that may qualify: HIV infection in combination with other impairments, Total blindness, Total deafness, Cerebral palsy, Down syndrome, Muscular dystrophy, Severe intellectual disability (child age 4 or older), Birth weight below 2 pounds, 10, ounces</td></tr>
</table>

Researchers have taken several approaches to operationalizing special needs and these approaches do not result in creation of comparable groups or groups that necessarily align with meanings of "special needs" or related term such as developmental delay or disability in various research or policy contexts (e.g., health, social security, special education).

Across past studies, special needs status is often narrowly defined and may not capture all young children who demonstrate delays or disabilities. Definitions may result from researchers' idiosyncratic conceptualization of special needs or be an artifact of available variables or subsamples. These approaches can be grouped in three categories:
- diagnosed conditions
- receipt of services for special needs
- performance on norm referenced standardized measures operationalized by percentile rank or standard deviations below the mean

Table 1 describes each approach with examples.

Table 1		
Approach	**Description**	**Examples**
Diagnosed conditions	Special needs status is based on diagnosed health or psychiatric conditions	Autism, diabetes, Down syndrome, Fragile X syndrome, dyslexia
Receipt of Services	Special needs status defined by receipt of services intended for individuals with delays or disability	Having an Individualized Family Service Plan; receiving services from a speech-language pathologist or other specialist; attending special education preschool
Performance	Performance at or below a certain cut point on standardized test	Scale score 1 or 2 standard deviations below the mean; score at or below X percentile

In Table 2, we summarize how special needs has been defined in previous large-scale analyses.

Table 2		
Study	Dataset	Special Needs Definition
Barton, Spiker, & Williamson (2012)[iv]	Head Start Family and Child Experiences Survey	Defined disability as having an IEP OR being diagnosed with a disability by a medical professional OR scoring at least 2 SD on a standardized measure of language development
Boyle et al. (2011)[v]	National Health Interview Survey 1997-2008	Parent report that (a) doctor told that child had ADHD; cerebral palsy; autism; seizures; mental retardation; other developmental delays; (b) child had seizures, stuttering, or stammering, (c) trouble with heading, blind or unable to see; or (d) told by school or health representative that child had learning disability
Cheng, Palta, Kotelchuck, Poehlmann, & Witt (2014)[vi]	ECLB-B	Defined cognitive delay as a scoring below the 10th percentile on the ECLS-B Bayley Scales of Infant Development – Short Form
Hillemeier, Farkas, Morgan, Martin, & Maczuga (2009)[vii]	ECLS-B	Defined delay as scoring in the lowest 10% on the Bayley Scales of Infant Development Short Form
Jeon et al.	Early	Defined delay as having a

Table 2		
Study	Dataset	Special Needs Definition
(2011)[viii]	Head Start Research and Evaluation Longitudinal Follow-Up study.	chronic biologically-based health condition OR scoring 1.5 SD below the mean on the Bayley Scales of Infant Development motor subscale OR having a medical diagnosis of a developmental delay or disability
Rosenberg, Zhang, & Robinson (2008)[ix]	ECLS-B	Defined delay as scoring 1 SD below the mean on both subscales of the Bayley Scales of Infant Development Short Form OR 1.5 SD below the mean on one subscale of the Bayley Scales of Infant Development Short Form OR having a birth weight below 1500 grams

Each of these approaches may yield overlapping but distinct subsamples and has noteworthy limitations. Relying on diagnosis may exclude children with limited health care access or who have developmental delays or conditions not captured in the data as collected. Because health services access and care are related to sociodemographic characteristics such as race, class, language, and parent education, this approach may not adequately capture special needs in the target population. Likewise, it is unlikely that all relevant conditions are included (e.g., the ECLS-B did not query regarding diagnosed autism at each wave). Relying on service receipt is also confounded by disparities in care access since research indicates that 60-90% of individuals eligible for special needs services in early childhood may not receive them and differential special education access during early childhood is related to child and family sociodemographics along with geographic differences (e.g., policy, service availability).

Performance measures may provide a broader net for special needs since they are not dependent on effective, equitable functioning of health service or educational systems, and can allow for differentiation of severity of special needs. Performance approaches may also be limited, however, by the comprehensiveness and psychometric properties of the instruments included in a study. To the extent that all relevant areas of early childhood development are not captured, or are measured poorly as demonstrated by psychometric evidence for reliability and validity, this approach will also underestimate special needs in a given sample. In addition, there may be children who have diagnosed conditions meeting policy definitions of special needs who do not perform below a researcher's cut point for special needs on a given instrument and are therefore considered typically developing or not having special needs, even though they should not be considered as such. Alternatively, some children who score below a cut point on standardized measures of cognitive, motor, and/or social-emotional development may not have been diagnosed with a special need by a medical professional or identified as eligible for special education by a school-based evaluation team. Or, if researchers rely solely on cognitive measures (e.g., cognitive ability or pre-academic skills), they may exclude children with communication, social-emotional, or adaptive delays.

In sum, while each approach captures *some* children with special needs, none of these approaches necessarily captures *all* children with special needs. Likewise, because researchers have employed a range of definitions of special needs, it is difficult to compare findings or generalize to the population.

Solutions.
After reviewing definitions of special needs status in past research as well as common definitions in the educational and medical criteria, we decided to define special needs status in a way that captured the greatest number of young children who demonstrated developmental delays and disabilities consistent with IDEA, and in turn, CCDF. In doing so, we endeavored to resolve two primary considerations in defining special needs. Namely, we aimed to balance between aligning with past definitions so that we can compare findings across studies while also trying to fully capture eligible children relative to federal law. The ECLS-B contained numerous variables that could be used to approximate special needs from any of the three approaches, but each comes with the aforementioned limitations.

Given these multiple competing considerations, we decided to capitalize on the breadth of measures afforded in the dataset and apply an inclusive definition of special needs. Accordingly, in our study, a child was identified as having a special need if they met one or more of the following conditions:

1. parent report of child having a diagnosed condition,

2. parent report of the child receiving special education or related services via an Individual Education Program (IEP) or Individual Family Service Plan (IFSP), or
3. delay in one or more major areas of development as indicated by scores ≥ 1.5 standard deviations below the mean on cognitive, communication, and social-emotional measures.

In sum, we sought to capture not only children with special needs previously identified by health or education professional, but those with unidentified special needs as well. Even while attempting to capture all eligible children, by virtue of relying on parent report, as opposed to administrate or health records, we may have nonetheless underestimated special needs via the first and second inclusion conditions. This is a necessary artifact of our reliance on secondary data analysis.

Implications for Research.

In any study or analysis, researchers must be clear on the subpopulation captured by their definition of special needs. This is especially true when engaging in secondary analyses of large-scale datasets that may contain a variety of imperfect measures of special needs. These measures can be utilized in isolation or combined, but no approach is without limitations. An important first step may be to ask, *To whom do we want to generalize our findings?* In our case, we sought to capture all children with conditions or performance reflective of special needs under federal special education law while accounting for health and education disparities that precluded reliance on receipt of diagnoses or services.

For any operationalization of special needs in a study, interpretation and implications must be tempered in light of limitations of each approach. As a result of the limitations of various approaches and unique operationalization in individual studies, researchers must be cautious when comparing findings and generalizing to specific populations.

For more information:
http://ceed.umn.edu/subsidy-utilization-and-impact-on-early-care-and-education-of-low-income-children-with-special-needs/

Contact
Amanda L. Sullivan, PhD, LP
Associate Professor
College of Education and Human Development
University of Minnesota
Phone: 612-626-7221
Email: asulliva@umn.edu

---

[i] http://idea.ed.gov/part-c/statutes.html

[ii] https://www.ssa.gov/pubs/EN-05-10026.pdf

[iii] https://www.ssa.gov/ssi/text-eligibility-ussi.htm#disabled-child

[iv] Barton, L. R., Spiker, D., & Williamson, C. (2012). Characterizing disability in Head Start programs: Not so clear-cut. *Early Childhood Research Quarterly, 27*, 596-612. doi:10.1016/j.ecresq.2012.04.002

[v] Boyle, C. A., Boulet, S., Schieve, L. A., Cohen, R. A., Blumberg, S. J., Yeargin-Allsopp, M., … Kogan, M. D. (2011). Trends in the prevalence of developmental disabilities in US children, 1997-2008. *Pediatrics, 127*, 1034-1042. doi: 10.1542/peds.2010-2989

[vi] Cheng, E. R., Palta, M., Kotelchuck, M., Poehlmann, J., & Witt, W. P. (2011). Cognitive delay and behavior problems prior to school age. *Pediatrics, 134*, e749-e757.

[vii] Hillemeier, M. M., Farkas, G., Morgan, P. L., Martin, M. A., & Maczuga, S. A. (2011). Disparities in the prevalence of cognitive delay: How early do they appear? *Paediatric and Perinatal Epidemiology, 23*, 186-1983.

[viii] Jeon, H., Peterson, C. A., Wall, S., Carta, J., Luze, G., Eshbaugh, E. M., Swanson, M. (2011). Predicting school readiness of low income children with disability risks identified early. *Exceptional Children, 77*, 432-452.

[ix] Rosenberg, S. A., Zhang, D., & Robinson, C. C. (2008). Prevalence of developmental delays and participation in early intervention. *Pediatrics, 121*, 1503-1509. doi: 10.1542/peds.2007-1680