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Disproportionality in Special Education: Effects of Individual and School Variables on Disability Risk

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ABSTRACT: *We examined the risk of disability identification associated with individual and school variables. The sample included 18,000 students in 39 schools of an urban K–12 school system. Descriptive analysis showed racial minority risk varied across 7 disability categories, with males and students from low-income backgrounds at highest risk in most disability categories. Multilevel analyses showed that school variables were not generally significant predictors of student risk for identification. The most consistent predictors of identification across the categories were students' gender, race, socioeconomic status, and number of suspensions. We provide implications for future studies of disparities in special education, as well as practice related to identification and systemic monitoring.*

Researchers and educators have long debated and studied disproportionality in special education identification; yet understanding of this complex phenomenon remains limited (Sullivan & Artiles, 2011). Many researchers have acknowledged differential risk along various dimensions of difference—for example, race, language status, socioeconomic status (SES), and gender. Consistent findings of racial disproportionality among the high-incidence disabilities—that is, specific learning disabilities (SLD), cognitive impairments (CI, often referred to as mental retardation), and emotional disabilities (ED), in particular (Donovan & Cross, 2002)—have had major policy implications. Studies of disproportionality related to gender or language status, however, are limited, as are empirical analyses of the intersections of sociodemographic characteristics or the correlates of individual risk. This study examines patterns and predictors of culturally and linguistically diverse students' identification for special education in a large urban school district. The study uses indexes typical in the disproportionality literature, as well as multilevel modeling of student and school factors.

BACKGROUND

Brief Historical and Legislative Context

Disproportionality was formally acknowledged in the special education literature more than four decades ago (e.g., Dunn, 1968) and has since garnered considerable attention throughout the literature, federal policy (e.g., 2004 amendments to the Individuals With Disabilities Education Act [IDEA] requiring state monitoring of disproportionality), case law (e.g., *Guadalupe Organization v. Tempe Elementary School District No. 3*, 1978; *Larry P. v. Riles*, 1984), and professional arenas (e.g., national technical assistance centers, training programs). Donovan and Cross (2002) described disproportionality as a *paradox* of special education in that identification is meant to allocate necessary and appropriate services and additional resources for students with disabilities, but it may also lead to stigmatization, segregation, exposure to low expectations, receipt of weak curriculum, and constraint of postschool outcomes. Scholars have also questioned the effectiveness of special education, and recent research indicates that services have negligible or negative effects on the learning and behavioral outcomes of elementary students (Morgan, Frisco, Farkas, & Hibel, 2010). Together, these issues underpin concerns about differential identification and its implications.

Patterns of Disproportionality in Special Education

Findings of racial disproportionality have been consistent for decades, with disproportionate representation commonly observed in the high-incidence categories of disability. Today, Black students are twice as likely to be identified as ED and 2.7 times as likely to be identified as CI than their White peers nationally, whereas Native American students are nearly twice as likely to be identified as SLD and 60% more likely to be identified as CI (U.S. Department of Education, 2010). Conversely, Latino students tend to be proportionally or slightly underrepresented across disability categories nationally whereas Asian/Pacific Islander students are typically moderately underrepresented (i.e., 20% to 70% less likely to be identified as disabled in the high-incidence categories) relative to White students (Donovan & Cross, 2002; U.S. Department of Education, 2010).

Whereas the national picture of racial disparities in identification is relatively stable, variations over time and locality exist, particularly for students identified as Latino or English learners (ELs), although the research on these population is limited (e.g., Artiles, Harry, Reschly, & Chinn, 2002; Artiles, Rueda, Salazar, & Higareda, 2005; Sullivan, 2011; Valenzuela, Copeland, Qi, & Park, 2006). Fewer than one in five disproportionality studies examined multiple racial groups—40% of studies focused exclusively on Black students (Waitoller, Artiles, & Cheney, 2010). Gender disparities have also received limited attention in the literature, although researchers have recognized that males are at heightened risk for ED and SLD (Coutinho & Oswald, 2005), particularly among Blacks and Native Americans identified as CI and SLD (Coutinho, Oswald, & Best, 2002; Oswald, Coutinho, Best, & Nguyen, 2001).

Factors Related to Disproportionate Representation

Scholars have acknowledged that disproportionality is a complex, multiply determined problem shaped by a variety of interpersonal, social, environmental, cultural, and institutional forces (Artiles, Kozleski, Trent, Osher, & Ortiz, 2010; Skiba et al., 2008). Concern that identification is based on factors beyond students' medical, developmental, or cognitive functioning is widespread, reflected in the focus on the high-incidence, or "subjective," disability categories rather than the more physically based disabilities (e.g., Artiles & Trent, 1994; Klingner et al., 2005). Researchers have investigated many variables as potentially related to racial disparities in identification. Early research examined potential implications of bias in teacher ratings of performance and referral patterns, but results were mixed (Cullinan & Kauffman, 2005; MacMillan, Gresham, & Bocian, 1996). Studies of assessment bias have also been equivocal, but the consensus appears to be that differential performance is not attributable to measurement bias (Skiba, Knesting, & Bush, 2002). Others have studied educational processes,

including referral and multidisciplinary teaming (e.g., Harry, Klingner, & Hart, 2005; Wilkinson, Ortiz, Robertson, & Kushner, 2006); and though scholars have identified shortcomings—particularly frequent disregard for legal disability criteria—researchers have not established links and causal relations to disproportionality.

Most studies of disproportionality have relied on school- or district-level datasets to explore variables related to group-level risk. Researchers have studied variables like enrollment, racial and linguistic makeup of student body, per-pupil expenditures, student-teacher ratios, teacher credentials, teacher demographics, discipline patterns, mean academic performance, dropout rates, and proportions of students receiving free and reduced-price lunch (e.g., see Coutinho et al., 2002; Eitle, 2002; Hosp & Reschly, 2004; Serwatka, Deering, & Grant, 1995; Skiba, Poloni-Staudinger, Simmons, Feggins-Azziz, & Chung, 2005; Sullivan, 2011). Researchers have also considered the influence of community socioeconomic variables such as median housing value, median income, and mean educational attainment of adults (e.g., Coutinho et al., 2002; Eitle, 2002). Findings across studies are inconsistent, particularly regarding economic variables, which appear to be differentially related to identification of racial and linguistic minority groups across disability categories. Often, community or school poverty is inversely related to risk, challenging the supposition that minority overrepresentation might result from disadvantage. Because of the nature of the data used in these studies, scholars have not widely explored the relations of individual poverty status to disability risk. This disparity may explain divergent results. Our study seeks to clarify this particular facet of the research by examining the relations of both individual and community socioeconomic factors to disability risk.

Studies of student-level data are relatively rare within the disproportionality literature. Recently, however, scholars have begun to use large-scale datasets to study differential special education risk. For instance, Hibel, Farkas, and Morgan (2010), though not explicitly concerned with disproportionality, used the Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999 (ECLS–K) to identify child, family, and school variables measured at kindergarten that predicted special education identification at fifth grade. Hibel and colleagues found that kindergarten academic skills were the strongest predictor of identification, even after controlling for child and school racial demographics, SES, and performance variables. Statistically controlling for academic performance resulted in Black and Latino students being at lower risk than White students for special education identification, and this variable mediated the effects of SES. Students of color were also less likely to be identified for special education in schools with high-minority enrollment than comparable peers in low-minority settings. In addition, school achievement also influenced risk, resulting in what the authors deemed a "frog-pond" effect in which lower performing students in high achieving schools were more likely to be identified for special education.

More recently, Shifrer, Muller, and Callahan (2011) employed multilevel modeling to predict SLD identification at 10th grade based on a variety of child academic and sociodemographic characteristics using data from the Education Longitudinal Study of 2002 (National Center for Education Statistics, 2002). Like Hibel et al. (2010), these authors found that racial minority students were less likely to be identified as SLD when gender and educational experiences were accounted for. Notably, SES accounted for disproportionality among Black and Latino students, which runs counter to the findings of Hibel and colleagues and earlier studies (Skiba et al., 2008; Sullivan & Artiles, 2011). The authors called attention to the discrepancies between the multivariate analyses previously described and bivariate analyses like those common in the disproportionality literature which indicated elevated risk for minority students. In light of these differences, the authors emphasized the need for sophisticated analyses when studying the factors related to disproportionality. Nonetheless, like other scholars before them (e.g., Artiles, 1998; Oswald et al., 2001), both Hibel et al. and Shifrer et al. (2011) posited that disproportionality may result more from social differences than from learning problems because of the influence of nonacademic factors in risk of identification.

Limitations to the Existing Disproportionality Research

The study of disproportionality has long been restricted by the availability of data. Often disproportionality scholars have been limited to federal and state databases that allowed only consideration of state- and district-level patterns of identification and were not sensitive to the state or local variations or within group diversity (Waitoller et al., 2010). Studies using child-level data are few, and even among those, attention to multiple dimensions of difference concurrently were limited. Most focused solely on race, with the majority studying only Black-White disparities (Waitoller et al., 2010). Many of the existing analyses were restricted to the study of race, gender, and SES, with language status unavailable because few school systems collected such information for students with disabilities (Zehler et al., 2003).

More fine-grained analyses—those using child data and considering both within- and between-group diversity—are needed to (a) better understand both the typography and roots of this problem, and (b) avoid the ecological fallacy and aggregation bias when making individual-level inferences without individual-level data. Further, analyses rarely account for nesting within school systems. Both of these shortcomings can be attenuated through the application of multilevel modeling to account for the nested nature of students' experiences and allow for examination of how individual-level risk factors may be moderated by school characteristics, a central concern in the disproportionality discourse. Although recent analyses (Hibel et al., 2010; Shifrer et al., 2011) accounted for a variety of child and school factors in multivariate analyses, both dealt with relatively restricted samples with regard to age/grade; and many variables not accounted for in these analyses are related to disproportionality when studied at the school level (e.g., discipline variables as in Skiba et al., 2005). Further, results of these studies were divergent and contradicted findings from earlier district-level analyses. Thus, more work in this vein is needed to enhance our understanding of both the child and school factors related to differential special education risk.

Present Study

The purpose of this study was to examine patterns and predictors of disproportionality within a diverse urban school system, using both descriptive analyses typical of the disproportionality literature and multivariate multilevel modeling. Results will contribute to the emerging literature base regarding the multiple levels of factors influencing individual special education risk, exploring a broader array of factors posited to relate to disproportionality than used in previous multilevel analyses. More specifically, the aim of this study was to further test the strength of sociodemographic variables and school performance in predicting risk of special education identification.

This analysis was guided by two broad research questions:

1. To what extent are students from diverse cultural and socioeconomic backgrounds disproportionately represented in special education when multiple dimensions of difference are considered simultaneously?
2. To what extent is individual risk for special education identification predicted by individual and school factors?

More specifically, the intent here was to consider not only race, but race in conjunction with other social groupings (i.e., gender, EL status, SES). We selected child- and school-level predictor variables to test the relations previously explored in both the recent multilevel analyses described previously and the more common district-level analyses from the earlier disproportionality literature. Here, we examined predictors of identification in each of the traditional high-incidence disability categories (i.e., SLD, CI, ED), as well as the lesser studied categories of other health impairment (OHI) and speech/language impairment (SLI), which also serve large proportions of students, as well as a general group comprised of the low-incidence disabilities (e.g., autism, hearing impairments, orthopedic impairments, traumatic brain injury) to test whether the relations of the sociodemographic and school variables vary across the different types of disabilities (i.e., high- vs. low-incidence), which has not generally been explored.

METHOD

Sample

We took the sample from archival data from one diverse urban school district in the Midwest, obtained through an institutional agreement between the authors and the district. After obtaining Institutional Review Board approval, we obtained student- and school-level data from the school district. No identifying information (i.e., names or identification numbers) was included in the data. The district served 24,295 students in 51 schools during 2009–2010. The analytic sample here included all students (N = 17,837) enrolled in 39 schools for which there were complete data on the scholar-level variables selected. To retain the largest number of cases in the analytic sample, we used multiple imputation to estimate missing values for four student-level variables for which complete data did not exist. Table 1 provides the general characteristics of the analytic sample relative to the full sample.

Student information selected for this analysis included race (i.e., White, Black, Latino, and Asian/Pacific Islander), language status (dichotomous variable indicating limited English proficient [LEP] status), gender (dichotomous variable indicating if the student was male), free/reduced-price lunch status (dichotomous variable indicating if the student received free or reduced-price lunch), attendance (i.e., percentage of days attended), number of suspensions, reported parent education level (some college as a referent), special education status (dichotomous variable indicating whether the child was identified for special education), and disability category (six dichotomous variables indicating status as LD, CI, ED, SLI, OHI, or low-incidence [LI]). Because small cell sizes for Native Americans (n < 20) undermined reliability, this racial category was excluded as a variable in the analyses. Measures of academic performance were excluded to avoid endogeneity problems, that is, inclusion of variables that may have been the result of having been identified for special education, rather than the cause, given research indicating that services can result in declining academic performance (Morgan et al., 2010).

School-level data obtained from the state's publically available archives (Wisconsin Department of Public Instruction, 2011) included building-level percentages for minority enrollment, LEP enrollment, free/reduced-price lunch recipients, students meeting state standards in the reading and math portions of the Wisconsin Knowledge and Concepts Examination (WKCE), students retained, and students suspended. (For information regarding definitions and determination process for the student classification, disability categories, and assessment classifications, visit the web site of the Wisconsin Department of Public Instruction, http://www.dpi.wi.gov.) In addition, the district provided information regarding percentage of White teachers and the percentage of teachers with a master's degree or higher within each school building.

Analyses

Descriptive Analysis. For the purposes of this study, we computed the risk index, an indicator of groups' overall likelihood of special education identification, for each of the demographic groupings to allow for comparison of risk according to the primary dimensions along which differential identification might occur—i.e., race, language status, gender, and SES as operationalized by receipt or nonreceipt of free or reduced-price lunch—as well as the intersections of those latter categories with race. For each demographic grouping, we calculated the risk index by dividing the total number of students identified in a given disability category by the total number of enrolled students for that group. Here, the focus is not on statistical significance of differences in risk because of both the large number of comparisons and because the interest in relative risk. It is relative risk, also a measure of effect size, that is the focus of much of the existing disproportionality literature and state policy analyses (Sullivan, 2011), thus allowing for comparison across studies and to the odds ratios obtained in the logistic regression described below.

Multilevel Logistic Regression. This study used multilevel logistic regression to estimate the effects of child and school factors on special education risk. We selected multilevel modeling to account for the clustering of students within schools; this modeling allows for more accurate estimations of within- and between-school effects—that is, the student-level effects within

TABLE 1

Descriptive Characteristics of the Sample

Variable	*Full Sample*		*Analytic Sample*	
Student Factors	*N* = 24,295		*N* = 17, 837	
Male	51.11		51.41	
White	50.35		49.46	
Black	23.58		24.59	
Latino	14.81		14.60	
Asian/Pacific Islander	10.45		10.55	
Native American	0.81		0.80	
Limited English Proficient (LEP)	15.77		16.82	
Free/reduced-price lunch (FRL)	46.92		49.32	
Parent Education Level – Less than High School	8.47		9.02	
Parent Education Level – High School	18.40		20.09	
Parent Education Level – Some College	23.21		24.94	
Parent Education Level – College	20.53		19.91	
Parent Education Level – Graduate/Professional Degree	29.39		26.04	
Special Education	15.35		15.42	
Learning Disability	4.54		4.18	
Cognitive Disability	1.06		1.01	
Emotional Disability	2.32		2.30	
Other Health Impairment	2.29		2.29	
Speech-Language Impairment	3.07		3.46	
Low-Incidence Disability	2.13		2.24	
	Mean	*(SD)*	Mean	*(SD)*
Age	10.99	(3.92)	10.23	(3.56)
Attendance Rate	93.72	(7.83)	93.96	(7.38)
Suspensions	0.14	(0.67)	0.15	(0.70)
School Factors	Mean	*(SD)*	Mean	*(SD)*
Total Enrollment	700.51	(1613.56)	469.15	(331.08)
Percent Racial Minority Enrollment	51.7	(16.16)	50.50	(14.68)
Percent LEP Enrollment	18.85	(11.50)	18.61	(10.61)
Percent FRL Enrollment	45.78	(18.85)	44.94	(17.89)
Percent Special Education Enrollment	15.26	(5.16)	15.2	(4.46)
Percent White Teachers	89.04	(7.61)	90.75	(5.09)
Teachers with Master's Degree or higher	63.86	(12.61)	64.89	(13.73)
Retention Rate	2.00	(5.26)	0.63	(0.95)
Suspension Rate	7.96	(12.08)	8.88	(7.62)
% Passing Reading	72.13	(16.09)	71.43	(13.73)
% Passing Math	65.85	(13.13)	66.15	(11.61)

schools, as well as the influences of the school context. We used multivariate hierarchical models to identify which characteristics were predictive of identification after accounting for other characteristics of the students and schools. We conducted these models using HLM7 software. We centered all continuous variables around the grand mean. The dependent variables were dichotomous indicators for special education status and specific disability identification. Independent variables included child-level factors and school-level factors.

Individual-level models were as follows: Model 1 included age and gender as predictors;

Model 2 added race and language status; Model 3 added free/reduced-price lunch status as a proxy for income, whereas Model 4 added parent education to capture a different dimension of SES and to explore whether parent education attenuated the effects of income; Model 5 added attendance and suspension rates. The two-level models built on Model 5 by adding measures of enrollment and school demographics (i.e., race, LEP, special education, and lunch status) in Model 6, measures of school practice (i.e., retention and suspension rates) in Model 7, measures of schoolwide academic performance in mathematics and reading in Model 8, and measures of teacher characteristics (i.e., race and advanced education attainment) in Model 9. Odds ratios, a measure of effect size, are reported. (Note: For full statistics for each model, contact the first author.)

RESULTS

Descriptive Analyses of Risk

Initial descriptive analyses examined the risk of identification associated with general demographic factors for special education, the high-incidence disability categories, and the combined low-incidence disability categories. Table 2 shows the risk indexes. When considering univariate risk (i.e., race, gender, poverty, or LEP status), males and those receiving free/reduced-price lunch were at the elevated risk for special education identification and in each of the specific disability categories examined; but racial-minority students demonstrated the greatest risk across categories. For instance, nearly a quarter of Black students were identified for special education and were more than 2.8 times more likely to be identified as SLD or ED, and 2.5 times more likely to be identified as CI than were White students. When we examined the intersections of categories (e.g., race and gender simultaneously), males and students receiving free/reduced-price lunch had the greatest risk across racial groups. Among Black males, nearly one in three were identified for special education, and Black females were nearly twice as likely to be identified as females of other races.

The analysis also showed the Black students were more likely than their White peers to be identified as OHI or SLI, but they were underrepresented among students with low-incidence disabilities. Indeed, each of the racial-minority groups examined were underrepresented among the low-incidence categories relative to their White peers. Lower income students, as indicated by free/reduced-price-lunch status, were consistently more likely to be identified for special education than students from higher income backgrounds, with the exception of low-incidence diagnoses.

Latino students were not generally overrepresented compared to White students, but were 55% more likely to be identified as SLI. Latino students from low-income backgrounds were at reduced risk for identification compared to White or Black students who also received free/reduced-price lunch. LEP students were less likely to be identified for special education, with the exception of SLI, where they were 28% more likely to be identified.

Asian students were 46% less likely to be identified for special education, and were especially underrepresented in ED. Within this group, LEP students were more likely to be identified across categories, which was not the case for the other three racial groups examined.

Multilevel Predictors of Special Education Identification

Tables 3 and 4 show the results of the multilevel logistic regression models predicting identification for special education, LD, ED, CI, OHI, SLI and the low-incidence categories. In Model 1, we used only age and gender as predictors. Consistent with the descriptive findings, males were significantly more likely than females (the referent group) to be identified for special education and in each of the specific disability categories examined, with the exception of CI. Older students were also more likely to be identified for special education and each of the high-incidence categories, but not low-incidence disabilities.

Model 2 added race and LEP status as predictors. Black students were significantly more likely than White students (the referent group) to be identified for special education overall (odds ratio [OR] = 2.20, $p < .001$), SLD (OR = 3.09, $p < .001$), CI (OR = 2.49, $p < .001$), ED (OR = 2.99, $p < .001$), and OHI (OR = 2.01, $p < .001$), but were significantly less likely to be identified in

TABLE 2

Risk of Identification for Special Education and in the Specific Disability Categories by Demographic Group

Variable	*Special Education*	*SLD*	*CI*	*ED*	*OHI*	*SLI*	*Low Incidence*
Female	10.81	3.55	0.95	3.17	3.16	2.41	1.19
Male	19.77	4.87	1.08	1.37	1.36	4.46	3.24
Non-FR Lunch	10.90	2.19	0.51	1.07	1.69	2.98	2.50
FR Lunch	20.06	6.23	1.53	3.56	2.90	3.97	1.98
English Proficient	16.17	4.37	1.05	2.68	2.49	3.31	2.35
LEP	11.70	3.23	0.83	0.43	1.27	4.23	1.73
White	**13.07**	**2.94**	**0.75**	**1.76**	**2.01**	**3.04**	**2.66**
Female	9.55	2.50	0.80	1.18	1.37	2.48	1.25
Male	16.32	3.34	0.70	2.29	2.60	3.56	3.97
Non-FR Lunch	10.60	2.22	0.48	0.96	1.61	2.86	2.52
FR Lunch	23.01	5.81	1.82	4.95	3.59	3.76	3.25
English Proficient	13.19	2.94	0.74	1.79	2.04	3.08	2.68
LEP	6.45	2.58	1.29	0	0	0.65	1.94
Black	**24.65**	**8.23**	**1.85**	**4.99**	**3.90**	**3.92**	**1.85**
Female	17.68	7.20	1.68	2.90	2.10	2.71	1.12
Male	31.27	9.21	2.00	6.98	5.60	5.07	2.54
Non-FR Lunch	16.98	3.65	.95	3.33	3.02	2.86	3.17
FR Lunch	25.93	9.00	2.00	5.27	4.05	4.10	1.62
English Proficient	24.91	8.42	1.86	5.09	3.87	3.89	1.86
LEP	17.12	2.74	1.37	2.05	4.79	4.79	1.37
Latino	**12.94**	**3.15**	**0.69**	**1.00**	**1.73**	**4.72**	**1.69**
Female	7.71	2.41	0.72	0.48	0.64	0.64	1.20
Male	17.72	3.82	0.66	1.47	2.72	2.72	2.13
Non-FR Lunch	13.67	2.41	0.54	1.61	2.95	4.55	1.61
FR Lunch	12.81	3.27	0.72	0.90	1.52	4.75	1.70
English Proficient	13.33	2.74	0.71	2.26	2.50	2.50	1.43
LEP	12.75	3.34	0.68	0.40	1.36	1.36	1.81
Asian/PI	**8.24**	**2.13**	**0.74**	**0.21**	**0.58**	**2.76**	**1.86**
Female	5.25	1.54	0.21	0.00	0.62	0.62	1.03
Male	11.44	2.75	1.32	0.44	0.55	0.55	2.75
Non-FR Lunch	7.69	0.88	0.33	0.00	0.77	0.77	2.31
FR Lunch	8.75	3.30	1.13	0.41	0.41	0.41	1.44
English Proficient	6.94	1.05	0.53	0.11	0.53	0.53	2.10
LEP	9.57	3.23	0.97	0.32	0.65	0.65	1.61

Note. PI = Pacific Islander; LEP = Limited English Proficient; FR Lunch = free/reduced-price lunch; SLD = specific learning disability; CI = cognitive impairment; ED = emotional disability; OHI = other health impairment; SLI = speech/language impairment. Risk represents percentage of a given group identified in a specified disability category.

the low-incidence disabilities (OR = 0.67, $p < .01$). Latino students were significantly more likely to be identified as SLI than White students were (OR = 1.44, $p < .01$), but were significantly less likely to be identified in the low-incidence categories (OR = 0.66, $p < .01$). Asian/Pacific Islanders were significantly less likely to be identified for special education generally (OR= 0.66, $p < .001$) or as ED (OR = 0.21, $p < .001$) and OHI (OR = 0.35, $p < .001$).

Model 3 added free/reduced-price-lunch status to the prediction of identification. Students who received free/reduced-price lunch were significantly more likely to be identified for special education (OR = 2.04, $p < .001$), SLD (OR = 2.77, $p < .001$), CI (OR = 3.07, $p < .001$), ED (OR = 3.69, $p < .001$), and OHI (OR = 1.66, $p < .001$). Statistically controlling for this variable attenuated the race effects for SLD (e.g., odds ratio for Black of 3.09 in Model 2 and 1.69 in Model 3), but race remained significant ($p < .001$). Controlling for free/reduced-price-lunch status, the overrepresentation of Black students as CI and ED was not significant. Adding parent education in Model 4 had little effect, and the earlier race effects remained significant. Nonetheless, once parent education was accounted for, Latino students were significantly less likely to be identified for special education (OR = 0.70, $p < .01$) and SLD (OR = 0.57, $p < .001$), as were LEP students for special education overall (OR = 0.78, $p < .01$).

Model 5 added student attendance and suspensions to the prediction of special education status. Students with higher attendance rates were significantly less likely to have been identified for special education, ED, or OHI (OR = 0.98, $p < .001$). Students with greater number of suspensions were significantly more likely to have been identified for special education (OR = 1.25, $p < .001$), ED (OR = 1.40, $p < .001$), or OHI (OR = 1.12, $p < .001$). Controlling for suspensions also reduced the relative risk of special education identification among Black students from 1.36 to 1.24.

School enrollment characteristics were accounted for in Model 6. Increasing enrollment was associated with small but significant increases in the likelihood that students would be identified for special education and in the ED, SLI, and OHI categories. Conversely, increased percentage of students receiving free/reduced-price lunch predicted decreased risk for SLD identification. The proportions of racial-minority or LEP students was not a significant predictor for any outcome, but their inclusion mediated the race effects for OHI such that the elevated risk for Black students was no longer significant.

Model 7 included school rates of retention and suspension. Students in schools with higher than average retention rates were significantly less likely to be identified for special education generally (OR = 0.85, $p < .001$) and as SLD specifically (OR = 0.76, $p < .001$). Model 8 added schoolwide academic performance in reading and math to the predictive models, but these were not significant. They did, however, mediate the significance of the effects of retention rates for special education identification and SLD.

Students with higher attendance rates were significantly less likely to have been identified for special education.

Finally, Model 9 added measures of teacher training and demographics, but these were not significant for any of the outcomes examined. In this model, however, retention rates were significant predictors of low risk of CI identification (OR = 0.44, $p < .001$).

DISCUSSION

The purpose of this study was to refine our understanding of the variables related to disproportionality in special education by simultaneously considering the influence of multiple sociodemographic and school characteristics on individual risk. This research extended the emerging literature utilizing multilevel modeling to examine predictors of disability and advanced earlier literature examining school predictors of disproportionality by examining individual risk across a variety of disabilities. The results highlight the importance of moving beyond studies of race alone and confirm that overrepresentation is unique to the subjective disability categories whereas underrepresentation was observed in the

TABLE 3

Individual- and Two-Level Logistic Regression Models Predicting Overall Special Education Identification: Odds Ratios

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Intercept	0.03†	0.02†	0.02†	0.02†	0.12†	0.11†	0.10†	0.09†	0.07†
Student Variables									
Age	1.17†	1.15†	1.15†	1.14†	1.15†	1.16†	1.19†	1.19†	1.19†
Male	2.0 †	2.07†	2.10†	2.11†	2.02†	2.04†	2.04†	2.04†	2.04†
Black		2.20†	1.43†	1.36†	1.24†	1.24†	1.24†	1.24†	1.24†
Latino		1.05	0.75*	0.70*	0.73*	0.73*	0.72*	0.72*	0.72*
Asian/PI		0.66†	0.55†	0.55†	0.58†	0.57†	0.57†	0.57†	0.57†
LEP		0.99	0.84	0.78*	0.83	0.83	0.83	0.83	0.83
FR Lunch			2.04†	1.79†	1.64†	1.64†	1.64†	1.64†	1.64†
PE < High School				1.24	1.15	1.15	1.15	1.15	1.15†
PE High School				1.30†	1.20*	1.21	1.21*	1.22*	1.22*
PE College Deg.				0.90	0.87	0.87	0.87	0.87	0.87
PE Grad. Deg.				0.78*	0.76†	0.75†	0.75†	0.75†	0.75†
Attendance Rate					0.98†	0.98†	0.98†	0.98†	0.98†
Suspensions					1.25†	1.26†	1.26†	1.26†	1.26†
School Variables									
District Enrollment						1.00†	1.00†	1.00†	1.00†
% Racial minority						1.00	1.00	1.00	1.00
% LEP						0.99	0.99	0.99	0.99
% SPED						0.99	1.00	1.00	1.00
% FR lunch						1.00	1.00	1.01	1.01
% Retained							0.85†	0.89	0.90
% Suspended							0.98	0.98	0.98
% Passing Math								1.00	1.00
% Passing Reading								1.00	1.00
% Teachers --Master's									1.00
% Teachers -- White									1.01

Note. Results reported as odds ratios. PI = Pacific Islander; LEP = Limited English Proficient; FR lunch = free/reduced-price lunch; PE = parent education; SPED = special education.
*$p \leq .01$. †$p \leq .001$.

low-incidence disabilities. Findings demonstrate that the relations of individual and school variables vary across disabilities. Gender and free/reduced-price lunch status, not race, had the largest effects on risk although all were consistently predictive of risk. Thus, findings emphasize the need to avoid simplistic binary framing of disproportionality, and to explore how social differences contribute to the construction of disability and the mechanisms by which disproportionality is produced (Artiles, Kozleski, Waitoller, & Lukinbeal, 2012).

Patterns of Differential Risk

The descriptive analysis showed that risk was most elevated for students identified as Black, receiving free/reduced lunch, or male. Highest risk was observed for Black males. Risk was not substantially different between poor Black and poor White students. In both cases approximately one in four of these students were identified for special education; rates were substantially lower for poor Latino and Asian students. Black males were at greatest risk for SLD, CI, ED, OHI, SLI, whereas White males were at greatest risk for the

TABLE 4

Individual- and Two-level Logistic Regression Models: Odds Ratios

	Specific Learning Disabilities									*Cognitive Impairments*								
Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Intercept	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†	0.00†
Student Variables																		
Age	1.29†	1.29†	1.30†	1.29†	1.29†	1.29†	1.34†	1.35†	1.35†	1.28†	1.26†	1.26†	1.24†	1.24†	1.35†	1.46†	1.43†	1.44†
Male	1.36†	1.36†	1.36†	1.37†	1.35†	1.36†	1.35†	1.35†	1.35†	1.13	1.14	1.14	1.14	1.14	1.13	1.12	1.12	1.11
Black		3.09†	1.69†	1.57†	1.54†	1.57†	1.55†	1.55†	1.55†		2.49†	1.30	1.16	1.14	1.13	1.11	1.13	1.12
Latino		1.03	0.64†	0.57†	0.58†	0.58†	0.57†	0.57†	0.57†		0.84	0.51*	0.43†	0.43†	0.44*	0.42*	0.42*	0.42*
Asian/PI		0.70	0.52†	0.50†	0.51†	0.49†	0.48†	0.48†	0.49†		0.99	0.71	0.67	0.66	0.69	0.67	0.67	0.68
LEP		1.34	1.10	1.01	1.02	1.05	1.06	1.05	1.05		1.37	1.08	0.97	0.96	0.98	0.99	1.00	1.01
FR Lunch			2.77†	2.33†	2.29†	2.35†	2.37†	2.36†	2.36†			3.07†	2.17†	2.20†	2.17†	2.18†	2.18†	2.20†
PE < High School				1.47*	1.45*	1.49*	1.49*	1.50*	1.50*				1.98	1.99	1.97	2.01	2.01	2.00
PE High School				1.41†	1.39*	1.43†	1.43†	1.44†	1.43†				2.00*	2.01*	2.00	2.03	2.03	2.01
PE College Deg.				0.95	0.94	0.95	0.96	0.96	0.96				1.16	1.17	1.15	1.16	1.16	1.15
PE Grad. Deg.				0.77	0.76	0.73	0.73	0.72	0.72*				0.65	0.65	0.67	0.66	0.68	0.70
Attendance Rate					1.00	1.00	1.00	1.00	1.00					1.00	1.00	1.00	1.00	1.00
Suspensions					1.05	1.05	1.05	1.05	1.05*					1.04	1.05	1.05	1.05	1.05
School Variables																		
Enrollment						1.00*	1.00†	1.00*	1.00*						1.00	1.00	1.00	1.00
% racial minority						1.01	1.01	1.01	1.01						0.98	0.97	0.97	0.99)
% LEP						0.99	0.99	0.99	0.99						0.98	0.97	0.96	0.96*
% SPED						1.01	1.02	1.02	1.02						0.94	0.98	0.98	0.95
% FR lunch						0.98*	0.98	0.98	0.99						1.04	1.05	1.03	1.03
% Retained							0.76†	0.83	0.81							0.56	0.40†	0.44†
% Suspended							1.00	1.00	0.99							0.97	0.98	1.00
% Passing Math								1.01	1.01								0.98	0.98
% Passing Reading								1.00	1.00								0.98	0.97
% Teachers ≥ Master's									1.00									1.00
% Teachers -- White									0.99									1.04

continues

TABLE 4. *Continued*

	Emotional Disability									*Speech-Language Impairments*								
Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Intercept	0.00†	0.00†	0.00†	0.00†	0.01†	0.01†	0.00†	0.00†	0.01*	0.06†	0.05†	0.05†	0.05†	0.08†	0.07†	0.06†	0.06†	0.03
Student Variables																		
Age	1.24†	1.22†	1.22†	1.21†	1.19†	1.27†	1.30†	1.32†	1.32†	0.92†	0.92†	0.92†	0.92†	0.92†	0.96	0.98	0.98	0.98
Male	2.35†	2.40†	2.43†	2.44†	2.20†	2.22†	2.20†	2.20†	2.20†	1.89†	1.88†	1.89†	1.89†	1.89†	1.90†	1.89†	1.89†	1.89†
Black		2.99†	1.44	1.34	1.07	1.06	1.06	1.05	1.05		1.29	1.15	1.12	1.11	1.11	1.11	1.11	1.11
Latino		1.12	0.61	0.56	0.63	0.63	0.63	0.63	0.63		1.44*	1.33	1.29	1.29	1.31	1.30	1.30	1.30
Asian/PI		0.21†	0.15†	0.15†	0.18†	0.18†	0.18†	0.18†	0.18†		0.88	0.85	0.85	0.86	0.87	0.87	0.87	0.87
LEP		0.29†	0.24†	0.22†	0.24†	0.24†	0.24†	0.24†	0.24†		1.05	1.00	0.98	0.99	0.99	1.00	1.00	1.00
FR Lunch			3.69†	2.91†	2.43†	2.39†	2.39†	2.40†	2.40†			1.19	1.13	1.12	1.09	1.09	1.09	1.09
PE < High School				1.72*	1.40	1.39	1.39	1.39	1.39				0.94	0.94	0.94	0.94	0.94	0.94
PE High School				1.46	1.23	1.24	1.24	1.24	1.24				1.27	1.25	1.26	1.26	1.26	1.26
PE College Deg.				1.27	1.14	1.14	1.14	1.14	1.14				0.87	0.87	0.87	0.87	0.87	0.87
PE Grad. Deg.				0.73	0.68	0.68	0.68	0.67	0.67				0.91	0.91	0.90	0.90	0.90	0.90
Attendance Rate					0.98†	0.98†	0.98†	0.98†	0.98†					1.00	0.99	0.99	0.99	0.99
Suspensions					1.40†	1.41†	1.42†	1.42†	1.42†					0.99	1.00	1.00	1.00	1.00
School Variables																		
Enrollment						1.00†	1.00†	1.00†	1.00†						1.00†	1.00*	1.00	1.00
% racial minority						0.98	0.98	0.98	0.98						0.99	0.99	0.98	0.99
% LEP						0.99	0.99	0.99	0.99						1.00	1.00	1.00	1.00
% SPED						0.97	0.97	0.97	0.97						0.98	0.99	0.99	0.98
% FR lunch						1.03	1.03*	1.03*	1.03*						1.01	1.01	1.02	1.02
% Retained							0.92	0.99	0.97							0.83	0.84	0.85
% Suspended							0.99	0.99	0.98							0.99	0.99	0.99
% Passing Math								1.02	1.02								1.00	1.00
% Passing Reading								1.00	1.00								1.00	1.00
% Teachers ≥ Master's									1.00									1.00
% Teachers – White									0.99									1.01

continues

TABLE 4. *Continued*

	Other Health Impairments									*Low-Incidence Disabilities*								
Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Intercept	0.00†	0.00†	0.00†	0.00†	0.02†	0.02†	0.01†	0.01†	0.01†	0.12†	0.02†	0.02†	0.02†	0.06*	0.07*	0.06*	0.06*	0.03
Student Variables																		
Age	1.14†	1.13†	1.13†	1.12†	1.11†	1.11†	1.16†	1.16†	1.16†	1.00	1.00	1.00	1.00	1.00	0.97	0.99	1.00	1.00
Male	2.37†	2.37†	2.38†	2.39†	2.31†	2.31†	2.30†	2.30†	2.30†	2.78†	2.77†	2.77†	2.76†	2.79†	2.79†	2.78†	2.78†	2.78†
Black		2.01†	1.47†	1.40*	1.32*	1.32	1.28	1.28	1.28		0.67*	0.68*	0.70*	0.73*	0.73*	0.73*	0.72*	0.72*
Latino		1.08	0.84	0.78	0.81	0.81	0.80	0.80	0.80		0.66*	0.66	0.70	0.70	0.70	0.70	0.70	0.70
Asian/PI		0.35†	0.31†	0.31†	0.32†	0.32†	0.32†	0.32†	0.32†		0.77	0.77	0.80	0.80	0.80	0.81	0.81	0.81
LEP		0.77	0.69	0.64	0.68	0.68	0.72	0.72	0.72		0.87	0.87	0.92	0.92	0.91	0.91	0.91	0.91
FR Lunch			1.66†	1.45†	1.32	1.32	1.30	1.30	1.30			0.99	1.08	1.06	1.04	1.04	1.03	1.03
PE < High School				1.50	1.38	1.38	1.35	1.35	1.35				0.52	0.52	0.50*	0.50*	0.50*	0.50*
PE High School				1.35	1.25	1.25	1.24	1.24	1.24				0.61*	0.61*	0.59*	0.59*	0.59*	0.59*
PE College Deg.				1.06	1.03	1.03	1.02	1.02	1.02				0.65*	0.65*	0.64*	0.64*	0.64*	0.63*
PE Grad. Deg.				0.93	0.92	0.92	0.92	0.92	0.92				0.61†	0.61	0.63†	0.62†	0.62†	0.62†
Attendance Rate					0.98†	0.98*	0.98*	0.98*	0.98*					0.99	0.99	0.99	0.99	0.99
Suspensions					1.12†	1.12†	1.13†	1.12†	1.12†					0.83	0.83	0.83	0.83	0.83
School Variables																		
Enrollment						1.00†	1.00†	1.00†	1.00†						1.00	1.00	1.00	1.00
% racial minority						1.02	1.02	1.01	1.02						1.01	1.00	1.01	1.01
% LEP						0.98	0.98*	0.98*	0.98*						1.00	1.00	1.00	1.00
% SPED						1.02	1.03	1.03	1.02						1.03	1.04*	1.05*	1.04
% FR lunch						1.00	1.00	1.00	1.00						1.00	1.00	1.00	1.00
% Retained							0.95	0.97	0.99							0.91	0.97	0.98
% Suspended							0.99	0.99	0.99							0.98	0.98	0.98
% Passing Math								1.00	1.00								1.00	1.00
% Passing Reading								1.00	1.00								1.01	1.01
% Teachers ≥ Master's									1.00									1.00
% Teachers – White									1.01									1.01

Note. Results reported as odds ratios. PI = Pacific Islander; LEP = Limited English Proficient; FR lunch = free/reduced-price lunch; PE = parent education; SPED = special education.

*$p \leq .01$. † $p \leq .001$.

low-incidence disabilities. Latino and Asian females were at the lowest risk for identification across all categories examined. These findings confirm and extend earlier findings of race and gender disproportionality (e.g., Coutinho et al., 2002; Oswald et al., 2001).

Lower-income students were generally less likely overall, and within each racial group, to be identified in the low-incidence disabilities despite elevated risk in the high-incidence categories. When language status was considered, LEP students who were White, Black, or Latino were less likely to be identified for special education than their English-proficient peers were. This pattern was reversed for LEP students who were Asian/Pacific Islander. These findings contradict earlier studies of LEP representation in special education, but those studies (i.e., Artiles et al., 2005; Sullivan, 2011; Valenzuela et al., 2006) utilized data from districts in the southwest only, and there is some research to suggest that LEP disproportionality is not observed outside of this region (e.g., Artiles et al., 2010). Further, earlier research did not allow for the examination of differences in LEP representation by race. The findings here underscore the need to account for the diversity within the LEP population when studying factors related to educational risk and special education.

It is also notable that risk associated with gender and poverty was not consistent across groups. This finding was in line with the general recognition that topography of disproportionality differs across groups and underscores the need for more sophisticated approaches, such as multilevel linear modeling, to studying this problem. Further, this corroborates earlier analyses of school and district-level risk in which the relations of community poverty to identification patterns were found to vary according to the racial groups and disability categories examined (Skiba et al., 2005).

Multilevel Analysis of Risk

Students were significantly more likely to be identified for special education and the high-incidence categories, but not the low-incidence categories, as they got older and these effects were not attenuated by the inclusion of other variables. This finding suggests that students in the low-incidence categories are identified at school entry or early elementary, which is not unexpected given medical or physical basis of many of the diagnoses that contribute to these categories (e.g., hearing impairments, severe cognitive impairments) are apparent early in development and that the average age of autism diagnosis is 3 years (Mandell, Novak, & Zubritsky, 2005). Later identification of the high-incidence disabilities may be attributable to the subjective nature of diagnoses, dynamics of the referral and evaluation process, or cumulative effects of educational experience on students' academic and behavioral difficulties.

Males were significantly more likely to be identified across disability categories except CI despite their elevated risk for CI in the descriptive analyses. This gender effect was not attenuated by any of the other child or school factors included in this study and were consistent with earlier disproportionality and disability research (e.g., Hibel et al., 2010; Oswald et al. 2001; Shifrer et al., 2011). Although such variation may be due to biological factors, evidence of state variations in prevalence suggests that cultural-historical context of local educational systems may also influence gender disproportionality (Coutinho & Oswald, 2005). Coutinho and Oswald suggested that special education policy and procedures may be applied differently based on gender, yet little research has investigated potential school organizational, institutional, or practices related to differential risk of educational disability between boys and girls.

Black students were significantly more likely to be identified for special education and as SLD, whereas Latino and Asian students were significantly underrepresented in special education generally, and SLD, CI (Latinos only) and ED (Asian only). Although these effects were attenuated by SES, race remained a significant predictor of special education status and SLD. This finding contradicted those of Shifrer and colleagues (2011) and Hibel and colleagues (2010), who found that Black students were underrepresented in special education and as SLD and SLI specifically after accounting for child and school variables. These researchers also found that Latino and Asian students were underrepresented across high-incidence categories. This was basically consistent

with the findings here for SLD but not those for the other disabilities examined, which were broader than those in Hibel's study.

Students who received free/reduced-price lunch were significantly more likely than their peers who were not likely to be identified for special education and in SLD, ED, and CI. Children whose parents had less than a college education were significantly more likely to be identified for special education and SLD, while those whose parents had advanced degrees were less likely to be identified, unlike Shifrer and colleagues (2011) who did not find significant predictive relations. These findings, however, were consistent with those of Hibel and colleagues (2010), who showed that high family SES predicted lower risk of disability. Differences from the earlier literature may be attributable to the unit of analysis—that is, community measures in earlier studies versus measures of individual SES in the recent work—and the mechanisms by which disproportionality is produced (for discussion, see Sullivan & Artiles, 2011, for example).

The relations of special education identification and discipline outcomes are not often explored in the disproportionality literature, but the present study suggests that the discipline policies and procedures are important to consider when investigating differential disability risk. Students with high numbers of suspensions were at increased risk of identification for special education, and as SLD, ED, or OHI specifically. Earlier research had shown that district rates of suspensions predicted district rates of identification for ED and CI (Skiba et al., 2005). The present study replicated this finding for individual suspensions-related ED, SLD, and OHI risk.

School-level variables were not generally significant predictors of individual risk here, although increases in school size were predictive of small but significant increases in risk of identification as SLD, ED, and OHI. In addition, students were more likely to be identified as ED in schools where a high proportion of the student body received free/reduced-price lunch. Students were also less likely to be identified as CI in schools serving high proportions of students identified as LEP or in schools where rates of retention were high. Where retention was high, students were less likely to be identified for special education and in the specific categories for SLD and CI. It may be that some school systems rely on retention or disciplinary exclusion as means of addressing students' learning and behavioral difficulties whereas others rely on special education. These findings suggest a need to examine the relations of disproportionality to retention and discipline because both are amenable to policy and practice change. School size also appears to affect responses to students' learning and behavioral difficulties. Together, these findings emphasize the need to explore the roles of school structures and everyday practices in shaping such inequities through the structuring of opportunity (Artiles et al., 2012).

Unlike Hibel and colleagues' (2010) analysis, neither racial-minority enrollment nor school-level achievement significantly affected student risk of identification here. These results also showed that school-level teacher and student race were not significant predictors, unlike earlier analyses conducted at the district-level only (e.g., Serwatka et al., 1995; Gaviria-Soto & Castro-Morera, 2005; Oswald et al., 2001; Oswald, Coutinho, Best, & Singh, 1999). Nonetheless, the results do indicate that school context influences the likelihood of special education identification, consistent with the conclusion of other researchers who concluded that social difference and context matter in the identification of educational disabilities (e.g., Hibel et al., 2010; Shifrer et al., 2011).

Limitations

It is necessary to acknowledge certain limitations of this research. First, this study relied on data from one school system only, which may limit generalizability because the sample characteristics differ from other locales; and the patterns observed may be attributable to idiosyncratic identification practice. Results may be most applicable to urban Midwestern school systems. Nonetheless, because large-scale data that includes both disabled and nondisabled subsamples are limited, this study is an important addition to an emerging body of literature examining child and school predictors of individual risk of disability. It provides a model for analyzing disproportionality across contexts, and the utility of this study may

supersede issues of generalizability with the present findings.

Second, the specific variables used to operationalize SES (i.e., parental education and free/reduced-price-lunch status) and school characteristics, may not have adequately captured the constructs of interest. However, given that this study entailed secondary data analysis, we were restricted to the variables available in the district's information systems. Unfortunately, it was impossible to identify the mechanisms by which the observed gender, race, and SES effects operate. More specifically, it is impossible to determine by these analyses alone whether male and Black students are at increased risk of disability because of inherent characteristics or systemic differential treatment within educational settings. Likewise, it was impossible to determine whether the observed SES differences resulted from prenatal, family, or environmental factors that shape cognitive and social development, or, conversely, because students of lower SES experience different opportunities to learn or treatment during disability identification than students of higher SES.

Finally, patterns and predictors of special education for students who were Native American could not be examined here because of the small size of this subsample. Given that this is one group that is understudied in the special education literature, despite consistent evidence of overrepresentation (Sullivan & Artiles, 2011), more research is needed in this domain. In addition, a substantial number of students were dropped from the analysis because of insufficient data at the school level.

Implications for Research

Scholars have long expressed concern that the study of disproportionality obscured patterns of disproportionality at the state, district, and school levels through reliance on national databases (Sullivan & Artiles, 2011). This analyses suggested that earlier studies may also have failed to accurately represent the factors related to individual—as opposed to group—risk. Moreover, such analyses generally prevented the analysis of multiple dimensions of difference simultaneously and erroneously assume within group homogeneity (Shifrer et al., 2011). Taken together, these shortcomings and the present results emphasize the need to study disproportionality through student or multilevel data. These findings also call for greater exploration of disparities in the low-incidence disabilities.

These results also highlight the need to consider the ways in which race, gender, and SES intersect to produce differential risk of disability through the structuring of opportunity and the construction of risk/disability. Earlier research examining district- or school-level risk suggested "poverty makes a weak and inconsistent contribution to the prediction of disproportionality" (Skiba et al., 2005, p. 130). The present study and similar analyses (Hibel et al., 2010; Shifrer et al., 2011) demonstrate that low income is consistently predictive of elevated risk in the high-incidence categories. These findings highlight the importance of a comprehensive conceptualization of SES in studying disproportionality, but do not explain the observed differences. Earlier scholars suggested race is a proxy for SES in disproportionality (MacMillan & Reschly, 1998) and that the overrepresentation of racial minority children among the poor results in differential susceptibility; but this explanation may be too simplistic (Artiles & Bal, 2008). More research is needed to understand the dynamic intersections of race, class, and disability, because this disproportionality may result from cognitive sequelea of poverty; differential treatment of poor students in identification process; or differential opportunity to learn in a racially and economically stratified society.

The observed attenuation of race effects also point to a need to move beyond a simplistic focus on race to more nuanced examinations of cultural-historical context and educational opportunities that account for intersectionality in students' lived experiences. Scholars have suggested that disproportionality may be caused by differential ability/susceptibility or differential opportunity (Coutinho & Oswald, 1998), but these explanations have not been supported, perhaps because they ignore the full scope of ecological factors shaping educational risk. Future research should explore how different demographic, school, family, and community factors interact to produce under- or overrepresentation in special education.

These findings support the need for future research examining the processes through which educational policies and procedures are applied to different groups across contexts. For instance, the finding regarding CI identification in schools with high rates of retention points to the need to examine how educational decisions are made for students with borderline functioning. These results suggest that some schools may retain students rather than identify them as CI. More studies of the referral and identification processes are needed—particularly the team eligibility determination process. Previous research has tended to consider distinct professionals (e.g., school psychologists, referring general education teachers) rather than the team process in which they are engaged (for an exception, see Klingner & Harry, 2006).

Future research should explore how different demographic, school, family, and community factors interact to produce under- or overrepresentation in special education.

Moreover, the findings here, combined with those by Hibel and colleagues (2010) suggest that disproportionality research should dedicate greater attention to school policies and procedures related to instruction and discipline and their implications for students' academic difficulties and treatment within the context of special education referral and identification. The lack of convergence across the more recent multilevel studies of disproportionality also underscores the importance of locality, as has been recognized elsewhere (Sullivan & Artiles, 2011), which further supports the contextually dependent nature of patterns of disproportionality and the need for more research to understand how locality affects special education risk. As Artiles and Bal (2008) suggest, "researchers need to document processes and outcomes in such fashion that help understand local experiences" (p. 6) and "should transcend the traditional exclusive focus on the various groups represented in schools (e.g., linguistic, socioeconomic, ethnic) and document the ways these students' cultural practices intersect with school cultural practices to construct and maintain inequitable conditions" (p. 7).

Note that documentation of disproportionality is not problematic in and of itself, but may be indicative of inequities related to the underlying general and special education policies and practices (Rueda & Windmueller, 2006). In identifying numerous disparities in identification patterns, these results further emphasize the need to explore the validity of the educational practices that precede and follow special education identification. More specifically, researchers and practitioners must consider two major questions: (a) Are the instructional, prereferral, and assessment practices that contribute to special education identification valid and equitable? and (b) Are the instructional and intervention practices provided through special education valid and equitable? Exploration of these questions should take into consideration the dimensions of difference along which disproportionality is observed, namely, the intersections of gender, race, and SES.

Practical Implications

These results have implications for educational professionals of all types and levels because they underscore the importance of social structures (e.g., race, class, and gender relations), school policy, and practice (e.g., retention and discipline) in the treatment of children with academic difficulties. The results highlight the need to examine multiple dimensions of difference when analyzing disproportionality as part of systemic monitoring and improvement efforts. Whereas the findings here and from this strand of scholarship generally do not allow for causal inference, they do point to dimensions warranting attention in daily practice. School districts tend to focus on race because of IDEA requirements, but policy makers, administrators, and educators should also be cognizant of broader disparities in identification and outcomes. Practitioners should examine potential disparities in the application of discipline, intervention, referral, and evaluation procedures and practices with diverse learners to understand constructions of differences based on intersecting statuses (e.g., SES with race and gender). Efforts should focus on (a) preventing inappropriate identification where academic difficulties result

from factors outside of disability (e.g., cultural difference, lack of learning opportunities) and (b) providing access to preventative services and interventions that may mitigate mild disabilities—particularly among racial minority males from lower SES backgrounds.

FINAL THOUGHTS

This study examined special education disproportionality by examining both univariate and bivariate risk across multiple disability categories and sociodemographic characteristics and individual and school predictors of individual student identification for special education. This study confirms that the relations of predictive variables vary across disability categories. When only the risk index was considered, severe racial disproportionality was observed. Multilevel modeling, however, revealed that these relations were attenuated when other sociodemographic and school factors were accounted for. In particular, this analysis underscored the intersections of race, class, and gender in disproportionality and highlighted the importance of school policies and practices related to discipline and retention. The present findings support the conclusions of recent researchers that disability identification is socially (Shifrer et al., 2011) and contextually based (Hibel et al., 2010) and call attention to the need to examine the mechanisms by which sociodemographics, school policy, and educational practices affect disproportionality, to foster appropriate educational opportunities for all through systemic solutions focused on enhancing access to quality educational services and supports within both general and special education. Such an approach recognizes that the study of disproportionality is rooted in concerns for the capacity of schools to support diverse learners.

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