Exceptional Children
2017, Vol. 84(1) 27–41
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DOI: 10.1177/0014402917718341
journals.sagepub.com/home/ecx
SAGE

Cross-Cohort Evidence of Disparities in Service Receipt for Speech or Language Impairments

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Abstract

We examined the extent to which disparities in the receipt of special education services for speech or language impairments (SLIs) on the basis of race, ethnicity, or language use by kindergarten—when the delivery of these services might be expected to be most effective—have changed over a 12-year period in the United States. Logistic regression modeling of 2 nationally representative cohorts (N = 16,800 and 12,080) indicated that children who are Black (covariate-adjusted odds ratios = 0.39 and 0.54) or from non-English-speaking households (covariate-adjusted odds ratios = 0.57 and 0.50) continue to be less likely to receive services for SLIs. Hispanic children are now less likely to receive these services (covariate adjusted odds ratio = 0.54) than otherwise similar non-Hispanic White children. Disparities in special education service receipt for SLIs attributable to race, ethnicity, and language presently occur in the United States and are not explained by many potential confounds.

Speech or language impairments (SLIs) increase young children's risk for atypical development, including lower cognitive, behavioral, and school functioning (Bornstein, Hahn, & Suwalsky, 2013; Petersen et al., 2013; U.S. Preventive Services Task Force, 2006). Elementary school–age children with SLIs are at increased risk of having reading (Catts, Fey, Tomblin, & Zhang, 2002; Snowling, Bishop, & Stothard, 2000) and behavioral (Yew & O'Kearney, 2013) disabilities and often experience greater bullying and feelings of isolation (Harrison, McLeod, Berthelsen, & Walker, 2009; McCormack, Harrison, McLeod, & McAllister, 2011; Morgan, Farkas, & Wu, 2011). As they age, children with SLIs are less likely to complete high school; are more frequently unemployed; and, if employed, hold lower-paying positions (Elbro, Dalby, & Maarbjerg, 2011; Felsenfeld, Broen, & McGue, 1994; Johnson, Beitchman, & Brownlie, 2010; Muir, O'Callaghan, Bor, Najman, & Williams, 2011). Prevalence estimates among preschool children vary, ranging from 5% to 8% for combined speech and language delays and 2% to 19% for language delays, with persistence rates of 40% to 60% for untreated speech and language delays (Nelson, Nygren, Walker, & Panoscha, 2006). Although SLIs may constitute a chronic condition (Silva, Williams, & McGee, 1987; Snowling et al., 2000; Tomblin, Zhang, Buckwalter, & O'Brien, 2003), children appropriately identified and provided with interventions and services by kindergarten display substantially improved speech and language capabilities (Beitchman, Wilson, Brownlie, Walters, & Lancee, 1996; Boyle, McCartney, O'Hare, & Forbes, 2009; Hebbeler et al., 2007; Law,

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Garrett, & Nye, 2004; Nelson et al., 2006; Roberts & Kaiser, 2011; Wilcox, Gray, Guimond, & Lafferty, 2011).

Disparities in SLI Identification and Service Receipt by Race, Ethnicity, and Language Use

Although young children should be regularly evaluated for possible speech or language delays (Hagan, Shaw, & Duncan, 2008), fewer than 50% of those who need treatment for SLIs receive it (Skeat et al., 2014). Racial, ethnic, and language minorities are a large and rapidly growing segment of the U.S. child population (Colby & Ortman, 2014). Although they are at greater risk for SLI symptoms (Harrison & McLeod, 2010; Morgan, Farkas, Hillemeier, & Maczuga, 2012; Pruitt, Oetting, & Hegarty, 2011), minority children with SLIs may be especially unlikely to be identified and so receive treatment, including through special education (Harrison & McLeod, 2010; Morgan et al., 2012; Morgan et al., 2016). Because of their unmet treatment needs, minority children therefore may be disproportionately likely to grow to experience the sequela of untreated SLIs (e.g., reading or behavioral disabilities, bullying, unemployment). For example, White children's behavioral struggles are more likely to be medicalized and those of minority more likely to be criminalized—and so ineffectively managed (Ramey, 2015). Minority children's greater likelihood of having unidentified and so untreated disabilities has been hypothesized to at least partly explain achievement gaps in the United States (Basch, 2011).

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Possible mechanisms for racial, ethnic, and language use disparities in special education service receipt for SLIs include socioeconomic, language, and cultural factors that reduce access and receptivity to SLI screening and treatment by minority families (E. Flores, Tschann, Dimas, Pasch, & de Groat, 2010; Peña & Fiestas, 2009; Zuckerman, Mattox, Sinche, Blaschke, & Bethell, 2014); a lack of diagnostic protocols designed and validated for use with cultural and language minority populations (Figueroa & Newsome, 2006; Kohnert, Yim, Nett, Kan, & Duran, 2005; Linan-Thompson, 2010; Zuckerman et al., 2013); and a reluctance by practitioners to identify minority children for fear of being considered racially biased (possibly by misattributing a speech or language dialectal difference to SLIs; Hibel, Farkas, & Morgan, 2010; Skiba et al., 2006). Practitioners may be comparatively less likely to solicit developmental concerns from minority families (Guerrero, Rodriguez, & Flores, 2011; Zuckerman, Sinche, et al., 2014; Zuckerman, Boudreau, Lipstein, Kuhlthau, & Perrin, 2009).

Extant Work's Limitations

There are major limitations in the field's knowledge base about which children in the United States are receiving special education services for SLIs, including the extent to which disparities based on race, ethnicity, and language use currently occur. Overall, researchers and practitioners currently have "little information" (U.S. Preventive Services Task Force, 2014) about the risk factors for SLIs to guide early screening and intervention efforts. This is despite repeated calls by the U.S. Preventive Services Task Force for epidemiological studies that better inform SLI screening, evaluation, and service delivery for this especially vulnerable population of children (Nelson et al., 2006; U.S. Preventive Services Task Force, 2006, 2014). Existing studies investigating disparities based on race, ethnicity, or language use have mostly used convenience samples or have not accounted for likely confounding factors, including family socioeconomic status, maternal age and marital status, health insurance coverage, prematurity, birth weight, academic functioning, and behavioral self-regulation (Morrier & Gallagher, 2010; Singer et al., 2001). Such factors are important to control for, as they otherwise explain disparities initially attributable to children's race, ethnicity, or language use (Morgan et al., 2015). For example, minority children are more likely to experience low birthweight (Clay & Andrade, 2016), which may itself increase the risk for SLIs (Yliherva, Olsen, Maki-Torkko, Koiranen, & Jarvelin, 2001). Available studies analyzing population-based data have mostly used non-U.S. samples (Harrison & McLeod, 2010; Reilly et al., 2010; Zubrick, Taylor, Rice, & Slegers, 2007) and so may not generalize to the increasingly diverse U.S. school-aged population. The few population-based studies based on U.S. samples have reported conflicting findings regarding whether racial, ethnic, and language minority children are less likely to receive special education services for SLIs (Hibel et al., 2010; Morgan et al., 2012; Morgan et al., 2015; Sullivan & Bal, 2013), possibly because the disparities have sometimes been investigated with samples of children attending upper elementary grades (Hibel et al., 2010; Sullivan & Bal, 2013). Instead, these disparities may be most likely to occur early in children's school careers because children in the United States are most likely to be identified as having SLIs by kindergarten (Morgan et al., 2015). Consistent with this, Morgan and colleagues' (2016) recent analyses of a nationally representative data set of children born in the United States indicated that Black children were less likely than otherwise similar White children to receive services for SLIs prior to or by kindergarten entry. Disparities attributable to children's race, ethnicity, and language use were also evident at the end of kindergarten in an older, nationally representative data set of U.S. children entering kindergarten in 1998 or 1999 (Morgan et al., 2015). However, whether and to what extent these disparities continue to occur in the United States, as well as the extent to which they may have changed over the preceding 12-year period as the nation has grown increasingly diverse, is currently unclear (Morgan et al., 2016).

Understanding whether racial, ethnic, and language use disparities in SLI identification are continuing to occur by kindergarten in the United States is especially timely, including for policy, research, and practice. Despite some studies finding that—among children displaying similar clinical needs—racial, ethnic, and language minority children are less likely to receive school-based services for SLIs (Morgan et al., 2012; Morgan et al., 2015; Morgan et al., 2016), federal policy makers have expanded efforts to reduce what is considered to be disproportionate overrepresentation in special education due to widespread misidentification based on children's race or ethnicity (U.S. Department of Education, 2016a). This includes for SLIs (U.S. Department of Education, 2016b). Establishing that underidentification and service receipt for SLIs currently occur or are possibly increasing in the United States on the basis of race, ethnicity, and language use—particularly during kindergarten, when these services may be most effective—should better inform federal policy making as well as educational research and practice. This includes policies designed to bring greater equity to special education by ensuring that all children with disabilities are being appropriately recognized and provided with the services to which they have a civil right. More generally, and by identifying factors that are repeatedly associated with an increased likelihood of SLI identification, cross-cohort analyses of two nationally representative samples should better inform empirically based efforts to appropriately screen, monitor, and possibly evaluate children who may be at risk for these impairments and their sequela.

Purpose

Our study had two purposes. The first was to estimate to what extent disparities on the basis of race, ethnicity, and language use in the receipt of special education services for SLIs by kindergarten continue to occur or possibly may be increasing in the United States. We did so by conducting cross-cohort analyses of two nationally representative data sets over a 12-year period. Because the disparity estimates are adjusted for many confounding factors, they should provide for less ambiguous inferences about whether the disparities are attributable to children's status as racial, ethnic, or language minorities. This in turn should help inform federal policy, including newly announced regulations (U.S. Department of Education, 2016a). The second purpose was to identify which factors—across a range of gestational and birth, sociodemographic, and other child and family characteristics—are most strongly and consistently associated with receiving special education services for SLIs during kindergarten. By replicating these estimates through cross-cohort analyses of two nationally representative samples of U.S. kindergarteners, these results should help inform efforts to identify and provide services to children with SLIs as they are beginning formal schooling.

Method

Data and Samples

Data from two Early Childhood Longitudinal Study (Pollack, Atkins-Burnett, Rock, & Weiss, 2005) cohorts were analyzed: the kindergarten class of 1998–1999 (ECLS-K: 1999; *N* = 16,800) and the kindergarten class of 2010–2011 (ECLS-K: 2011; *N* = 12,080). Both of these nationally representative data sets are maintained by the National Center for Education Statistics, U.S. Department of Education (https://nces.ed.gov/ecls/index.asp). Table 1 displays descriptive statistics of the two samples. The racial and ethnic distribution was similar for the two cohorts, with non-Hispanic White children composing a little more than half the sample. Children who are Black, Hispanic, and of another race or ethnicity constituted 13%–14%, 17%–22%, and 10%–12% of the samples, respectively. Similar proportions of the two cohorts were born at low birth weight (7%–9%) or prematurely (17%–20%). Family characteristics were also similar between the groups, including maternal age at first birth, marital status, health insurance coverage, and English language usage at home. Nearly equivalent proportions of the two samples were reported to have communication problems (7%–8%), were evaluated by professionals for a communication problem (10%–11%), or had a school record of having SLIs (3%–4%).

Measures

Special Education Services for SLIs. Special education service receipt for SLIs was reported in each cohort by the children's special education teachers. These teachers were responsible for coordinating delivery of the children's school-based special education services.

Sociodemographic Characteristics. Children's race or ethnicity was classified as being non-Hispanic White, non-Hispanic Black, Hispanic, or other race/ethnicity. The incidence of SLIs may vary by other demographic characteristics, including region of residence (Northeast, Midwest, South, West) and family's socioeconomic status, which were included as covariates in the analyses (Morgan et al., 2012). A composite continuous variable measuring a family's socioeconomic status was constructed by the National Center for Education Statistics based on multivariate information from parent questionnaires about the family's household income and each parent's education level and occupation. This variable has been used in prior studies analyzing the ECLS-K data (McCormack et al., 2011). Parents reported in the spring of kindergarten on their marital status, which was also included in the analyses to control for family composition.

Child Characteristics. Parents identified their children's gender, which was included as a covariate because of its associations with speech or language delays and SLI service receipt (Harrison & McLeod, 2010). The child's age (in months) was recorded at the date of the interview in spring of kindergarten for both cohorts and was included in the analyses to control for variation in age at the time of testing. Variables were also included to indicate whether the child was born with low birth weight (<5.5 lb) or prematurely (>2 weeks before due date), as they are associated with increased risk of atypical language

Table 1. Descriptive Statistics.

	ECLS-K: 1999 (*N* = 16,800)		ECLS-K: 2011 (*N* = 12,080)	
Variable	Percentage	Mean (*SD*)	Percentage	Mean (*SD*)
Race/ethnicity				
White	58		54	
Black	14		13	
Hispanic	17		22	
Other race/ethnicity	10		12	
Socioeconomic status		0.04 (0.79)		–0.01 (0.8)
Child characteristics				
Male	51		51	
Child age, fall of kindergarten		68.47 (4.44)		68.45 (4.5)
Low birth weight	7		9	
Born more than 2 weeks before due	17		20	
Biological mother gave her first birth at age <18	12		11	
Biological mother gave her first birth at age ≥38	1		2	
Covered by health insurance, spring of kindergarten	91		95	
Parents were married, spring of kindergarten	68		71	
Language primarily spoken at home is not English	12		13	
Region				
Northeast	19		15	
Midwest	25		23	
South	32		38	
West	23		23	
Academic achievement				
Reading test, spring of kindergarten		32.4 (10.4)		49.99 (11.78)
Mathematics test, spring of kindergarten		28 (8.83)		42.63 (11.1)
Behavioral functioning				
Behavioral self-regulation		3.11 (0.67)		3.11 (0.68)
Externalizing problem behaviors		1.67 (0.64)		1.64 (0.62)
Internalizing problem behaviors		1.57 (0.51)		1.51 (0.48)
School record of speech or language impairment[a]	3		4	

Note. ECLS-K = Early Childhood Longitudinal Study–Kindergarten.
[a]Special education teacher report

development (e.g., Vohr, 2014). Whether the child was covered by health insurance was also included as a covariate because insurance has been associated with greater access to health care providers who could refer for eligibility and service receipt for SLIs prior to school entry (G. Flores & the Committee on Pediatric Research, 2010). In the fall of kindergarten, interviewed parents reported the biological mother's age when she gave birth to her first child. Because differences in health risks, including those for SLIs, have been associated with whether children are born to young or older mothers (Harrison &

McLeod, 2010), these factors were captured by maternal age dummy variables in the analyses. Because non-English-speaking families may have reduced interactions with health care providers and school personnel, we included a variable indicating whether English or another language was primarily spoken at home (Morgan et al., 2016). We did so to examine whether disparities in SLI service receipt were also occurring based on language use, as well as possibly based on race or ethnicity.

Academic Achievement. Children's academic achievement is strongly associated with the likelihood for disability identification, including that for SLIs (Morgan et al., 2015), and so was included here as an additional explanatory factor. For both cohorts, grade-appropriate, item response theory-scaled psychometrically validated measures of reading and mathematics achievement were individually administered in kindergarten. These adaptive assessments included some items that were specifically created for the ECLS-K studies, some that were adapted from commercial assessments with copyright permission, and some that were developed for other studies fielded by the National Center for Education Statistics. The reading assessment includes questions measuring basic skills, such as print familiarity, letter recognition, beginning and ending sounds, word recognition, and vocabulary knowledge. The mathematics assessment includes questions on number sense, properties, and operations. The conceptual basis and psychometric processes used to derive the assessments were highly similar in the two ECLS-K cohorts, although the measures were not identical. Theta reliabilities for the reading and mathematics achievement measures in kindergarten were in the mid-.90s (Pollack et al., 2005). We used children's spring-of-kindergarten scores on the reading and mathematics achievement measures from both cohorts as covariates.

In each cohort, English language proficiency was assessed prior to administration of the achievement assessments. Spanish speakers who were not sufficiently fluent in English received Spanish forms of the achievement assessments. Children who did not speak either English or Spanish did not participate in the achievement assessments.

Behavioral Functioning. Children's behavior, including their self-regulation and internalizing problem behaviors, is associated with the incidence of language delays and SLI service use (Harrison & McLeod, 2010) and so was included as an explanatory factor. In the spring of kindergarten, children's behaviors were rated by their general education teachers using items from the Social Rating Scale (Pollack et al., 2005), a psychometrically validated behavioral measure (e.g., split-half reliabilities ranging from .76 to .91; Pollack et al., 2005). We controlled for three types of behavioral functioning. The Approaches to Learning Scale measures self-regulatory behaviors, including the frequency with which the child pays attention, keeps belongings organized, works independently, shows eagerness to learn new things, easily adapts to changes in routine, and persists in completing tasks. The Externalizing Problem Behaviors Scale measures acting-out behaviors, including the frequency with which a child argues, fights, becomes angry, acts impulsively, and disturbs ongoing classroom activities. The Internalizing Problem Behaviors Scale measures how often the child seems anxious, lonely, or sad, or displays low self-esteem.

Missing Data

Each cohort sample was initially captured in the fall of kindergarten. There was a small amount of missing data in spring when we measured whether children were receiving special education services for SLIs. However, and by controlling for variables included in the data associated with missingness (e.g., socioeconomic status, race/ethnicity, academic achievement), we reasonably assumed that the data were missing at random. We then used multiple imputation procedures to impute missing independent variable data, resulting in the largest possible number of cases in our analyses. The missingness of the predictors in the study ranged from 0% to 8.3% for ECLS-K: 1999 and from 0% to 19.3% for ECLS-K: 2011. We imputed missing data for each cohort five times to create five data sets for each, which enabled us to estimate five sets of model parameters. We then used standard formulas to combine these five sets of estimates into those reported here.

Analytical Methods

Separate logistic regression equations predicting special education service receipt for SLIs were estimated for each period, and the difference in coefficients for race, ethnicity, and language use was tested for statistical significance. Because the data were collected by first sampling kindergarten classrooms and then sampling children within these classrooms, we used multilevel modeling (children nested in kindergarten classrooms) to estimate the regression equations. Doing so adjusted the standard errors for the clustering of observations within schools. We standardized family socioeconomic status, child age, academic achievement scores, and teacher ratings of behavior with $M = 0$ and $SD = 1$ for each cohort. Doing so made the data from these two cohorts more comparable (with continuous predictors now measured in standard deviation units). We obtained Institutional Review Board approval.

Results

Table 2 shows the coefficient estimates for the multilevel multiple logistic regressions predicting whether children were receiving special education services for SLIs for each U.S. cohort. All factors were simultaneously entered into each cohort's regression model. In 1999, the covariate-adjusted odds ratio coefficient for Black children was a statistically significant 0.39. This odds ratio indicates that the odds that Black children were receiving services for SLIs were 61% lower (calculated as 1 minus the odds ratio of .39) than the odds for otherwise similar White children. Twelve years later, in 2011, the same covariate-adjusted odds ratio was .54, indicating that Black children's odds of service receipt were 46% lower than for otherwise similar White children (1 – .54). Black children in the United States therefore continued to be less likely than otherwise similar White children to be receiving services for SLIs by kindergarten. The estimated magnitude of this disparity in 2011 was not statistically significantly different from the disparity in 1999.

In 1999, the covariate-adjusted odds ratio for Hispanic children was .86, which was not statistically significant. However, by 2011, this same ethnic disparity had increased and become statistically significant. This odds ratio for Hispanic children was .54 at the more recent time point, indicating that the odds that they were receiving services were now 46% (1 – .54) lower than for otherwise similar non-Hispanic White children.

For children from non-English-speaking homes, their odds of receiving services for SLIs were 43% (1 – .57) and 50% (1 – .50) lower than those from English-speaking homes in 1999 and 2011, respectively. Both these disparity estimates were statistically significant, but they are not significantly different from each other. Taken together, the results indicated that children from non-English-speaking homes continued to be less likely to receive services for SLIs than otherwise similar children from English-speaking homes.

Children from non-English-speaking homes continued to be less likely to receive services for SLIs than otherwise similar children from English-speaking homes.

Covariates that were statistically significant at both periods for increased risk of SLI service delivery included being male, being older at the time of assessment, having lower reading as well as mathematics achievement, and displaying less frequent behavioral self-regulation. Residing in the Western region of the United States was consistently associated with a lower likelihood of service receipt. A number of other predictors achieved significance at one but not the other period.

Table 2. Multilevel Multivariate Logistic Regression Models of Teacher-Reported SLIs, Spring Kindergarten: Estimated for ECLS-K 1998–1999 and ECLS-K 2010–2011 Data.

	Odds ratio coefficients [95% confidence intervals]	
Variables	ECLS-K: 1999 *N* = 16,800	ECLS-K: 2011 *N* = 12,080
Race/ethnicity		
Black	0.39*** [0.28, 0.55]	0.54*** [0.39, 0.75]
Hispanic	0.86 [0.62, 1.2]	0.54*** [0.38, 0.75]
Other race/ethnicity	1 [0.68, 1.46]	0.83 [0.58, 1.19]
Socioeconomic status	0.89 [0.79, 1.01]	0.87 [0.76, 1]
Child characteristics		
Language primarily spoken at home is not English	0.57* [0.37, 0.88]	0.5** [0.33, 0.78]
Male	1.75*** [1.41, 2.18]	1.71*** [1.37, 2.14]
Child age, fall of kindergarten	1.49*** [1.37, 1.63]	1.43*** [1.31, 1.57]
Low birth weight	1.27 [0.9, 1.79]	1.21 [0.86, 1.69]
Born more than 2 weeks before due	1.4* [1.08, 1.82]	1.18 [0.91, 1.53]
Biological mother gave her first birth at age <18	0.96 [0.71, 1.29]	0.85 [0.61, 1.17]
Biological mother gave her first birth at age ≥38	1.7 [0.67, 4.3]	2.38** [1.27, 4.44]
Covered by health insurance, spring of kindergarten	1.55* [1.02, 2.36]	1.66 [0.85, 3.23]
Parents were married, spring of kindergarten	1.07 [0.85, 1.34]	0.99 [0.76, 1.3]
Region		
Midwest	0.31*** [0.23, 0.42]	1.02 [0.75, 1.39]
South	0.79 [0.62, 1.01]	0.8 [0.6, 1.08]
West	0.24*** [0.17, 0.35]	0.5*** [0.35, 0.73]
Academic achievement		
Reading test, spring of kindergarten	0.73** [0.6, 0.89]	0.76** [0.65, 0.9]
Mathematics test, spring of kindergarten	0.63*** [0.53, 0.76]	0.52*** [0.44, 0.61]
Behavioral functioning		
Behavioral self-regulation	0.83** [0.73, 0.95]	0.76*** [0.67, 0.88]
Externalizing problem behaviors	0.91 [0.82, 1.02]	0.94 [0.84, 1.05]
Internalizing problem behaviors	1.19*** [1.08, 1.31]	0.99 [0.9, 1.09]

Note. Socioeconomic status, child age, academic achievement test scores and teacher ratings of child's behaviors standardized with $M = 0$ and $SD = 1$. Odds ratios >1 indicate a positive relation between the variable and the outcome. Odds ratios <1 indicate a negative relation between the variable and the outcome. For example, the .39 coefficient for children who are Black indicates that their odds of being identified with SLIs are .39 that of otherwise similar children who are White. That is, these odds are 61% (1 – .39) lower for Black than for White children. SLIs = speech or language impairments; ECLS-K = Early Childhood Longitudinal Study–Kindergarten.
$^{*}p \leq .05$. $^{**}p \leq .01$. $^{***}p \leq .001$.

Discussion

This study provides covariate-adjusted estimates of disparities in special education service delivery for SLIs attributable to kindergarten children's status as racial, ethnic, and language minorities. Similar disparities have been found in some studies (Morgan et al., 2016; Morrier & Gallagher, 2010) but not others (Campbell et al., 2003; Sullivan & Bal, 2013), possibly because of sampling limitations. Our analyses of two nationally representative, individual-level data sets based on extensive covariate adjustment indicate that children in the United States who are racial, ethnic, and language minorities are less likely than otherwise similar White and/or English-speaking children to receive services for identified SLIs during kindergarten—when delivery of these school-based services might be expected to be most effective due to the children's young age. These disparities occur despite racial, ethnic, and language minority children's previously reported greater risk of SLI symptoms (Harrison & McLeod, 2010; Morgan et al., 2012), suggesting that minority children in the United States may be disproportionately more likely to experience the many adversities associated with untreated SLIs, including lower academic achievement, bullying, school dropout, unemployment, and psychiatric disorders (Elbro et al., 2011; Felsenfeld et al., 1994; Harrison et al., 2009; Johnson et al., 2010; McCormack et al., 2011; Morgan et al., 2011; Muir et al., 2011). These disparities are not explained by a wide variety of potential confounds, including gestational, birth, and sociodemographic characteristics, as well as children's own academic achievement or behavioral functioning. It is important to note that we found no evidence indicating that the disparities for children who are Black and those from non-English-speaking homes have appreciably lessened in the United States. Instead, racial, ethnic, and language use disparities in SLI service receipt have been generally stable across a 12-year period. The disparities increased in estimated magnitude for Hispanic children in the United States and now have become statistically as well as practically significant (i.e., a difference of 46% in respective odds).

We found no evidence indicating that the disparities for children who are Black and those from non-English-speaking homes have appreciably lessened in the United States.

Our analyses extend the currently limited and inconsistent knowledge base by identifying a general set of factors associated with an increased or decreased likelihood of receiving services for SLIs, thereby helping to inform screening, monitoring, and intervention efforts by the beginning of formal schooling. Factors associated with a greater likelihood of special education service receipt for SLIs include being male, being older, and displaying lower academic achievement as well as behavioral self-regulation (e.g., off task, inattentive, disorganized). Residence in the Western region of the United States is associated with a significantly decreased likelihood of SLI service receipt. This suggests differences in SLI identification and service use depending on where children and their families live in the United States. Further research is needed to identify factors that may account for this geographic variation.

Limitations

The present study is limited to estimates of disparities in service receipt for SLIs during children's kindergarten year. Due to data limitations, we were unable to independently verify whether children reported by their teachers met formal diagnostic criteria for SLIs. Children identified as having SLIs may be quite heterogeneous in regard to their specific types of speech or language delays and disorders. We were unable to distinguish among types of SLIs because of how special education teachers were surveyed about SLIs in the ECLS data sets, which might be particularly important in regard to identification of speech versus language impairments for children who are English language learners. The two ECLS-K databases do not include independently administered measures of children's speech production, expressive or receptive vocabulary, or other indicators of SLI symptoms, although such variables would likely correlate with children's academic achievement and behavioral functioning as well as other controls included in our analyses. Despite extensive statistical control for many potential confounding factors, it is possible that characteristics not measured in the study may contribute to the disparities inferred to children's status as racial, ethnic, or language minorities. Consistent with prior work on health disparities (Cheng & Goodman, 2015; E. Flores et al., 2010; Morgan, Staff, Hillemeier, Farkas, & Maczuga, 2013), we interpret the directionality of the disparities as indicating that minority children are disproportionately underidentified as having SLIs and so less likely to receive services for SLIs. It may be instead that White children are disproportionately overidentified and so more likely to receive these services. Recent work suggests that minority underidentification may be the more likely explanation (Coker et al., 2016). Because the data analyzed for each cohort were cross sectional, it is not possible to clearly distinguish whether those with lower academic and behavioral functioning are more likely to be identified for SLI services or, instead, whether SLI impairments are more likely to result in impaired academic and behavioral functioning. Analyses of longitudinal data, including from the ECLS-K: 2011, would provide helpful insights in this regard.

Study's Contributions and Implications for Policy and Practice

Our study adds to an expanding literature indicating that racial, ethnic and language minority children in the United States may be less likely to receive additional supports and services to which they may be legally entitled due to disabling conditions (E. Flores et al., 2010; Hibel et al., 2010; Morgan, Hillemeier, Farkas, & Maczuga, 2014; Zuckerman et al., 2013). Disparities in special education service receipt for SLIs may be contributing to minority children's well-documented lower educational attainment including in both reading and mathematics, greater likelihood of experiencing harsh or punitive discipline in school, more frequent experiences of economic adversity, and comparatively fewer societal opportunities over the life course (Basch, 2011; Braveman & Barclay, 2009; National Assessment of Educational Progress, 2013; Ramey, 2015). Our findings indicate that these disparities, which continue to occur for children who are Black as well as those who are language minorities, now occur for children who are Hispanic. These findings suggest that policies designed to address overrepresentation in special education for SLIs based on race or ethnicity, although well intentioned, may be misdirected and instead risk exacerbating already occurring disparities in service receipt. Instead, our findings suggest that such policies should attempt to ensure that Child Find procedures are used throughout the United States that result in children with SLIs, including those who are racial, ethnic, or language minorities, being appropriately recognized and provided the special education services to which they have a civil right. Our results provide further evidence indicating that underidentification for disabilities based on race or ethnicity in the United States may be widespread as well as long-standing (Hibel et al., 2010; Morgan et al., 2012; Morgan et al., 2015), as indicated by contrasts among similarly situated children (U.S. Department of Education Office of Civil Rights, 2016).

One practical implication of our findings is the importance of school-based practitioners soliciting developmental concerns from racial, ethnic, and language minority parents to better identify possible delays or impairments in speech or language production. Parental report of developmental concerns strongly predicts SLI identification and service receipt (Skeat, Eadie, Ukoumunne, & Reilly, 2010). Unfortunately, some studies have also found practitioners to be less likely to solicit developmental concerns from minority families (Guerrero et al., 2011; Zuckerman, Sinche, et al., 2014), even when their children are at high risk for developmental disorders (Zuckerman et al., 2009). Strategies that can be implemented to better solicit a parent's concerns include universal use of a structured and standardized screening measure (e.g., Ages & Stages Questionnaires; Squires, Bricker, & Potter, 1997), as well as utilizing effective interviewing techniques such as eliciting parental information on children's speech and language abilities in comparison to siblings, cousins, or same-aged peers and in the parent's preferred language (Kummerer & Lopez-Reyna, 2009). Doing so should help account for family and peer norms that vary across racial, ethnic, and spoken-language groups. Identifying SLIs in children who are language minorities may require special care and additional assessments, including the use of bilingual peer-based comparisons that may be more sensitive to SLIs than comparisons with monolingual peers (Kohnert, 2010). Universal screening based on structured protocols has been found to help address disparities in medical care as well as in gifted education service receipt (Card & Giuliano, 2015; Payne & Puumala, 2013) and so may be helpful in reducing disparities in special education service receipt (Morgan et al., 2015).

Another practical implication of our study is that school-based practitioners should ensure that their screening and monitoring efforts are sensitive to the needs of cultural and language minorities. Although some minority parents have reported that practitioners were instrumental in identifying their children's SLIs (Kummerer & Lopez-Reyna, 2009), others have reported practitioners being dismissive of their concerns (Zuckerman, Mattox, et al., 2014) or culturally insensitive or indifferent (Shapiro, Monzó, Rueda, Gomez, & Blacher, 2004). For example, Gillborn, Rollock, Vincent, and Ball's (2016) qualitative study involving 77 interviews of Black middle-class parents of children with identified disabilities indicated that the families felt that they encountered school professionals who were resistant to their concerns "at virtually every stage" and who "reacted with little interest, ranging from slow responses to open antagonism and refusal" (p. 53). Actively engaging parents during children's SLI evaluation (e.g., asking open-ended follow-up questions over concerns about language development and then restating the parent's response to ensure proper interpretation), doing so in the parent's preferred language, and working collaboratively to introduce and coordinate interventions and services that are sensitive to diverse cultural beliefs may lessen disparities in SLI identification and service delivery (Kummerer, 2012; Thordardottir, 2010; Toomey, Chien, Elliott, Ratner, & Schuster, 2013; Westby, 2009). More generally, research on culturally and language sensitive care has highlighted the importance of engaged and personal practitioner–parent relationships (DeCamp et al., 2013; Guerrero et al., 2011), including conscious efforts to understand the family's perspective (Langdon, 2008). Additional relevant interventions could include public awareness campaigns, community- and school-based Child Find programs, and targeted screenings of minority children at elevated risk (e.g., older boys who are persistently experiencing academic difficulties during kindergarten). A combination of these efforts involving speech or language pathologists, special education teachers, parents, and schools and community organizations may be needed to reduce widespread and continuing disparities in service delivery for SLIs that are disproportionately experienced by racial, ethnic, and language minority children. Such efforts may be needed to ensure that minority children are not disproportionately experiencing the sequela of untreated SLIs (e.g., reading or behavioral disabilities, bullying, unemployment), especially as they begin formal schooling in the United States.

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Authors' Note

Funding for this study was provided by the National Center for Special Education Research, Institute of Education Science, U.S. Department of Education (R324A120046) and the Spencer Foundation. Infrastructure support was provided by Penn State's Population Research Institute through funding from the National Institute of Child Health and Human Development, National Institutes of Health (P2CHD041025). These funders had no direct involvement in the study.

Manuscript received October 2016; accepted January 2017.