Article

When Salt Ain't Enough: A Critical Quantitative Analysis of Special Education and Education Degree Production

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Abstract

Background/Context: An ever-growing list of scholars in the United States have highlighted the importance of racially/ethnically diverse teachers. There is evidence suggesting that White teachers, who represent most teachers in the United States, may act to the detriment of the academic and socioemotional outcomes of minoritized students. What has been given limited attention is the degree production within special education (SPED) and education (ED) baccalaureate programs.

Purpose/Objective/Research Question/Focus of Study: Using data from the Integrated Postsecondary Education Data System (IPEDS), we examined degree production in SPED and ED degree programs by race. We began by analyzing trend data of SPED and ED degrees produced, specifically by race, to provide a foundation for further inquiry as to why the trends exist. Using a random-effects panel regression, we then conducted an exploratory analysis of relations between degrees produced in SPED and ED by race and institutional factors (e.g., cost of attendance and institutional racial demographics) and characteristics (e.g., Carnegie classification and HBCU [historically Black college and university] status), building on the analyses of trend data and providing some more direction for future research. Broadly, we ask: What is the recent history of SPED and ED degree production, and what institutional characteristics relate to degree production? An examination of this question provides a foundation for further inquiry that could lead to understanding issues in the recruitment of racially/ethnically diverse special education teachers and general education teachers into the profession. Specifically, we addressed the following research questions: (1) What are the overall

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trends in the distribution of baccalaureate degrees awarded in special education and education by race? (2) What are the within-race trends in the distribution of baccalaureate degrees awarded in special education and education? (3) What is the relative difference in the racial distribution of special education degrees awarded and the makeup of special students in K–12 public schools? (4) For each racialized group, what is the relation between the number of special education baccalaureate degrees produced and institutional characteristics? (5) For each racialized group, what is the relation between the number of education baccalaureate degrees produced and institutional characteristics?

Research Design: For this study we used an exploratory quantitative research design guided by a quantitative criticalism (QuantCrit) as our conceptual framework. Using IPEDS data spanning 25 years (1995–2019), we examined trends in SPED and ED baccalaureate degree production by racialized categories, compared the racial distribution of SPED degrees produced to public school students receiving SPED services (2000–2018), and then, for each racialized group, used a random-effects panel regression to explore the relations between the number of degrees produced and institutional characteristics over the 25 years.

Findings/Results: In general, the percentage of SPED and ED degrees awarded relative to all degrees has declined for all racialized categories since 1995. We found an increase in the percentage of SPED and ED degrees awarded to Hispanic/Latino students and a decrease in the percentage of SPED degrees awarded to Black/African American students. The racial demographics of the potential SPED teacher workforce has not matched the racial demographics of students receiving SPED services between 2000 and 2018. Finally, we found that an increase in the percentage enrollment for each racialized group is related to an increase the number of ED degrees produced for that group. HBCU status is positively related to ED degree production for Black/African American students, and cost of attendance is related to lower numbers of SPED degrees awarded to Black/African American, Hispanic/Latino, and White students and ED degrees awarded to American Indian/Alaska Native, Black/African American, Hispanic/Latino, and White students.

Conclusions/Recommendations: Data analyzed in this study suggest that there is a general decline in the numbers of racial/ethnic minority teacher candidates in both SPED and ED, with the exception of Hispanic/Latino degree holders. If school districts and policy makers consider it important (as has been mentioned) to increase the number of minority teacher candidates in both of these teaching areas, there needs to be a better targeted approach to determine the best ways to entice this group to enter into baccalaureate programs, particularly ones that lead to teaching credentials. However, we also note that even with bringing in more candidates of color to obtain baccalaureate degrees and licenses in SPED and ED, there must be ways for schools and districts to address the many racialized challenges that these teachers face once in schools (e.g., being expected to be cultural brokers and disciplinarians, and taking on other tasks that are outside the normal teaching responsibilities because of their racial and gendered identities).

Keywords
Teacher education, special education teachers, degree attainment, diversity in teacher education

Much as using salt alone to season meat yields a rather disappointing result, scholars have extensively demonstrated that having a teacher workforce comprising solely White teachers has disadvantages, particularly for minoritized learners. Diversity among teachers positively supports the academic (Gershenson et al., 2021; Redding, 2019) and socioemotional needs of minoritized learners in public schools, as researchers both in the United States and abroad have revealed (for example, see Cormier et al., 2021). Yet, the teacher workforce remains overwhelmingly White even though the ethnic/racial diversity of the population, and particularly the nation's students, continues to rise (Hussar et al., 2020). Even with efforts to recruit and retain certain groups that might act as a different type of seasoning (e.g., pepper—Black men) in the profession, explanations of the need for integration often reflect a devaluation of Teachers of Color (TOC) as content experts (Bristol & Goings, 2019; Kohli, 2021). Given the belief by minoritized groups (a common discussion among Black Americans on social media outlets such at Black Twitter) that Whites' food is often flavorless because of the use of basic seasoning (e.g., salt only), which leaves the food bland and without much-needed variety. In this work, we argue that this same blandness has made its way into U.S. classrooms. Therefore, in an effort to add more diversity in the "seasonings" of teachers, we believe that "salt ain't enough"; we explore how the population of those achieving special education (SPED) and education (ED) degrees is still overwhelmingly White, and we explore the benefits of variety of seasonings in the teacher pipeline. Furthermore, the focus on TOC highlights that there is often more attention placed on their perceived ability to be schoolwide cultural brokers, which could allow their White colleagues to believe that they do not have to fully engage in culturally competent practices with minoritized students, passing the responsibility to their minoritized colleagues (Cormier et al., in press; Kohli, 2021). Using a critical lens, we acknowledge that a reason the teaching workforce has been much like a container of salt lies in systematic inequities that affect SPED and ED degree programs as well as schools, which are microcosms of society (Starck et al., 2020)—particularly in terms of their privileging of salt and devaluation of other seasonings. Thus, we direct our attention to critically understanding the production of SPED and ED degrees, one aspect of understanding diversity within the teacher education pipeline.

The Impact of Salt Only: The United States' Dire Need for a Diverse Teaching Workforce

Evidence suggests that White teachers may act to the detriment of the academic and socioemotional outcomes of minoritized students (Gershenson et al., 2021; Redding, 2019). A growing list of scholars have also shown the importance of having the

demographics of the teaching population match the demographics of the students being served. For example, a recent meta-analysis of literature on same-race teachers found significant evidence that minority students performed better academically and socially when they had same-race teachers (Redding, 2019). Such evidence has led to rapid growth in interventions aimed at recruiting a more diverse teacher workforce, reflecting shifting policy recommendations. However, neither research nor policy has gotten much beyond the need for more acute attention to recruitment; there's an understanding of the need to get beyond salt, but not much understanding of how to do, or what might be preventing diversification (Billingsley et al., 2019; Scott & Alexander, 2019; Trainor et al., 2019).

Research suggests that a lack of knowledge of what factors might be filtering out particles other than salt is hampering efforts to diversify the teaching force. For example, using data from the National Center for Education Statistics (NCES), Ingersoll et al. (2019) examined recruitment, retention, and employment in the teaching workforce. They found that the number of TOC entering the profession has spiked over the last two decades, but they have higher than average turnover rates. This study calls attention to the need for more investigation of trends in the racial/ethnic characteristics of the teacher workforce in both SPED and ED using nationally representative data.

Using data from the Integrated Postsecondary Education Data System (IPEDS), we examined degree production in SPED and ED degree programs by race. We began by analyzing trend data of SPED and ED degrees produced, specifically by race, to provide a foundation for further inquiry as to why the trends exist. Using a random-effects panel regression, we then conducted an exploratory analysis of relations between degrees produced in SPED and ED by race and institutional factors (e.g., cost of attendance and institutional racial demographics) and characteristics (e.g., Carnegie classification and historically Black college and university [HBCU] status), building on the analyses of trend data and providing some more direction for future research. Broadly, we ask: What is the recent history of SPED and ED degree production, and what institutional characteristics relate to degree production? An examination of this question provides a foundation for further inquiry that could lead to understanding issues in the recruitment of racially/ethnically diverse special education teachers (SETs) and general education teachers (GETs) into the profession. Specifically, we address the following research questions:

1. What are the overall trends in the distribution of baccalaureate degrees awarded in special education and education by race?
2. What are the within-race trends in the distribution of baccalaureate degrees awarded in special education and education?
3. What is the relative difference in the racial distribution of special education degrees awarded and the makeup of special students in K–12 public schools?
4. For each racialized group, what is the relation between the number of special education baccalaureate degrees produced and institutional characteristics?

5. For each racialized group, what is the relation between the number of education baccalaureate degrees produced and institutional characteristics?

We begin this report of our examination with a positionality statement from all the authors, followed by a literature review focusing on racial trends in degree attainment, the shortages of SETs and GETs, and the need for diversity in the teacher workforce. We then detail our conceptual framework for this study, quantitative criticalism (QuantCrit), followed by the methods, results, discussion, and considerations for the future.

Positionality

The authors are three Black men who center the pursuit of diversity, equity, and justice in their scholarship. The first and third authors are former SPED teachers in public schools; the first author worked exclusively in Title 1 schools. The second author is the son, grandson, and nephew of Black women and men who were public school educators. The first and third authors are first-generation college graduates who come from low socioeconomic backgrounds. The second author comes from a working-class family. Our collective focus is on pursuing avenues of research for the benefit of those historically marginalized within the education system, with specific attention on Black-identifying individuals.

The Predominance of Salt: Racial Trends in Degree Attainment

U.S. Bureau of Labor Statistics data show an upward trend among the U.S. labor workforce in the overall percentage of people earning higher education degrees in the United States, with 17.2% having earned bachelor's degrees in 1992 compared with 24.2% in 2016, and 9.3% of the labor force having earned master's degrees in 1992 compared with 14.7% in 2016 (U.S. Bureau of Labor Statistics, 2017). People of Color have driven this trend. For example, 194,500 Black students were in bachelor's degree programs in 2016, up from 111,300 in 1992; the percentage of U.S. college students who were White dropped from 77% to 65% in the same period (National Center for Education Statistics, 2019; U.S. Bureau of Labor Statistics, 2017). However, access for Students of Color has not led to a diversification of the teacher workforce, with data indicating that 79% of U.S. K–12 teachers were White in the 2017–2018 school year (Hussar et al., 2020). Given steady increases in the diversity of the K-12 student population, where minority students, as of the 2017–2018 school year, represented approximately 53% of the student population (Hussar et al., 2020), this constitutes a crisis.

Calls for diversification of the teacher workforce are often conflated across content and program areas. In this context, attention to the need to diversify SPED teachers has been scant. In response to this ongoing issue in SPED, researchers, policy makers, and

practitioners have expressed concerns that efforts to recruit a more racially/ethnically diverse SET workforce are inadequate given the nature of the problem. Furthermore, scant research has examined the recruitment and degree attainment patterns of racially diverse candidates in SET degree programs (for some exceptions, see Billingsley et al., 2019; Cooc & Yang, 2016; Patton et al., 2003).

Conceptual Framework

In this quantitative study, we used a critical lens that centered an exploration of systemic inequality within a facet of the structure of the teacher-education pipeline. It responds to calls by Stage (2007) and others for a more nuanced and critical approach to quantitative higher education research in order to identify and classify areas of inequality and inequity with greater precision. From decentering White men as reference groups to disaggregating analyses, subsequent calls (Stage & Wells, 2014) have challenged researchers to explore how the use of quantitative methods could be moved beyond postpositivistic assumptions to address areas of injustice and begin to incorporate more critically oriented theoretical frameworks to guide all facets of the research process. As Gillborn et al. (2018) noted,

> quantitative methods cannot match qualitative approaches in terms of their suitability for understanding the nuances of the numerous social processes that shape and legitimate race inequity. However, quantitative methods are well placed to chart the wider structures, within which individuals live their everyday experiences, and to highlight the structural barriers and inequalities that differently racialized groups must navigate (p. 160).

Grounded in the tenets of critical race theory, QuantCrit provides a guiding framework of how to approach quantitative research and centers on the following tenets: the centrality of racism; numbers are not neutral; categories are neither "natural" nor given: for "race" read "racism"; voice and insight: data cannot "speak for themselves"; and using numbers for social justice (Gillborn et al., 2018). We center race in our assessment of one factor of the teacher pipeline because the teaching workforce consists predominantly of White (female[1]) teachers and thus increasingly does not mirror the student population (Hussar et al., 2020). Following Covarrubias (2011) and Sólorzano et al. (2005), we explore and identify sources of inequality within one facet of the teacher pipeline, namely, the institutions of higher education (IHE). Furthermore, we do not assume homogeneity in the relations between degrees awarded within each race and institutional factors that may influence the teacher pipeline. We decenter Whiteness by disaggregating data to explore within-racialized group heterogeneity while not comparing degree attainment outcomes with White students. We acknowledge the nonneutrality of numerical data by analyzing our results using the theory of racialized organizations (Ray, 2019), and we use our perspectives as Black male special educators (Authors 1 and 3) to add critical context, humanize the data, and identify future lines of inquiry in the pursuit of equity and justice within the teacher pipeline.

Ray (2019) provided an analytical framework, the theory of racialized organizations, that grounds our discussion. Given the institutional context of our study, we consider IHE as racialized organizations. In understanding organizations, Ray (2019) noted that their "approach replaces the notion of organizations as race-neutral with a view of organizations as constituting and constituted by racial processes that may shape both policies of the racial state and individual prejudices" (p. 27). Ray addressed four tenets of his theory of racialized organizations: "1) racialized organizations enhance or diminish the agency of racial groups; 2) racialized organizations legitimate the unequal distribution of resources; 3) Whiteness is a credential; 4) the decoupling of formal rules from organizational practices is often racialized" (p. 26). Focusing on two tenets, we note that higher education institutions legitimate inequitable resource allocation through the underfunding of the social sciences and humanities (Zuckerman & Ehrenberg, 2009), the disparate funding between regional and flagship state institutions (Orphan, 2018), and the separate but unequal state funding of HBCUs (Harris, 2021). Second, teacher education programs may reinforce Whiteness as a credential (Picower, 2021; Sleeter, 2017), specifically that it may reinforce the assumed neutrality of colorblind instruction and practices in a variety of ways.

Therefore, we examine the relations between institutional characteristics (e.g., cost of attendance, control, and Carnegie classifications) and within-racialized group SPED and ED degree attainment. By centering our analyses at the institutional level, we acknowledge the institution's place in reinforcing systems of inequity, particularly as one facet of the teacher pipeline. As such, we conceptualize this study from a critical quantitative perspective, specifically QuantCrit (Garcia et al., 2018), and frame the analysis using the theory of racialized organizations (Ray, 2019).

Data and Method

The NCES IPEDS data were used for this analysis. IPEDS is the national repository of postsecondary information from U.S. Institute of Education Sciences that receive Title IV funds. Since 1980, a myriad of information has been reported to IPEDS, including the number of baccalaureate degrees awarded per instructional program. Starting with the 1994–1995 school year, degrees awarded were disaggregated by both race and six-digit Classification of Instructional Programs (CIP) code. SPED CIP codes are in the range of 13.1000 to 13.1099. ED CIP codes are in the range of 13.0000 to 13.9999. Central to a critical quantitative approach is the disaggregation of data to address and identify patterns of inequality. As such, the data span from the 1994–1995 to the 2018–2019 academic school years. From 1995 to 2010, seven racialized categories were used. In 2008 and following the 2000 census, the Department of Education began allowing multiple racialized categories to be used and a classification of Native Hawaiian/Pacific Islander (NHPI). Thus, nine racialized categories were used beginning in 2011.

Racially disaggregated publicly available institutional data, including baccalaureate completions, were downloaded from the NCES IPEDS. For each year (*year)* and by institution (*unitid*), data were organized by credential level and CIP code. All non-baccalaureate credential-level counts and CIP codes identified with a 99 were deleted. For each institution and within each year, the sum of baccalaureate degrees awarded,

ED baccalaureate degrees awarded (CIP codes 13.0000–13.9999), and SPED baccalaureate degrees awarded (CIP codes 13.1000–13.1099) were tabulated. Overarching descriptive information about the data is found in Table 1, and a description of the variables used in the regression analyses is found in Table 2. The descriptive and regression analyses are further discussed.

Descriptive Analysis

Because total numbers are relative to the population that attends, percentages of total degrees awarded by race were examined. Data from Table 3 were used to calculate the percentage of total baccalaureate degrees awarded, total SPED baccalaureate degrees awarded, and total ED baccalaureate degrees awarded, each by race for each year. Table 4 shows the percentage distribution of degrees awarded by race. Thus, we address the distribution of degrees awarded within each group, paying particular attention to the percentage of SPED and ED degrees awarded relative to the total degrees awarded within each racialized category. In Table 5, data from Table 3 were used to calculate the percentage of SPED and ED degrees awarded relative to all degrees awarded within each racialized category.

$$TSPI = (\%\ \text{of Degree Recipients})/(\%\ \text{of K12 students})$$

Using a lagged teacher–student parity index (TSPI; Villegas et al., 2012), we examined the distribution of SPED degrees awarded in the previous spring compared with the distribution of the percentage of K–12 students receiving SPED services across each racialized category enrolled during the fall of the same year. We use a lagged comparison because students who obtained degrees in the spring term would likely begin employment in the fall term. The TSPI allows for a comparison of the racial demographics of the prospective teaching workforce and the students in the classroom (see Bettini et al., 2018; Villegas et al., 2012). A TSPI score of 1 indicates parity, such that the percentage of Black/African American SPED degree recipients is equal to the percentage of Black/African American K–12 students receiving SPED services. A score below 1 would indicate that the percentage of Black/African American SPED degree recipients is less than the percentage of Black/African American K–12 students receiving SPED services, and a score above 1 indicates the opposite.

Panel Regression Analysis

Two panels were created to address Research Questions 4 and 5. We specifically estimated the number of SPED and ED baccalaureate degrees awarded relative to institutional characteristics. Completion data for each institution, along with other institutional characteristics, were merged by year across the 25 years of analysis. Because the analyses were exploratory in nature, we explored institutional characteristics available within IPEDS that were conceptually and/or theoretically associated with degree

Table 1. Descriptive Statistics for Each Analysis.

	SPED (n = 11,606)		ED (n = 32,114)	
Average Degrees Awarded	*M* (*SD*)	Range	*M* (*SD*)	Range
American Indian/Alaska Native	0 (1)	(0, 21)	1 (1)	(0, 129)
Asian	0 (1)	(0, 43)	2 (7)	(0, 220)
Black/African American	1 (3)	(0, 146)	5 (16)	(0, 685)
Hispanic/Latino	1 (5)	(0, 130)	6 (22)	(0, 511)
White	17 (28)	(0, 546)	65 (104)	(0, 2283)
Percent Fall Enrollment	SPED (n = 11,584)		ED (n = 31,746)	
American Indian/Alaska Native	1.1% (5.7%)	(0, 1)	1.3% (7.0%)	(0, 1)
Asian	2.7% (5.3)	(0, 0.92)	3.1% (5.5%)	(0, 1)
Black/African American	14.0% (21.0%)	(0, 1)	13.6% (21.1%)	(0, 1)
Hispanic/Latino	9.8% (20.1%)	(0, 1)	9.2% (18.0%)	(0, 1)
White	64.0% (26.7%)	(0, 1)	63.5% (26.7%)	(0, 1)
Institutional Characteristics				
	SPED		ED	
Open Admission	*N*	%	*N*	%
Yes	119	16.6	416	24.7
No	685	95.4	1,526	90.6
HBCU				
Yes	44	6.1	84	5.0
No	674	93.9	1,600	95.0
Sector				
Public	312	43.5	596	35.4
Private	404	53.6	1,016	60.3
For-Profit	5	0.7	99	5.9
Carnegie Status				
Research	120	16.7	223	13.2
Master's	346	48.2	571	33.9
Baccalaureate	220	30.6	608	36.1
Tribal	3	0.4	15	0.9
Special	10	1.4	109	6.5
Not Defined	24	3.3	175	10.4
Locale				
City	321	44.8	724	43.3
Suburb	148	20.6	379	22.7
Town	166	23.2	320	19.1
Rural	82	11.4	250	14.9

Table 2. Description of Variables Used in the Panel Regression Models.

Variable	Description
Cost of Attendance	The sum of the reported tuition/fees and room/board for each institution for each year. Costs were adjusted to 2019 dollars using inflation estimates from the World Bank (2021).
Percent Fall Enrollment	The percentage of each respective race of the reported total fall enrollment, both full- and part time. The percentage of American Indian/Alaska Native students of the total fall enrollment are used in the American Indian/Alaska Native regression models.
Open Admission	Identifies if an institution is open admission.
Carnegie	This is a modified version of the 2000 Carnegie classifications. Major groups are collapsed, such that all research-intensive institutions are classified as research, etc. Tribal colleges and universities receive their own Carnegie classification and are represented as such. Institutions not defined by Carnegie were classified as not defined.
HBCU	Identifies if an institution is a historically Black college or university, as defined by the Higher Education Act of 1965.
Control	Identifies if the institution is public, private not-for-profit, or private for-profit.
Degrees Awarded	The total number of baccalaureate degrees awarded in education or special education at an institution each year.

Note. HBCU = historically Black college or university.

production and were constant across the 25 years of analysis. Specifically, prior research suggests a relation between degree production and cost of attendance (Stange, 2015), selectivity as measured by open admission status (Hearn & Belasco, 2015), and institutional classifications (i.e., Carnegie, HBCU, and control; Pike & Robbins, 2020). Finally, we included a measure of relative race-specific enrollment to account for the percentage of each race enrolled at each institution (Pike & Robbins, 2020).

As such, we estimated the following general random-effects specification model to address Research Questions 4 and 5. For institution *(i)* in year *(t)* and for racial group *(r)*, we estimated the following model where degrees awarded are the total number of degrees awarded at the i^{th} institution in the t^{th} year for each racial group *(r)*, for a total of five models for each question. *Cost of attendance* and *% of total enrollment* are log-transformed random variables for each institution, while *open admission status* and classifications (i.e., *HBCU, control, Carnegie*, and *locale*) are fixed variables (see Table 2 for a description of the variables). The *% of total enrollment* corresponds to the percentage of the total enrollment of racial group *(r)* within the i^{th} institution in the t^{th} year.

$$
\begin{aligned}
&Degrees\ Awarded_{it}^{r} \\
&= log(cost\ of\ attendance)\beta_{1it} + log(\%\ of\ total\ enrollment^{r})\beta_{2it} \\
&+ (open\ admission)\beta_{3it} + (HBCU)\beta_{4it} + (control)\beta_{5it} + (Carnegie)\beta_{6it} \\
&+ (locale)\beta_{6it} + \varepsilon_{it}
\end{aligned}
$$

Table 3. Total Number of Baccalaureate Degrees, Special Education Baccalaureate Degrees, and Education Baccalaureate Degrees Awarded by Race, 1995–2019.

	American Indian/ Alaska Native			Asian			Black/African American			Hispanic/Latino			Native Hawaiian/ Other Pacific Islander			Two or More Races			White		
Year	All	SPED	ED	All	SPED	ED	All	SPED	ED	All	SPED	ED	All	SPED	ED	All	SPED	ED	All	SPED	ED
1995	6,474	58	835	59,656	68	1,457	85,856	523	6,589	67,049	393	5,240							897,786	8,690	91,819
1996	6,815	64	872	63,191	78	1,623	89,592	595	7,070	71,072	467	5,612							884,876	8,752	89,943
1997	7,245	94	919	67,452	86	1,742	92,170	571	7,462	75,012	438	5,969							878,929	8,731	88,669
1998	7,718	79	938	70,167	109	1,868	96,091	581	7,568	78,270	509	6,157							880,351	8,671	89,009
1999	8,438	73	1,049	72,283	109	1,982	99,454	614	7,827	82,749	466	6,528							885,243	8,402	89,431
2000	8,453	52	927	75,478	136	1,966	104,522	629	7,595	88,522	513	6,996							897,439	8,179	89,844
2001	8,944	64	911	79,584	126	1,920	109,626	576	7,348	93,472	479	6,781							933,678	8,243	90,478
2002	9,022	82	999	83,794	143	2,029	114,219	523	6,862	99,336	458	7,051							963,262	7,987	90,611
2003	9,714	71	1,027	88,462	117	1,698	121,268	521	6,799	105,300	444	7,011							993,130	7,458	90,557
2004	10,428	62	974	92,407	117	1,849	127,330	391	6,346	111,098	509	7,502							1,020,791	7,125	91,244
2005	10,130	62	920	97,309	122	1,826	132,091	414	6,303	116,706	486	7,694							1,045,580	7,213	90,908
2006	10,733	53	885	95,253	130	2,008	129,038	385	6,770	123,233	511	8,402							1,068,733	7,152	91,563
2007	11,143	67	890	105,235	131	2,111	141,563	428	6,633	130,305	646	8,668							1,092,946	7,530	90,332
2008	11,166	56	891	108,719	124	2,182	146,553	403	6,440	137,081	630	8,737							1,110,207	7,161	87,004
2009	11,828	48	911	111,876	125	2,064	149,667	394	6,485	143,580	678	8,812							1,128,500	7,282	85,682
2010	11,937	55	872	115,533	148	2,050	156,262	394	6,597	153,510	754	8,722							1,144,005	7,392	84,083
2011	11,587	54	834	116,140	97	1,860	165,062	397	6,935	167,932	804	8,641	4,377	54	514	20,382	73	788	1,168,754	7,246	85,079
2012	11,157	54	750	120,890	118	1,973	177,806	444	7,465	185,120	836	8,832	4,715	25	261	26,946	103	1,064	1,200,114	8,156	86,390
2013	11,190	59	719	124,978	101	1,954	184,190	518	8,151	204,040	876	8,783	5,110	16	276	33,764	116	1,239	1,216,622	8,500	84,897
2014	10,575	44	720	126,725	104	1,985	185,330	485	7,549	221,120	913	8,546	5,269	21	297	45,417	135	1,540	1,219,868	8,540	79,557
2015	9,995	46	676	129,238	120	1,963	187,032	461	7,213	237,148	869	8,521	5,101	18	254	54,170	165	1,778	1,213,132	8,157	73,312
2016	9,656	31	590	134,679	99	2,022	190,069	434	6,557	255,497	959	9,172	4,864	27	261	61,999	190	2,123	1,209,484	8,111	68,945
2017	9,518	33	549	141,254	109	2,183	192,821	451	6,308	273,743	948	9,565	4,755	10	190	67,267	199	2,173	1,212,367	7,908	66,543
2018	9,151	40	500	149,414	107	2,295	193,567	428	6,126	290,214	989	9,972	4,689	27	188	71,715	205	2,256	1,214,317	7,636	63,743
2019	9,119	29	522	154,438	97	2,356	193,894	317	5,958	306,826	785	10,343	4,711	25	223	74,757	192	2,448	1,211,031	7,146	63,617

Table 4. Percentage Distribution of Baccalaureate Degrees, Special Education Baccalaureate Degrees, and Education Baccalaureate Degrees Awarded by Race, 1995–2019.

	American Indian/ Alaska Native			Asian			Black/African American			Hispanic/Latino			Native Hawaiian/ Other Pacific Islander			Two or More Races			White		
Year	All	SPED	ED	All	SPED	ED	All	SPED	ED	All	SPED	ED	All	SPED	ED	All	SPED	ED	All	SPED	ED
1995	0.50%	0.60%	0.80%	5.00%	0.70%	1.30%	7.30%	5.30%	6.10%	5.70%	4.00%	4.80%							75.90%	87.80%	84.80%
1996	0.60%	0.60%	0.80%	5.30%	0.80%	1.50%	7.60%	5.90%	6.60%	6.00%	4.60%	5.20%							74.90%	86.30%	83.50%
1997	0.60%	0.90%	0.90%	5.70%	0.90%	1.60%	7.80%	5.60%	7.00%	6.30%	4.30%	5.60%							74.00%	86.40%	82.60%
1998	0.60%	0.80%	0.90%	5.80%	1.10%	1.70%	8.00%	5.70%	7.00%	6.50%	5.00%	5.70%							73.10%	85.40%	82.20%
1999	0.70%	0.70%	1.00%	5.90%	1.10%	1.80%	8.10%	6.20%	7.10%	6.80%	4.70%	5.90%							72.40%	85.00%	81.40%
2000	0.70%	0.50%	0.80%	6.00%	1.40%	1.80%	8.30%	6.50%	6.90%	7.00%	5.30%	6.30%							71.40%	83.90%	81.10%
2001	0.70%	0.70%	0.80%	6.00%	1.30%	1.70%	8.30%	5.90%	6.60%	7.10%	4.90%	6.10%							70.80%	84.50%	81.20%
2002	0.70%	0.90%	0.90%	6.10%	1.50%	1.80%	8.30%	5.50%	6.10%	7.20%	4.80%	6.30%							70.10%	83.90%	80.60%
2003	0.70%	0.80%	0.90%	6.20%	1.30%	1.50%	8.50%	5.80%	6.10%	7.30%	5.00%	6.30%							69.20%	83.40%	81.00%
2004	0.70%	0.70%	0.90%	6.20%	1.40%	1.60%	8.50%	4.60%	5.60%	7.40%	6.00%	6.60%							68.40%	83.60%	80.70%
2005	0.70%	0.70%	0.80%	6.30%	1.40%	1.60%	8.60%	4.80%	5.60%	7.60%	5.60%	6.80%							68.00%	83.50%	80.60%
2006	0.70%	0.60%	0.80%	6.50%	1.50%	1.70%	8.80%	4.50%	5.90%	8.40%	5.90%	7.30%							72.90%	82.80%	79.50%
2007	0.70%	0.70%	0.80%	6.50%	1.40%	1.90%	8.70%	4.70%	5.80%	8.00%	7.10%	7.60%							67.20%	82.40%	79.20%
2008	0.70%	0.60%	0.80%	6.50%	1.40%	2.00%	8.80%	4.60%	5.80%	8.20%	7.20%	7.90%							66.80%	82.10%	78.60%
2009	0.70%	0.50%	0.80%	6.60%	1.40%	1.90%	8.80%	4.40%	5.90%	8.40%	7.60%	8.10%							66.30%	82.00%	78.40%
2010	0.70%	0.60%	0.80%	6.60%	1.60%	1.90%	8.90%	4.30%	6.10%	8.80%	8.20%	8.10%							65.40%	80.70%	78.00%
2011	0.60%	0.60%	0.80%	6.40%	1.00%	1.70%	9.00%	4.20%	6.30%	9.20%	8.60%	7.80%	0.20%	0.60%	0.50%	1.10%	0.80%	0.70%	63.90%	77.10%	76.80%
2012	0.60%	0.50%	0.70%	6.30%	1.10%	1.80%	9.30%	4.30%	6.60%	9.70%	8.10%	7.90%	0.20%	0.20%	0.20%	1.40%	1.00%	0.90%	62.80%	79.10%	76.90%
2013	0.60%	0.50%	0.60%	6.40%	0.90%	1.80%	9.40%	4.80%	7.30%	10.40%	8.10%	7.90%	0.30%	0.10%	0.20%	1.70%	1.10%	1.10%	62.10%	78.40%	76.30%
2014	0.50%	0.40%	0.70%	6.40%	1.00%	1.90%	9.30%	4.50%	7.20%	11.10%	8.40%	8.10%	0.30%	0.20%	0.30%	2.30%	1.20%	1.50%	61.30%	78.50%	75.80%
2015	0.50%	0.40%	0.70%	6.40%	1.20%	2.00%	9.30%	4.40%	7.40%	11.80%	8.40%	8.70%	0.30%	0.20%	0.30%	2.70%	1.60%	1.80%	60.30%	78.70%	74.90%
2016	0.50%	0.30%	0.60%	6.60%	1.00%	2.20%	9.30%	4.30%	7.00%	12.50%	9.40%	9.80%	0.20%	0.30%	0.30%	3.00%	1.90%	2.30%	59.20%	79.50%	73.80%
2017	0.50%	0.30%	0.60%	6.80%	1.10%	2.40%	9.30%	4.50%	6.90%	13.20%	9.50%	10.50%	0.20%	0.10%	0.20%	3.20%	2.00%	2.40%	58.30%	79.20%	73.10%
2018	0.40%	0.40%	0.60%	7.10%	1.10%	2.60%	9.20%	4.40%	6.90%	13.80%	10.10%	11.30%	0.20%	0.30%	0.20%	3.40%	2.10%	2.60%	57.60%	78.20%	72.10%
2019	0.40%	0.30%	0.60%	7.20%	1.10%	2.60%	9.10%	3.60%	6.70%	14.40%	8.90%	11.60%	0.20%	0.30%	0.30%	3.50%	2.20%	2.80%	56.60%	80.60%	71.50%

Table 5. Percentage of Special Education and Education Baccalaureate Degrees Awarded Relative to the Total Number of Baccalaureate Degrees Awarded by Race, 1995–2019.

	American Indian/ Alaska Native		Asian		Black/African American		Hispanic/Latino		Native Hawaiian/Other Pacific Islander		Two or More Races		White	
Year	SPED	ED	SPED	ED	SPED	ED	SPED	ED	SPED	ED	SPED	ED	SPED	ED
1995	0.90%	12.90%	0.10%	2.40%	0.60%	7.70%	0.60%	7.80%					1.00%	10.20%
1996	0.90%	12.80%	0.10%	2.60%	0.70%	7.90%	0.70%	7.90%					1.00%	10.20%
1997	1.30%	12.70%	0.10%	2.60%	0.60%	8.10%	0.60%	8.00%					1.00%	10.10%
1998	1.00%	12.20%	0.20%	2.70%	0.60%	7.90%	0.70%	7.90%					1.00%	10.10%
1999	0.90%	12.40%	0.20%	2.70%	0.60%	7.90%	0.60%	7.90%					0.90%	10.10%
2000	0.60%	11.00%	0.20%	2.60%	0.60%	7.30%	0.60%	7.90%					0.90%	10.00%
2001	0.70%	10.20%	0.20%	2.40%	0.50%	6.70%	0.50%	7.30%					0.90%	9.70%
2002	0.90%	11.10%	0.20%	2.40%	0.50%	6.00%	0.50%	7.10%					0.80%	9.40%
2003	0.70%	10.60%	0.10%	1.90%	0.40%	5.60%	0.40%	6.70%					0.80%	9.10%
2004	0.60%	9.30%	0.10%	2.00%	0.30%	5.00%	0.50%	6.80%					0.70%	8.90%
2005	0.60%	9.10%	0.10%	1.90%	0.30%	4.80%	0.40%	6.60%					0.70%	8.70%
2006	0.50%	8.20%	0.10%	2.10%	0.30%	5.20%	0.40%	6.80%					0.70%	8.60%
2007	0.60%	8.00%	0.10%	2.00%	0.30%	4.70%	0.50%	6.70%					0.70%	8.30%
2008	0.50%	8.00%	0.10%	2.00%	0.30%	4.40%	0.50%	6.40%					0.60%	7.80%
2009	0.40%	7.70%	0.10%	1.80%	0.30%	4.30%	0.50%	6.10%					0.60%	7.60%
2010	0.50%	7.30%	0.10%	1.80%	0.30%	4.20%	0.50%	5.70%					0.60%	7.30%
2011	0.50%	7.20%	0.10%	1.60%	0.20%	4.20%	0.50%	5.10%	1.20%	11.70%	0.40%	3.90%	0.60%	7.30%
2012	0.50%	6.70%	0.10%	1.60%	0.20%	4.20%	0.50%	4.80%	0.50%	5.50%	0.40%	3.90%	0.70%	7.20%
2013	0.50%	6.40%	0.10%	1.60%	0.30%	4.40%	0.40%	4.30%	0.30%	5.40%	0.30%	3.70%	0.70%	7.00%
2014	0.40%	6.80%	0.10%	1.60%	0.30%	4.10%	0.40%	3.90%	0.40%	5.60%	0.30%	3.40%	0.70%	6.50%
2015	0.50%	6.80%	0.10%	1.50%	0.20%	3.90%	0.40%	3.60%	0.40%	5.00%	0.30%	3.30%	0.70%	6.00%
2016	0.30%	6.10%	0.10%	1.50%	0.20%	3.40%	0.40%	3.60%	0.60%	5.40%	0.30%	3.40%	0.70%	5.70%
2017	0.30%	5.80%	0.10%	1.50%	0.20%	3.30%	0.30%	3.50%	0.20%	4.00%	0.30%	3.20%	0.70%	5.50%
2018	0.40%	5.50%	0.10%	1.50%	0.20%	3.20%	0.30%	3.40%	0.60%	4.00%	0.30%	3.10%	0.60%	5.20%
2019	0.30%	5.70%	0.10%	1.50%	0.20%	3.10%	0.30%	3.40%	0.50%	4.70%	0.30%	3.30%	0.60%	5.30%

Results

We sought to better understand trends in SPED and ED degree production disaggregated by race. Additionally, we sought to explore the relation between institutional characteristics and changes in degree production, again, disaggregated by race. To do this, we examined the overall distribution (total number and percentage) of baccalaureate degree production in SPED and ED, each by race. We then examined the within-race percentage distribution of SPED and ED degree production relative to all baccalaureate degrees awarded. Next, we examined the relative difference in the racial distribution in the percentage of SPED baccalaureate degrees awarded compared with the racial distribution in the percentage of K–12 public education students. Finally, we estimated random-effects panel regression models to explore the relation between institutional characteristics and degree production for each racialized category.

Degrees Awarded

Baccalaureate Degrees. From 1995 to 2019, the total number of BA/BS degrees awarded annually increased for each racialized category (see Table 3). The percentage of BA/BS degrees awarded to American Indian/Alaska Native (AIAN) and NHPI students annually has remained flat (see Table 4). The percentage of degrees awarded to Asian, Black/African American, Hispanic/Latino students, and students identifying with two or more races has increased. The largest increase was among Hispanic/Latino students, 5.7% in 1995 to 14.4% in 2019. The percentage of BA/BS degrees awarded to White students decreased from 75.9% in 1995 to 56.6% in 2019.

Special Education Baccalaureate Degrees. From 1995 to 2019, a higher percentage of SPED degrees as compared with ED degrees were awarded to White students. The annual percentage of SPED baccalaureate degrees awarded to Hispanic/Latino students increased from 4.0% in 1995 to 8.9% in 2019, with a high of 10.1% in 2018. However, the percentage of SPED degrees awarded to Black/African American students decreased from 5.3% in 1995 to 3.6% in 2019.

Education Baccalaureate Degrees. The percentage of ED degrees awarded annually is similar to the percentage of SPED degrees awarded (see Table 4). The percentage of ED degrees awarded annually to AIAN students decreased from 0.8% in 1995 to 0.6% 2019 (see Table 4). The percentage of ED degrees awarded annually to Asian, Black/African American, and Hispanic/Latino students increased. Like the trends in BA/BS degrees, the percentage of ED degrees awarded to Hispanic/Latino students increased from 4.8% in 1995 to 11.6% in 2019. The percentage of ED degrees awarded to NHPI students annually remained flat. The percentage of ED degrees awarded annually to White students decreased from 84.8% in 1995 to 71.5% in 2019.

Overall, the trends in baccalaureate degrees awarded mimic the changing racial demographics of the country. However, the percentage of degrees awarded by race does

not match the racial demographics of college-eligible persons, with White and Asian persons being overrepresented and AIAN, Black/African American, and Hispanic/Latino persons being underrepresented. The percentage of SPED and ED degrees awarded to AIAN, Asian, Black/African American, Hispanic/Latino, and NHPI students increased from 1995 to 2019. However, the percentage of SPED and ED degrees awarded to White students is above 80% and 70%, respectively, or 24% and 15% higher than the percentage of all BA/BS degrees awarded to White students.

Within-Group Percentages of SPED and ED Degrees

Across all racialized groups, the percentages of SPED and ED degrees awarded relative to all degrees awarded annually within each group decreased from 1995 to 2019 (see Table 5). In 1995, SPED and ED degrees made up 0.9% and 12.9% of degrees awarded, respectively, to AIAN students. In 2019, those percentages were 0.3% and 5.7%. For Black/African American students, SPED and ED degrees made up 0.6% and 7.7% of degrees awarded in 1995 but only 0.2% and 3.1% of degrees awarded in 2019 (see Table 5). The change in the percentages of both SPED and ED degrees awarded to Hispanic and White students between 1995 and 2019 was similar, a decrease of about half. On average, SPED and ED degrees made up 8.2% and 0.6% of degrees awarded in 1995, compared with 4% and 0.3% in 2019. Overall, these trends are not surprising, and they match both the anecdotal and empirical evidence regarding the shortages and even interest in the teaching workforce.

The Lagged SPED Teacher–Student Parity Index

To address the third research question, we examined the TSPI between the percentage of each racialized category among K–12 public-school SPED and the percentage of each racialized category among SPED degree recipients. It was assumed that a lagged comparison was more accurate because it compared the degrees conferred by the spring of one year to the student population during the fall of the same year. Theoretically, students receiving SPED degrees in the spring term will enter the teaching workforce the following fall. Thus, we would hope that the demographics of the teacher pipeline would be similar to the demographics of the student population the following school year.

The TSPI of White SPED degree recipients and the percentage of the K–12 student body who are White and receiving SPED services has been over 1 and has increased positively since 2001 (see Table 6 and Figure 1). The TSPI of SPED degree recipients who are Asian and Black/African American and the percentage of the K–12 student body from each group has been less than 1 and increased negatively over the years, indicating that the percentage of degree recipients has not kept pace with the percentage of the K–12 student population receiving SPED services. The TSPI of SPED Hispanic/Latino degree recipients and the percentage of the K–12 student population who are Hispanic/Latino was relatively constant, suggesting that the growth in the

Table 6. Percent of SPED Baccalaureate Degrees Awarded by Race, Percent of K–12 Students by Race, and the Lagged Teacher–Student Parity Index (TSPI) by Race, 2000–2018.

	American Indian/Alaska Native			Asian			Black/African American			Native Hawaiian/Pacific Islander			Hispanic/Latino			White		
Year	SPED Degrees	K–12 Students	TSPI	SPED Degrees	K–12 Students	TSPI	SPED Degrees	K–12 Students	TSPI	SPED Degrees	K–12 Students	TSPI	SPED Degrees	K–12 Students	TSPI	SPED Degrees	K–12 Students	TSPI
2000	0.5%	1.3%	0.42	1.4%	1.9%	0.75	6.6%	20.0%	0.33				5.4%	13.9%	0.39	86.0%	62.9%	1.37
2001	0.7%	1.3%	0.52	1.3%	1.9%	0.70	6.1%	20.0%	0.30				5.0%	14.5%	0.35	86.9%	62.3%	1.39
2002	0.9%	1.3%	0.69	1.6%	2.0%	0.78	5.7%	20.1%	0.28				5.0%	15.0%	0.33	86.9%	61.5%	1.41
2003	0.8%	1.4%	0.59	1.4%	2.1%	0.65	6.1%	20.1%	0.30				5.2%	15.6%	0.33	86.6%	60.8%	1.42
2004	0.8%	1.4%	0.54	1.4%	2.1%	0.68	4.8%	20.2%	0.24				6.2%	16.1%	0.39	86.8%	60.2%	1.44
2005	0.7%	1.4%	0.53	1.5%	2.2%	0.67	5.0%	20.1%	0.25				5.9%	16.7%	0.35	86.9%	59.6%	1.46
2006	0.6%	1.4%	0.46	1.6%	2.3%	0.69	4.7%	20.0%	0.23				6.2%	17.3%	0.36	86.9%	59.1%	1.47
2007	0.8%	1.4%	0.54	1.5%	2.4%	0.62	4.9%	19.9%	0.24				7.3%	18.0%	0.41	85.5%	58.3%	1.47
2008	0.7%	1.4%	0.48	1.5%	2.5%	0.59	4.8%	19.7%	0.24				7.5%	18.6%	0.40	85.5%	57.7%	1.48
2009	0.6%	1.4%	0.40	1.5%	2.6%	0.56	4.6%	19.5%	0.24				8.0%	19.4%	0.41	85.4%	56.6%	1.51
2010	0.6%	1.4%	0.45	1.7%	2.3%	0.74	4.5%	18.9%	0.24				8.6%	20.4%	0.42	84.5%	54.7%	1.55
2011	0.6%	1.4%	0.43	1.1%	2.3%	0.47	4.4%	18.7%	0.24				9.0%	21.1%	0.43	81.2%	53.7%	1.51
2012	0.6%	1.4%	0.40	1.2%	2.3%	0.53	4.6%	18.5%	0.25	0.3%	0.3%	0.86	8.6%	21.9%	0.39	83.8%	52.8%	1.59
2013	0.6%	1.3%	0.45	1.0%	2.4%	0.41	5.1%	18.4%	0.28	0.2%	0.3%	0.52	8.6%	22.7%	0.38	83.4%	51.9%	1.61
2014	0.4%	1.3%	0.33	1.0%	2.5%	0.41	4.7%	18.3%	0.26	0.2%	0.3%	0.68	8.9%	23.4%	0.38	83.4%	51.1%	1.63
2015	0.5%	1.3%	0.36	1.2%	2.5%	0.49	4.7%	18.1%	0.26	0.2%	0.3%	0.61	8.8%	24.0%	0.37	82.9%	50.4%	1.65
2016	0.3%	1.3%	0.24	1.0%	2.6%	0.39	4.4%	17.9%	0.25	0.3%	0.3%	0.91	9.7%	24.7%	0.39	82.3%	49.6%	1.66
2017	0.3%	1.3%	0.26	1.1%	2.6%	0.43	4.7%	17.7%	0.26	0.1%	0.3%	0.35	9.8%	25.2%	0.39	81.9%	49.0%	1.67
2018	0.4%	1.3%	0.31	1.1%	2.7%	0.42	4.4%	17.5%	0.25	0.3%	0.3%	1.00	10.1%	25.8%	0.39	78.2%	48.3%	1.62

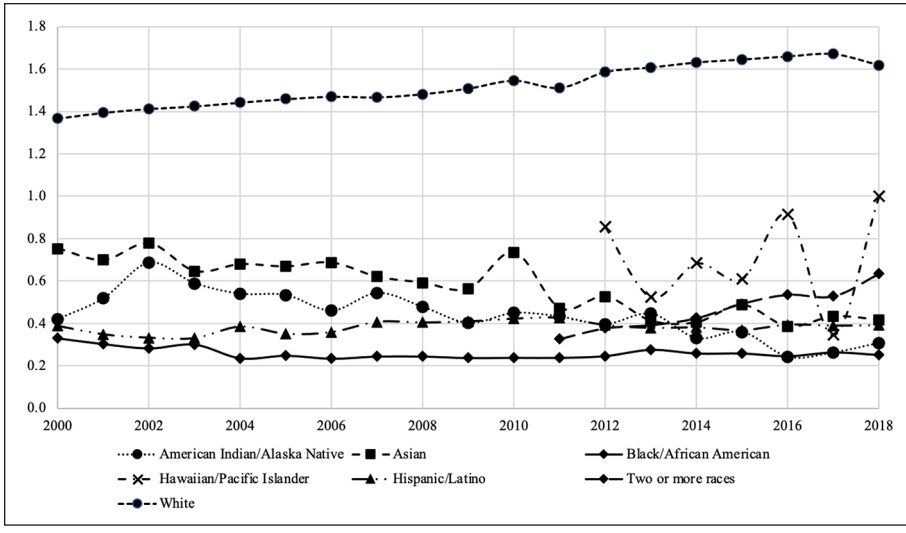

Figure 1. Lagged Teacher–Student Parity Index (TSPI) in Racial Representation of Special Education Degrees Awarded Compared to the Racial Demographic Population of the Public K–12 Special Education Population from 2000 to 2018.

percentage of Hispanic/Latino K–12 students receiving SPED services and Hispanic/Latino SPED degree recipients was similar. At no time between 2000–2001 and 2018–2019 did the percentage of SPED degrees awarded to Black/African American, Hispanic/Latino, or AIAN students get close to the percentage of Black/African American, Hispanic/Latino, or AIAN students in the K–12 population who received SPED services.

SPED and ED Degrees Awarded Relative to Institutional Characteristics

To address Research Questions 4 and 5, we separately explored the relation between the number of SPED and ED degrees awarded and institutional characteristics for each racialized group using a random effects panel regression. Statistically significant results are highlighted.

For SPED, an increase in the fall enrollment percentage was related to an increase in the number of degrees awarded for all racialized groups (see Table 7). For example, a doubling of the percentage of Black/African American or Hispanic/Latino students was related to an increase of 1 additional SPED degree awarded. Cost of attendance was negatively related to the number of degrees awarded to Black/African American, Hispanic/Latino, and White students. Compared with private, not-for-profit institutions, public institutions were associated with increases in the number of SPED degrees awarded to Asian, Black/African American, Hispanic/Latino, and White students. For

Table 7. Random Effects Panel Regression of the Relationship Between Institutional Characteristics and the Number of Special Education Degrees Awarded Between 1995 and 2019 by Race.

	American Indian/Alaska Native		Asian		Black/African American		Hispanic/Latiino		Native Hawaiian/Pacific Islander[a]		White	
	β (*SE*)	95% CI	β (*SE*)	95% CI	β (*SE*)	95% CI	β (*SE*)	95% CI	β (*SE*)	95% CI	β (*SE*)	95% CI
Cost of Attendance[b]	−0.05 (0.03)	(−0.11, 0.01)	−0.03 (0.03)	(−0.08, 0.02)	−0.28 (0.1)**	(−0.48, −0.08)	−0.23 (0.11)*	(−0.45, −0.01)	−0.05 (0.06)	(−0.16, 0.07)	−1.21 (0.49)*	(−2.17, −0.25)
Percent Fall Enrollment[b]	0.36 (0.13)**	(0.11, 0.6)	0.39 (0.17)*	(0.05, 0.72)	0.79 (0.15)***	(0.49, 1.1)	1.23 (0.25)***	(0.75, 1.72)	0.67 (0.28)*	(0.12, 1.21)	5.99 (1.54)***	(2.97, 9.01)
Open Admission												
Yes	−0.07 (0.04)+	(−0.15, 0.01)	0 (0.02)	(−0.05, 0.05)	−0.07 (0.24)	(−0.53, 0.39)	0.21 (0.43)	(−0.63, 1.04)	−0.09 (0.1)	(−0.28, 0.1)	−0.05 (1.34)	(−2.67, 2.58)
No												
Carnegie												
Master's	−0.1 (0.05)+	(−0.2, 0.01)	−0.14 (0.1)	(−0.34, 0.06)	−0.53 (0.21)*	(−0.94, −0.11)	−0.87 (0.43)*	(−1.71, −0.04)	−0.02 (0.07)	(−0.16, 0.11)	−4.41 (2.36)+	(−9.04, 0.22)
Baccalaureate	−0.1 (0.05)*	(−0.19, −0.01)	−0.1 (0.07)	(−0.24, 0.04)	−0.57 (0.28)*	(−1.12, −0.03)	−0.01 (0.75)	(−1.49, 1.47)	0.15 (0.2)	(−0.25, 0.54)	−7.74 (2.8)**	(−13.22, −2.26)
Tribal	−0.6 (0.69)	(−1.95, 0.75)	−0.08 (0.09)	(−0.25, 0.1)	−0.01 (0.34)	(−0.67, 0.66)	−0.38 (0.67)	(−1.7, 0.93)	0.09 (0.09)	(−0.08, 0.26)	−11.52 (3.92)**	(−19.21, −3.83)
Special	−0.1 (0.05)+	(−0.2, 0)	0.01 (0.08)	(−0.15, 0.18)	−0.69 (0.34)*	(−1.37, −0.02)	−0.64 (0.5)	(−1.62, 0.35)	−0.04 (0.06)	(−0.17, 0.08)	−4.97 (4.5)	(−13.8, 3.86)
Not Defined	0.03 (0.19)	(−0.34, 0.4)	−0.29 (0.18)	(−0.65, 0.06)	−1.28 (0.62)*	(−2.49, −0.07)	0.43 (2)	(−3.5, 4.36)	−0.22 (0.12)+	(−0.45, 0.01)	−18.68 (7.03)**	(−32.46, −4.9)
Research												
HBCU												
Yes	0.01 (0.03)	(−0.04, 0.06)	0.06 (0.08)	(−0.1, 0.22)	0.2 (0.6)	(−0.97, 1.38)	−0.06 (0.34)	(−0.72, 0.59)	−0.08 (0.11)	(−0.3, 0.14)	2.55 (4.43)	(−6.13, 11.23)
No												
Control												
Private not-for-profit	−0.05 (0.03)	(−0.11, 0.01)	−0.11 (0.04)**	(−0.19, −0.04)	−0.54 (0.17)**	(−0.88, −0.21)	−1.27 (0.49)**	(−2.23, −0.32)	0.01 (0.07)	(−0.13, 0.16)	−10.63 (1.44)***	(−13.45, −7.8)
Private for-profit	0.45 (0.36)	(−0.25, 1.15)	0.64 (0.44)	(−0.21, 1.49)	22.77 (13.32)+	(−3.33, 48.87)	17.61 (11.95)	(−5.81, 41.04)	1.31 (0.76)+	(−0.18, 2.79)	86.75 (60.59)	(−32.01, 205.51)
Public												
Locale												
Suburb	0.03 (0.01)*	(0, 0.06)	0.03 (0.05)	(−0.07, 0.12)	0.26 (0.17)	(−0.07, 0.58)	1 (0.52)+	(−0.02, 2.03)	−0.14 (0.14)	(−0.41, 0.13)	7.42 (2.16)**	(3.19, 11.65)
Town	−0.04 (0.04)	(−0.11, 0.04)	0.04 (0.05)	(−0.05, 0.14)	−0.41 (0.13)**	(−0.66, −0.15)	−0.35 (0.3)	(−0.94, 0.24)	−0.16 (0.15)	(−0.45, 0.12)	−0.33 (1.9)	(−4.06, 3.4)
Rural	−0.06 (0.03)*	(−0.11, −0.01)	0.02 (0.05)	(−0.07, 0.12)	−0.3 (0.17)+	(−0.64, 0.03)	−0.22 (0.35)	(−0.91, 0.48)	−0.14 (0.13)	(−0.4, 0.13)	−0.55 (2.03)	(−4.53, 3.43)
City												
_cons	2.16 (0.78)**	(0.64, 3.68)	2 (0.93)*	(0.19, 3.82)	6.47 (1.23)***	(4.05, 8.88)	8.07 (1.72)***	(4.7, 11.43)	3.6 (1.43)*	(0.79, 6.41)	39.22 (5.38)***	(28.68, 49.75)
R^2	Within, Between, Overall		Within, Between, Overall		Within, Between, Overall		Within, Between, Overall		Within, Between, Overall		Within, Between, Overall	
	0.01, 0.26, 0.15		0, 0.15, 0.12		0.07, 0.45, 0.24		0.04, 0.29, 0.24		0, 0.04, 0.01		0.05, 0.22, 0.19	

[a]Data for Native Hawaiian/Pacific Islander students range from 2011 to 2019. [b]Cost of attendance and percent fall enrollment are log-transformed variables. Each coefficient β for the two variables can be interpreted as a 100% change in the variable as related to an increase of β in the number of degrees awarded. For example, if the average fall enrollment of Hispanic/Latino students increases from 5% to 10% (a 100% change), the model predicts an increase of 1 degree awarded to Hispanic/Latino students.
$+p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

SPED degrees awarded to Black/African American students, private, for-profit institutions were related to an increase compared with public institutions.

For all racialized groups, an increase in the fall enrollment percentage of each group was related to an increase the number of ED degrees awarded. For ED degrees, an increase in cost of attendance was negatively related to the number of degrees awarded to AIAN, Black/African American, Hispanic/Latino, and White students (see Table 8). For perspective, a 100% increase in cost of attendance would be related to about a decrease of 1 ED degree awarded to Black/African American students. Institutions with Carnegie classifications of Research were associated with increased numbers of ED degrees awarded relative to other classifications for all racialized groups. For the number of degrees awarded to Hispanic/Latino students, institutions with Research Carnegie classifications were associated with between 4 and 9 more degrees awarded relative to institutions with other Carnegie classifications. Public institutions were associated with increased numbers of ED degrees awarded compared with private, not-for profit institutions for all racialized groups. For Black/African American students, HBCUs were associated with an increase in awarded ED degrees, with approximately 13 more ED degrees awarded on average compared with non-HBCUs (see Table 8).[1]

Discussion

The purpose of this study was to explore trends in baccalaureate degree production by racial/ethnic group in the fields of SPED and ED from 1995 to 2019. Additionally, we modeled the extent to which institutional characteristics were related to degree production across SPED and ED for each racialized group. To do this, descriptive statistics were used for the trend data, and random-effects panel regression models were fitted.

In general, we found that the trends in the number of SPED and ED degrees awarded annually to each racialized group were not consistent, with SPED and ED degrees awarded to Hispanic/Latino students increasing over the 25 years (see Table 3). The number of ED degrees awarded annually to White students has generally decreased, while the number of SPED degrees awarded remained consistent. The percentage of SPED and ED degrees awarded to Hispanic/Latino students steadily increased, while the percentages of ED degrees awarded to Black/African American students remained consistent, and the percentage of SPED degrees decreased (see Table 4). The percentage of SPED degrees awarded to White students was near or above 80% over the 25 years, while the percentage of ED degrees decreased to just over 70%, which provides evidence of the Whiteness of the SET and GET workforce (Boveda & McCray, 2021). Across all groups, SPED and ED degrees awarded made up a decreasing percentage of all baccalaureate degrees awarded (see Table 5). These findings extend the work of Nash and Zaback (2011), who indicated that the overall trends in degrees awarded in ED were decreasing.

Table 8. Random Effects Panel Regression of the Relationship Between Institutional Characteristics and the Number of Education Degrees Awarded Between 1995 and 2019 by Race.

	American Indian/Alaska Native		Asian		Black/African American		Hispanic/Latino		Native Hawaiian/Pacific Islander[a]		White	
	β (robust *SE*)	95% CI	β (robust *SE*)	95% CI	β (robust *SE*)	95% CI	β (robust *SE*)	95% CI	β (robust *SE*)	95% CI	β (robust *SE*)	95% CI
Cost of Attendance[b]	−0.14 (0.08)+	(−0.3, 0.01)	0 (0.06)	(−0.12, 0.12)	−0.62 (0.18) ***	(−0.96, −0.27)	−0.31 (0.16)+	(−0.62, 0.01)	−0.11 (0.07)	(−0.25, 0.03)	−4.37 (1.05) ***	(−6.43, −2.31)
Percent Fall Enrollment[b]	1.26 (0.33) ***	(0.61, 1.91)	1.44 (0.35) ***	(0.75, 2.13)	2.97 (0.67) ***	(1.66, 4.29)	3.51 (0.35) ***	(2.84, 4.19)	2.28 (0.95) *	(0.41, 4.14)	23.19 (2.77) ***	(17.75, 28.63)
Open Admission												
Yes	−0.05 (0.08)	(−0.2, 0.1)	−0.22 (0.28)	(−0.78, 0.34)	0.52 (1.89)	(−3.19, 4.23)	−0.45 (0.72)	(−1.86, 0.97)	0.08 (0.16)	(−0.23, 0.39)	4.83 (3.13)	(−1.31, 10.97)
No												
Carnegie												
Master's	−0.47 (0.26)+	(−0.98, 0.03)	−1.18 (0.6)+	(−2.36, 0)	−4.56 (1.2) ***	(−6.9, −2.21)	−4.18 (2.19)+	(−8.48, 0.11)	−0.21 (0.15)	(−0.5, 0.07)	−40.44 (11.07) ***	(−62.14, −18.73)
Baccalaureate	−0.79 (0.22) ***	(−1.22, −0.36)	−1.68 (0.5) **	(−2.67, −0.7)	−6.94 (1.23) ***	(−9.36, −4.53)	−6.39 (2.04) **	(−10.38, −2.4)	−0.25 (0.14)+	(−0.53, 0.03)	−74.9 (11.08) ***	(−96.61, −53.18)
Tribal	−1.53 (1.73)	(−4.92, 1.86)	−1.4 (0.67) *	(−2.71, −0.08)	−7.06 (1.86) ***	(−10.69, −3.42)	−8.77 (2.29) ***	(−13.27, −4.28)	−0.39 (0.14) **	(−0.67, −0.11)	−84.28 (14.61) ***	(−112.92, −55.65)
Special	−0.78 (0.24) **	(−1.24, −0.32)	−1.64 (0.51) **	(−2.64, −0.64)	−6.35 (1.28) ***	(−8.85, −3.85)	−7.2 (1.96) ***	(−11.05, −3.35)	−0.48 (0.17) **	(−0.82, −0.15)	−73.67 (15.26) ***	(−103.57, −43.77)
Not Defined	−0.67 (0.3) *	(−1.25, −0.09)	−2.14 (0.56) ***	(−3.23, −1.05)	−9.93 (2.59) ***	(−15.02, −4.85)	−8.44 (2.47) **	(−13.28, −3.6)	−0.51 (0.18) **	(−0.86, −0.16)	−98.79 (16.93) ***	(−131.98, −65.6)
Research												
HBCU												
Yes	−0.13 (0.08)	(−0.28, 0.03)	−0.22 (0.27)	(−0.74, 0.31)	12.73 (3.03) ***	(6.78, 18.67)	−1.41 (0.72)+	(−2.83, 0.01)	0.02 (0.09)	(−0.16, 0.2)	10.52 (9.83)	(−8.75, 29.79)
No												
Control												
Private not-for-profit	−0.67 (0.1) ***	(−0.87, −0.47)	−1.7 (0.26) ***	(−2.22, −1.18)	−6.11 (0.83) ***	(−7.74, −4.47)	−5.5 (1.09) ***	(−7.64, −3.35)	−0.07 (0.1)	(−0.26, 0.12)	−59.31 (7.16) ***	(−73.33, −45.28)
Private for-profit	0.14 (0.5)	(−0.84, 1.11)	−0.23 (0.55)	(−1.3, 0.84)	20.26 (16.39)	(−11.87, 52.39)	7.5 (6.93)	(−6.07, 21.07)	0.11 (0.24)	(−0.35, 0.58)	21.99 (32.04)	(−40.81, 84.79)
Public												
Locale												
Suburb	0.01 (0.08)	(−0.14, 0.16)	−0.32 (0.29)	(−0.89, 0.24)	0.01 (0.57)	(−1.11, 1.12)	0.89 (1.33)	(−1.72, 3.49)	−0.05 (0.07)	(−0.18, 0.09)	6.62 (4.88)	(−2.94, 16.19)
Town	0.45 (0.27)+	(−0.07, 0.97)	−0.21 (0.32)	(−0.83, 0.41)	−0.24 (1.06)	(−2.32, 1.84)	−1.81 (0.78) *	(−3.33, −0.29)	0.15 (0.16)	(−0.16, 0.45)	15.14 (5.6) **	(4.17, 26.1)
Rural	−0.11 (0.08)	(−0.27, 0.05)	−0.4 (0.21)+	(−0.82, 0.01)	0.64 (1.03)	(−1.38, 2.66)	0.52 (1.18)	(−1.79, 2.84)	−0.05 (0.09)	(−0.21, 0.12)	4.91 (5.65)	(−6.17, 15.98)
City												
_cons	8.14 (2.11) ***	(4, 12.27)	8.99 (2.02) ***	(5.03, 12.96)	26.11 (3.26) ***	(19.72, 32.49)	26.9 (3.82) ***	(19.41, 34.4)	11.66 (4.25) **	(3.33, 19.99)	198.84 (15.55) ***	(168.37, 229.31)
R^2	Within, Between, Overall		Within, Between, Overall		Within, Between, Overall		Within, Between, Overall		Within, Between, Overall		Within, Between, Overall	
	0.02, 0.19, 0.18		0.01, 0.18, 0.16		0.04, 0.26, 0.24		0.01, 0.18, 0.18		0, 0.26, 0.12		0.03, 0.31, 0.33	

[a]Data for Native Hawaiian/Pacific Islander students ranges from 2011 to 2019. [b]Cost of attendance and percent fall enrollment are log-transformed variables. Each coefficient β for the two variables can be interpreted as a 100% change in the variable as related to an increase of β in the number of degrees awarded. For example, if the average fall enrollment of Hispanic/Latino students increases from 5% to 10% (a 100% change), the model predicts an increase of 1 degree awarded to Hispanic/Latino students.
$+p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

Both Bettini et al. (2018) and Billingsley et al. (2019) used one wave of the 2011–2012 School and Staffing Survey to explore racial parity in the SET and GET workforce compared with students in the classroom. In one part of this study, we took a similar analytical approach but used SPED and ED completion data as proxies for the GET and SET workforce. Similar to Bettini et al. and Billingsley et al., we found that the racial/ethnic demographic distribution of SPED degrees awarded did not match the demographics of SPED students. Adding to the literature, we also found that the distribution of SPED degrees did not match the demographics of the SPED students in public education over the 25 years and, most concerning, that the distribution had a negative trend. This finding supports evidence from Hussar et al. (2020) that the demographics of the student population are becoming more racially diverse, and the teaching profession is not keeping pace. The finding addresses the specific trends for each racialized group and calls to attention the need to disaggregate analyses (Rios-Aguilar, 2014) to understand the nuances of each racialized group in the pursuit of a more diversified SET and GET workforce.

Specific to the regression models, across each racialized group, increases in the enrollment percentages specific to that group were associated with an increase in the number of SPED and ED degrees awarded (see Tables 7 and 8). For most groups, an increase in the cost of attendance was associated with a decrease in the number of SPED and ED degrees awarded. Institutions with a Carnegie Classification of Research were associated with an increase in the number of SPED and ED degrees across each racialized group. For Black/African American students, HBCUs were related to increases in ED degrees awarded as compared with non-HBCUs, which supports the descriptive evidence that HBCUs have played a significant role in ED degree attainment for Black/African American students (Houston et al., in press). In thinking of the system of higher education as a racialized organization (Ray, 2019), attention to the historical legacy of inequitable funding of HBCUs surfaces. What could HBCUs accomplish, for the educator pipeline in this case, with equitable support (funding and resources) compared with non-HBCUs? Finally, for-profit institutions were associated with increases in SPED degrees awarded to Black/African American students, which could be explained by what Cottom (2017) described as new credentialism, in which both the need for credentials and inaccessibility to traditional postsecondary institutions has created a market filled by for-profit institutions.

Implications for the Teacher Education Preparation Landscape

Teacher education program stakeholders are uniquely positioned to increase the racial/ethnic diversity of the SET and GET workforce. As such, these stakeholders play a key role in the development of preparation models and policies used to recruit teachers into their programs; thus, they should evaluate these factors for recruiting diverse preservice SETs and GETs. For example, reports have indicated that alternative pathway and residency programs have had greater successes with recruiting and retaining diverse teachers (Scott, 2017). Faculty members at IHE with SPED and ED degree

programs may consider examining the needs for alternative pathway and residency tracks. Additionally, to increase access to IHE teacher education programs for racially/ethnically diverse special educators, it is imperative that stakeholders also engage with policy makers on this topic. For example, the Higher Education Opportunity Act (2008) is ripe with opportunity to advocate for financial support for pathway programs that recruit racially/ethnically diverse teacher educators into the workforce (Bristol, 2019). Faculty members at IHEs, states, and school districts must be committed to contacting lawmakers about the issues. Moreover, officials at the Office of Special Education Programs provide grants to IHEs to increase the number of teachers working in special education. Another possibility with these grants is for officials to require IHEs that receive funding to develop goals to increase the diversity of students enrolled in their SPED and ED programs.

Limitations

This study has limitations. Conceptually, our analysis of the teacher education pipeline is limited to degree attainment at the baccalaureate level. Teacher licensure may or may not be part of the degree attainment process, and the students represented by our data may or may not have become teachers; the data do not include these outcomes. Some states allow degree programs to provide a path to licensure, while others provide credentialing outside the university system. Additionally, the data do not include individuals with BA/BS degrees outside education who may obtain licensure through alternative certification programs or postbaccalaureate graduate programs. Future research could ascertain the efficacy of these programs in helping to diversify the teacher education pipeline.

A second limitation is that we do not know how many students entered or exited the SPED or ED programs along the way. In general, evidence suggests that Black/African American, Hispanic/Latino, and NHPI students matriculate into college at lower rates than their White and Asian peers (Hussar et al., 2020). Because IPEDS does not track student-level or program-level data before completion, we are unable to identify the relative flow of students into and out of programs and/or institutions.

Considerations for the Future

Efforts to diversify the teacher workforce overlook some crucial factors. The first is the experiences of racially/ethnically diverse students who are enrolled at predominantly White institutions, the largest producers of university degrees and the largest producers of teacher education candidates (Sawchuk, 2013). Furthermore, researchers have indicated that racially/ethnically diverse students are often marginalized at such institutions (Baber, 2012), particularly in teacher education programs (Berry et al., 2020).

The second factor involves university officials' efforts to attract students to the teaching profession. Administrators at colleges/schools of education have attempted to

diversify the teacher workforce by offering scholarships for racially/ethnically diverse teacher candidates (Clemson University College of Education, 2021) and marketing college loan forgiveness programs to racially/ethnically diverse students who teach in the state for a period of time. Each of these programs offers different strategies for diversifying the teacher workforce (e.g., scholarships and teaching commitment grants).

Finally, the results of the current study add to previous knowledge of the continued shortage of racially/ethnically minority teachers in SPED. Overall, there is a persistent shortage of these teachers, particularly Black/African American special educators. Using the results of the current study, future researchers could examine reasons for the rise in some ethnic/racial categories (i.e., Hispanic/Latino) and the challenge in growing the number of other racial/ethnic SET groups (i.e., Black/African American). Future projects could include analyses at the intersection of multiple categorical variables, including, but not limited to, Carnegie classification and locale, or, in addition to HBCUs (see Houston et al., in press) and tribal colleges and universities, include an identifier for institutions that have reached minority-serving status. In the spirit of research to practice, next steps for the larger project will be to identify institutions that have graduated relatively large numbers of Black/African American, Hispanic/Latino, and AIAN students in SPED and ED. This and additional evidence from the project will be summarized for groups that advocate for diversifying the population and improving the structure of the teacher pipeline.

Conclusion

The data we analyzed in this current study suggest that the decline in racial/ethnic minority teaching candidates both in SPED and in ED is likely to continue to be "salty" without decisive action. It is vital to address the disparities and to recruit a greater number of racial/ethnic minority teachers into both SPED and ED degree programs that could potentially influence all K–12 racially/ethnically diverse students.

Furthermore, the search for a more diverse pool of teacher candidates does not stop at the preservice level. Diverse teachers may need supports, given the obstacles to persistence they face, including the sense that they are not valued as an integral part of the teaching team (Cormier & Scott, 2021). Such a perspective is needed in the development or redevelopment of requirements in degree programs, particularly at predominantly White institutions as well. Until it is provided, the teaching force will remain almost entirely salt. While a mediocre meal is an outcome we can all live with occasionally, the negative implications for our students of not giving them the diverse teaching workforce they deserve are enormous and highly concerning.

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Note

1. White women make up the largest percentage of teachers (Hussar et al., 2020). For this article, we do not include an analysis of gender within each racialized group. Future research will explore the pipeline of women's and men's SPED and ED degree attainment and their relationship to institutional characteristics.

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Cormier, C. J. (in press). I wouldn't invite them to the cookout: How Black male special education teachers feel about socializing with their White colleagues. *Harvard Educational Review*; and

Cormier, C. J., Scott, L. A., Powell, C., Hall., & K. (in press). Locked in glass classrooms: Black male special education teachers socialized as everything else but educators. *Teacher Education and Special Education.*

Derek A. Houston, Ph.D., currently serves as an associate program officer at the Spencer Foundation and will serve as associate professor of educational leadership in the School of Education, Health, and Human Behavior at Southern Illinois University Edwardsville beginning January 2022. His research is centered at the nexus of critical theory and quantitative methods, where he engages with policy questions relative to resource inequality across the P–20 educational pipeline, advocating for a socially just future. His most recent scholarship focuses on critically engaging the tools and processes of quantitative research. Recent and upcoming scholarship includes:

Houston, D. A., Brewer, T. J., & Wronowski, M. L. (2020). Critical approaches for policy-relevant research. In A. Urick, D. E. DeMatthews, & T. G. Ford (Eds.), *Maximizing the policy relevance of research for school improvement* (pp. 241–264). Information Age; and

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Laron A. Scott, Ed.D., is an associate professor of special education, as well as the executive director of the Minority Educator Recruitment, Retention, and Equity Center at Virginia Commonwealth University. His research focuses on the intersections of race and gender in attracting, preparing, and retaining special education teachers. His research also focuses on postsecondary transition experiences for youth of color with an intellectual and developmental disability. Recent scholarship includes:

Scott, L. A., Taylor, J., Bruno, L., Padhye, I., Brendli, K., Wallace, W., & Cormier, C. J. (2021). Why do they stay? Factors associated with special education teachers' persistence. *Remedial and Special Education*. Advance online publication. https://doi.org/10.1177/07419325211014965; and

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