The Minority Report: Disproportionate representation in Australia's largest education system

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Abstract

The overrepresentation of students from minority ethnic groups in separate special education settings has been extensively documented in North America, yet little research exists for Australian school systems. To address this gap, we systematically analyzed 13 years of enrolment data from the state of New South Wales. Stark differences are seen in patterns of enrolment between Indigenous students, students from a Language Background Other than English (LBOTE), and non-Indigenous English speaking students. Moreover, these differences are increasing. While enrollments of Indigenous students in separate settings increased faster across time than did enrollments of Indigenous students in mainstream, enrollments of LBOTE students in mainstream increased faster than did enrollments of LBOTE students in separate settings.

Keywords: disproportionality, overrepresentation, underrepresentation, Indigenous and minority groups, special education, enrolment trends, education policy.

Introduction

The research on disproportionate representation in special education is extensive, spanning some four decades since the outgoing president of the Council for Exceptional Children, Lloyd Dunn (1968) first brought the issue to attention in the United States. At least five notable themes emerge on review of the literature. Firstly, African American, American Indian and Hispanic students are more likely to be overrepresented in special education than White or Asian-Pacific Islander students; particularly if they happen to be male, from a low-socioeconomic background, or living in a high-density urban area with a relatively large proportion of students of minority status (Hosp & Reschly, 2004; Oswald, Coutinho, Best, & Nu, 2001; Oswald, Coutinho, Best, & Singh, 1999; Skiba, Poloni-Staudinger, Gallini, Simmons, & Feggins-Azziz, 2006). Secondly, disproportionality is more common and of greater magnitude in "high incidence" disability categories, such as mild mental retardation (MMR), learning disabilities (LD), and emotional disturbance (ED), where professional judgments "vary according to personal tolerance of non-compliance as well as the social and cultural norms of different groups" (Harry, 2007, p. 75). Thirdly, boys tend to be significantly more overrepresented in these categories than girls – particularly African American boys – with gender disproportionality increasing with restrictiveness of setting (Coutinho & Oswald, 2000; Skiba, et al., 2006). Fourth, despite advances in research and information technology, and changes to curriculum and pedagogical practice, it appears little has changed over the last half-century (Artiles, Kozleski, Trent, Osher, & Ortiz, 2010). Finally, there remains very little published research from outside the United States, which tends to give the impression that disproportionality is a problem particular to North America.

While there are calls in the US to "shift the focus of research in this area away from documenting patterns [and] towards taking action and developing solutions" (Hosp & Reschly, 2004, p. 186), we argue that this shift is only possible if a problem has first been

properly identified; that is, if a pattern of disproportionate identification and placement has indeed been documented and the existence of a problem is recognized by those with the means to enact change in both policy and practice. The collection of national special education data (covering variables such as age, placement, gender, race/ethnicity and socioeconomic status) by the Office of Civil Rights (OCR) and the Office of Special Education Programs (OSEP) has afforded US-based researchers with extensive national databases from which to conduct increasingly sophisticated analyses (Valenzuela, Copeland, Huaring, & Park, 2006). However, comparable datasets are not necessarily published elsewhere (Dinero, 2002; Dyson & Gallannaugh, 2008; Gabel, Curcic, Powell, Khader, & Albee, 2009). In Australia, for example, it is currently impossible to determine how many students of disability status are enrolled in separate special education settings on a national basis (Westwood & Graham, 2000), let alone decipher any defining characteristics about these students, such as their disability classification, gender, race, socioeconomic status and/or geographic region.

The most transparent Australian education jurisdiction is the New South Wales (NSW) government school sector, yet even here only selected datasets are published. The number, gender and age of students in mainstream classes, special schools and support classes are available but not, for example, the number of students with a disability who are receiving additional support funding *within* mainstream classes. It is not possible therefore to determine disability identification or placement rates, as do so many of the studies from the US and, more recently, the UK (see Dyson & Gallannaugh, 2008). Nor is it possible in Australia to conduct fine-grained analyses of variables like ethnicity or race. Since 1975, the *Racial Discrimination Act* has prohibited the identification of students on the basis of specific language or ethnic backgrounds (Conway, 2006). To avoid further racialization through the deployment of categories that were previously used to discriminate *against* ethnic minorities,

only somewhat global distinctions denoting English as a second language status are made (Simon, 2005). Indigenous Australians are the one exception. In recognition of their First People status, statistics relating to Aboriginal and Torres Strait Islanders are often separated out to avoid relegating Indigenous Australians "to the status of just another ethnic group" (Dunn, Kamp, Shaw, Forrest, & Paradies, 2010). Again however, there are limitations to avoid stigmatizing particular groups within the Indigenous population. For example, while the NSW Department of Education and Communities (DEC) publish total enrollments for special schools and support classes disaggregated by age, gender, disability category and geographic region, they report only statewide aggregated data for Indigenous Australians (Aboriginal or Torres Strait Islanders) and students from a Language Background Other than English (LBOTE).

Australian analyses have thus been limited to the data that researchers can access. For example, Graham, Sweller and Van Bergen (2010) present broad-brush evidence that boys are overrepresented in special schools and classes in NSW: particularly in high-incidence disability categories (e.g., ED, BD). Yet, for the reasons outlined above, they were not able to determine how many Indigenous boys relative to non-Indigenous boys were enrolled in each disability category. In addition, data that is accessible is sometimes difficult to interpret. This is particularly the case for the LBOTE category, which includes students from a very wide range of language and ethnic backgrounds. The inclusion of traditionally under-represented groups, such as Chinese and Indian students, with traditionally overrepresented groups, such as Pasifika or Maori, and recent refugees, such as Sudanese and Afghani students, masks the differential effects experienced by particular groups within this broad category. This lack of access to accurate and meaningful data has thus far prevented any serious investigation of disproportionate representation in Australia for any demographic variable but gender.

The existence of a gap in the Australian research literature does not mean that disproportionality on the basis of race or ethnicity does not exist here (see Graham, 2012); simply that its extent remains relatively uncharted. Nonetheless, as Dyson and Gallannaugh (2008) report from England, even with the absence of comprehensive special education enrolment statistics, an abundance of other indicators point to the inequity of educational outcomes for various social and ethnic groups. For example, although Australian students regularly achieve above the OECD average in the *Program of International Student Assessment* (PISA), the release of successive PISA results highlights the concentration of Indigenous students in the lowest achievement bands (Thompson, De Bortoli, Nicholas, Hillman, & Buckley, 2010). PISA includes six bands of achievement and Level 2 has been defined internationally as a 'baseline proficiency' level. Notably, while 14% of all Australian students scored in the two lowest achievement bands in reading literacy in PISA 2009, compared to 19% across the OECD, Indigenous students scored significantly lower than the OECD average with 40% of Indigenous students in the two lowest bands (Thompson, et al., 2010). This makes the average performance of Indigenous students more than 2 years of schooling lower than their non-Indigenous peers. Disproportionality in student achievement is well known in Australia; however, due to the lack of public data we know little about disproportionality in separate special education settings.

As mentioned above, the NSW DEC *does* publish some usable data in successive annual reports and associated statistical compendiums. Enrollments in special schools and support classes are disaggregated at group level for students identifying as (1) Aboriginal or Torres Strait Islander, and (2) Language Background Other than English (LBOTE). Data drawn from the most recent publication year (DET, 2009) showed that Indigenous students account for just 5.5% of total enrollments in NSW government schools, but 13% of students in special schools and 11.6% of students in support classes (13.2% of support class

placements at elementary level and 10.6% of enrollments at secondary school level).

Conversely, while students in the LBOTE category make up 29.3% of total enrollments in

NSW government schools, they account for only 24.9% of enrollments in special schools and

33.5% of students in support classes (25.9% of support class placements at elementary level

and 38.4% of enrollments at secondary school level).

While there are no empirically validated cutoff criteria, one widely used criterion for

judging disproportionality is Chinn and Hughes' "plus or minus 10%" rule which establishes

an acceptable proportional bandwidth around the total enrolment percentage of a target group

(see Skiba, Pauloni-Staudinger, Gallini, Simmons, & Feggins-Azziz, 2006). Enrolment

percentages in special educational settings above or below the limits set by this bandwidth

signal over or under-representation. Using these criteria, an acceptable bandwidth for

Indigenous representation in special schools or support classes would be 4.55% −6.05% of

total enrollments in either setting type, while an enrolment percentage within the bandwidth

of 26.37%−32.23% would be acceptable for students of LBOTE status. It is clear from these

data that Indigenous students are overrepresented in NSW government special schools and

support classes, at both elementary and secondary levels, whereas LBOTE students are

slightly underrepresented in special schools and support classes at the elementary school

level, but overrepresented in support classes at secondary level. It is not yet clear how these

trends have changed over time, nor whether enrollments in these settings are increasing or

decreasing at pace with changes in total enrollments.

In this paper, we consider the problem of disproportionate representation in special

education settings from two angles. First, we analyzed trends in the enrolment of all students

in NSW government schools across a thirteen-year span (1997 to 2009). Of particular interest

are the trends in special school and special class enrollments, relative to mainstream

enrollments. Whilst total student enrollments vary from year to year, we focus primarily on

relative changes in enrollments in separate special education settings, and whether such changes are matched by commensurate increases in the enrollments in mainstream settings. Second, we analyzed the number of Indigenous students, students classified as LBOTE, and Other (non-Indigenous, English speaking) students enrolled in separate special education settings, with a view towards comparing the enrolment patterns of students across these categories.

<div align="center">**Enrolment Trends for All Students**</div>

NSW is Australia's oldest and most populous state comprising one third of the national population. In 2009, there were 1,110,939 school-aged students, 33.8% of whom attended non-government (or private) schools. NSW has one of the largest private school markets in the world and, whilst Catholic and other non-government providers have long been part of the educational landscape, government school enrollments have experienced a steady decline over the last two decades (see Graham & Jahnukainen, 2011). This being said, academically selective government schools are in high demand; a fact not lost on the NSW DEC which has actively engaged in the further development of selective schools since state government promotion of school markets in the mid-1990s. There are now 31 academically selective secondary schools, compared to 19 in 1997, together with district-based competitive enrolment streams in 74 elementary schools across the state (DET, 1997; 2009). Entry to these classes and schools is highly competitive, drawing enrollments from the top 15% of students from both government and non-government school sectors. Government schools therefore retain a reasonable proportion of the most academically able students; however, academic selectivity has been criticized for contributing to the residualization of government comprehensive schools (Ho, 2011). Insufficient enrolment data is available for non-government schools; therefore the remainder of this analysis focuses on the bulk of the student population attending NSW government schools.

The NSW government school sector is Australia's largest education system; educating approximately 66.2% of the state's K-12 schooling population with over 2240 schools and 735,692 students (DET, 2009). According to DEC, approximately 4.5% of students have a confirmed disability within the 6 categories eligible for targeted support, which include: Physical Disability, Hearing Impairment, Vision Impairment, Intellectual Disability, Autism Spectrum Disorders, and Mental Health Problems. A continuum of provision for students with a disability exists within the government school sector. This extends from full-time attendance in a regular classroom within a 'mainstream' school, to enrolment in a Support Class (or special education unit) allocated to selected mainstream schools within each school district, to attendance in separate special schools called Schools for Specific Purposes (SSPs). Enrolment data is available for (1) total enrollments, (2) enrollments in support classes at (i) elementary and (ii) secondary school level, and (3) enrollments in special schools. Our interest here focuses on the extent to which enrollments in these categories have changed across the time span in question. We therefore first examine the rates of change (increase, decrease, or static enrollments) across the time span, and then compare these rates of change between categories.

Method

This study draws upon school enrolment data published in NSW DEC annual reports and statistical bulletins. At the time of analysis, the oldest data archived was from 1997 and the most recent data publically available was from 2009; thus, enrollments from the thirteen-year period 1997 to 2009 were included. After obtaining ethical approval from the Macquarie University Human Research Ethics Committee, data was examined for total state-wide enrollments (i.e. all students) and was broken down into five enrolment types: (1) total enrollments across all types of classrooms, (2) enrollments in mainstream classrooms, (3)

Support Classes in Elementary schools (SC Elementary), (4) Support Classes in secondary schools (SC Secondary), and (5) Schools for Specific Purposes (SSP).

Before commencing the analyses, student enrollments in mainstream and separate special education settings were converted to a percentage of total enrollments across all classrooms. Percentages are a more informative measure than raw numbers for most enrolment categories, as total enrollments change with each calendar year. Only total enrollments per year were analyzed as a raw number of children.

Next, a series of curve estimations with time as the independent variable were carried out to fit linear trends to enrollments in each category for all enrollments. Linear trends indicate a steady increase or decrease in enrollments across the time-span in question. Quadratic trends, in contrast, could indicate several different patterns: for example, a change in the rate of increase or decrease with time, or a "U-shaped" trend, in which enrollments either first increase and then decrease, or first decrease and then increase. Preliminary analyses indicated that linear trends would be the best fit for the data, with no indication of any quadratic or other higher-order patterns. Higher order trends were therefore excluded from the analyses, making the analyses equivalent to linear regressions predicting enrollments for each calendar year. Follow-up analyses were conducted comparing the slopes for each regression, to determine whether enrollments were increasing or decreasing at significantly different rates across settings. Analyses were carried out in IBM SPSS Statistics version 19.

Results

Table 1 shows total enrolment numbers for all students between 1997 and 2009.

Curve estimation. Negative linear slopes significantly predicted both mainstream and total (mainstream and separate special education settings, combined) enrollments, indicating steady decreases in the total government school population and in the non-segregated (or

"mainstream") subset of that population (see Table 2). Conversely, significant positive slopes predicted SC Secondary and SSP enrollments. No evidence of a trend, either positive or negative, is seen for SC Elementary enrollments, with both significant fluctuation from year to year and minimal net change in enrollments between 1997 and 2009 (see Figure 1). Since total enrollments subsume mainstream and separate special education settings (SC and SSP) enrollments, we will focus here on the latter two categories. Before shifting our focus away from total enrollments, however, it is worth noting that on average there were 2878 fewer children enrolled in the government school system with each passing year. Figure 1 shows observed and predicted values for mainstream, SSP, SC Elementary and SC Secondary models.

To check for first order autocorrelation, Durbin-Watson statistics were calculated for all models. The presence of significant autocorrelation would indicate non-independence of errors, violating the assumption in regression analyses that errors are independent of each other. For models with one predictor, in addition to the intercept and 13 cases, limits for positive autocorrelation are $dL = 0.738$, $dU = 1.038$. Positive autocorrelation may therefore have been present for total, mainstream, SSP and SC Elementary analyses, where values ranged from 0.84 to 0.98 and thus all fell between dL and dU (see Table 2), but was not present for SC Secondary (1.20; above dU). No negative autocorrelation was present. As no definite positive autocorrelation was present (that is, no values fell below dL), the analyses were deemed acceptable.

Given the overall model fit and significance, we now turn to a comparison of the rates of growth or decline in enrollments in each educational setting.

Slope comparison. A series of t statistics comparing B values across settings were calculated from the difference in the slopes divided by the square root of the sum of the squared standard errors. That is:

$$t = \frac{b_1 - b_2}{\sqrt{s_{b_1}^2 + s_{b_2}^2}}$$

All alpha levels were Bonferroni adjusted for planned multiple comparisons. Note that comparisons can only be made for independent cases, meaning that total enrollments cannot be compared to any of the four other categories that are subsumed under the first category of Total Enrollments. Comparisons were therefore made between (1) Mainstream, (2) SC Elementary, (3) SC Secondary and (4) SSP enrollments only.

Enrollments in all three special education settings (SC Elementary, SC Secondary and SSP) increased significantly faster than Mainstream enrollments, which instead decreased (SSP vs Mainstream, $t(9) = 12.13$, $p < .0005$; SC Elementary vs Mainstream, $t(9) = 8.72$, $p < .0005$; SC Secondary vs Mainstream, $t(9) = 15.21$, $p < .0005$). SSP enrollments also increased significantly faster than SC Elementary enrollments, $t(9) = 4.92$, $p = .0008$, but significantly slower than SC Secondary enrollments, $t(9) = -8.05$, $p < .0005$. SC Secondary enrollments increased significantly faster than SC Elementary enrollments, $t(9) = 10.25$, $p < .0005$.

Discussion

Our findings show that the decrease seen in total government school enrollments can be almost entirely accounted for by a decrease in students enrolled in the mainstream. While mainstream enrollments as a percentage of total enrollments decreased between 1997 and 2009, SC Secondary and SSP enrollments increased. SC Elementary enrollments fluctuated across the time period of interest, thus resulting in an overall flat trend. The difference between mainstream and segregated settings implied by the trends was significant: mainstream enrollments decreased significantly faster than all separate settings, including SC Elementary. SC Secondary enrollments increased fastest of all categories, with enrollments in SC Secondary settings increasing at a greater rate than both SC Elementary and SSP enrollments.

These analyses go some way towards setting the scene of changing enrolment patterns in NSW government schools; namely, an overall decline in enrollments coupled with increasing or steady enrollments in separate special education settings. It is important to note that the decrease in school enrollments experienced by the government sector (-3.6% over the 13 year study period) has not been shared by the non-government sector. In fact, the overall student population in NSW has increased by 3.4% in the period 1997-2009, with a 20.5% increase in enrollments in the non-government sector more than compensating for the decline in government school enrollments (Australian Bureau of Statistics, 2009). These enrolment patterns suggest that particular types of students are moving into and out of government schools as seen by the strong growth in the use of separate special education settings combined with a hollowing out of the mainstream. To better understand this phenomenon from the perspective of student groupings, we turn now to a comparison of the enrolment patterns of subsets of the student population.

Enrolment Trends Disaggregated by Student Type

As discussed previously, DEC publishes state-wide enrolment data in these placement categories disaggregated by two minority status indicators: (a) students identifying as Aboriginal or Torres Strait Islander (or Indigenous Australians), and (b) students from a Language Background Other than English (LBOTE). In 2009 there were some 40,605 students identifying as Indigenous and 215,788 students from a Language Background Other than English (5.5% and 29.3% of total enrollments respectively). As noted above, statewide aggregates show that Indigenous students are overrepresented in special schools and support classes at both elementary and secondary levels, while students in the LBOTE category are underrepresented in special schools and support classes at elementary level, but overrepresented in secondary school support classes. We know from our preceding analysis, however, that overall enrolment patterns are changing over the 1997 to 2009 time period. It is

of primary interest, therefore, to assess the extent to which LBOTE enrollments, Indigenous

enrollments, and enrollments of the remaining non-minority students are changing across

time. A simple snapshot of overrepresentation at one time period does not provide the whole

picture of changing enrolment trends.

Method

Using the same DEC enrolment data from the years 1997 to 2009, we next examined

enrollments for three specific categories of students: Indigenous students, LBOTE students

and the remaining students referred to here as 'Other' (non-Indigenous, English speaking).

Enrollments were again split into the same five categories (Total, Mainstream, SSP, SC

Elementary and SC Secondary), however, our analysis of statistical bulletins revealed that

DEC includes one additional support category, Intensive English, in the SC Secondary

enrolment count. Students in the Intensive English category are enrolled in SC Secondary

classes purely for the purposes of learning English, whereas all remaining SC Secondary

students are enrolled in a disability support program. For the purposes of this research, which

is to examine and compare special education placement patterns, we then separated LBOTE

SC Secondary into two categories: (1) Intensive English classes and (2) students from a

Language Background Other than English enrolled in Disability Support classes, as only the

latter group can be meaningfully compared with SC Secondary enrollments relating to our

other student groups. As noted in the introduction, ethnicity and language of origin cannot be

inferred from the LBOTE category, with students of Chinese, Indian, Maori, Sudanese,

Afghan, and other descents included.

While the *number* (or indeed percentage) of students in the Other group can be easily

inferred for each calendar year by subtracting Indigenous and LBOTE enrollments from total

enrollments, the *trends* seen in enrollments for this category cannot. For example, if for a

given category Indigenous student enrollments trended up (i.e. a positive trend) while

LBOTE student enrollments trended down (a negative trend), it is unclear what pattern enrollments in the remaining category (Other) would take, and whether any trend would be statistically significant. It could be that the increase in Indigenous enrollments was greater than the decrease in LBOTE enrollments, meaning Other enrollments trended down, or perhaps the decrease in LBOTE enrollments was greater than the increase in Indigenous enrollments, meaning Other enrollments trended up. Alternately, the increases and decreases in the Indigenous and LBOTE enrollments may have been of equivalent magnitude, resulting in no net change in Other enrollments. It is therefore crucial to examine all three groups.

The same analysis strategy was used here to examine patterns of enrolment for the three subsets of the student population as was used above: curve estimations followed by *t* tests comparing the values of the slopes obtained in the regressions. All analyses included enrollments as a percentage of the relevant base category. For example, Indigenous SC Elementary enrollments were the number of Indigenous SC Elementary enrollments as a percentage of total SC Elementary enrollments. Likewise, mainstream LBOTE enrollments were the number of LBOTE enrollments in non-separate classrooms as a percentage of total non-separate enrollments.

Results

Curve estimation. Positive linear slopes were significant predictors of all categories of Indigenous enrollments and of both total and mainstream LBOTE enrollments, but not of any of the three segregated LBOTE enrollments (see Table 3; see Table 1 for enrolment numbers between 1997 and 2009). Significant negative slopes predicted total SC Secondary LBOTE enrollments and SC Secondary LBOTE (Disability Support) enrollments. No significant change is noted for LBOTE SSP enrollments ($p = .92$), while the apparent increase seen in SC Elementary LBOTE enrollments was non-significant ($p = .14$). In other words, while all Indigenous enrollments and total and mainstream LBOTE enrollments each

increased over time between 1997 and 2009, no significant trend was present for SC Elementary and SSP LBOTE enrollments, and SC Secondary LBOTE enrollments significantly decreased over time. SC Secondary LBOTE enrollments can be further differentiated by Intensive English status: there was a significant decrease in enrollments for those in Disability Support classes, but the decrease in the Intensive English category was non-significant ($p = .07$). Significant negative slopes predicted all categories of 'Other' enrollments with the exception of SC Secondary classes, for which the apparent increase over time was non-significant ($p = .08$).

Model fits were medium to high for all significant models. The highest model fits are seen for mainstream and total enrollments (see Figures 2, 3 and 5 for observed and predicted values for mainstream, SSP, SC Elementary and SC Secondary models for Indigenous, LBOTE and Other respectively, and Figure 4 for Intensive English and Disability Support LBOTE SC Secondary enrollments). Fits were low to medium for LBOTE and Other separate settings, with notable variability in enrollments from year to year.

Positive autocorrelation was not present (as values are above dU) for any models except for total LBOTE enrollments, mainstream LBOTE enrollments and Indigenous SSP enrollments (see Table 2). Positive autocorrelation may have been present for total and mainstream Other enrollments. No significant negative autocorrelation was present in any analysis. Since autocorrelation was present in a maximum of five out of the 17 models, the analyses were deemed acceptable.

Slope comparison. As noted above, t statistics comparing slopes can only be calculated for independent cases. There should be no overlap between Indigenous and Other classification of children across all school settings. Although there may be a small degree of overlap due to the general increase in Indigenous enrollments as more students identify as Indigenous, this level of overlap is minor, as no child can simultaneously be in more than one

of these two categories. In addition, no child would simultaneously be in both the LBOTE and either the Indigenous or Other categories. It was therefore deemed acceptable to compare these three categories. For LBOTE SC Secondary, only Disability Support enrollments were compared with Indigenous and Other SC Secondary, as it is these students who have been diagnosed with a disability and are therefore comparable with the SC Secondary Indigenous and Other categories. Total SC Secondary and SC Secondary (Intensive English) enrollments from the LBOTE categories were not compared with any other enrolment categories, as there are no equivalent categories within the Indigenous or Other student populations. Within the Indigenous, LBOTE and Other enrolment categories, Mainstream, SSP, SC Elementary and SC Secondary enrollments were compared. As for our prior analyses, no such comparison can be made between these categories and the Total enrolment category in which enrollments in all mainstream and separate settings are combined. Contrasts are Bonferroni adjusted for multiple comparisons within each family of analyses.

Within the Indigenous category, all three separate settings increased at a faster rate than mainstream enrollments: SSP $t(9) = 6.53$, $p < .0005$; SC Elementary $t(9) = 3.48$, $p = .007$; SC Secondary $t(9) = 6.10$, $p < .0005$. There were no significant differences between enrollments in any of the separate settings however: SSP vs. SC Elementary, $t(9) = 3.17$, $p = .01$ (non-significant after Bonferronni adjustment); SC Elementary vs. SC Secondary, $t(9) = -1.34$, $p = .21$; SSP vs. SC Secondary, $t(9) = 2.22$, $p = .054$.

The overall pattern in which enrollments in special settings increased faster over time than enrollments in mainstream was somewhat reversed for LBOTE students. Mainstream enrollments increased faster than both SSPs, $t(9) = 5.26$, $p = .0005$, and total SC Secondary classes, $t(9) = 6.61$, $p < .0005$, due to the significant decrease in SC Secondary enrollments and the relatively flat trend seen for SSPs. This result held when LBOTE enrollments for SC Secondary were split into Intensive English and Disability Support classes: Mainstream

enrollments increased faster than enrollments in either LBOTE category (for Intensive English, $t(9) = 5.87$, $p < .0005$; and for Disability Support, $t(9) = 5.47$, $p < .0005$). There was no significant difference between Mainstream and SC Elementary enrollments, $t(9) = 2.2$, $p = .06$. Within separate settings, SC Elementary enrollments increased significantly faster than total SC Secondary, $t(9) = 3.86$, $p = .003$. There were no other significant differences after Bonferroni adjustment amongst the separate special education settings for LBOTE enrollments.

Within the Other category, SC Secondary enrollments increased faster than enrollments in the other three settings, primarily due to the significant decreases in all other categories: SC Secondary vs. Mainstream, $t(9) = 5.85$, $p < .0005$; SC Secondary vs. SSP, $t(9) = 3.88$, $p = .004$; and SC Secondary vs. SC Elementary, $t(9) = 3.85$, $p = .004$. No other comparisons were significant, with Mainstream, SSP and SC Elementary enrollments all decreasing at similar rates (ps > .05).

Lastly, we compare enrollments of Indigenous, LBOTE and Other students within each setting. Starting with Mainstream settings, LBOTE enrollments had the fastest rate of growth, with increases significantly faster than both Other ($t(9) = 39.79$, $p < .0005$) and Indigenous ($t(9) = 19.76$, $p < .0005$) enrollments. Indigenous enrollments in turn increased significantly faster over time than did Other enrollments ($t(9) = 33.17$, $p < .0005$). In SSPs in comparison, Indigenous enrollments had the fastest rate of growth, with increases significantly faster than both Other ($t(9) = 7.64$, $p < .0005$) and LBOTE ($t(9) = 4.20$, $p = .002$) enrollments, while Other enrollments decreased significantly faster than LBOTE enrollments ($t(9) = 2.98$, $p = .015$). A similar pattern is seen in SC Elementary classes, where Indigenous and LBOTE enrollments both increased significantly faster than Other enrollments, ($t(9) = 5.70$, $p < .0005$ and $t(9) = 3.78$, $p = .004$ respectively); although in the latter case this was primarily due to a non-significant change for LBOTE coupled with a

significant decrease for Other. There was no significant difference in the rate of change between Indigenous and LBOTE enrollments ($t(9) = 0.29$, $p = .78$). Finally, in SC Secondary classes, while LBOTE Disability Support enrollments decreased significantly faster than both Indigenous ($t(9) = -4.21$, $p = .002$) and Other ($t(9) = -2.95$, $p = .016$) enrollments, there was no difference between Indigenous and Other enrollments ($t(9) = 0.11$, $p = .92$).

Risk ratios. In the primary analyses, described above, percentages of enrollments of the relevant base category were used in order to maintain consistency between the trends for the results involving all students and the disaggregated trends. Risk ratios were not used in the primary analysis, as risk ratios cannot be calculated for the trends for all students (we considered it important to keep all analyses in the same metric). Given the use of risk ratios in other literature, however, it is of interest to compare the primary analysis using percentages of enrollments to a supplementary parallel analysis using risk ratios (see Hosp & Reschly, 2003; Parrish, 2002; NRC, 2002; Skiba et al., 2006). Risk ratio results were highly similar to the percentage of enrolment results (only significant results reported here, complete analyses available from authors on request). For Indigenous students, the risk of being in a regular setting decreased, while the risk of being in SC Secondary or SSP settings increased. For LBOTE students, the risk of being in a regular setting increased, while the risk of being in SC Secondary Disability Support or SSP settings decreased, showing the opposite trend to that of Indigenous students. Finally for Other students, the risk of being in regular settings decreased, while the risk of being in SC Secondary classes increased.

Comparing slopes, the risk of being in Mainstream classes increased significantly faster for LBOTE students than for both Indigenous and Other students. Within SSPs, LBOTE decreased significantly faster than both Indigenous and Other, and finally for SC Secondary classes both Indigenous and Other increased faster than LBOTE. The similarity between the percent of enrollments and risk ratio results should be emphasized, with both

analyses suggesting inflated enrollments / risk for Indigenous students in separate settings relative to LBOTE and Other students.

Discussion

Several revealing findings emerge from these analyses. First, enrollments of Indigenous students in special settings are increasing at a faster rate than Indigenous enrollments in mainstream. This point is crucial, as it is cannot therefore be claimed that increases in Indigenous enrollments in special education settings are due only to increases in the Indigenous population: if this were the case, then the enrollments of Indigenous students should increase at similar rates for both mainstream and special settings. Rather, it appears that Indigenous students face a significantly higher chance than non-Indigenous students of being placed in a separate special education setting. This is not simply a case of Indigenous enrollments in special settings "catching up" to a level commensurate with those in mainstream. Baseline rates from 1997 show that Indigenous students were already overrepresented in separate settings at that time, with Indigenous students making up 3.3% of the total school population, but 8.4% of SC Primary, 5.6% of SC Secondary, and 6.9% of SSP enrollments (see Figure 2). The percentage of Indigenous students in separate settings increased from this baseline, resulting in even more exaggerated overrepresentation of Indigenous students in special schools and support classes over the 13-year study period.

This trend does not generalize, however, to the other minority group analyzed here: students from a Language Background Other than English (LBOTE). For this group, enrollments in mainstream settings were found to increase faster than enrollments in both special schools (SSPs) and support classes at secondary school level (SC Secondary). This trend holds when SC Secondary enrollments are split into classes for Intensive English instruction and those for students enrolled in a Disability Support class. Overall, LBOTE enrollments in separate settings are not significantly increasing at all, and indeed, LBOTE SC

Secondary enrollments are significantly decreasing. This decrease is more pronounced in Disability Support classes, but is also present in Intensive English classes.

Importantly, these findings explain the apparent overrepresentation of LBOTE students in secondary school support classes that was noted in the introduction to this paper. Disaggregation of enrolment data has shown that this is due to DECs inclusion of Intensive English support classes in the SC Secondary enrolment count. These Intensive English classes are provided to recent immigrants specifically for the purpose of learning English and are not commensurate with all the remaining support classes which are provided for students with a disability. The correct comparison in terms of determining disproportionality then is to compare (i) Indigenous enrollments in SC Secondary with (ii) Other SC Secondary and (iii) LBOTE SC Secondary (Disability Support).

Such a comparison reveals that there are almost as many Indigenous students in SC Secondary classes as there are LBOTE, despite Indigenous students making up a much smaller percentage of the total student population. The net result of this discrepancy is that a larger percentage of the Indigenous student population (2.2% in 2009) is being placed in secondary school Disability Support classes than that of students from a Language Background Other than English (0.5% in 2009). Also of importance is the constitution of the LBOTE category which includes groups traditionally underrepresented in special education (e.g., students of Asian background) with traditionally overrepresented groups (e.g., students from Pasifika or Maori background). Interestingly, students of the former group dominate the LBOTE category with students of Chinese, Vietnamese and Korean descent accounting for 28.1% of all students from a Language Background Other than English attending NSW government schools.

Further to this discrepancy between Indigenous and LBOTE students, there is a clear trend towards a faster increase in enrollments of Indigenous students in segregated settings

than students in either the LBOTE or Other categories. Alternatively, in mainstream classes, LBOTE enrollments increased significantly faster than both Indigenous and Other enrollments. This dichotomy highlights an important point: not only are enrollments of Indigenous students in separate settings increasing at a disproportionate rate to total Indigenous enrollments but the different enrolment destinations of LBOTE and Indigenous students means that the increased presence of Indigenous children in special schools and support classes cannot be simply attributed to increases in "minority" enrollments.

It should be noted that the percentage of enrollments made up of students in the Other category decreased in all settings but SC Secondary. Recall that NSW government schools are losing enrollments to non-government schools, with the implication that the drift is being fuelled by students leaving the mainstream. Our second set of analyses comparing Indigenous, LBOTE and Other enrollments provides clarification, indicating that this traffic from government to non-government schooling consists mainly of students in the Other category. It is not therefore the case that the non-Indigenous, English-speaking majority is being subsumed by an increasing Indigenous/ LBOTE minority, or that more students are identifying as Indigenous and LBOTE: rather, the decline in government school enrollments overall can be accounted for by decreasing enrollments of students in the majority group: non-Indigenous, English speaking students enrolled in mainstream settings. While it has been argued elsewhere that "white flight" is compounding an increase in the number of immigrant students in publically-funded government schools (Ho, 2011), our research provides the first empirical support for the claim that government schools in NSW are becoming increasingly diverse, with non-Indigenous, English-speaking students in mainstream settings the most likely group to move from government to non-government schools.

Furthermore, our research indicates not only that referral to restrictive settings within government schools is increasing at the expense of more inclusive options, but also that there

are differential effects by student group; with placement in special schools and support classes significantly more likely for Indigenous students than either of the other two groups. This is a worrying trend, especially given that the enrolment of Indigenous students in special schools and support classes appears to have accelerated in the 6 years since the release of the *2004 NSW Aboriginal Education Review.* This Review prompted 71 recommendations – including the development of culturally relevant curricula, an Aboriginal employment strategy and teacher professional development in Aboriginal education – that were designed to "close the gap" between Indigenous and non-Indigenous students and, while there has been some success with, for example, a higher percentage of Indigenous students completing secondary school, measures to address cultural bias in special education assessment and referral procedures appear to have been neglected (Graham, 2012).

Finally, although the shift to special schooling is strongest for Indigenous students, it is nonetheless of note that secondary school support classes are the only setting in which enrollments of non-Indigenous, English-speaking students are increasing. This may be where we can borrow from Dyson and Gallannaugh (2008) by drawing parallels with findings from existing research. For example, Graham and Sweller (2011) noted recently that growth in secondary school support classes was principally due to a significant rise in enrollments under the autism (+ 280%), emotional disturbance (+348%), and behavior disorder (+545%) support categories. Graham, Sweller and Van Bergen (2010) found that the disproportionate overrepresentation of boys in NSW government special schools and support classes was particularly acute in subjective categories of disability, that disproportionality increased with age, and that students initially referred to support classes for emotional disturbance and behavior disorder may be graduating to more restrictive special education settings (e.g., special schools and juvenile detention). Further research is therefore needed to understand more about the characteristics of students entering support classes at secondary school level

in NSW and, in particular, whether there is a specific sub-group of non-Indigenous, English-speaking young people entering separate special education settings and what factors are at play in this process.

At this point, we wish to return to the call made by US-based researchers for the field to move beyond the documentation of trends toward the development of solutions. This is important and urgent work; however, even when a problem - or solution - has already been identified at one timepoint, there remains a need for vigilant observation of enrolment trends over time. The trends noted here signal that successive policy measures adopted by the NSW government to improve educational outcomes for Indigenous students as well as compete with non-government schools have had little success. Indeed, the conflict that arises through the implementation of two very different policy agendas may well be contributing to poor outcomes in practice. Close attention to these enrolment trends now and into the future is critical to understand what initiatives produce positive outcomes and whether policies that are in part designed to protect market share (e.g., the promotion of academically selective streams and secondary schools) may be counteracting those aiming to promote more equitable achievement and outcomes.

Conclusion

Findings from this study resonate with research on the disproportionate overrepresentation of minority groups from the United States, strongly indicating that disproportionality is not a problem unique to North America. While the constitution of student populations and education systems differ internationally, there are some similarities in terms of disproportionate representation in separate special education settings. New South Wales shares the cultural diversity of many North American states but this diversity is unevenly distributed across the continuum of provision offered by the government school sector. Students constituting our main "minority" group (Language Background Other than

English) are underrepresented in all separate special education settings serving students with a disability, while Indigenous students (Aboriginal and Torres Strait Islanders) are significantly overrepresented. Furthermore, it is clear that Indigenous students are being enrolled in separate settings faster than students in any other group.

These findings signal that there is an urgent need to establish rigorous protocols through which referrals to separate settings can be scrutinized for potential bias and to devise systematic processes to prompt the review of the cultural and academic practices within referring schools. Furthermore it is critical that all education systems in Australia commit to full transparency by publishing comprehensive special education enrolment data detailing gender, age, disability category and ethnicity. Only then will researchers in education be able to determine the extent of disproportionality in this country and whom it affects.

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Table 1

Number of enrolled students across all classroom types for Total, Indigenous, LBOTE and

Other enrollments between 1997 and 2009

Year	Total	Indigenous	LBOTE	Other
1997	764 173	25 127	164 147	574 899
1998	765 375	29 670	171 068	564 637
1999	765 332	28 154	176 462	560 716
2000	761 836	29 465	182 884	549 487
2001	756 740	30 825	187 506	538 409
2002	754 800	32 875	191 818	530 107
2003	751 185	33 662	196 651	520 872
2004	745 507	35 291	200 622	509 594
2005	741 578	35 968	203 378	502 232
2006	740 415	36 924	206 296	497 195
2007	738 636	38 015	207 031	493 590
2008	735 777	39 247	212 529	484 001
2009	736 647	40 605	215 788	480 254

NB: Total enrollments are the sum of Indigenous, LBOTE and Other enrollments.

Table 2

Linear model fits predicting enrollments from time

	F	R^2	B	95% CI for B	Durbin-Watson
Total	265.19***	.96	-2878.08***	[-3267.07, -2489.08]	0.94
Mainstream	82.63***	.88	-0.04***	[-0.05, -0.03]	0.84
SSP	363.19***	.97	0.01***	[0.010, 0.012]	0.98
SC Elementary	0.05	.004	<0.001	[-0.005, 0.004]	0.86
SC Secondary	183.30***	.94	0.03***	[0.02, 0.03]	1.20

Note. Due to the presence of only one predictor (time), significance levels for F and B values are identical.

*** $p < .001$.

Table 3

Linear model fits predicting enrollments from time for Indigenous, LBOTE and Other students

		F	*R*^{2}	*B*	95% CI for *B*	Durbin-Watson
Indigenous	Total	479.47***	.98	0.17***	[0.16, 0.19]	2.68
	Mainstream	413.35***	.97	0.17***	[0.15, 0.19]	2.56
	SSP	86.71***	.89	0.58***	[0.45, 0.72]	0.71
	SC Elementary	49.44***	.82	0.33***	[0.23, 0.44]	1.36
	SC Secondary	106.52***	.91	0.42***	[0.33, 0.51]	2.12
LBOTE	Total	691.77***	.98	0.65***	[0.59, 0.70]	0.47
	Mainstream	744.20***	.99	0.67***	[0.61, 0.72]	0.52
	SSP	0.01	.001	-0.01	[-0.29, 0.27]	2.12
	SC Elementary	2.58	.19	0.28	[-0.10, 0.66]	2.33
	SC Secondary (total)	13.34**	.55	-0.81**	[-1.30, -.32]	2.44
	SC Secondary (DS)	5.18*	.32	-0.47*	[-0.92, -0.02]	2.21
	SC Secondary (IE)	4.03	.27	-0.34	[-0.72, 0.03]	1.55
Other	Total	920.54***	.99	-0.82***	[-0.88, -0.76]	0.76
	Mainstream	848.12***	.99	-0.83***	[-0.89, -0.77]	0.88
	SSP	17.33**	.61	-0.57**	[-0.87, -0.27]	1.84
	SC Elementary	14.92**	.58	-0.61**	[-0.96, -0.26]	2.38
	SC Secondary	3.61	.25	0.39	[-0.06, 0.85]	2.50

Note. Due to the presence of only one predictor (time), significance levels for *F* and *B* values are identical.
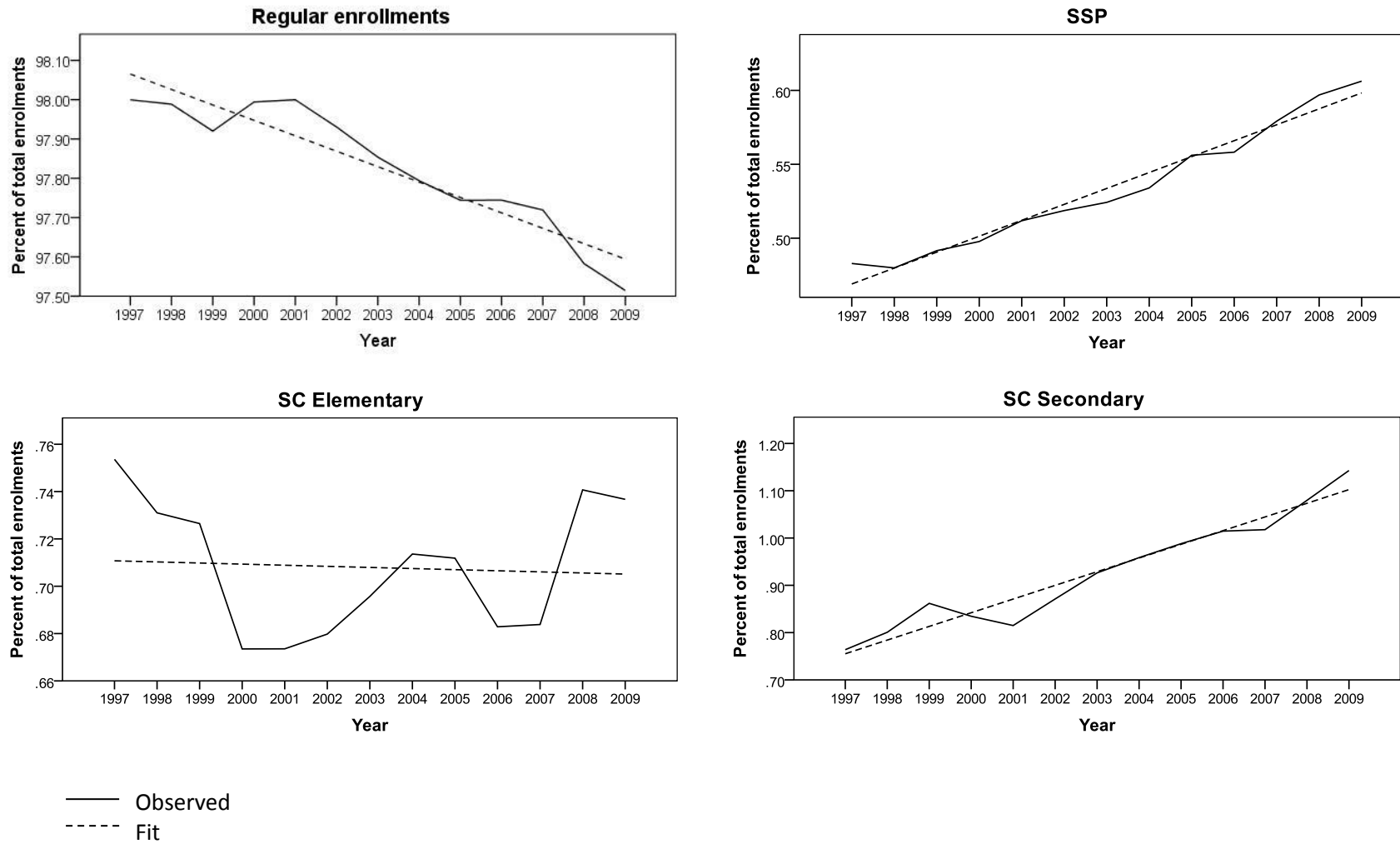
* *p* < .05. ** *p* < .01. *** *p* < .001.

Figure 1. Observed and predicted mainstream, SSP, SC Elementary and SC Secondary enrollments for all students.
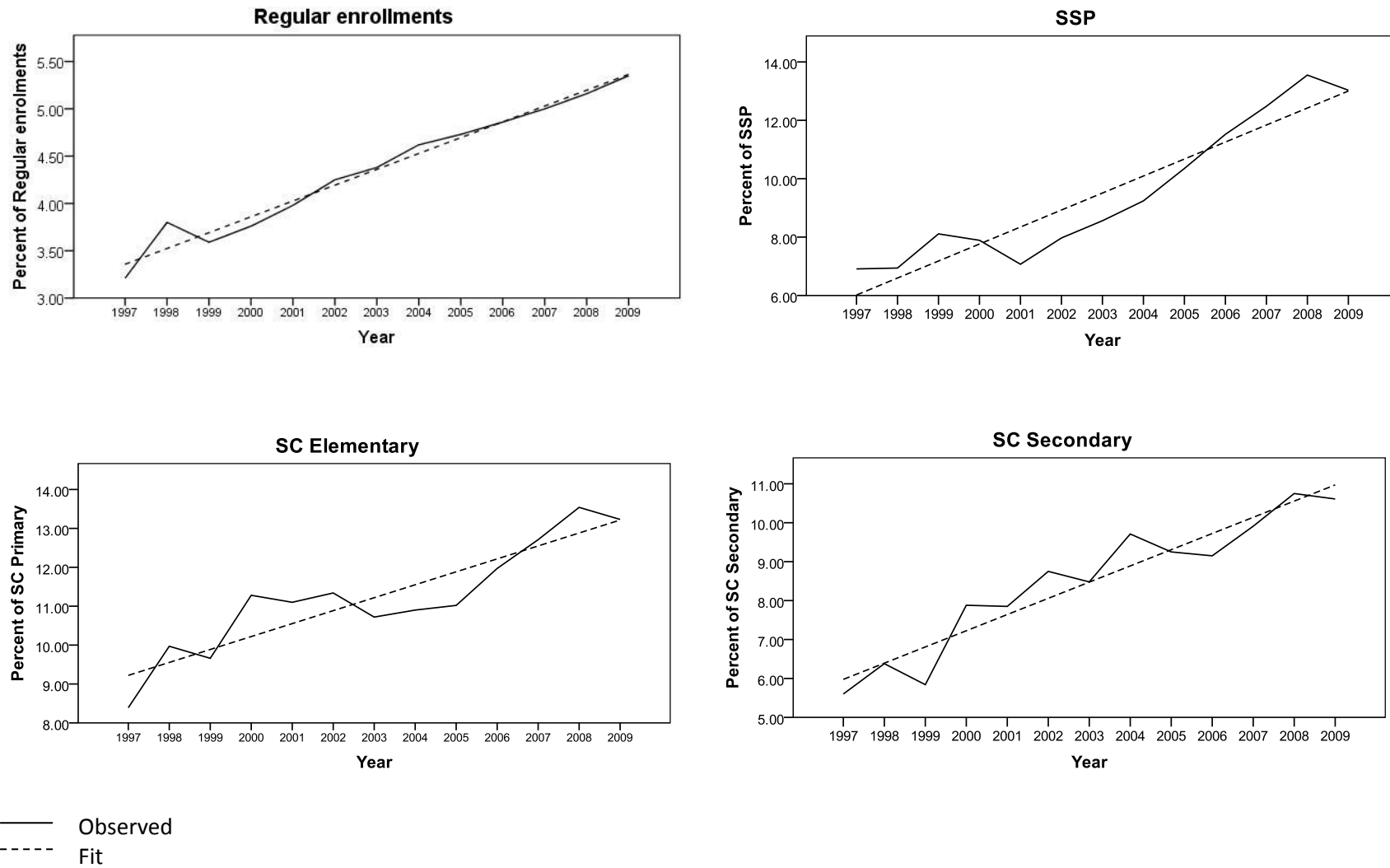
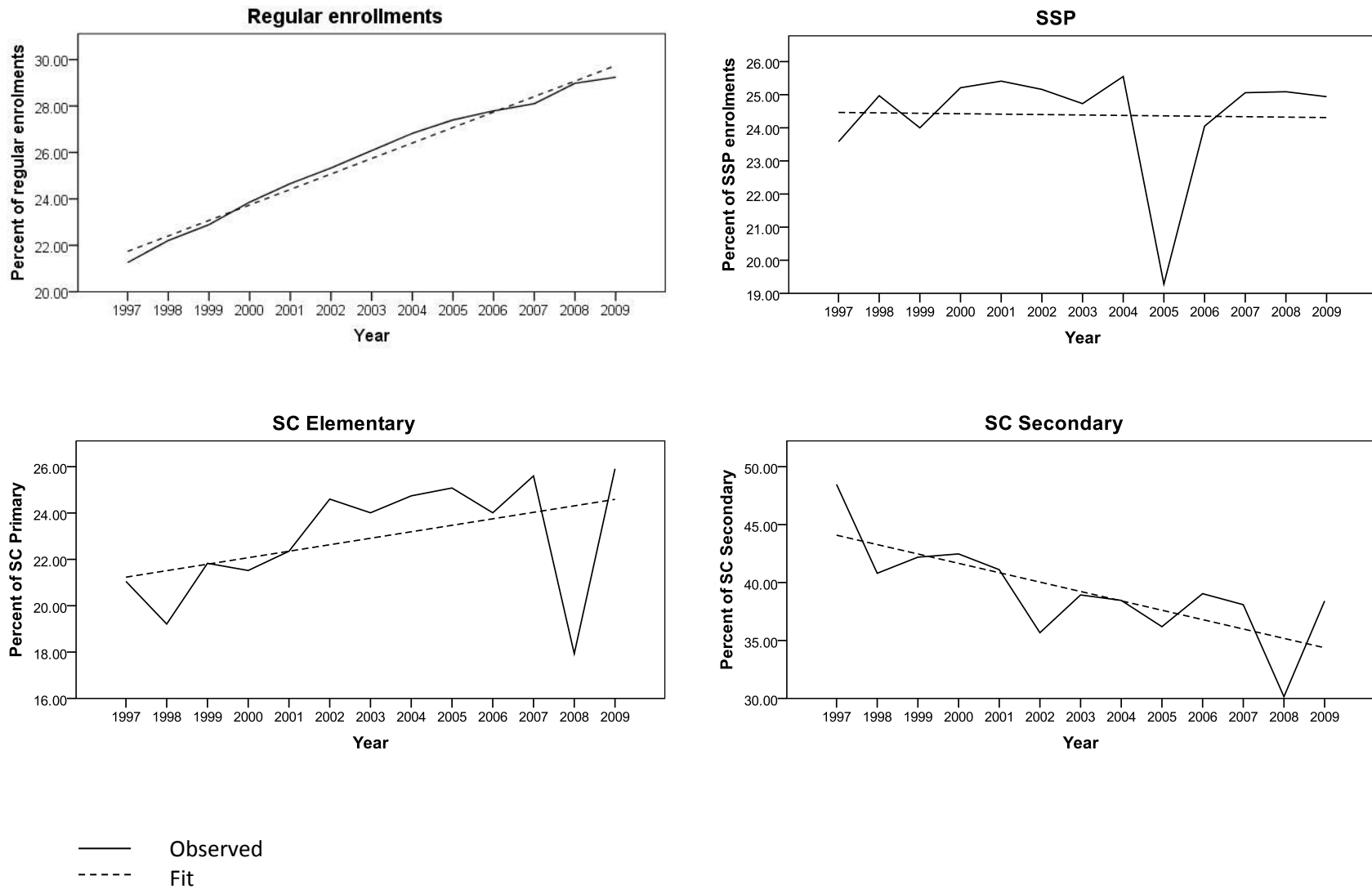*Figure 2.* Observed and predicted Mainstream, SSP, SC Elementary and SC Secondary Indigenous enrollments.

Figure 3. Observed and predicted Mainstream, SSP, SC Elementary and SC Secondary LBOTE enrollments.
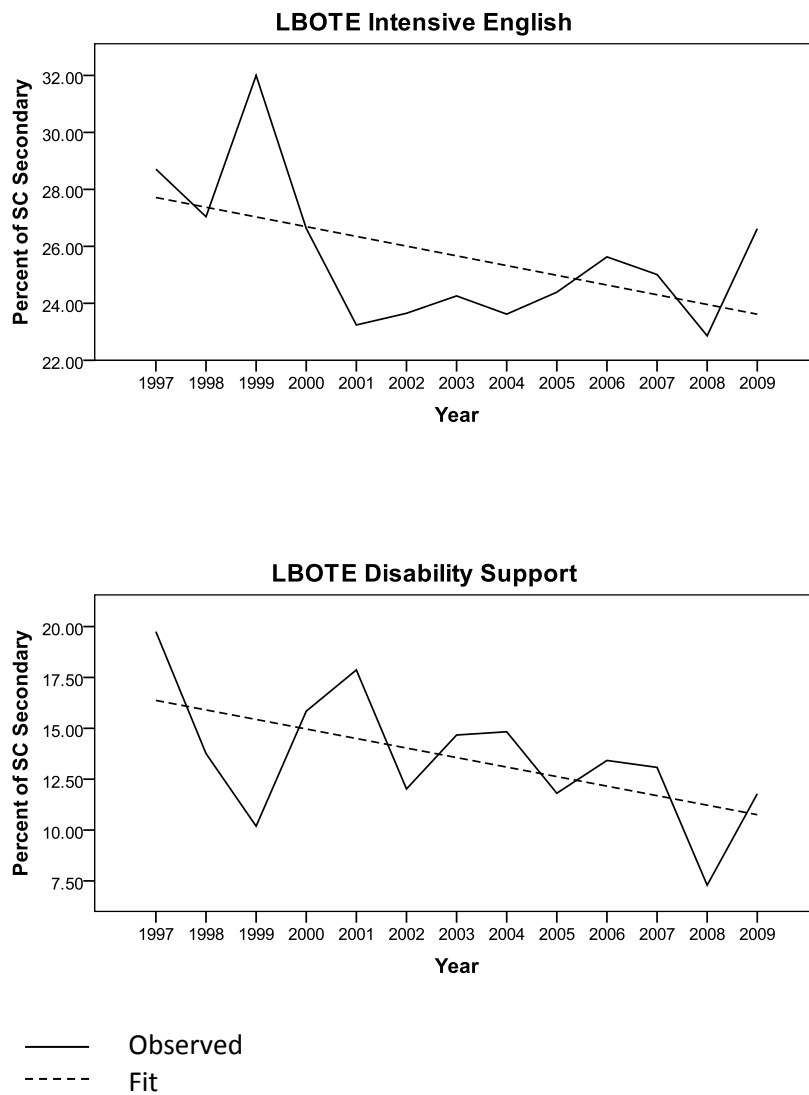
Figure 4. Observed and predicted LBOTE SC Secondary Intensive English and Disability
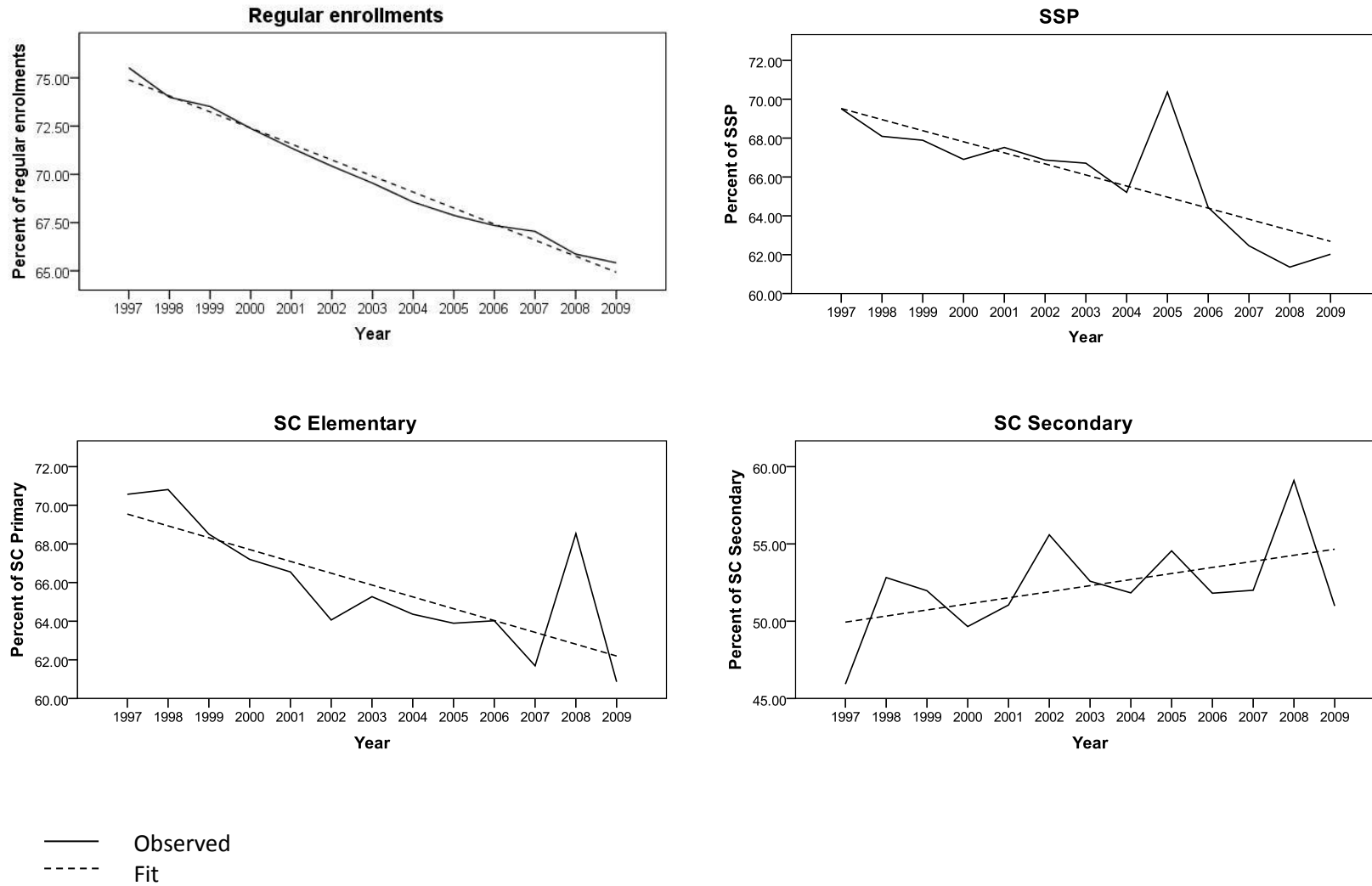
Support enrollments.

Figure 5. Observed and predicted Mainstream, SSP, SC Elementary and SC Secondary Other enrollments.