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Child Care for Families Raising Children with Disabilities: The Role of Federal Policy in Equitable Access

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Abstract

Access to affordable and appropriate child care is a crucial employment support for families and may be particularly salient for families with young children with disabilities. Without access to quality child care, parents may not be able to find and maintain employment, increasing the likelihood of economic precarity for families that are already likely to experience economic hardship. In this study, we use data from the ECLS-B to examine whether child care arrangements differ by disability status. We find that having an identified disability in childhood, and particularly IEP receipt, is associated with increased likelihood of attending center-based and part-time care as well as lower child care costs. We employ a difference-in-difference framework to examine changes in maternal employment rates at kindergarten enrollment by disability status; the results of the difference-in-difference analysis are generally not significant, but they do show a smaller rate of change in maternal employment at kindergarten enrollment for parents of children with disabilities compared to parents of typically developing peers. These results are consistent with the conclusion that current federal policies support access to child care for children with disabilities.

Keywords: child care, disability, policy

JEL Codes: I14, I18, I30, I38,

1. Introduction

The number of families raising young children with identified disabilities has grown in recent decades. Using the example of a single diagnostic category, Boyle and colleagues (2011) find a seventeen percentage-point increase in the proportion of children with developmental disabilities (defined broadly) born in the United States between 1997 and 2008. This growth means that a significant number of families are now raising children with disabilities; Halfon and colleagues (2012) estimate there are currently 1.2 million children under the age of six in the United States who have a chronic condition that may reflect an underlying disability, representing a prevalence rate of around 5%.

This increase in the number of children with disabilities has important implications for social safety net programs; families caring for children with disabilities are at increased risk of economic insecurity due to increased costs and caregiving needs. Given this increase in recognized disabilities among children, it is not surprising that the childhood Supplemental Security Income (SSI) program has been affected, prompting concerns about growth in the program (Aizer, Gordon, and Kearney 2013; Office of the Assistant Secretary of Planning and Evaluation 2015). The childhood SSI program is the largest federal program intended specifically to provide financial support for families raising children with disabilities. Childhood SSI is a means-tested program that provides modest monthly benefits—\$771/month in federal benefits in 2019¹—to children who qualify based on strict medical criteria, in addition to income and asset eligibility requirements² (SSA 2019).

That support is especially needed because families raising children with disabilities face greater constraints in balancing employment and caregiving responsibilities, resulting in decreased labor market participation for these parents (e.g., Parish and Cloud 2006; Stabile and Allin 2012). Easier access to quality care could help increase labor market participation. It may also have

¹ Some states supplement the federal benefit with additional payments.

² For children who live at home with a parent who is not also an SSI recipient, a portion of the household's earned, and in some cases unearned, income is considered available to the child through a process called *deeming*. For more information, see <https://www.ssa.gov/ssi/spotlights/spot-deeming.htm>.

benefits for children; participation in high-quality early care and education settings for children with disabilities can also support healthy development (Odom, Buysse, and Soukakou 2012). Yet, the policy and research literature has largely overlooked the role of overlapping and complementary federal early care and education policies in supporting labor market participation for parents of children with disabilities.

This study seeks to understand the current landscape of child care access and arrangements for young children with disabilities in supporting parental employment, indirectly shedding light on the role of the current set of child care policies in supporting access to care. If families' need for child care is met by existing policies and programs and families are able to maintain consistent employment, then families' use of public benefits, including childhood SSI benefits, may be reduced as their household income increases. Describing the current child care use and employment patterns of parents who have young children with disabilities can inform policymakers and researchers about the extent to which the current menu of federal policies is supporting labor market attachment and thus the potential for economic self-sufficiency for families raising children with disabilities.

2. Background

Access to affordable and appropriate child care is a crucial employment support for all families, one that may be particularly salient for families with young children with disabilities, such as childhood SSI recipients. Indeed, parents raising children with disabilities may face greater challenges to labor market participation than the general population. Parents of children with disabilities have a difficult time locating appropriate child care for a host of reasons, including the limited supply of trained caregivers, perceived discrimination, additional costs, and difficulty integrating needed services and care (Ceglowski et al. 2009; DeVore and Bowers 2006; Knoche et al. 2006; Weglarz-Ward and Santos 2018). Thus, access to child care remains difficult, despite federal policies intended to support access and affordability. Raising a child with a disability is already associated with economic disadvantage; difficulty accessing early care may exacerbate economic vulnerability by limiting parental employment (Parish and Cloud 2006).

Access to child care may be an overlooked yet key support that could help support families' financial stability and reduce their use of SSI benefits. In 2017, 1.2 million children under the age of 18 received childhood SSI benefits (SSA 2018). Children served by the SSI program are, by definition, more economically disadvantaged than the general population of children and the overall population of children with disabilities. The number of children served by the program has increased in recent decades, although it has begun leveling off (Romig 2017). Still, multiple stakeholders have expressed concern about growth in the program (e.g., American Public Media 2013; Office of the Assistant Secretary of Planning and Evaluation 2015) as well as about how SSI receipt affects the employment trajectories of recipients' parents (Deshpande 2016). This concern is particularly acute for families with very young children; approximately 18% of childhood SSI recipients in 2018 were under the age of six (SSA 2018). Employment for parents of these children is likely at least partially dependent on their parents' ability to find appropriate child care.

2.1. Review of the Literature

Families with children with disabilities are more likely to live in poverty (Parish and Cloud 2006) and more likely to experience an episode of material hardship than families of typically developing children (Parish et al. 2008). In part, this finding may be a result of the increased costs associated with raising a child with a disability. The cost of high-quality child care has increased for all families over the past decades; in some cases, the increase has outpaced the rise in the cost of college tuition (Child Care Aware 2017; Laughlin 2013). The economic burden of care may be particularly difficult for families raising children with disabilities. In qualitative studies, families raising children with disabilities report high cost of care as a barrier to locating appropriate, quality care for their children (Glenn-Applegate, Pentimonti, and Justice 2010; Weglarz-Ward and Santos 2018); some families report that providers charge increased fees to care for children with disabilities (Ceglowski et al. 2009). These increased fees come on top of other additional costs, such as higher out-of-pocket healthcare costs, related to raising a child with a disability (Lukemeyer, Meyers, and Smeeding 2000; Mitra et al. 2017; Shattuck and Parish 2008). Using the National Survey for Children with Special Health Care Needs, Shattuck and Parish (2008) estimate that, on average families raising children with disabilities incur an

additional \$1,000 in child-related costs annually (2018 dollars). This average, however, disguises the high costs faced by families raising children with severe disabilities; using a more recent version of the same survey, Lindley and Mark (2010) find that over 20% of families with children with disabilities had additional child-related costs of more than \$1,285 annually (2018 dollars).

In addition to the economic challenges, families with young children with disabilities report struggling to find care that can accommodate their children's needs; these challenges include difficulty coordinating care with other needed services, perceived discrimination and discomfort on the part of caregivers, and lack of appropriate therapeutic or other support services (Booth-Laforce and Kelly 2004; Ceglowski et al. 2009; Knoche et al. 2006; Weglarz-Ward and Santos 2018). In interviews, parents report that they perceive their child care options as limited due to the difficulty of integrating care with outside services (Booth-Laforce and Kelly 2004) or finding providers who provide supports, such as physical therapy or speech therapy, to meet their children's specific needs (Glenn-Applegate, Pentimonti, and Justice 2010).

One major concern that could be addressed by policy is the lack of caregivers trained in early childhood inclusion. A joint policy statement from the Departments of Health and Human Services and Education explicitly notes lack of training as a major barrier to inclusion (US Departments of Health and Human Services and Education 2015). This concern is also borne out by several studies, from both the parent and provider perspectives (Ceglowski et al. 2009; Grisham-Brown et al. 2010; Weglarz-Ward, Santos, and Timmer 2019).

Despite these challenges, children with disabilities are enrolled in early care and education settings. They often start care later in life and may experience a greater number of care transitions or a greater number of arrangements overall (Booth and Kelly 1999; Ceglowski et al. 2009; DeVore and Bowers 2006; Knoche et al. 2006). Several studies of low-income populations find no difference by disability status in child care setting, specifically between center-based care and home-based care (Parish et al. 2005; Wall et al. 2006). Qualitative studies suggest parents raising young children with disabilities prefer informal care settings (Booth-Laforce and Kelly,

2004; Ceglowski et al. 2009). However, more recent analyses of nationally representative data suggest children with disabilities may use center-based care at higher rates than other children, and that differences in settings may vary by the child's age (Costanzo and Magnuson 2019; Sullivan, Farnsworth, and Sussman-Stillman 2018).

The difficulty of finding appropriate and affordable child care may compromise parents' ability to find and keep employment. Labor market attachment for mothers of children with disabilities is consistently lower than that of mothers of typically developing children, with mothers of children with disabilities having a decreased likelihood of overall employment and increased levels of part-time work (e.g., DeRigne and Porterfield 2010; Loprest and Davidoff 2004; Powers 2001). Evidence suggests that many factors influence the relationship between children's health and maternal employment. Several studies find that the definition and severity of disability impact the magnitude and significance of the estimated effects (e.g., Brandon 2000; DeRigne, and Porterfield 2010; Lemmon 2015; Loprest and Davidoff 2004; Wasi, van den Berg, and Buchmueller 2012). Likely as a result of inconsistent diagnosis criteria and groupings, the evidence is mixed on the type of disability that has the greatest effect on employment, with various authors pointing to physical disabilities (Lemmon 2015; Wasi, van den Berg, and Buchmueller 2012) and autism (DeRigne and Porterfield 2010), among others. Severity, however it may be defined, is also implicated in the magnitude of the effect on maternal employment (e.g., Brandon 2000; DeRigne and Porterfield 2010). Brennan and Brannon (2005) demonstrated that the greater the symptomology of the illness, the larger the impact on parental employment due to less frequent school attendance and less availability of adequate care. Somewhat contrary to the general findings about severity, Powers (2003), using the 1985–1993 SIPP panels with three different definitions of disability, found the most expansive (i.e., less severe) definition rendered the greatest effect on maternal employment, lowering the probability of beginning employment by 23.8% over a two-year period.

The relationship between childhood disability and parental employment is slightly more nuanced for SSI beneficiaries. Specifically, SSI payments may allow parents to forego labor market participation and provide specialized care for their children or SSI receipt may enable parents to

pay for specialized care or have greater flexibility in the decision to work or not. The findings in the literature are decidedly mixed, though most tend to show a negative relationship between SSI receipt and parental employment (DeRigne and Porterfield 2010). Guldi and colleagues (2018) find that SSI eligibility—though not necessarily SSI receipt—reduces maternal labor supply from full to part time. A recent study using SSA administrative data found a similar relationship with parental earnings; specifically, when a child was removed from SSI, parents responded by increasing earnings (Deshpande 2016). However, some evidence has found little or no effect on parental earnings (Duggan and Kearney 2007).

Of central importance to this study is how parental labor market participation is affected in the early childhood years, given the need for early care and education prior to enrollment in elementary school. Porterfield (2002) finds a stronger effect of a child's disability on employment or hours worked for parents of young children. However, other studies find that the child's age does not affect the relationship (Wasi, van den Berg, and Buchmueller 2012). Notably, studies that consider child's age often consider it merely as a confounder or conduct analyses by age group and do not allow the relationship to vary by age; thus, there is no current evidence as to whether and how the relationship between parental labor supply and childhood disability varies by child's age, and, particularly, how it varies from early childhood to enrollment in kindergarten. This study seeks to fill that gap.

2.2 Policy Context

Like many areas of federal policy in the United States, child care supports are comprised of a variety of funding streams overseen by a mix of authorities. For this study, we focus on the constellation of policies intended to influence access to child care for families of children with disabilities: (1) subsidies available through the Child Care and Development Fund (CCDF), (2) Head Start and Early Head Start, and (3) the Individuals with Disabilities in Education Act (IDEA). The policy mechanisms differ; some are intended to lower economic costs, some to guarantee access, and some to do both. In this study, we are interested broadly in whether this package of policies creates access to care and do not focus specifically on the role of any one

policy or mechanism. Thus, we briefly describe the policies to further motivate the analysis and provide context for study design, findings, and discussion.

The Child Care and Development Fund (CCDF) is a block grant program that provides child care subsidies to low-income parents who are employed. Recent reauthorizations require states to give priority for funding to children with disabilities (US Department of Health and Human Services 2016) and develop strategies to increase the availability of high-quality care for children with disabilities (US Department of Health and Human Services 2015), though some states were already prioritizing children with disabilities prior to these requirements (US Department of Health and Human Services 2003). One recent study using the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) found that subsidies increased use of nonparental care, particularly center-based care, for children with special healthcare needs (Sullivan, Farnsworth, and Sussman-Stillman 2018).

Like CCDF, which may offset costs for families, Head Start and Early Head Start are required by statute to set aside 10% of their enrollment slots for young children with disabilities (45 CFR §1308). IDEA may allow access to care for children who qualify both by ensuring receipt of required services and by providing necessary care at no cost to the family. IDEA mandates inclusion for children with disabilities in all education settings, including early childhood and child care (US Department of Education 2016). IDEA also provides funding for nonparental care for children with disabilities for the portion of the day when the child receives services, defraying some of the cost of care (U.S. Library of Congress 2016). Unlike subsidies and Head Start and Early Head Start, which are income limited, children from households across the income distribution are entitled to services via IDEA.³

Though we focus on access to care for children with disabilities, the general child care environment for all families provides important context for the study. In particular, the costs of

³ There is essentially no empirical work examining interactions between child care programs and childhood SSI, though the program policies are explicit about some of the eligibility relationships. For example, receipt of SSI qualifies a child for enrollment in Head Start or Early Head Start (Office of Head Start 2019). SSA policy explicitly states that subsidies for child care received through CCDF should not be included as countable income in determining SSI eligibility (20 CFR 416.1102, 416.1103, and 416.1124(b)).

child care are high for all families, and many parents of typically developing children also struggle to locate appropriate, affordable care (Laughlin 2013). Some of the policies intended to support children with disabilities also apply to children in the general population. Specifically, both Head Start and child care subsidies are available to typically developing children from low-income families. However, use of subsidies is limited; estimates of utilization range from 7 to 34% of income-eligible families (Forry, Daneri, and Howarth 2013). In recent years, interest in implementing public preschool programs has grown. In 2018, 44 states provided publicly funded preschool for some children for some portion of the day; still, a limited number of children enroll in public preschool—approximately one-third of all four-year-olds and just under 6% of all three-year olds (National Institute for Early Education Research 2019). Availability of high-quality care for very young children—infants and toddlers—has lagged that of preschoolers (Lally et al. 2003).

This study examines the extent to which parents of children who have disabilities have differing child care arrangements and parental employment patterns compared with parents of typically-developing children. Though the research literature has focused on parental employment overall and has provided some indication of the difficulty families have in accessing early care and education, evidence about access to early care and parental employment in the early years is currently lacking. In particular, little is known about the efficacy of the package of policies including CCDF, Head Start and Early Head Start, and IDEA in fulfilling its goal of ensuring free and appropriate access to early education and care for young children with disabilities. Nor is it known whether this access is, in turn, supporting parental employment. One recent study, using the ECLS-B, finds a relationship between subsidy eligibility and child care use (Sullivan, Farnsworth, and Sussman-Stillman 2018). However, no current national study attempts to understand the effect of the current constellation of policies related to early care for children with disabilities on parental employment and economic stability. Understanding whether the current landscape of complementary policies and programs that, like the childhood SSI program, are intended to support families of children with disabilities is salient for policy makers.

3. Data and Methods

We use data from the Department of Education’s ECLS-B. The ECLS-B is representative of children born in the United States in 2001 and designed to provide information about children’s health and development from birth through enrollment in kindergarten. Data are collected from parent interviews, which were conducted at four or five time points, depending on the child’s year of kindergarten enrollment. Parents of 10,700 children⁴ born in 2001 were interviewed in the first interview (wave 1), around the child’s nine-month birthday. The second interview (wave 2) was intended to coincide with the child’s second birthday; data were collected from parents of 9,850 children in this wave, as well as in the third interview (wave 3, or the preschool wave), which occurred during academic year 2005–2006. Parents were also interviewed during the 2006–2007 academic year (wave 4, or the kindergarten 2006 wave), which is the year 75% of the sample began kindergarten. Because states have different age cutoffs for kindergarten enrollment and because age eligibility may not follow the calendar year, some children did not begin kindergarten until the following school year. Parents of these children (approximately 1,550) were interviewed both during the first kindergarten wave (2006–2007) and again the following academic year (wave 5), when their children enrolled in kindergarten for the first time (Snow et al. 2009). We include children who entered kindergarten in both waves and control for year of kindergarten entrance in analyses. Interviews for the last three waves of data collection could have occurred at any time between September and March of the academic year of collection; we also account for this timing in our analysis.

The ECLS-B data are well suited for the current study because they are nationally representative as well as longitudinal, alleviating endogeneity concerns that may arise with cross-sectional data. The survey collected detailed information about children’s health and development and about parental employment. In addition, the ECLS-B includes a relatively large sample of children with disabilities, thereby relieving some concerns about statistical power or sample size in other datasets. In this study, we use data from the parent interviews, which contain detailed information about (1) diagnosed health conditions, (2) child care arrangements and use, (3) receipt of Individualized Education Programs (IEPs),⁵ and (4) parental employment.

⁴ As required by the Department of Education, we present only weighted proportions and round all sample sizes to the nearest 50.

⁵ An IEP is the document that specifies the specialized services a child is eligible for under IDEA.

The child's mother was the respondent in a majority of the cases across waves. We limit our analytic sample to children whose mother was present in the household and completed the survey in the focal child's kindergarten year, which could have been either 2006–2007 or 2007–2008 (N=6,900).⁶ To reduce bias, we also exclude children who were diagnosed with a disability during their year of kindergarten enrollment from our difference-in-difference analysis, leaving an analytic sample of 6,700 children. When presenting descriptive statistics, we use weights suggested by the Department of Education to adjust for the complex sampling design and nonresponse. Because our models account for endogenous sampling concerns, we present multivariate results using unweighted models with robust standard errors; however, results are robust to the inclusion of weights (Solon, Haider, and Wooldridge 2015).

In addition to the main analysis, we also used multiple imputation with chained equations (MICE) to account for missing data and disproportionate nonresponse by disability status. As a robustness check, we conduct all analyses on the analytic sample with imputed data for missing responses. We also run models on the full ECLS-B sample (N=10,700) with imputed data for all missing data, including missing waves.⁷

3.1. Measures

Disability. The key independent variable is the focal child's disability status. Parents were asked in each wave of interviews whether the focal child had been diagnosed with any of a variety of health conditions. The conditions varied by interview wave⁸ but generally included measures of intellectual disability, developmental delays, autism, issues with mobility, mental health diagnoses, speech and language conditions, blindness, difficulty hearing, and other conditions.

⁶ Approximately 100 cases do not have a household mother when the child is in kindergarten; these are excluded from the sample. A very small number of cases did not enroll in kindergarten by the 2007 wave (Snow et al. 2009); these cases are also excluded from our sample.

⁷ Additional information on our MICE models, including analytic results, is available by request.

⁸ Appendix A contains a detailed list of the conditions included in each wave of interviews.

Table 1: Proportion of ECLS-B Sample That Meets Various Disability Definitions

Disability Measure	Operationalization	Wave	Weighted Proportion	Population Size	Unweighted N
General Disability	Binary indicator for parents who responded affirmatively to the question, "Has your child been diagnosed with any of the following conditions . . .?"	Wave 1	6.3%	247,856	600
		Wave 2	9.7%	379,620	900
		Wave 3	13.9%	541,618	1,100
		Wave 4	15.5%	604,177	1,200
		Wave 5	21.7%	259,489	500
Multiple Diagnoses	Indicator for parents who responded that the child had more than one diagnosis in the conditions listed	Wave 1	1.2%	45,398	150
		Wave 2	2.9%	113,457	350
		Wave 3	5.0%	196,227	450
		Wave 4	5.2%	202,832	450
		Wave 5	7.6%	90,877	200
Continuing Disability Measure, Prior to Kindergarten & All Waves	Once a parent answers yes to the disability question, the parent continues to report the child's disability through all remaining waves	Waves 1–3/4	8.4%	328,742	700
		All	14.4%	562,384	1100
Disability in any Wave, Prior to Kindergarten & All Waves	A parent responded that the child had a disability in any interview wave	Waves 1–3/4	23.2%	902,989	1,850
		All	29.2%	1,141,895	2,250
Disability in any Wave, Including Asthma	A parent responded that the child had a disability, including asthma, in any interview wave	All	43.8%	1,712,151	3,300
Child's Health is Fair or Poor	A parent rated the child's health fair or poor on the 5-category self-rated health scale	Wave 1	2.3%	89,987	200
		Wave 2	2.2%	86,099	200
		Wave 3	2.6%	100,046	200
		Wave 4	2.0%	78,944	200
		Wave 5	2.1%	25,111	50
IEP, IEP before Kindergarten	The child has an Individualized Education Program in place	Wave 3	5.1%	197,395	450
		Wave 4	5.4%	212,248	500
		Wave 3/4	5.6%	218,894	500
Received Special Services	The parent reported that the child received intervention services in the previous month, including physical therapy, occupational therapy, speech and language therapy, or other support services	Wave 1	2.5%	97,776	350
		Wave 2	2.5%	99,377	350
		Wave 3	3.2%	125,199	250
		Wave 4	5.1%	198,363	400
		Wave 5	8.3%	99,080	200

Table 1: Proportion of ECLS-B Sample That Meets Various Disability Definitions

Disability Measure	Operationalization	Wave	Weighted Proportion	Population Size	Unweighted N
Received Early Intervention Services Prior to Kindergarten	The parent reported that the child received Early Intervention Services, in any location	Waves 1–3/4	6.1%	239,058	600
Specific Diagnoses					
Communication Related	Specific measure of child having difficulty hearing, talking, or other communication-related condition (including speech and language delays)	Wave 1	0.7%	28,952	50
		Wave 2	4.5%	175,950	750
		Wave 3	10.4%	405,467	1100
		Wave 4	8.7%	341,343	700
		Wave 5	10.2%	19,482	250
Intellectual Disability	Specific measure of intellectual disability (e.g., Down Syndrome, Turner Syndrome, intellectual disability)	Waves 1–3/4	11.9%	464,414	1050
		Wave 1	—	—	—
		Wave 2	0.4%	13,697	—
		Wave 3	0.2%	7,815	50
		Wave 4	0.4%	14,459	50
		Wave 5	0.4%	5,142	—
Emotional or Mental Health	Specific measure of emotional or mental health conditions (e.g., oppositional defiant disorder, ADD, ADHD)	Waves 1–3/4	0.6%	25,040	50
		Wave 3	4.3%	168,184	400
		Wave 4	5.1%	199,316	400
		Wave 5	7.8%	93,221	200
Autism	Specific measure of autism	Waves 3/4	6.7%	262,055	550
		Wave 3	0.9%	34,370	100
		Wave 4	1.1%	44,153	100
		Wave 5	1.0%	11,944	50
Physical/Orthopedic	Specific measure of challenges with mobility, limbs, or a diagnosis of spina bifida	Waves 3/4	1.2%	46,498	100
		Wave 1	1.3%	496,885	150
		Wave 2	0.6%	22,698	100
		Wave 3	2.6%	101,618	300
		Wave 4	2.1%	82,051	200
Chronic Condition	Specific measure of chronic conditions, including heart	Wave 5	2.5%	29,894	100
		Waves 1–3/4	4.1%	160,803	400
		Wave 1	2.7%	104,463	200
		Wave 2	2.3%	91,187	200

Table 1: Proportion of ECLS-B Sample That Meets Various Disability Definitions

Disability Measure	Operationalization	Wave	Weighted Proportion	Population Size	Unweighted N
Congenital Syndromes, Identifiable at Birth	Specific measure of Down Syndrome, Turner Syndrome, or Spina Bifida	Wave 3	2.6%	102,799	200
		Wave 4	3.2%	124,279	250
		Wave 5	3.6%	43,047	100
		Waves 1–3/4	6.0%	234,669	500
		All Waves	0.2%	7824.896	—

Source: ECLS-B

One of the major methodological considerations with this study, as with all studies concerned with disability, is the imprecise and heterogenous nature of the disability construct, as outlined in Table 1. The table also showcases the consequential—and challenging—nature of measuring disability in this and other common data sets. At the high end of prevalence estimates, using the broadest definition, which includes measures for children diagnosed with asthma and children who require vision correction with glasses, 44% of the sample has a disability diagnosis. The proportion of the sample in each wave with a disability begins at about 6% at the nine-month wave and increases to 16 to 22% in the kindergarten waves; these are children whose parents reported that they had been diagnosed with a specific health condition in the previous year. About 23% of the sample has a disability in at least one wave prior to kindergarten, even if they do not report having a disability in later waves; 8% have a disability continuously once they report having a disability (and have a diagnosis prior to kindergarten enrollment). The proportion of children who receive intervention services or who have IEPs is substantially smaller than the proportion who report having a disability. Approximately 6% of the sample had an IEP in place prior to kindergarten enrollment and also reported receiving early intervention services. We also examined the distribution of some of the disability categories of the sample; communication-related diagnoses are the largest group represented (12% with a diagnosis before kindergarten) and intellectual disability is the least represented (less than 1%). Note that the list is not exhaustive and thus the estimates do not total the overall measures.

We present results using three binary measures of disability, as measured before the child's enrollment in kindergarten: (1) a continuing measure of disability, (2) a measure of disability in any wave, and, for some models, (3) an indicator for having an IEP. We exclude diagnoses of asthma and difficulty seeing in the first two measures for a few reasons. First, these conditions are often relatively manageable and may not require time-intensive care from a parent or child care provider. Second, neither is explicitly covered under applicable federal policies. Finally, less than 1% of children with asthma or difficulty with vision report receiving regular special services. The first measure—continuing disability—indicates that once the parent reports that the child has a disability, the disability continues to be reported in each subsequent interview. We restrict this measure to children whose disabilities were identified prior to kindergarten enrollment in an attempt to disentangle diagnostic and parental employment timelines. The second measure—disability in any wave prior to kindergarten enrollment—is intended to be a broad measure of whether a parent ever reports the child has a disability in any wave of data collection. Though it is likely this measure biases the estimate of the number of children with disabilities upwards, the parent survey asks whether a child has been diagnosed since the previous survey, so it is also possible that the previous measure of disability does not capture parents who no longer report the condition in subsequent interviews based on the wording of the survey.

We select these measures for a few reasons. First, given the difficulty in measuring disability, taken together, the measures may help bound the estimated impact of having a child with a disability on child care access and parental employment. If the definitions exist on a spectrum of severity, children who are identified as having a continuing disability may represent an upper bound of the effect of having a child with a disability while the other measure—disability in any wave—may offer a lower bound; the second measure may capture children with less severe conditions or temporary conditions that may be less likely to influence child care access. Additionally, these measures may estimate the effect of two different aspects of disability. While the first measure—continuing disability—captures children with an ongoing health condition, the second includes children who may have experienced a health shock or whose health condition may have improved. We use IEP receipt in our child care analyses because of its policy

relevance; children with IEPs are receiving services under IDEA. Thus, estimates for this measure help us understand the role of IDEA in child care access and parental employment.

Child Care Arrangements. One of our primary outcomes of interest is child care arrangements. We employ multiple measures of child care use. First, to determine whether a child is in regular nonparental child care, we use a binary indicator for parental report of regular nonparental care at least ten hours each week. We are also interested in understanding patterns in the length of time children are in nonparental care each week. We use a continuous measure of the number of hours each week a child is typically in nonparental care, across all arrangements. We also use binary measures for full-time care, which includes children in nonparental care for more than 30 hours each week, and part-time care, which includes children in care at least ten hours but less than or equal to 30 hours each week. Given public funding for and emphasis on access to center-based care settings, investigating patterns of arrangements is also important to understand how policy may be creating access. Thus, we include measures of the child's primary care arrangement, defined as the arrangement in which the child spends the most time each week. We define the arrangements as informal or relative care, if the child is in care by a relative, regardless of the location of the care, or a nonrelative in the child's home; home-based care if the child is in care with a nonrelative at a location other than the child's own home (e.g., in-home providers); and center-based if a child is in care at a child care center or preschool. We also include a measure for whether the child is ever enrolled in Head Start. Children in different arrangements for equal time default to center-based care first (due to its policy relevance), then home-based care. Finally, we look at the cost of care for families, both annually and hourly. In some models, we also use a binary indicator for whether a child is receiving a child care subsidy; the indicator is based on a parent's report that an institution of some kind is helping with child care payments, or a parent's report of paying no fee for home-based or center-based care (with the exception of Head Start). Thus, this indicator is not a precise measure of subsidies received under CCDF.

Employment. Another key dependent variable is parental employment, with a focus on maternal employment specifically. We use several measures of employment in this analysis. The first is a

binary measure of whether a child's mother is employed at the time of the survey, regardless of the number of hours worked. We also include binary indicators for full-time employment (at least 35 hours per week) and part-time employment. In addition, we include measures of the continuous hours worked by the household mother respondent in the last week and total number of hours worked by all parents in the household.⁹ In some models, we also include a binary indicator for household father employment. We focus on employment outcomes at two time points: employment during the preschool wave (wave 3) and employment during the child's first year of kindergarten enrollment. Since the year of kindergarten enrollment varies across the sample, this measure could be employment at wave 4 for children who first enrolled in kindergarten in wave 4 or employment at wave 5 for children who first enrolled in wave 5. We account for these differences with a binary indicator for year of entrance.

Covariates. We include covariates that are likely related to either child care and disability or parental labor supply and disability. For the child care models, these covariates include indicators of the child's race and ethnicity (white, black, Latinx, or other race) and sex and a four-category indicator for household income-to-poverty ratio, adjusted for household size (below 100% of the 2005 federal poverty threshold, between 100% and 200% of the threshold, between 200% and 400% of the threshold, and above 400%). Models predicting parental employment use the mother's race instead of the child's, a control for whether the mother was employed in the 12 months prior to the child's birth, a measure for whether the child is homeschooled or attending half-day kindergarten, the year the child entered kindergarten, and the quarter in which the interview occurred. All models include a categorical indicator of highest parental education level, an indicator for single-mother households, the number of children under six in the household, the number of other children in the household, the number of nonparental adults in the household, an indicator for poor or fair maternal health status, and an indicator for urbanicity. Each model also includes state fixed effects.

Ideally, we would also account for employment in our child care analyses and household economic status in our employment analyses. However, there are clear endogeneity concerns.

⁹ These analyses are restricted to households in which the household mother was the survey respondent.

Households are unlikely to make child care and parental employment decisions independently, and the causal direction of the relationship is not clear. Similarly, though household economic status likely drives parental employment behavior, it also directly influences household income. We use income-to-poverty ratio in wave 3 when considering child care arrangements at the same time point. For employment outcomes, we use income-to-poverty ratio at wave 1, which is conceptually less problematic than income from the same time point. We also include a measure of parental education level as a proxy for socioeconomic status. Additionally, we conduct robustness checks including relevant variables.

3.2 Statistical or Analytic Methods

To describe child care use for children with disabilities, we first use multivariate regression to predict child care use by disability status, holding constant other relevant demographic and household characteristics. We focus our main analysis on the preschool wave (wave 3, which occurred the year the child turned four), because this is the age at which the majority of children are enrolled in early care or education.¹⁰ We use OLS models to test the association between disability status and hours in care and cost of care. We use logistic regression to predict regular nonparental child care (for at least ten hours each week), full-time child care (defined as greater than or equal to 30 hours/week), and part-time child care (more than ten but fewer than 30 hours/week). We also examine the type of child care use, with logistic regressions predicting center-based care, home-based care, and Head Start, as well as a multinomial logistic regression comparing the outcomes of no regular nonparental care, informal care (combining relative care and home-based care), or center-based care.

Our analytic models are below, where $\ell_{child\ care\ dv}$ is the log odds of the binary child care variables, β_1 Disability is the indicator for childhood disability, and β_2X is a vector of covariates described above. The multinomial model is represented by Equations 1 and 2 below, where $\log\left(\frac{\pi_i^{(CC/IC)}}{\pi_i^{(NC/CC)}}\right)$ represents the odds ratio of the outcomes of informal care (IC) and center-based care (CC) compared to the base outcome of no care (NC) in Equation 1, and the outcomes of informal

¹⁰ Results for earlier waves of care are available in Appendix B. More information is available upon request.

care compared to the base outcome of center care in Equation 2 for an individual, i ; $\beta 1^{(IC)}$ disability $_i$ is the key predictor; and $\beta 2^{(IC)} \chi_i$ is the vector of covariates.

$$\text{Equation 1: } \ell_{child\ care\ dv} = \beta_0 + \beta_1 \text{Disability} + \beta_2 X + \varepsilon$$

$$\text{Equation 2: } Y_{hours/cost} = \beta_0 + \beta_1 \text{Disability} + \beta_2 X + \varepsilon$$

$$\text{Equation 3: } \log \left(\frac{\pi_i^{(HC/CC)}}{\pi_i^{(NC)}} \right) = \alpha^{(FC)} + \beta 1^{(CC)} \text{disability}_i + \beta 2^{(FC)} \chi_i + \varepsilon_i$$

$$\text{Equation 4: } \log \left(\frac{\pi_i^{(HC)}}{\pi_i^{(CC)}} \right) = \alpha^{(HC)} + \beta 1^{(HC)} \text{disability}_i + \beta 2^{(HC)} \chi_i + \varepsilon_i$$

We use a difference-in-difference framework (DD) to examine the difference in the rate of change of maternal employment at kindergarten enrollment between parents of children with a disability and parents of typically developing children. The DD framework compares a “treatment” group to a control group, comparing outcomes before and after a specific intervention or policy event. If the major assumptions of the method hold, using DD methodology can provide a stronger foothold in causality than regression alone. In addition, the intuition behind DD offers a clear interpretation of results. Theoretically, unlike early care and education, which may have barriers to access for all children and potentially for children with disabilities in particular, access to kindergarten is free and universal. Given this change at the time of kindergarten enrollment, parental employment is likely to increase for all children. If current policies are not supporting access to child care for children with disabilities, the effect will be larger for parents of children with disabilities; that is, the increase in parental employment rates will be greater for this group. If, however, current policies are supporting access to child care for these families, the analysis would show a similar effect on parental employment at kindergarten enrollment for both groups, or potentially a smaller change for parents of children with disabilities.

We compare parental employment outcomes for children with disabilities to typically developing children. In our main DD analyses, we use data from the latter two waves (or three if the child enrolled in kindergarten in 2007) and compare outcomes from both groups from parent interviews pre-kindergarten to kindergarten enrollment. Our analytic model is outlined in

Equation 5, where Y_{it} is a measure of maternal employment for individual i and time t . The dummy variable $B1Disability_{it}$ is an indicator for a child with a disability, $B2Kindergarten_{it}$ is an indicator for kindergarten enrollment, and $\delta(Disability * Kindergarten)_{it}$ is the DD estimate for the effect of kindergarten enrollment on maternal employment rates for mothers of children with disabilities. βX_{it} is the vector of covariates including maternal health status, parental education level, and household and demographic variables. We also include controls for half-day kindergarten and year of kindergarten enrollment, as well as state fixed effects.

$$\text{Equation 5: } Y_{it} = \beta_0 + \beta_1 Disability_{it} + \beta_2 Kindergarten_{it} + \delta(Disability * Kindergarten)_{it} + \beta X_{it} + \varepsilon$$

DD requires additional assumptions beyond the general assumptions for all multivariate regression analyses to obtain unbiased estimates. In particular, DD relies on the parallel trends assumption, which, in this case would mean that maternal employment rates for children with and without disabilities follow the same time trends in absence of treatment. That is, the difference in the level of maternal employment between the two groups would remain relatively stable in the absence of kindergarten enrollment. We are able to provide some evidence that this assumption is met. Additionally, the DD framework assumes that the composition of each group cannot be altered by the intervention itself. In this case, whether or not a child has an identified disability cannot be determined by enrollment in kindergarten. In order to assure that this assumption is not violated, we include only children who have been identified as having a disability prior to kindergarten enrollment. Results are robust when we also include children who are identified as having a disability in kindergarten.

4. Results

4.1. Main Results

There are some differences in key characteristics by disability status (Table 2). In particular, children with disabilities are disproportionately likely to live in households with a single parent and with a mother reporting fair or poor health. As expected, there are also differences in birth

weight status as well as likelihood of the household ever having received SSI or SSDI.¹¹ Across all measures, boys and children who are white are more likely to be identified as having disabilities. Differences in kindergarten enrollment are apparent by homeschool status and the increased likelihood for children with disabilities to begin kindergarten in the second year of enrollment covered by the survey.

Table 2: Sample Summary Statistics, Selected Characteristics by Disability Type,

	All	Any Disability, Pre-K			Continuing Disability, Pre-K			SS
		Yes	No	SS	Yes	No	SS	
N=	6900	5100	4750		700	6250		
Male	51.2%	58.4%	49.0%	***	64.7%	50.0%	*	
Child race/ethnicity								
White	53.7%	59.0%	52.2%	***	59.1%	53.2%	**	
Black	13.9%	13.3%	14.1%		12.6%	14.0%		
Latinx	25.1%	21.6%	26.2%	***	21.1%	25.5%	*	
Other race	7.2%	6.1%	7.6%	*	7.1%	7.2%		
Low birth weight	7.5%	11.5%	6.3%	***	10.7%	7.2%	*	
Single parent HH (wave 3)	21.9%	25.1%	21.0%	**	24.9%	21.6%		
Number of children in HH ≤ 5 (wave 3)	1.6	1.6	1.6		1.7	1.6		
Number of siblings, total (wave 3)	1.4	1.4	1.4		1.4	1.4		
Number of nonparental adults in HH (wave 3)	0.38	0.41	0.37		0.46	0.37	*	
HH income, mean (wave 1)	\$50,720	\$49,773	\$51,019		\$49,829	\$50,802		
Family income as % FPL (wave 3)								
< 100% FPL	23.5%	23.7%	23.5%		24.6%	23.4%		
100–199% FPL	28.8%	28.8%	28.8%		27.3%	28.9%		
200–399% FPL	24.3%	26.4%	23.7%		27.0%	24.0%		
400%+ FPL	23.4%	21.2%	24.1%	*	21.2%	23.6%		
HH income ever below FPL (waves 1–3)	37.0%	36.9%	37.1%		40.0%	36.8%		
HH income ever below 200% FPL (waves 1–3)	63.8%	64.5%	61.4%		65.8%	61.8%		
HH received SSI/DI benefits	8.9%	14.7%	7.1%	***	22.0%	7.7%	*	
HH ever received SSI/DI (since child's birth)	9.5%	11.9%	8.7%	**	10.4%	9.3%	**	
Parents' highest level of education (wave 3)								
High school or less	33.8%	33.8%	33.8%		32.8%	33.9%		
Some college	33.3%	35.7%	32.6%	*	36.9%	32.9%		

¹¹ The survey does not differentiate which member of the household is eligible for SSI/SSDI; thus, it is not clear whether the receipt of benefits is due to the health of the child or that of another household member.

Table 2: Sample Summary Statistics, Selected Characteristics by Disability Type,

	All	Any Disability, Pre-K			Continuing Disability, Pre-K		
College or higher	32.9%	30.5%	33.6%		30.0%	33.3%	
Urbanicity (wave 3)							
Urban, Large	71.7%	68.6%	72.6%	**	67.5%	72.1%	*
Urban, Small	11.7%	12.8%	11.4%		13.3%	11.6%	
Rural	16.6%	18.5%	16.0%		19.2%	16.3%	
Census region (wave 3)							
Northeast	16.3%	15.1%	16.7%		15.2%	16.4%	
Midwest	21.7%	25.5%	20.1%	***	26.9%	21.2%	**
South	38.0%	38.5%	37.8%		35.6%	38.2%	
West	24.0%	21.0%	25.0%	**	22.3%	24.2%	
Mother Employed 12 months before birth	71.9%	72.1%	71.8%		72.3%	71.8%	
First enrolled in K in wave 4 (2006)	73.0%	68.0%	74.4%	***	66.3%	73.6%	**
Homeschooled for kindergarten	1.8%	1.0%	2.0%	***	1.1%	1.8%	**
IEP	5.1%	21.5%	0.1%	***	41.1%	1.7%	*

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculations using ECLS-B data

Patterns of child care use suggest an increased use of nonparental care overall as children age and a significant shift to center-based care from home-based care at the preschool wave (Table 3). This trend is not surprising, given the shift in availability and reduction in costs of center-based care for preschoolers compared to infants and toddlers. Some differences by disability status are evident in the table; most of these differences emerge in the preschool wave. Children with disabilities are significantly more likely to be in any regular nonparental care, more likely to be in part-time care, and more likely to be in full-time care than typically developing peers. Children with disabilities are also more likely to be enrolled in center-based care and, by some measures, less likely to be in relative or informal care. Disability status is also associated with some sort of subsidy for child care use. Perhaps as a result, parents of children with disabilities are paying, on average, less for care, both annualized and hourly. Finally, children with disabilities began nonparental care of all types and center-based care specifically at later ages compared with other children.

Table 3: Child Care Arrangements by Disability Status (Bivariate)

		Wave	All	Any Disability, Pre-K			Continuing Disability, Pre-K		
				Yes	No	SS	Yes	No	SS
Regular	Avg Hours in	1	15.96	15.99	15.94		14.45	16.10	
	Care/Week	2	16.00	15.80	16.04		13.85	16.19	**

Table 3: Child Care Arrangements by Disability Status (Bivariate)

		Wave	All	Any Disability, Pre-K		Continuing Disability, Pre-K			
		3	22.63	23.58	22.33	24.95	22.41	**	
PT vs FT Care	Regular Child Care	1	42.8%	42.5%	42.9%	39.6%	43.1%		
		2	44.2%	43.4%	44.4%	40.6%	44.5%		
		3	65.5%	69.7%	64.2%	***	75.6%	64.6%	**
	PT Care (10–29 hrs/wk)	1	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	
		2	12.5%	12.3%	12.5%	15.9%	12.2%		
		3	25.2%	27.7%	24.5%	32.2%	24.6%	**	
	FT Care (>/=30 hrs/wk)	1	30.3%	30.0%	30.4%	27.1%	30.6%		**
		2	31.7%	31.1%	31.9%	24.7%	32.4%	*	
		3	40.3%	42.0%	39.6%	43.5%	40.0%	*	
Primary Care Arrangement Type	Relative Care/Informal Care	1	23.8%	23.2%	24.0%	22.6%	23.9%		
		2	18.9%	17.1%	19.5%	16.3%	19.2%		
		3	13.4%	10.7%	14.3%	***	12.0%	13.6%	
	Center-Based Care	1	8.0%	7.8%	8.0%	7.3%	8.0%		
		2	13.9%	13.5%	14.1%	14.7%	13.9%		**
		3	46.8%	52.5%	45.1%	***	56.9%	45.9%	*
	Home-Based Care	1	11.1%	11.5%	11.1%	10.0%	11.3%		
		2	11.4%	12.8%	11.0%	9.6%	11.6%		
		3	5.2%	6.4%	4.8%	**	6.8%	5.1%	
Policy-Relevant	Head Start	3	3.6%	4.5%	3.3%	4.0%	3.5%		
	IEP	3	5.1%	21.5%	0.1%	***	41.1%	1.7%	**
	Child Care Subsidy	1	6.2%	6.0%	6.3%	6.2%	6.3%		
		2	8.2%	8.8%	8.0%	10.4%	7.9%		**
		3	20.0%	27.3%	17.7%	***	37.6%	18.4%	*
	Cost of Care (Annual)	1	\$2,695.66	\$2,636.66	\$2,711.45	\$2,519.17	\$2,709.89		
		2	\$3,209.63	\$3,241.84	\$3,200.54	\$2,904.37	\$3,234.62		**
		3	\$2,529.44	\$2,216.03	\$2,627.95	**	\$1,829.34	\$2,597.88	*
	Cost of Care (Hourly)	1	\$ 1.92	\$ 1.62	\$ 2.00	***	\$ 1.61	\$ 1.94	*
2		\$ 2.17	\$ 2.18	\$ 2.17		\$ 2.00	\$ 2.19	**	
3		\$ 2.25	\$ 1.88	\$ 2.36	***	\$1.39	\$ 2.33	*	
Earliest Age (Months)	All Types	—	12.17	13.27	11.83	*	14.55	11.94	**
	Center-Based Care	—	28.25	29.47	27.86	**	30.50	28.01	**

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculations using ECLS-B data

To further unpack the relationship between disability status and child care use in the preschool wave, we conducted multivariate regression models predicting child care use and child care type by disability status while controlling for relevant demographic and household characteristics (Table 4). Overall, results indicate that both primary measures of disability are significantly associated with increased likelihoods of regular care use for at least ten hours each week, part-time care, and center-based care, with larger magnitudes for children with continuing disabilities than for children with disabilities in any wave. Children with a continuing disability are 9% more likely to be enrolled in regular care, 8% more likely to be enrolled in part-time care, and 11% more likely to be enrolled in center-based care than typically developing peers. Children with a disability in any wave before kindergarten are 4% more likely to be in any regular care, 4% more likely to be in part-time care, and 6% more likely to be in center-based care than typically developing peers.

The policy-relevant measure of disability—whether the child has an IEP—is strongly associated with increased use of care overall (children with an IEP are 18% more likely to be in care than children without an IEP), part-time care (12% more likely), center-based care (19% more likely), and Head Start enrollment (2% more likely). Children with disabilities are less likely to be in only parental care, slightly less likely to be in informal care, and more likely to be in center-based care than typically developing peers. The magnitude of the estimates is moderate for children with a continuing disability and rather large for children with an IEP. Children with a disability on average pay less for child care than their peers; the hourly cost estimates indicate that the lower cost of care is not simply an artifact of children with disabilities being in care fewer hours each week.¹²

¹² In order to focus discussion on the disability measures, and because the covariate estimates are consistent and expected across models, we do not present covariate estimates here. Appendix C contains covariate estimates for the model using the indicator for disability in any wave, excluding the state fixed effects estimates. In general, these are in the direction we would expect. Additional covariate estimates available upon request.

Table 4: Regression Models Predicting Child Care Outcomes at Wave 3

	Regular Care	Hours in Care	FT	PT	Center	Head Start	Home- Based	Cost/Hour	Annual Cost
Any Wave	0.04*** (0.01)	0.05 (0.53)	-0.01 (0.01)	0.04*** (0.01)	0.06*** (0.01)	0.01** (0.01)	0.00 (0.01)	-0.41*** (0.08)	-386.75*** (87.54)
Continuing Disability	0.09*** (0.02)	0.99 (0.79)	-0.00 (0.02)	0.08*** (0.02)	0.11*** (0.02)	0.01 (0.01)	-0.01 (0.01)	-0.65*** (0.10)	-649.28*** (105.75)
IEP Indicator	0.18*** (0.03)	2.32** (0.93)	0.02 (0.02)	0.12*** (0.02)	0.19*** (0.02)	0.02*** (0.01)	-0.02 (0.01)	-1.10*** (0.11)	1,055.15*** (119.72)
Mean	[0.68]	[23.90]	[0.43]	[0.25]	[0.50]	[0.04]	[0.05]	[2.21]	[2,565.34]

	Multinomial Logit Predicting Care Type			Marginal Effect Estimate for Care Type		
	Home- Based Care vs. No Care	Center- Based vs. No Care	Home- Based vs. Center	No Care	Home	Center- Based
Any Wave	1.01 (0.09)	1.29*** (0.09)	0.78*** (0.06)	- (0.01)	-0.02* (0.01)	0.06*** (0.01)
Continuing Disability	1.19 (0.16)	1.77*** (0.19)	0.67*** (0.08)	- (0.02)	-0.02 (0.02)	0.12*** (0.02)
IEP Indicator	1.64*** (0.29)	2.85*** (0.40)	0.58*** (0.08)	- (0.03)	-0.02 (0.02)	0.19*** (0.03)

*** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses. Regular care indicates a child was in nonparental care at least ten hours each week; PT indicates part-time care (between 10-29 hours/week); FT indicates full-time nonparental care (30 hours/week or more). Models were all analyzed separately. Results are presented as marginal effects for binary outcomes or regression coefficients for continuous outcomes. Multinomial logistic models presented as odds ratios and overall marginal effects, respectively. Models predicting cost have sample sizes of 5,350; all others use sample of 6,600 (due to missing values for covariates). Dependent variable means are in brackets and unweighted.

Source: Authors' calculations using ECLS-B data

In general, when models include the subsidy indicator, the magnitude of the estimates decreases slightly (Table 5). Subsidy receipt decreases the likelihood of full-time care use and increases the likelihood of part-time care for children with disabilities in any wave. Subsidies are associated with decreased center-based care for children with continuing disabilities and increased use of home-based care.

Table 5: Regression Models Predicting Child Care Outcomes at Wave 3, Subsidy Models

	Regular Care	Hours in Care	FT	PT	Center	Head Start	Home-Based	Cost/Hour	Annual Cost
Any Wave	0.00 (0.02)	-0.63 0.62	-0.01 (0.02)	0.01 (0.01)	0.02 (0.02)	0.00 (0.01)	0.00 (0.01)	-0.25** (0.11)	-206.37* (115.59)
Marginal effect of subsidy	0.02	-0.91	-0.07**	0.09***	-0.01	0.01	0.00	0.05	-59.05
Continuing Disability	0.04 (0.02)	-0.4 -0.99	-0.01 (0.02)	0.05** (0.02)	0.09*** (0.03)	0.00 (0.01)	-0.02** (0.01)	-0.44** (0.18)	-459.60*** (168.93)
Marginal effect of subsidy	-0.01	-0.64	-0.07*	0.06	-0.10**	-0.01	0.04**	0.15	164.63

*** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses. Regular care indicates a child was in nonparental care at least ten hours each week; PT indicates part-time care (between 10-29 hours/week); FT indicates full-time nonparental care (30 hours/week or more). Models were all analyzed separately. Results are presented as marginal effects for binary outcomes or regression coefficients for continuous outcomes. Models predicting cost have sample sizes of 5,350; all others use sample of 6,600.

Source: Authors' calculations using ECLS-B data

We also examine difference in child care use by disability type (Table 6, top panel). When results are broken out by disability by type, it is clear that the overall disability estimates obscure some heterogeneity by disability type; estimates of the effects of different diagnoses differ in magnitude and, in some cases, direction. Broadly, the different diagnostic groups are related to increased use of care overall, increased likelihood of part-time care, increased use of center-based care, and decreased annual and hourly costs. However, some diagnostic groups, including autism and physical impairments, are not significantly associated with use of regular nonparental care, though for some, like congenital syndromes, the magnitude of the relationship is quite

Table 6: Regression Models Predicting Child Care Outcomes at Wave 3, Subgroups

	Any Care	Hours in Care	FT	PT	Center	Head Start	Home-Based	Cost/Hour	Annual Cost
Panel 1: Full Sample by Disability Type									
Communication Group	0.09*** (0.02)	1.09* (0.64)	0.00 (0.02)	0.08*** (0.01)	0.10*** (0.02)	0.01 (0.01)	0.00 (0.01)	-0.65*** (0.09)	-621.95*** (99.07)
Intellectual Disability	0.14* (0.07)	2.10 (3.76)	-0.02 (0.06)	0.12** (0.05)	0.19*** (0.07)	0.02 (0.03)	-0.05 (0.05)	-1.06*** (0.21)	-997.27*** (342.99)
Emotional/Mental Health	0.11***	1.10	-0.00	0.10***	0.14***	0.01	-0.01	-0.78***	-769.43***

	(0.02)	(0.86)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.12)	(121.67)
Autism	0.09	0.08	-0.05	0.11***	0.13**	0.03	-0.03	-1.20***	-1,631.23***
	(0.06)	(1.98)	(0.05)	(0.04)	(0.06)	(0.03)	(0.03)	(0.32)	(274.87)
Chronic Condition	0.04*	1.25	0.03	0.01	0.04*	-0.00	0.01	-0.22*	10.62
	(0.02)	(0.96)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.12)	(157.87)
Physical Impairment	-0.05	-1.19	-0.05**	0.05**	0.05*	0.04***	-0.02	-0.52***	-465.12***
	(0.11)	(1.04)	(0.03)	(0.02)	(0.03)	(0.01)	(0.01)	(0.13)	(156.76)
Congenital Syndromes	0.18***	-8.06**	-0.21	0.12	0.05	0.02	—	-1.14***	-558.57
	(0.03)	(3.81)	(0.15)	(0.09)	(0.12)	(0.06)		(0.42)	(1,011.36)
Mean	[0.68]	[23.90]	[0.43]	[0.25]	[0.50]	[0.04]	[0.05]	[2.21]	[2,565.34]
Panel 2: HH Income Ever < Poverty									
Any Wave	0.01	-1.12	-0.03	0.04**	0.04*	0.02	0.00	-0.17**	-200.29**
	(0.02)	(0.92)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.07)	(84.63)
Continuing Disability	0.07**	-0.53	-0.02	0.08***	0.10***	0.01	0.01	-0.35***	-472.45***
	(0.03)	(1.24)	(0.03)	(0.02)	(0.03)	(0.02)	(0.01)	(0.10)	(92.47)
IEP Indicator	0.26***	2.78**	0.05	0.13***	0.24***	0.04**	0.01	-0.42***	-543.27***
	(0.05)	(1.34)	(0.04)	(0.03)	(0.04)	(0.02)	(0.02)	(0.09)	(109.26)
Mean	[0.66]	[23.91]	[0.43]	[0.23]	[0.49]	[0.08]	[0.03]	[0.68]	[887.99]
Panel 3: HH Ever Received SSI/SSDI									
Any Wave	0.11***	2.37	0.04	0.07*	0.17***	0.04*	0.01	-0.59**	-363.14**
	(0.04)	(1.75)	(0.04)	(0.03)	(0.04)	(0.02)	(0.02)	(0.23)	(171.42)
Continuing Disability	0.13***	2.32	0.02	0.10***	0.20***	0.01	-0.02	-0.75***	-861.03***
	(0.04)	(2.01)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.19)	(226.91)
IEP Indicator	0.26***	5.67***	0.08*	0.13***	0.28***	0.04	-0.01	-0.76***	-978.78***
	(0.06)	(1.96)	(0.04)	(0.04)	(0.05)	(0.03)	(0.03)	(0.19)	(250.39)
Mean	[0.68]	[24.37]	[0.44]	[0.25]	[0.52]	[0.07]	[0.03]	[0.83]	[1,001.53]

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Regular care indicates a child was in nonparental care at least ten hours each week; PT indicates part-time care (between 10-29 hours/week); FT indicates full-time nonparental care (30 hours/week or more). Results are presented as marginal effects for binary outcomes or regression coefficients for continuous outcomes. In the top panel, models predicting cost have sample sizes of 5,350; all other models in the top panel use sample of 6,900. In the middle panel, models predicting cost have sample sizes of 1,875; all other models in the middle panel have sample sizes of 2,550. In the bottom panel, models predicting cost have sample sizes of 550; all other models in the middle panel have sample sizes of 750. Dependent variable means are in brackets and unweighted.

Source: Authors' calculations using ECLS-B data

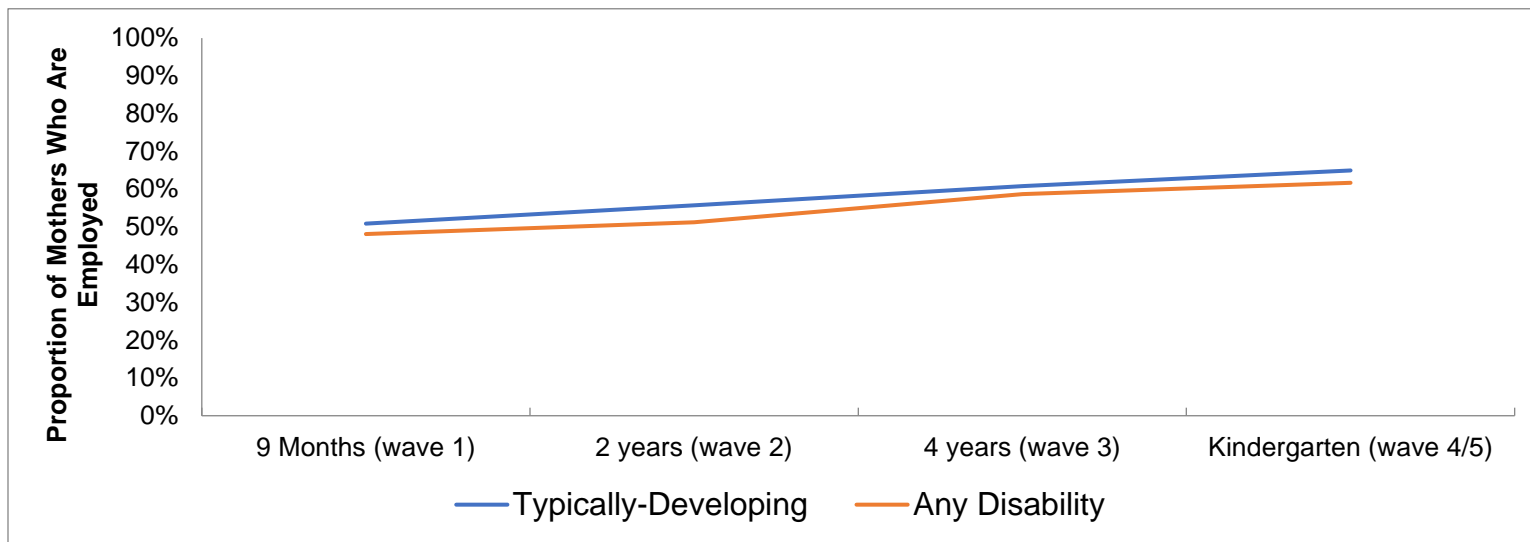
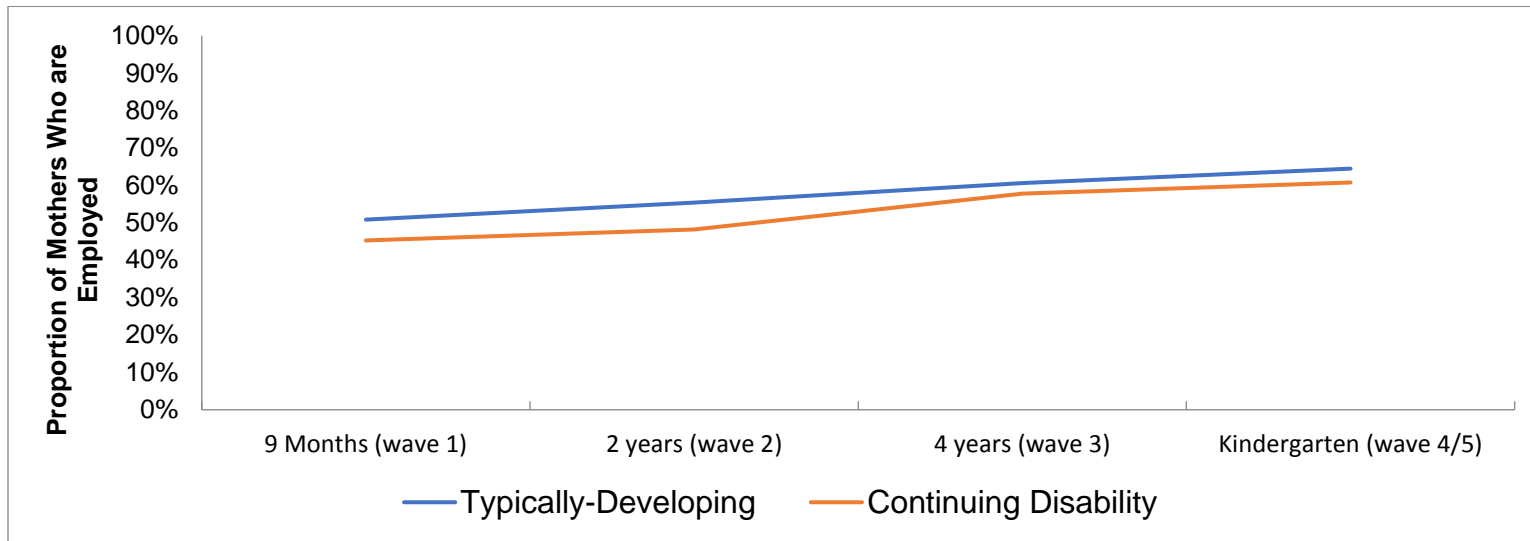
large. While communication group conditions are associated with a slight increase in the number of weekly hours in care, congenital syndromes are associated with a moderate decrease. Physical impairments are the only diagnostic group significantly associated with a decreased use of full-time care and a significantly increased likelihood of Head Start enrollment. Notable differences

are also evident in costs by diagnostic type, but all groups are associated with lower cost, with the discount ranging from \$465 annually (physical impairments) to \$1600 annually (autism).

To better understand child care use among the potential SSI population, we repeat these estimates for the subgroup of families who have ever had income below the poverty threshold in any of the first three waves of the survey and families who report ever having received disability benefits (Table 6, bottom panels). The pattern of results remains similar for both subgroups, though the magnitude of the relationships is generally larger for both than it is for the population overall, particularly for children who have an IEP. The estimates for likelihood of center-based care for children in families who received disability benefits are notably large.

We graphed the unadjusted mean maternal employment rates for children with disabilities and typically developing children, using the two main disability measures by survey wave, to better understand patterns over time (Figures 1a, 1b). These figures suggest that as children age, rates of maternal employment increase, which follows previous literature and our understanding of the availability of child care for all children. Mothers of children with disabilities have lower rates of overall employment than mothers of typically developing children. These figures also provide some indication that the parallel trends assumption required for unbiased DD estimates is met for these data; the two groups follow relatively similar patterns across survey waves. They do indicate, however, that the biggest change in the rates of employment for mothers of children

Figures 1a, 1b: Maternal Employment Rates Across Survey Waves by Disability Status



Source: Authors' calculations using the ECLS-B

Table 7: Unadjusted Maternal Employment Rates by Wave, Weighted

	Employed			FT Employment			PT Employment		
	Disability, Any Wave	Typically Developing	Difference	Disability, Any Wave	Typically Developing	Difference	Disability, Any Wave	Typically Developing	Difference
Wave 2	53.9%	55.4%	1.5%	33.2%	35.6%	2.4%	20.7%	19.8%	-0.8%
Wave 3	58.6%	60.1%	1.4%	40.1%	40.7%	0.6%	18.6%	19.4%	0.8%
Change	4.7%	4.7%	0.1%	6.9%	5.1%	1.8%	-2.1%	-0.4%	2.2%
Wave 3	58.6%	60.1%	1.4%	40.1%	40.7%	0.6%	18.6%	19.4%	0.8%
Kindergarten	60.2%	63.9%	3.7%	41.7%	43.8%	2.1%	18.5%	20.1%	1.6%
Change	1.5%	3.8%	-2.3%	1.6%	3.1%	-1.5%	-0.1%	0.7%	-0.7%

FT Employment indicates household mother was employed at least 35 hours/week. PT Employment indicates household mother was employed less than 35 hours/week.

Source: Authors' calculations using the ECLS-B

with disabilities occurs between wave 2 (when the child is two years old) and the preschool wave, rather than in kindergarten, as hypothesized.

At kindergarten enrollment, mothers of children with disabilities increase their employment at a lower rate than mothers of typically developing children (Table 7). Beginning in wave 2, there is a 1.5 percentage point difference in employment levels between the two groups overall. This finding disguises the heterogeneity in the differences between full- and part-time employment between the two groups; there is a larger gap in full-time employment (2 percentage points) and a larger proportion of mothers of children with disabilities have part-time employment compared to mothers of typically developing children. Between wave 2 and wave 3, both groups increased employment overall at the same rate, though mothers of children with disabilities increased full-time employment and decreased part-time employment at a higher rate than mothers of typically developing children (seven percentage points in full-time employment compared to five percentage points; two percentage point decrease in part-time employment compared to .4 percentage point). Between wave 3 and kindergarten enrollment, however, mothers of typically developing children increased employment at a slightly higher rate (3.8 compared to 1.5 percentage points), almost all of the growth in full-time employment. There is essentially no change in part-time employment for mothers of children with disabilities between preschool and kindergarten enrollment, and a .7 percentage point increase for mothers of typically developing children.

To further examine the relationship between disability and maternal employment at the two different waves, Appendix D contains the results of logistic regressions predicting maternal employment in the preschool wave (wave 3) and at kindergarten enrollment by the two main disability measures. Generally, the marginal effects estimates of disability status for any maternal employment for both measures in the preschool wave are nonsignificant. At the kindergarten wave, however, both measures are significantly associated with a three percentage point decrease in the likelihood of any maternal employment. Both are also associated with a decrease in the average maternal hours worked and average total parental hours worked. Results are similar for

Table 8: DD Analysis using LPM predicting maternal employment

	Any Employment			FT Employment			PT Employment			Hours			Total Hours		
	Any	Continuing	IEP	Any	Continuing	IEP	Any	Continuing	IEP	Any	Continuing	IEP	Any	Continuing	IEP
Panel 1: Full Sample															
Disability	**			**	***	*				***	**		***	**	***
	-0.0261	-0.0311	-0.0141	-0.0320	-0.0467	-0.0302	0.0063	0.0023	0.0189	-1.5104	-1.6092	-1.1633	-2.4557	-2.0491	-2.7377
	(0.0128)	(0.0192)	(0.0189)	(0.0131)	(0.0161)	(0.0178)	(0.0109)	(0.0158)	(0.0169)	(0.5233)	(0.7753)	(0.7097)	(0.6418)	(0.9318)	(0.9506)
Kindergarten	***				*					***	***	***	*	**	**
	0.0214	0.0188	0.0188	0.0116	0.0123	0.0105	0.0102	0.0069	0.0088	0.7871	0.8123	0.7736	0.6848	0.8291	0.7311
	(0.0071)	(0.0066)	(0.0066)	(0.0071)	(0.0066)	(0.0066)	(0.0070)	(0.0066)	(0.0065)	(0.2771)	(0.2570)	(0.2551)	(0.3803)	(0.3518)	(0.3467)
DD	-0.0120	-0.0073	-0.0117	0.0022	0.0116	0.0186	-0.0143	-0.0059	-0.0317	-0.0208	-0.3159	0.0258	0.1784	-0.9658	-0.0937
	(0.0120)	(0.0179)	(0.0212)	(0.0118)	(0.0167)	(0.0226)	(0.0119)	(0.0166)	(0.0208)	(0.4625)	(0.6957)	(0.8361)	(0.6266)	(0.9414)	(1.1795)
Panel 2: HH Income Ever < Poverty															
DD	0.0034	-0.0036	-0.0291	0.0197	0.0095	-0.0057	-0.0174	-0.0109	-0.0267	0.4491	-0.2671	-0.2612	0.3202	-1.6562	-0.2706
	(0.0224)	(0.0310)	(0.0380)	(0.0223)	(0.0313)	(0.0394)	(0.0199)	(0.0273)	(0.0334)	(0.8836)	(1.1985)	(1.5164)	(1.1784)	(1.6563)	(2.1812)
Panel 3: HH Ever Received SSI/SSDI															
DD	0.0078	-0.0316	-0.0556	0.0289	-0.0325	-0.0343	-0.0238	0.0007	-0.0232	0.9649	-1.5668	-1.9047	0.6690	-2.7590	-1.6716
	(0.0378)	(0.0407)	(0.0429)	(0.0374)	(0.0423)	(0.0465)	(0.0333)	(0.0385)	(0.0424)	(1.5100)	(1.5964)	(1.7132)	(2.0564)	(2.2617)	(2.5534)

*** p<0.01, ** p<0.05, * p<0.1 Standard errors in parentheses. FT Employment indicates household mother was employed at least 35 hours/week; PT Employment indicates household mother was employed less than 35 hours/ week. Hours is a measure of regular weekly hours worked by household mother; Total Hours is a measure of combined weekly hours for all parents in the households. The full sample has 6,700 observations. The sub-sample of households ever below poverty includes 2,550 observations. The sub-sample of households that have ever received disability benefits has 750 observations. Source: Authors' calculations using ECLS-B

children who live in households that have ever had income below poverty and those that have ever received SSI or SSDI (second and third panels).

We examined the differences in the rates of change of maternal employment at kindergarten enrollment for children with and without disabilities using DD estimates for linear probability models (LPM) that predict any maternal employment, full-time employment, and part-time employment, as well as models predicting maternal and total parental hours worked in the last week (Table 8). The estimates for the main effects of having a disability are negative in all models, except for the LPM predicting part-time employment, and mostly statistically significant. Childhood disability, depending on the measure, is associated with an approximately three to four percentage point decrease in maternal employment overall and in full-time employment at kindergarten, as well as one-to-two fewer average hours worked each week for both mothers and all parents in the household. The estimates for the effect of kindergarten enrollment on employment outcomes are generally positive and statistically significant. The DD estimator estimates the difference in the change of employment rates for mothers of children with disabilities compared to mothers of typically developing children. For the most part, the DD estimates are not statistically significant; all are close to zero. The direction of the estimates is negative for overall employment and part-time employment. This finding suggests that there is no statistically significant difference in the change in the rate of maternal employment at kindergarten enrollment for mothers of children with disabilities compared to mothers of typically developing children. We find a similar pattern for poor households and households that have ever received disability benefits (second and third panels).

4.2. Alternate Specifications

We tested our DD models using a range of alternative specifications. First, we included wave 2 of the data in our estimates; this specification results in a statistically significant negative estimate for the rate of change in part-time maternal employment for mothers of children with disabilities compared to other mothers. This finding is consistent when we apply the recommended survey weights whether or not we include wave 2. We find similar results when we run models excluding children in half-day kindergarten; in this specification, mothers of

children with IEPs increase their rates of part-time employment at kindergarten by approximately four percentage points less than mothers of typically-developing children.

We also estimated models using imputed data for the main analytic sample and imputed data across waves for all 10,700 of the original participants. Using the imputed data, results from some models suggest a statistically significant but smaller rate of change in maternal employment for mothers of children with disabilities. Using imputed data, we estimate that mothers of children with a disability in any wave increased their rate of overall employment less than mothers of typically developing children by approximately two percentage points, with a similar estimate for part-time employment. The imputed data also suggest that the rate by which mothers of children with continuing disabilities increased their rate of full-time employment was four percentage points lower than it was for mothers of typically developing children. Contrary to our initial hypothesis, these findings suggest employment at kindergarten for mothers of typically developing children increases at a higher rate than for mothers of children with a disability diagnosis in any wave prior to kindergarten.

Because of the increase in child care use at the preschool wave for all children, but for children with disabilities in particular, we estimated models using the preschool year as the treatment year to determine whether availability of care during this developmental stage may differentially impact maternal employment. This analysis did not yield any significant results. Due to endogeneity concerns related to early identification and use of care (i.e., children in care may also be more likely to be identified as having a disability), we also tested a model where we limited children with a disability only to those whose condition was identified prior to entering child care; this analysis does not find any differences in results.

We also examined differences by diagnostic categories for the LPMs predicting differences in maternal employment rates at kindergarten enrollment (Table 9). Looking at main effects, all of the categories are associated with a decreased likelihood of maternal employment but with

differences in the relationship to maternal employment by childhood conditions.¹³ Though the DD estimates for all conditions are nonsignificant, the magnitude and, in some cases, the direction differs notably from the overall disability estimates. Indeed, when we use imputed data, we find a positive and statistically significant estimate for employment for mothers of children with autism.

Table 9: DD Analysis using LPM predicting maternal employment by disability category

	Main Effect	DD Estimator
Communication	-0.0423*** (0.0160)	-0.0028 (0.0148)
IDD	-0.1572** (0.0672)	0.0441 (0.0572)
Emotional/Mental Health	-0.0414* (0.0231)	0.0014 (0.0200)
Autism	-0.0382 (0.0577)	0.0443 (0.0368)
Chronic	-0.0134 (0.0216)	-0.0126 (0.0211)
Physical/Orthopedic	-0.0465* (0.0263)	-0.0144 (0.0244)
Congenital Syndromes	-0.2259** (0.1113)	0.2018 (0.1342)

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses

Source: Authors' calculation using the ECLS-B

5. Discussion

At age four, children with disabilities are more likely to be in any regular nonparental care, more likely to be in part-time care, more likely to be enrolled in center-based care as their primary arrangement, more likely to attend Head Start, and more likely to have arrangements that cost less on an hourly and annual basis compared to typically developing children. Children with disabilities are no more or less likely to be enrolled in full-time care than their typically developing peers; there is some indication they are less likely to be enrolled in informal care.

¹³ We do not show the main effects of kindergarten enrollment because these estimates do not differ substantially across models, nor do they differ substantially from the main models.

Notably, the pattern of results is broadly similar no matter which definition of disability is employed, with the exception of the outcome of Head Start enrollment. As expected, our two non-IEP measures for disability bound estimates; the measure for disability in any wave generally results in estimates of lower magnitude than those for continuing disability. These findings provide some confidence in our selection of disability measures. Receipt of an IEP is associated with the largest magnitude estimates. Results are robust when we control for employment and across measures of income.

We exclude the subsidy indicator from our main models due to concerns about endogeneity (e.g., in order to receive a subsidy, children must be enrolled in care). However, when we model subsidy receipt, the magnitude of the relationship between disability and child care use is decreased moderately, particularly for the disability in any wave measure (our lower-bound measure), though the pattern of relationships remains the same. Given the disproportionate number of children with disabilities who report subsidized care—approximately 10 to 20 percentage points higher than typically developing children—this is to be expected. To further probe the effect of subsidies, we also examined the marginal effect of subsidies by disability status. We find that subsidy receipt is associated with a decreased likelihood of full-time child care for both measures of disability. For children with a continuing disability, subsidy receipt is associated with a decreased likelihood of center-based care and an increased likelihood of home-based care. The negative relationship with center-based care is surprising; we might expect subsidies to increase access to center-based care.

The patterns of care access and use do not differ when we consider only households that have had income below the poverty threshold at any point in the child's life—households that are most likely to be meet the SSI eligibility criteria—and those that have ever received disability benefits. In fact, the strength of the relationship between disability status and part-time care and center-based care are stronger for these subgroups. This finding indicates that the relationship to access is not being driven simply by high-income families choosing center-based care. This analysis paints an encouraging picture of child care access for SSI recipients and the families

most likely to be eligible for SSI; these estimates suggest that the current child care landscape may be sufficiently supporting employment for these families.

Our results are consistent with the conclusion that the constellation of child care policies may be effectively supporting access to child care for children with disabilities. At the most basic level, we see an increased likelihood of regular child care in general for children with disabilities. We also find an increased likelihood of center-based care compared to other care types. In general, much of the public policy infrastructure is designed to improve access to center-based care; thus, this relationship may be a result of policy levers. Our results also suggest that children with disabilities receive care at a decreased cost, all else constant, even compared to other families with income below the poverty threshold. Though this may be related to the quality of care these families can access, there is some indication that it is instead a result of policy. In particular, we find that cost is decreased overall, both annually and hourly. We also see differences by disability type; the cost of care for children with autism is discounted by the largest amount, followed by children with intellectual disabilities and children with other congenital syndromes. These conditions are often diagnosed prior to preschool, and we might expect to result children with these conditions to have the most difficulty accessing affordable care. Thus, differences in cost may be the result of effective public policy that provides access to early care and education via IEP or subsidy.

Our estimates for explicitly policy-relevant measures are also consistent with policy increasing access. Having a disability in any wave statistically significantly increases the likelihood of Head Start enrollment, which is notable given the small number of children in our sample enrolled in Head Start. The estimates for the IEP indicator are particularly telling. Having an IEP, which indicates that the child is receiving services from the Department of Education under IDEA, strongly increases the likelihood of care overall, center-based care, Head Start enrollment, and decreased costs. These indicators are all consistent with increased access and in clear keeping with the purpose of IDEA. The estimates for the effect of an IEP on care use for low-income children and children in households that have received disability benefits are particularly encouraging. Having an IEP increases the likelihood of any child care use and center-based care

by over 25 percentage points for these groups. Further, while receipt of an IEP is associated with fewer hours in care for the overall population, it is associated with an increased number of hours in care for these populations and an increased likelihood of full-time care for children in households who have ever received disability benefits.

One issue to consider is the direction of the relationship between child care use and disability. Children in child care—particularly high-quality, center-based care—are more likely to be screened for health concerns; screening is required by law, under IDEA’s Child Find provision. However, some of our estimates indicate that the relationship is not just about increased identification for children in care. First, results are robust when we conducted analyses using only children with diagnoses prior to care enrollment. Also, our results by diagnostic type are not indicative of a story of increased identification once in care. Though the patterns are all broadly similar to the overall results, children with intellectual disabilities and children with autism have some of the strongest likelihoods of center-based care use. These conditions are generally identified at an early age. The strength of these relationships is also stronger than the estimates for communication-related conditions, which may be more likely to be identified and screened for after a child has entered care. It is also possible that parents may select center-based care for children with disabilities, even prior to diagnosis, because they think it will be helpful to their children and as a means of connecting to services, including formal diagnoses and IEP receipt. Although, our approach cannot rule out that parents with non-typically developing children prefer center based care, and it is also possible that experiencing center-based care increases the odds of a disability being formally diagnosed.

The association between disability status and use of part-time care rather than full-time care warrants additional consideration. It may indicate that young children with disabilities are using early childhood centers primarily as sites for services or learning enrichment rather than traditional child care to support parental employment. In this case, policy may be succeeding in supporting the child’s health needs, but it may not be providing care sufficient to support parental employment. This pattern may also reflect the complexity families face in balancing caregiving needs and other requirements like medical appointments or it may be a result of

children's health conditions impacting their ability to participate in full-time care. Indeed, the results of the DD analysis indicate that parents of children with disabilities are less likely to increase their rates of part-time employment at kindergarten enrollment, perhaps because of their overall higher rates of part-time employment in earlier waves. Finally, we may be concerned that policy is effectively supporting part-time enrollment and access, but not full-time access. Indeed, the marginal effect of subsidy receipt is associated with an increased likelihood of part-time compared to full-time care. Children may have access to care for the portion of the day when they receive IEP services, for example, but not for the rest of the day. This pattern could also be the result of the expansion of public pre-K programs, which are typically not full day but do lower the age of access to free, public education.

That we find a stronger association with part-time care use may also indicate that our findings are more consistent with the previous literature emphasizing families' challenges finding care than it first appears. Though we find that children with disabilities are more likely to be enrolled in care than children without disabilities, we have no insight into parents' satisfaction with care, the length of time the child has been in that particular child care arrangement (or how long they will remain), nor the process of locating care and what public resources may be available to help them in that process. Indeed, what evidence we do have, suggests that children with disabilities enter care later than typically-developing peers, which may underscore the difficulty locating care. The differences we find in care use by disability status also underscore that our findings represent an average for all children identified with disabilities, which may understate the difficulty some families have accessing care.

Overall, the results of our DD analysis could have several policy implications. These results, taken in concert with the child care estimates, suggest child care is accessible for families raising young children with disabilities. The constellation of federal child care policies may be adequately supporting access to child care for families, particularly low-income families, raising children with disabilities. Further, the increased availability of public pre-K programs for four-year-olds may play a role. The unadjusted rates of employment indicate a greater shift in employment between the two-year-old wave and the four-year-old wave, which may also suggest

this expansion has a role in the results. To test this, we also ran a model with preschool as the treatment year; results were nonsignificant.

Additionally, the nonsignificant results and the overall trend of negative estimates may simply indicate that the labor supply of parents of children with disabilities is less elastic than that of parents of typically developing children. We know these parents have many more responsibilities to juggle, and enrollment in kindergarten may not relieve these responsibilities. In fact, given the length of school days and other out-of-school time for holidays and summer, kindergarten may provide less support for employment for parents who have to find after-school or other out-of-school care for children enrolled in school. It may also be important to consider other policy levers to support employment for parents raising a child with a disability. Even if child care is sufficiently available, parents' ability to work may be hindered by the increased needs of children with disabilities. Parents may not be able to take their children with disabilities to more frequent medical appointments or address their overall needs if they do not have access to paid leave or flexible scheduling. This limitation may be highlighted in the different patterns of results for children with continuing disability in households that report ever having received disability benefits; the DD estimates are larger and concentrated almost entirely in full-time employment, meaning mothers of children with disabilities in this group are less likely to increase employment at kindergarten enrollment compared to mothers of typically developing children.

Finally, the DD estimates for specific diagnostic categories indicate the need to consider how different conditions may differentially affect access to care and parental employment. Mothers of children with autism appear to increase their employment at kindergarten enrollment at greater rates than mothers of typically developing children. Though nonsignificant, the results suggest this may also be true for other conditions under the broad umbrella of developmental disability, including intellectual disability and congenital syndromes. This finding may be a result of the severity of the condition, which could influence care availability (though we do not see this in the child care results), or it may be indicative of the role of diagnostic timing or differences in how conditions manifest across developmental stages. All of these conditions can be identified

early, which may allow families time to account for services and supports by kindergarten enrollment.

6. Limitations

The nature and severity of children's special needs are clearly important to understanding child care accommodations and parents' employment contexts. Although the data offer a relatively large sample of children with disabilities and we attempt to disaggregate by some diagnoses, we are still unable to do so beyond broad categorizations. In addition, we rely on child care arrangements and estimates of maternal employment rates to infer information about the accessibility of child care. This approach does not account for parental preferences related to child care; parents of children with disabilities may have different preferences for care than children of typically developing peers. It also does not account for the parental employment context, such as the availability of employer flexibility and paid leave, which may also influence parental employment. Therefore, lower rates of maternal employment may simply reflect a difference in parental preferences or the impact of related policies rather than accessibility of care. The relationship between the child's health status and parental employment characteristics could also bias our estimates. Similarly, while this study aims to provide information about the current menu of policies intended to assist families that have children with disabilities in accessing child care, it cannot disentangle the roles of specific policies nor can it account for the supply of child care. These data also do not reflect some recent, consequential changes in the child care landscape, such as changes to the subsidies intended to increase access and implementation of IDEA Part C, which extends services to infants and toddlers. Our data also limit our understanding of some key timing issues; it may be useful to have data on post-treatment outcomes, particularly since the kindergarten enrollment years coincide with the beginning of the Great Recession. Additionally, though we have information for the first wave that a parent reports their child having a specific health condition, we do not know precisely when the child was diagnosed.

7. Summary and Conclusions

Our analysis broadly supports the idea that federal policies—including subsidies, IDEA, and Head Start—are providing access to child care for children with disabilities, including SSI recipients. Children with disabilities have higher likelihoods of enrollment in child care, particularly part-time and center-based care, at age four, and there is some evidence that policy levers may be easing access and decreasing costs. The results of our DD analysis are nonsignificant and indicate, that, if anything, mothers of children with disabilities increase their rate of employment at kindergarten enrollment at lower rates than mothers of typically developing peers. Thus, our analysis finds support for the efficacy of policies designed to support employment for parents of children with disabilities, including for children from very low-income families, who may be most likely to receive SSI. Our findings also suggest several avenues for future research, including examining child care access for very young children with disabilities and the role of IDEA Part C in providing access; exploiting state differences in child care policy to disentangle the role of specific policies; oversampling children with disabilities in large-scale data collections to disaggregate by disability type; and exploring employment supports available to parents of school-age children with disabilities, such as out-of-school care and paid leave.

Children with disabilities, including SSI recipients and their families, appear to be using early care and education at relatively high rates. This access may provide an important support for parental employment and may also confer developmental benefits for children. As the number of young children with disabilities continues to grow, it will be important for early care and education providers to be appropriately trained to meet the needs of these children and their families. It will also remain important for policymakers and federal agencies that serve children with disabilities to monitor and continue to support child care access and provide other policy supports to ensure families are receiving the support they need to maintain economic stability.

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Appendix A: Conditions By Interview Wave

Condition	Waves Included
Asthma	All
Blindness	1,2
Difficulty seeing	All
Difficulty hearing	All
Cleft palate	1
Heart defect	All
Failure to thrive	1
Problem with mobility	All
Problem using hands	1
Down Syndrome	1
Turner Syndrome	1
Spina bifida	1
Other special need	1
Crossed eyes	2
Delay in walking	2
Delay in talking	2
Other delay	2-5
Epilepsy	2-5
Intellectual disability	2-5
Requires special equipment	2-5
Condition impairs play	2
Evaluated and diagnosed problem with attention	3-5
Evaluated and diagnosed problem with activity level	3-5
Evaluated and diagnosed problem using limbs	3-5
Evaluated and diagnosed problem with communication	3-5
Autism	3-5
Oppositional Defiant Disorder	3-5
ADHD	3-5
Blood disease	4-5
Other chronic condition	4-5

Source: ECLS-B

Appendix B: Models Predicting Child Care Arrangements in Waves 1 & 2

Models Predicting Child Care Arrangements in Waves 1 & 2

	Regular Care ^a	Hours in Care ^b	FT ^a	PT ^a	Center ^a	Home-Based ^a	Annual Cost ^b
Wave 1	-0.02 (0.02)	-0.60 (0.86)	-0.02 (0.02)	0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)	119.17 (243.56)
Wave 2	0.01 (0.02)	0.53 (0.71)	0.00 (0.02)	0.01 (0.01)	0.02 (0.01)	0.02 (0.01)	-106.68 (175.83)
	Informal and Home-Based Care vs No Care	Center-Based vs No Care	Informal and Home-Based vs Center	No Care	Informal/Home	Center-Based	
Wave 1	0.89 (0.07)	0.95 (0.13)	0.94 (0.13)	0.02 (0.02)	-0.02 (0.02)	-0.00 (0.01)	
Wave 2	0.99 (0.09)	1.17 (0.13)	0.85 (0.10)	-0.01 (0.02)	-0.01 (0.02)	0.02 (0.01)	

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses. Regular care indicates a child was in nonparental care at least ten hours each week; PT indicates part-time care (between 10-29 hours/week); FT indicates full-time nonparental care (30 hours/week or more).

Models use wave specific disability measures and outcomes.

Source: Authors' calculations using the ECLS-B

Appendix C: Covariate Estimate for Models Predicting Child Care Use in Wave 3

Covariate Estimates for Models Predicting Child Care Use in Wave 3

	Regular Care ^a	Hours in Care ^b	FT ^a	PT ^a	Center ^a	Head Start ^a	Home- Based ^a	Annual Cost ^b
Any Disability, Before Kindergarten	0.04*** (0.01)	0.05 (0.53)	-0.01 (0.01)	0.04*** (0.01)	0.06*** (0.01)	0.01** (0.01)	0.00 (0.01)	-386.75*** (87.54)
Male	1.13** (0.06)	0.31 (0.47)	1.06 (0.06)	1.06 (0.06)	1.07 (0.06)	1.02 (0.13)	1.04 (0.13)	-118.70 (78.22)
Child Race/Ethnicity, White	reference	reference	reference	reference	reference	reference	reference	reference
Black	1.73*** (0.17)	8.08*** (0.81)	2.55*** (0.24)	0.51*** (0.06)	1.78*** (0.16)	3.31*** (0.67)	0.96 (0.23)	-203.41 (127.86)
Latinx	1.09 (0.10)	1.01 (0.74)	1.22** (0.10)	0.86* (0.08)	1.06 (0.09)	1.61** (0.34)	0.91 (0.17)	-186.79 (132.93)
Other Race/Ethnicity	1.34*** (0.11)	3.53*** (0.66)	1.46*** (0.11)	0.86* (0.07)	1.39*** (0.10)	1.43* (0.30)	0.64** (0.11)	471.86*** (122.94)
Single Parent Family	1.92*** (0.15)	8.66*** (0.66)	2.30*** (0.17)	0.70*** (0.06)	1.12 (0.08)	1.25 (0.20)	1.58*** (0.27)	522.63*** (104.41)
Number of Household Children 5 and Under	0.79*** (0.03)	-2.29*** (0.32)	0.78*** (0.03)	1.01 (0.04)	0.90*** (0.03)	1.14* (0.09)	0.67*** (0.06)	-296.85*** (51.26)
Number of Household Children 6-17	0.87*** (0.02)	-1.55*** (0.24)	0.88*** (0.03)	0.99 (0.03)	0.89*** (0.02)	1.00 (0.06)	0.99 (0.06)	-171.63*** (35.84)
Number of Nonparental Adults in Household	1.11*** (0.04)	2.08*** (0.30)	1.18*** (0.04)	0.90*** (0.04)	0.94* (0.03)	1.19*** (0.08)	0.73*** (0.07)	-109.45** (46.20)
Household Income <100%FPL	0.87	-3.74***	0.67***	1.42***	1.30***	1.75**	0.37***	-1,316.52***

Covariate Estimates for Models Predicting Child Care Use in Wave 3

	Regular Care ^a	Hours in Care ^b	FT ^a	PT ^a	Center ^a	Head Start ^a	Home-Based ^a	Annual Cost ^b
	(0.08)	(0.79)	(0.06)	(0.14)	(0.11)	(0.39)	(0.08)	(101.53)
Household Income 100–199% FPL	0.92	-1.67**	0.78***	1.24**	1.07	1.66**	0.67**	-861.87***
	(0.07)	(0.69)	(0.06)	(0.11)	(0.08)	(0.35)	(0.11)	(97.44)
Household Income 200–399% FPL	reference	reference	reference	reference	reference	reference	reference	reference
Household Income 400%+ FPL	2.03***	5.05***	1.66***	1.13	1.74***	0.87	0.88	2,025.16***
	(0.17)	(0.70)	(0.13)	(0.10)	(0.14)	(0.27)	(0.14)	(126.86)
Mother Respondent Health Is Fair/Poor	0.89	-0.91	0.85*	1.07	0.89	1.31	0.80	-243.19***
	(0.08)	(0.81)	(0.08)	(0.11)	(0.08)	(0.23)	(0.19)	(93.84)
Parental Education Level High School	0.89	-0.01	0.98	0.88	0.75***	2.13***	1.36	-1,115.75***
	(0.08)	(0.76)	(0.09)	(0.08)	(0.06)	(0.58)	(0.27)	(113.61)
Parental Education Level Some College	1.18**	1.77***	1.19**	0.97	0.92	2.31***	1.14	-881.80***
	(0.09)	(0.65)	(0.09)	(0.08)	(0.07)	(0.58)	(0.18)	(104.72)
Parental Education College or Higher	reference	reference	reference	reference	reference	reference	reference	reference
Urban City, Urban Large	reference	reference	reference	reference	reference	reference	reference	reference
Urban, Small	1.21**	1.91**	1.19**	0.98	0.96	1.60**	2.67***	-532.84***
	(0.11)	(0.76)	(0.11)	(0.09)	(0.08)	(0.30)	(0.41)	(100.02)
Rural	1.15*	0.88	1.19**	0.95	1.00	2.13***	1.60**	-799.70***
	(0.10)	(0.72)	(0.10)	(0.09)	(0.08)	(0.38)	(0.29)	(98.02)
Constant	1.62	19.85***	0.47**	0.43**	0.53**	0.00***	0.18***	4,507.85***
	(0.50)	(2.85)	(0.16)	(0.14)	(0.17)	(0.00)	(0.10)	(475.68)
Observations	6,600	6,600	6,600	6,600	6,600	6,500	6,600	5,350

*** p<0.01, ** p<0.05, * p<0.1 Standard errors in parentheses. Models also include state fixed effects. Regular care indicates a child was in nonparental care at least ten hours each week; PT indicates part-time care (between 10-29 hours/week); FT indicates full-time nonparental care (30 hours/week or more).

^aResults presented as odds ratios for logistic regression model

^bOLS regression models

Source: Authors' estimates using the ECLS-B

Appendix D: Regression Models Predicting Employment Outcomes

Wave 3 and Kindergarten Enrollment by Disability Status

		Wave 3					Kindergarten						
		Employed ^a	Employed FT ^a	Employed PT ^a	Hours Worked ^b	Total HH Hours ^b	Father Employed ^a	Employed ^a	Employed FT ^a	Employed PT ^a	Hours Worked ^b	Total HH hours ^b	Father Employed ^a
Full Sample	Any Disability, Before Kindergarten	-0.01 (0.01)	-0.02* (0.01)	0.01 (0.01)	-0.93* (0.54)	-1.62** (0.66)	-0.02** (0.01)	-0.03** (0.01)	-0.02* (0.01)	-0.00 (0.01)	-1.11** (0.54)	-1.52** (0.69)	-0.01 (0.01)
	Continuing Disability, Before Kindergarten	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)	-0.85 (0.80)	-1.14 (0.98)	-0.01 (0.01)	-0.03* (0.02)	-0.03 (0.02)	-0.00 (0.02)	-1.81** (0.79)	-2.53** (1.07)	-0.02* (0.01)
< 100% FPL	Any Disability, Before Kindergarten	-0.03 (0.02)	-0.03 (0.02)	0.00 (0.02)	-1.02 (0.88)	-1.60 (1.13)	-0.02 (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.01 (0.02)	-0.97 (0.93)	-1.34 (1.21)	-0.01 (0.02)
	Continuing Disability, Before Kindergarten	-0.04 (0.03)	-0.04 (0.03)	0.00 (0.02)	-2.00* (1.21)	-1.46 (1.55)	0.01 (0.03)	-0.03* (0.02)	-0.04 (0.03)	-0.00 (0.02)	-3.11** (1.25)	-2.55 (1.82)	-0.01 (0.03)
SSI/DI	Any Disability, Before Kindergarten	-0.02 (0.04)	0.03 (0.03)	0.01 (0.01)	-0.59 (1.61)	-0.63 (2.09)	0.03 (0.05)	-0.03 (0.04)	-0.04 (0.04)	0.02 (0.03)	-3.13* (1.65)	0.08 (2.10)	0.08 (0.05)
	Continuing Disability, Before Kindergarten	0.00 (0.04)	0.02 (0.04)	-0.01 (0.03)	0.21 (1.79)	1.85 (2.30)	0.06 (0.06)	-0.03* (0.02)	-0.06 (0.05)	0.01 (0.03)	-4.67*** (1.78)	-1.17 (2.36)	0.05 (0.06)

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses. FT employment indicates the household mother was employed at least 35 hours/week; PT employment indicates household mother was employed less than 35 hours/week.

^aResults presented as marginal effects for logistic regression model

^bOLS regression models

Source: Authors' calculations using ECLS-B



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