# The Impact of Bilingual Education and English as A Second Language Programs on Acquisition of the New York State Learning Standards

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*Abstract*

The advent of universal accountability has provided the opportunity to evaluate the progress of students who have had programs to address limited English proficiency. In particular, as part of the New York statewide assessment system, students are identified as belonging to one of four categories: never having been identified as limited English proficient (LEP), LEP and below the 30th percentile on a test of English reading (with reference to norms based on students in the general or monolingual curriculum), LEP and at or above the 30th percentile on a test of English reading skills, and former LEP students. In general, on the grade four and grade eight examinations of English Language Arts and Mathematics, the former LEP students do not score as well as students who have never been identified as LEP. This is counter to theory about the effectiveness of programs for these students. However, in the absence of information about the quality or scope of programs these students have had, and in view of the disproportionate representation of LEP students in less-affluent school districts, it is impossible to conclude from these data anything about the statewide intervention as a whole. A number of studies were conducted to control for factors that influence performance. These factors the community type in which the students attend school and the representation of LEP students in the schools test taking population. When these factors are controlled, the test scores on the four examinations are much more consistent with bilingual education theory. In particular, after controlling for community needs/resource category ( a proxy for district affluence), former LEP students score higher than students who were never identified as LEP.

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# The Impact of Bilingual Education and English as A Second Language Programs on Acquisition of the New York State Learning Standards

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Overview of Issues

Second language acquisition theory holds that the development of a common underlying linguistic proficiency[1] is manifest not only in native language skills but in the acquisition of a second language and ultimate proficiency in that language. This proficiency involves some linguistic skills that are not necessarily language specific, but that can be developed through use and instruction in the child's native language. It follows that an efficient approach to developing linguistic proficiency is through the native language. Practically speaking first, language skills can be developed through instruction that requires applying that language in an academic environment. If that first language ($L_1$) is comprehensible to the child, instructional time in the subject matter is not lost while the second language ($L_2$) is introduced and developed.

By theory, then, experience with multiple linguistic applications should promote the language arts skills of the children. These multiple applications are available where native language and English language skills are developed because development of the two is interdependent and the academic environment provides rich opportunity for enhancement of skills. Therefore, one measure of the theory of a common underlying proficiency or a linguistic interdependence would be a demonstration that bilingual education students who were initially lower in English language arts than peers in a monolingual English environment, ultimately score higher than those peers on English language arts examinations. By theory, an effective program should enhance their language arts skills by providing for an interdependent development of the first and second languages.

Furthermore, by theory, progress in language arts, as manifest in English, should be made at no cost to academic achievement in other subjects, like mathematics, because the instructional

program is not delayed waiting for the child to become sufficiently proficient in academic English, and the subject matter skills acquired in the context of $L_1$ are transferable to the context of $L_2$ (English). Therefore, a successful bilingual education program would not promote any deficits in the acquisition of the State Learning Standards.

Confounding Variables

Studies of progress in language arts or other subjects should be sensitive to such variables as the performance of the school districts in which students reside and the degree of program exposure. Populations of limited English proficient (LEP) students are not uniformly distributed throughout New York State. Children receiving bilingual education programs or English as a second language services without bilingual education (ESL-only) are disproportionately located in New York City, adjoining urban centers in Nassau and Westchester counties including Yonkers, and in Buffalo, Rochester, and Syracuse. As a consequence, the design of studies that compare whole student groups defined by LEP status must be sensitive to the performance differences associated with community types.

The differences in program services are also important to the study design. Clearly, while the hypothesized cognitive-linguistic advantages may accrue fully to bilingual education programs, informal avenues of native language enhancement, including home and peer experiences, accompanied by systematic development of English language skills should enhance the common underlying proficiencies of all children, including those who receive ESL-only services.

Naturally, the intensity and degree of services interacts with the size of the student population in each district for a number of reasons. There are two major informal influences related to the population size. First, where the populations are larger, the availability of a supportive language community provides opportunity for language development. Also, greater

numbers of children in a language group are also associated with better-experienced teachers who are proficient in that language and are better able to address the particular needs of students sharing that language. More formally, New York State requires that bilingual education be provided for each language group in which there are 20 or more native speakers of that language.

Clearly, enrollment of language minority children varies by community type, and program services and the availability of language-enhancing experiences varies by enrollment, both formally and informally. Any post hoc study of the impact of these program services, then, must account for these confounding variables, to the degree possible (it would be impossible to randomly assign students to a program, community, or language group).

## Study Hypotheses

With these considerations in mind, the following hypotheses are addressed in this study:

1. Former LEP students should score higher on State examinations of English language arts than current LEP students within the same school districts because they have had the advantage of full program experience;

2. Former LEP students should score higher on State examinations of English language arts than students in the same school districts who have never been identified for program services because they, too, have not had the advantage of interdependent language experience;

3. Former LEP students should score at least as high as current LEP students in the same school districts on State examinations of Mathematics because the program should not have been implemented at the expense of content areas;

4. Former LEP students should score at least as high as students in the same school districts who have never been identified for program services on State examinations of Mathematics for the same reason as in 3, above.

## Methods

Population Groups

Student populations on State examinations are identified as belonging to one of four LEP categories:

1. never having received program services (never-LEP students),
2. LEP students receiving program services and scoring lower than the 30th percentile on a test of English reading skills (low-skill LEP students),
3. receiving program services and scoring at or above the 30th percentile on a test of English reading skills (high-skill LEP students), and
4. former (or graduated) LEP students.

Students are generally eligible for program exit and mainstreaming into the monolingual English environment of general education when they achieve the 40th percentile on a test of English reading skills. Very often, the New York City Revised Language Assessment Battery is used for this program exit purpose. Students who are lower than the 30th percentile on a test of English reading skills may be exempted from taking State examinations in English language arts, which are not translated into other languages, but are not exempted from taking State examinations in mathematics, which are translated.

Examinations

Scores on the current State examinations in grade four English Language Arts (ELA-4) and grade eight English Language Arts (ELA-8) as well as the current examinations in Mathematics in grades four and eight (Math-4 and Math-8, respectively) are the dependent variables in this study. The independent variable is LEP status, as defined above. Two intervening variables are the size of the examination populations in the school districts who are current LEP students receiving program services and the community type.

Six community types, termed "needs/resource" categories are identified in New York for reporting purposes: New York City; the Big Four (Buffalo, Rochester, Syracuse, and Yonkers); Urban Suburban districts (e.g., Utica, Schenectady, Troy, Albany, Mount Vernon, Newburgh); High need rural districts (e.g., Cuba-Rushford, Norwich City); Average districts (e.g., Rhinecliff, Uniondale); and Low need or affluent districts (e.g., Hewlitt-Woodmere, Massapequa, Scarsdale). Two population types were identified: Districts that tested 10 or more current LEP students (below the 30$^{th}$ percentile or at or above the 30$^{th}$ percentile) in any of the three years of test administration (1999, 2000, or 2001) and districts that did not test as many as 10 or more current LEP students in any of the three years. Because the tests are analyzed separately, this criterion is within each grade the tests are given.

Population Size

The numbers of students contributing to the data analyses are shown in Table 1.

**Table 1**

**Numbers of Students by Test, LEP Status, Needs Resource Category, and District LEP Representation, 1999-2001**

| Needs/ Resource | LEP Rep. | LEP Status | 3-Year Totals ELA-4 | ELA-8 | Math-4 | Math-8 |
|---|---|---|---|---|---|---|
| NYC | Less than 10 | At or above 30th | 1 | 9 | 0 | 14 |
| | | Below 30th | 16 | 16 | 4 | 17 |
| | | Former LEP | 14 | 74 | 5 | 88 |
| | | Never LEP | 488 | 795 | 116 | 862 |
| | | Total | 519 | 894 | 125 | 981 |
| | 10 or more | At or above 30th | 2,427 | 3,613 | 2,294 | 3,907 |
| | | Below 30th | 14,102 | 10,009 | 19,666 | 16,010 |
| | | Former LEP | 45,314 | 46,703 | 46,356 | 46,952 |
| | | Never LEP | 169,200 | 124,690 | 170,006 | 126,459 |
| | | Total | 231,043 | 185,015 | 238,322 | 193,328 |
| | All | At or above 30th | 2,428 | 3,622 | 2,294 | 3,921 |
| | | Below 30th | 14,188 | 10,025 | 19,670 | 16,027 |
| | | Former LEP | 45,328 | 46,777 | 46,361 | 47,040 |
| | | Never LEP | 169,688 | 125,485 | 170,122 | 127,321 |
| | | Total | 231,562 | 185,909 | 238,477 | 194,309 |
| Big Four | Less than 10 | At or above 30th | 0 | 0 | 0 | 0 |
| | | Below 30th | 0 | 0 | 0 | 0 |
| | | Former LEP | 0 | 0 | 0 | 0 |
| | | Never LEP | 0 | 0 | 0 | 0 |
| | | Total | 0 | 0 | 0 | 0 |
| | 10 or more | At or above 30th | 563 | 375 | 1,219 | 663 |
| | | Below 30th | 202 | 170 | 875 | 415 |
| | | Former LEP | 1,226 | 1,092 | 1,230 | 1,145 |
| | | Never LEP | 27,598 | 21,674 | 27,907 | 21,802 |
| | | Total | 29,589 | 23,311 | 31,231 | 24,025 |
| | All | At or above 30th | 563 | 375 | 1,219 | 663 |
| | | Below 30th | 202 | 170 | 875 | 415 |
| | | Former LEP | 1,226 | 1,092 | 1,230 | 1,145 |
| | | Never LEP | 27,598 | 21,674 | 27,907 | 21,802 |
| | | Total | 29,589 | 23,311 | 31,231 | 24,025 |

**Table 1**

**Numbers of Students by Test, LEP Status, Needs Resource Category, and District LEP Representation, 1999-2001**

| Needs/ Resource | LEP Rep. | LEP Status | 3-Year Totals ELA-4 | ELA-8 | Math-4 | Math-8 |
|---|---|---|---|---|---|---|
| Urb./Sub. | Less than 10 | At or above 30th | 115 | 76 | 44 | 56 |
| | | Below 30th | 70 | 51 | 68 | 76 |
| | | Former LEP | 336 | 130 | 42 | 26 |
| | | Never LEP | 34,143 | 32,125 | 17,044 | 26,618 |
| | | Total | 34,664 | 32,382 | 17,198 | 26,776 |
| | 10 or more | At or above 30th | 288 | 44 | 385 | 150 |
| | | Below 30th | 225 | 257 | 1,611 | 950 |
| | | Former LEP | 1,181 | 736 | 1,328 | 859 |
| | | Never LEP | 11,603 | 9,308 | 28,756 | 14,777 |
| | | Total | 13,297 | 10,345 | 32,080 | 16,736 |
| | All | At or above 30th | 403 | 120 | 429 | 206 |
| | | Below 30th | 295 | 308 | 1,679 | 1,026 |
| | | Former LEP | 1,517 | 866 | 1,370 | 885 |
| | | Never LEP | 45,746 | 41,433 | 45,800 | 41,395 |
| | | Total | 47,961 | 42,727 | 49,278 | 43,512 |
| Rural | Less than 10 | At or above 30th | 33 | 15 | 26 | 27 |
| | | Below 30th | 18 | 15 | 61 | 42 |
| | | Former LEP | 75 | 62 | 35 | 42 |
| | | Never LEP | 39,155 | 41,669 | 37,988 | 41,624 |
| | | Total | 39,281 | 41,761 | 38,110 | 41,735 |

**Table 1**

**Numbers of Students by Test, LEP Status, Needs Resource Category, and District LEP Representation, 1999-2001**

| Needs/ Resource | LEP Rep. | LEP Status | 3-Year Totals ELA-4 | ELA-8 | Math-4 | Math-8 |
|---|---|---|---|---|---|---|
| Rural | 10 or more | At or above 30th | 60 | 9 | 65 | 9 |
| | | Below 30th | 12 | 13 | 75 | 16 |
| | | Former LEP | 22 | 8 | 79 | 8 |
| | | Never LEP | 1,647 | 798 | 2,742 | 804 |
| | | Total | 1,741 | 828 | 2,961 | 837 |
| | All | At or above 30th | 93 | 24 | 91 | 36 |
| | | Below 30th | 30 | 28 | 136 | 58 |
| | | Former LEP | 97 | 70 | 114 | 50 |
| | | Never LEP | 40,802 | 42,467 | 40,730 | 42,428 |
| | | Total | 41,022 | 42,589 | 41,071 | 42,572 |
| Average | Less than 10 | At or above 30th | 306 | 149 | 167 | 112 |
| | | Below 30th | 163 | 155 | 386 | 255 |
| | | Former LEP | 869 | 497 | 288 | 187 |
| | | Never LEP | 184,079 | 190,939 | 153,026 | 170,459 |
| | | Total | 185,411 | 191,740 | 153,867 | 171,013 |
| | 10 or more | At or above 30th | 215 | 96 | 375 | 198 |
| | | Below 30th | 129 | 60 | 1,301 | 698 |
| | | Former LEP | 151 | 7 | 767 | 328 |
| | | Never LEP | 11,491 | 3,694 | 43,955 | 24,639 |
| | | Total | 11,986 | 3,857 | 46,398 | 25,863 |
| | All | At or above 30th | 521 | 245 | 542 | 310 |
| | | Below 30th | 292 | 215 | 1,687 | 953 |
| | | Former LEP | 1,021 | 504 | 1,055 | 515 |
| | | Never LEP | 195,564 | 194,633 | 196,981 | 195,098 |
| | | Total | 197,397 | 195,597 | 200,265 | 196,876 |

**Table 1**

**Numbers of Students by Test, LEP Status, Needs Resource Category, and District LEP Representation, 1999-2001**

| Needs/ Resource | LEP Rep. | LEP Status | 3-Year Totals ELA-4 | ELA-8 | Math-4 | Math-8 |
|---|---|---|---|---|---|---|
| Low Need | Less than 10 | At or above 30th | 247 | 165 | 244 | 179 |
| | | Below 30th | 102 | 125 | 386 | 324 |
| | | Former LEP | 672 | 203 | 603 | 188 |
| | | Never LEP | 82,215 | 78,819 | 78,810 | 73,644 |
| | | Total | 83,236 | 79,312 | 80,043 | 74,335 |
| | 10 or more | At or above 30th | 180 | 0 | 193 | 23 |
| | | Below 30th | 28 | 0 | 195 | 104 |
| | | Former LEP | 172 | 0 | 241 | 21 |
| | | Never LEP | 6,346 | 0 | 7,071 | 5,813 |
| | | Total | 6,726 | 0 | 7,700 | 5,961 |
| | All | At or above 30th | 427 | 165 | 437 | 202 |
| | | Below 30th | 130 | 125 | 581 | 428 |
| | | Former LEP | 844 | 203 | 844 | 209 |
| | | Never LEP | 88,561 | 78,819 | 85,881 | 79,457 |
| | | Total | 89,962 | 79,312 | 87,743 | 80,296 |
| Whole State | Less than 10 | At or above 30th | 702 | 414 | 481 | 388 |
| | | Below 30th | 369 | 362 | 905 | 714 |
| | | Former LEP | 1,966 | 966 | 973 | 531 |
| | | Never LEP | 340,074 | 344,347 | 286,984 | 313,207 |
| | | Total | 343,111 | 346,089 | 289,343 | 314,840 |
| | 10 or more | At or above 30th | 3,733 | 4,137 | 4,531 | 4,950 |
| | | Below 30th | 14,698 | 10,509 | 23,723 | 18,193 |
| | | Former LEP | 48,066 | 48,546 | 50,001 | 49,313 |
| | | Never LEP | 227,885 | 160,164 | 280,437 | 194,294 |
| | | Total | 294,382 | 223,356 | 358,692 | 266,750 |
| | All | At or above 30th | 4,435 | 4,551 | 5,012 | 5,338 |
| | | Below 30th | 15,067 | 10,871 | 24,628 | 18,907 |
| | | Former LEP | 50,032 | 49,512 | 50,974 | 49,844 |
| | | Never LEP | 567,959 | 504,511 | 567,421 | 507,501 |
| | | Total | 637,493 | 569,445 | 648,035 | 581,590 |

Analyses

Two major analyses and several secondary analyses were conducted on each of the four sets of test results. The first was a general linear model regression in which the scale score achieved on the examinations was the dependent variable. The design was a factorial three (year) by four (LEP status groups) by six (needs/resource) by two (ten or more current LEP students in the testing population or less than ten in the testing population). These regressions were further explicated by conservative scheffe post hoc contrasts.[2]

The second set of analyses were concerned with the differences in scores throughout the distribution of scores. For this, percentiles of performance were computed within each of the four LEP status groups. The mean scale scores at each percentile were then computed, and these means for the four groups were plotted against and presented for the reader's study.[3] Basically, these type of data enable a more comprehensive examination of percentiles of scoring ranges in which the students of different LEP status excel or are weak compared to those of the other status groups.

## Results

General Findings

The three (year) by two (LEP representation) by four (LEP status) by six (needs/resource categories) analysis for each of four tests (144 means by four tests) presents a formidable reporting task. Table 2a through 2b present an overview of the findings from the general linear analyses (Appendix 1), to assist the reader in working through the many comparisons of score means. To organize the information for the reader, the statistically significant main effects and interactions are summarized according to test. Interactions involving LEP status by LEP representation are of particular interest to the hypotheses, including the second order effects related to year and needs/resource categories. Those interactions are starred ('*') in the summaries below.

ELA-4

Table 2a presents the results from the general linear model analysis. All of the main effects were statistically significant:

1. Year of administration (2001 > 2000> 1999),
2. LEP status (never LEP > former LEP > LEP at or above the 30$^{th}$ percentile > LEP below the 30$^{th}$ percentile),
3. Needs/resource category (Low need > Average > High need rural > High need urban/suburban > New York City and the Big Four cities), and
4. LEP enrollment (less than 10 LEP examinees > 10 or more LEP examinees).

Among the interactions, the following were significant:

1. Year by needs/resource category,
2. LEP status by needs/resource category (The post hoc contrasts revealed that in New York City, former LEP students were scoring higher than either current LEP students at the 30$^{th}$ percentile or higher or students who were never identified as LEP),

3. Year by LEP status by needs/resource category
   (This interaction is of little interest to this study),

4. LEP status by needs/resource category by LEP representation
   (In New York City, students who were never LEP scored higher in the few districts where fewer than 10 current LEP students were tested, while in the greater number of districts testing 10 or more current LEP students, the former LEP students scored higher than the never LEP students), and

5. Year by LEP status by needs/resource category by LEP representation
   (In New York City, in 1999 and in 2000, both in districts in which 10 or more current LEP students were tested and in which fewer than 10 current LEP students were tested, the each year, the former LEP students scored higher than the never LEP students. It was not possible to reach this conclusion in 2001 in districts testing fewer than 10 current LEP students because the numbers of former LEP students in those districts was very small.)

ELA-8

Table 2b presents the means for the ELA-8 analysis. The following were significant effects:

1. Year of administration (1999>2001>2000),

2. LEP status (Never LEP>Former LEP>LEP at or above 30$^{th}$ percentile> LEP below 30$^{th}$ percentile), and

3. Needs/Resource Category (Low Need>Average>High Need Rural>High High Need Urban/Suburban>New York City>Big Four),

The following interactions were also significant effects:

1. LEP status by needs/resource category
   (in New York City, former LEP students > both never-LEP and current LEP students. In the Big Four districts, former LEP students and never-LEP students > current LEP students. In high need urban suburban districts, never-LEP students > former and current LEP students),

**2.** Needs/resource category by LEP representation
   (In New York City, students from districts testing 10 or more current LEP students > students from districts testing fewer than 10 current LEP students. In high need urban suburban districts, students from districts in which fewer than 10 current LEP students were tested > students from districts in which there were 10 or more current LEP students tested),

**3.** Year of administration by LEP status by needs/resource category

(In all three years in New York City, never-LEP students and former LEP students > current LEP students), and

**4.** LEP status by year of administration by LEP representation*
(Among districts that tested fewer than 10 current LEP students, in the low need districts, never-LEP students > current LEP students. Among districts testing 10 or more current LEP students, in New York City, never-LEP students and former LEP students each > current LEP students).

Math-4

Table 2c presents the results of the Math-4 general linear analysis. All of the main effects were significant:

1. Year of administration (2001>1999>2000),

2. LEP status (never LEP>former LEP>at or above the 30th percentile>below the 30th percentile),

3. Needs/resource category (Low need>average>high need rural>high need urban suburban>New York City and the Big Four),

3. LEP representation (less than 10> 10 or more).

In addition, the following interactions reached significant statistical levels:

1. Year of administration by LEP status,

2. Year of administration by needs/resource category,

3. LEP status by needs/resource category
(In New York City, former LEP students >never-LEP students>current LEP students. In Big Four, High need urban/suburban, average, and high need rural districts never and former LEP students> current LEP students. In low need districts, never LEP students> former and current LEP students, but former are not greater than at or above 30th percentile students.)

4. Needs/resource category by LEP representation*
(Among districts with 10 or more tested LEP students: (Low need> average>high need rural>high need urban/suburban>New York City and the Big Four. Among districts with 10 or fewer LEP students, Low need>average>rural>high need urban/suburban>New York City), and

5. Year of administration by LEP status by needs/resource category*
(For each of the three years, among New York City students, former LEP students > students who were never LEP students, and, in turn, both never LEP and former LEP students >current LEP students. These contrasts were not significant in the other needs/resource categories.).

Math-8

The Math-8 results are summarized in Table 2d. Each of the main effects is significant, as are several of the first and second order interactions. The main effects are:

1. Year of administration (200>2001>1999),

2. LEP status (Never LEP>former LEP>both current LEP student groups),

3. Needs/resource category (students from low needs districts>average> High need rural>high need urban suburban>New York City>Big Four),

4. LEP representation (10 or more>fewer than 10).

The statistically significant interactions included:

1. LEP status by needs/resource category
   (For New York City, Former LEP students>never-LEP and current LEP students;
   For Big Four, former and never-LEP students>current LEP students above the 30$^{th}$ percentile;
   For high need urban/suburban districts, never-LEP students>former and current LEP students above the 30$^{th}$ percentile;
   For high need rural districts, no significant differences among former, never, and current LEP students above the 30$^{th}$ percentile;
   For average districts, never LEP students>former LEP students and current LEP students above the 30$^{th}$ percentile;
   For low needs districts, no significant differences among never- and former-LEP students and current-LEP students above the 30$^{th}$ percentile.),

2. LEP representation by needs/resource category
   (Among districts with fewer than 10 LEP students tested: Low needs districts>average districts>high need rural districts> High need urban/suburban districts> New York City. Among Districts testing 10 or more LEP students: Low needs districts> average districts> high need urban/suburban districts>New York City> the Big Four districts),

3. LEP status by needs/resource category by LEP representation
   (Among districts with fewer than 10 LEP students tested no significant contrasts were observed either of former LEP students and never-LEP students nor of former LEP students and current LEP students at or above the 30$^{th}$ percentile. Among districts with 10 or more current LEP students tested, former LEP students scored significantly higher than never-LEP and current LEP students in New York City, and in the Big Four districts both the former and never-LEP students scored significantly higher than the current LEP students.),

## Table 2a

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Fourth Grade English Language Arts (ELA-4), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| New York City | At or above 30th | LEP ≥ 10 | 601.60 | 602.77 | 604.59 | 602.67 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 601.60 | 602.77 | 604.56 | 602.67 |
| | Below 30th | LEP ≥ 10 | 578.31 | 585.26 | 586.09 | 583.32 |
| | | LEP < 10 | 591.00 | 579.00 | 559.09 | 566.06 |
| | | Both | 578.31 | 585.25 | 586.02 | 583.31 |
| | Former LEP | LEP ≥ 10 | 632.84 | 641.87 | 642.06 | 639.06 |
| | | LEP < 10 | 585.50 | 608.13 | 597.50 | 601.86 |
| | | Both | 632.83 | 641.85 | 642.05 | 639.05 |
| | Never LEP | LEP ≥ 10 | 630.51 | 639.79 | 640.62 | 637.04 |
| | | LEP < 10 | 574.00 | 602.82 | 608.77 | 603.62 |
| | | Both | 630.47 | 639.65 | 640.49 | 636.95 |
| | All | LEP ≥ 10 | 627.41 | 636.25 | 637.52 | 633.80 |
| | | LEP < 10 | 575.00 | 602.58 | 606.42 | 602.40 |
| | | Both | 627.38 | 636.15 | 637.42 | 633.73 |
| Big Four | At or above 30th | LEP ≥ 10 | 625.53 | 640.32 | 639.05 | 634.92 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 625.53 | 640.32 | 639.05 | 634.92 |
| | Below 30th | LEP ≥ 10 | 600.10 | 625.72 | 627.86 | 618.51 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 600.10 | 625.72 | 627.86 | 618.51 |
| | Former LEP | LEP ≥ 10 | 633.04 | 638.15 | 649.21 | 641.69 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 633.04 | 638.15 | 649.21 | 641.69 |
| | Never LEP | LEP ≥ 10 | 628.06 | 635.09 | 635.91 | 633.03 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 628.06 | 635.09 | 635.91 | 633.03 |
| | All | LEP ≥ 10 | 627.92 | 635.28 | 636.57 | 633.33 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 627.92 | 635.28 | 636.57 | 633.33 |
| High Need Urb/Sub | At or above 30th | LEP ≥ 10 | 612.73 | 642.92 | 652.40 | 630.40 |
| | | LEP < 10 | 624.85 | 632.59 | 630.18 | 629.85 |
| | | Both | 614.60 | 638.03 | 645.16 | 630.24 |
| | Below 30th | LEP ≥ 10 | 612.63 | 640.60 | 638.24 | 629.55 |
| | | LEP < 10 | 601.08 | 631.67 | 620.14 | 612.76 |
| | | Both | 608.94 | 638.24 | 635.90 | 625.56 |
| | Former LEP | LEP ≥ 10 | 629.70 | 636.17 | 640.87 | 635.57 |
| | | LEP < 10 | 629.45 | 645.77 | 649.58 | 642.29 |
| | | Both | 629.65 | 638.29 | 642.98 | 637.06 |
| | Never LEP | LEP ≥ 10 | 635.56 | 645.97 | 651.59 | 644.40 |
| | | LEP < 10 | 637.81 | 649.82 | 650.74 | 646.24 |
| | | Both | 637.23 | 648.81 | 650.95 | 645.78 |
| | All | LEP ≥ 10 | 633.84 | 645.10 | 650.31 | 643.06 |
| | | LEP < 10 | 637.58 | 649.69 | 650.61 | 646.08 |
| | | Both | 636.52 | 648.41 | 650.53 | 645.25 |

## Table 2a

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Fourth Grade English Language Arts (ELA-4), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| High Need Rural | At or above 30th | LEP ≥ 10 | 623.47 | 624.17 | 639.52 | 630.90 |
| | | LEP < 10 | 608.36 | 640.83 | 645.57 | 628.06 |
| | | Both | 616.17 | 630.83 | 640.76 | 629.89 |
| | Below 30th | LEP ≥ 10 | 634.00 | 633.67 | 647.00 | 638.25 |
| | | LEP < 10 | 614.78 | 638.60 | 662.00 | 631.89 |
| | | Both | 621.64 | 636.75 | 654.50 | 634.43 |
| | Former LEP | LEP ≥ 10 | 647.52 | ---- | 678.00 | 648.91 |
| | | LEP < 10 | 633.18 | 659.24 | 639.54 | 641.12 |
| | | Both | 638.65 | 659.24 | 641.08 | 642.89 |
| | Never LEP | LEP ≥ 10 | 644.27 | 651.05 | 651.07 | 648.75 |
| | | LEP < 10 | 643.38 | 653.75 | 653.03 | 650.08 |
| | | Both | 643.42 | 653.64 | 652.95 | 650.03 |
| | All | LEP ≥ 10 | 643.78 | 650.11 | 650.54 | 648.06 |
| | | LEP < 10 | 643.30 | 653.74 | 653.00 | 650.04 |
| | | Both | 643.32 | 653.59 | 652.90 | 649.95 |
| Average | At or above 30th | LEP ≥ 10 | 639.84 | 630.64 | 650.29 | 643.73 |
| | | LEP < 10 | 635.60 | 643.70 | 639.34 | 639.20 |
| | | Both | 637.39 | 640.93 | 645.07 | 641.07 |
| | Below 30th | LEP ≥ 10 | 629.18 | 663.07 | 625.25 | 635.19 |
| | | LEP < 10 | 623.34 | 630.09 | 638.35 | 627.36 |
| | | Both | 625.54 | 642.57 | 629.75 | 630.82 |
| | Former LEP | LEP ≥ 10 | 642.63 | 651.55 | 649.26 | 648.19 |
| | | LEP < 10 | 636.78 | 649.15 | 641.99 | 642.89 |
| | | Both | 637.70 | 649.63 | 642.52 | 643.67 |
| | Never LEP | LEP ≥ 10 | 651.11 | 665.93 | 664.20 | 660.49 |
| | | LEP < 10 | 650.53 | 663.17 | 663.87 | 659.38 |
| | | Both | 650.57 | 663.34 | 663.88 | 659.45 |
| | All | LEP ≥ 10 | 650.44 | 665.43 | 663.30 | 650.76 |
| | | LEP < 10 | 650.40 | 663.06 | 663.72 | 659.24 |
| | | Both | 650.40 | 663.20 | 663.69 | 659.27 |
| Low Need | At or above 30th | LEP ≥ 10 | 645.76 | 659.55 | 655.16 | 655.10 |
| | | LEP < 10 | 639.91 | 653.72 | 654.48 | 649.01 |
| | | Both | 641.92 | 656.73 | 654.72 | 651.58 |
| | Below 30th | LEP ≥ 10 | 646.08 | 647.44 | 670.50 | 651.75 |
| | | LEP < 10 | 631.09 | 657.46 | 660.16 | 646.07 |
| | | Both | 634.39 | 655.50 | 662.64 | 647.29 |
| | Former LEP | LEP ≥ 10 | 659.18 | 681.98 | 672.51 | 670.76 |
| | | LEP < 10 | 644.93 | 659.83 | 666.12 | 655.66 |
| | | Both | 647.41 | 663.71 | 667.85 | 658.74 |
| | Never LEP | LEP ≥ 10 | 659.60 | 678.96 | 683.50 | 674.18 |
| | | LEP < 10 | 659.56 | 676.94 | 680.36 | 672.56 |
| | | Both | 659.56 | 677.08 | 680.59 | 672.68 |
| | All | LEP ≥ 10 | 659.21 | 678.10 | 682.64 | 673.49 |
| | | LEP < 10 | 659.30 | 676.71 | 680.19 | 672.32 |
| | | Both | 659.29 | 676.81 | 680.37 | 672.41 |

## Table 2a

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Fourth Grade English Language Arts (ELA-4), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| Whole State | At or above 30th | LEP ≥ 10 | 608.67 | 617.73 | 622.21 | 615.02 |
| | | LEP < 10 | 634.43 | 645.28 | 642.30 | 640.52 |
| | | Both | 612.01 | 623.31 | 625.43 | 619.06 |
| | Below 30th | LEP ≥ 10 | 580.07 | 586.81 | 588.32 | 585.15 |
| | | LEP < 10 | 620.15 | 638.08 | 629.65 | 627.33 |
| | | Both | 581.61 | 587.85 | 588.94 | 586.18 |
| | Former LEP | LEP ≥ 10 | 632.91 | 641.78 | 642.38 | 639.19 |
| | | LEP < 10 | 638.53 | 652.01 | 650.22 | 646.79 |
| | | Both | 633.15 | 642.17 | 642.67 | 639.49 |
| | Never LEP | LEP ≥ 10 | 632.42 | 642.12 | 642.98 | 639.23 |
| | | LEP < 10 | 650.53 | 664.04 | 665.18 | 660.10 |
| | | Both | 643.17 | 655.39 | 656.24 | 651.73 |
| | All | LEP ≥ 10 | 629.53 | 638.84 | 640.07 | 636.22 |
| | | LEP < 10 | 650.37 | 663.91 | 665.03 | 659.95 |
| | | Both | 640.66 | 652.48 | 653.47 | 648.99 |

## Table 2b

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Eighth Grade English Language Arts (ELA-8), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| New York City | At or above 30th | LEP ≥ 10 | 655.51 | 654.95 | 657.90 | 655.65 |
| | | LEP < 10 | 622.43 | 628.50 | ---- | 623.78 |
| | | Both | 655.43 | 654.76 | 657.90 | 655.57 |
| | Below 30th | LEP ≥ 10 | 657.26 | 646.37 | 649.41 | 648.79 |
| | | LEP < 10 | 701.00 | 615.63 | 653.00 | 640.31 |
| | | Both | 657.34 | 646.32 | 649.41 | 648.78 |
| | Former LEP | LEP ≥ 10 | 694.48 | 690.06 | 690.78 | 691.70 |
| | | LEP < 10 | 662.00 | 652.94 | 669.55 | 661.04 |
| | | Both | 694.45 | 689.99 | 690.74 | 691.65 |
| | Never LEP | LEP ≥ 10 | 692.12 | 688.34 | 689.60 | 690.00 |
| | | LEP < 10 | 672.15 | 659.79 | 669.21 | 666.73 |
| | | Both | 692.01 | 688.15 | 689.45 | 689.85 |
| | All | LEP ≥ 10 | 690.22 | 685.51 | 687.00 | 687.53 |
| | | LEP < 10 | 670.37 | 657.80 | 668.95 | 665.35 |
| | | Both | 690.14 | 685.37 | 686.90 | 687.42 |
| Big Four | At or above 30th | LEP ≥ 10 | 680.39 | 662.44 | 667.59 | 669.58 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 680.39 | 662.44 | 667.59 | 669.58 |
| | Below 30th | LEP ≥ 10 | 655.23 | 671.00 | 663.90 | 659.78 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 655.23 | 671.00 | 663.90 | 659.78 |
| | Former LEP | LEP ≥ 10 | 686.96 | 685.44 | 682.16 | 684.34 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 686.96 | 685.44 | 682.16 | 684.34 |
| | Never LEP | LEP ≥ 10 | 687.81 | 682.07 | 682.18 | 683.97 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 687.81 | 682.07 | 682.18 | 683.97 |
| | All | LEP ≥ 10 | 687.31 | 681.95 | 681.75 | 683.58 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 687.31 | 681.95 | 681.75 | 683.58 |
| High Need Urb/Sub | At or above 30th | LEP ≥ 10 | 693.40 | 694.18 | 695.29 | 694.80 |
| | | LEP < 10 | 680.76 | 666.00 | 668.21 | 671.67 |
| | | Both | 682.87 | 675.12 | 681.75 | 680.15 |
| | Below 30th | LEP ≥ 10 | 667.63 | 669.82 | 667.82 | 668.36 |
| | | LEP < 10 | 674.69 | 657.73 | 668.15 | 667.14 |
| | | Both | 668.87 | 667.85 | 667.87 | 668.16 |
| | Former LEP | LEP ≥ 10 | 681.62 | 682.12 | 686.02 | 683.40 |
| | | LEP < 10 | 672.43 | 671.48 | 680.52 | 676.03 |
| | | Both | 681.13 | 680.07 | 684.98 | 682.30 |
| | Never LEP | LEP ≥ 10 | 689.70 | 687.48 | 688.38 | 688.55 |
| | | LEP < 10 | 694.76 | 691.38 | 691.10 | 692.37 |
| | | Both | 693.56 | 690.56 | 690.49 | 691.51 |
| | All | LEP ≥ 10 | 688.67 | 686.72 | 687.66 | 687.71 |
| | | LEP < 10 | 694.67 | 691.19 | 690.94 | 692.21 |
| | | Both | 693.14 | 690.18 | 690.14 | 691.12 |

## Table 2b

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Fourth Grade English Language Arts (ELA-8), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| High Need Rural | At or above 30th | LEP ≥ 10 | 659.80 | 650.25 | ---- | 655.56 |
| | | LEP < 10 | 671.33 | 690.33 | 696.17 | 688.87 |
| | | Both | 664.13 | 674.30 | 696.17 | 676.38 |
| | Below 30th | LEP ≥ 10 | 652.00 | ---- | 664.42 | 663.46 |
| | | LEP < 10 | 664.86 | 661.00 | 658.25 | 662.07 |
| | | Both | 663.25 | 661.00 | 662.88 | 662.71 |
| | Former LEP | LEP ≥ 10 | 665.29 | ---- | 625.00 | 660.25 |
| | | LEP < 10 | 674.92 | 669.38 | 679.27 | 676.31 |
| | | Both | 672.74 | 669.38 | 677.52 | 674.47 |
| | Never LEP | LEP ≥ 10 | 694.70 | 685.73 | 688.97 | 689.83 |
| | | LEP < 10 | 698.62 | 695.54 | 696.16 | 696.79 |
| | | Both | 698.55 | 695.36 | 696.03 | 696.66 |
| | All | LEP ≥ 10 | 693.21 | 685.21 | 687.65 | 688.76 |
| | | LEP < 10 | 698.56 | 695.52 | 696.12 | 696.74 |
| | | Both | 698.45 | 695.32 | 695.95 | 696.59 |
| Average | At or above 30th | LEP ≥ 10 | 692.32 | 689.82 | 675.78 | 687.92 |
| | | LEP < 10 | 688.48 | 677.50 | 678.14 | 681.31 |
| | | Both | 689.89 | 684.50 | 677.62 | 683.90 |
| | Below 30th | LEP ≥ 10 | 695.20 | 680.54 | 680.57 | 681.78 |
| | | LEP < 10 | 666.78 | 669.81 | 671.31 | 669.22 |
| | | Both | 669.19 | 671.92 | 675.63 | 672.73 |
| | Former LEP | LEP ≥ 10 | 667.50 | ---- | 666.60 | 666.86 |
| | | LEP < 10 | 693.81 | 688.16 | 688.31 | 689.67 |
| | | Both | 693.41 | 688.16 | 687.75 | 689.36 |
| | Never LEP | LEP ≥ 10 | 707.22 | 708.87 | 708.53 | 708.23 |
| | | LEP < 10 | 704.64 | 702.99 | 703.80 | 703.78 |
| | | Both | 704.69 | 703.87 | 703.89 | 703.86 |
| | All | LEP ≥ 10 | 706.75 | 707.88 | 707.05 | 707.24 |
| | | LEP < 10 | 704.57 | 702.90 | 703.71 | 703.70 |
| | | Both | 704.61 | 703.00 | 703.78 | 703.77 |
| Low Need | At or above 30th | LEP ≥ 10 | ---- | ---- | ---- | ---- |
| | | LEP < 10 | 694.93 | 692.17 | 683.89 | 689.81 |
| | | Both | 694.93 | 692.17 | 683.89 | 689.81 |
| | Below 30th | LEP ≥ 10 | ---- | ---- | ---- | ---- |
| | | LEP < 10 | 687.83 | 681.71 | 700.00 | 688.84 |
| | | Both | 687.83 | 681.71 | 700.00 | 688.84 |
| | Former LEP | LEP ≥ 10 | ---- | ---- | ---- | ---- |
| | | LEP < 10 | 691.59 | 702.55 | 704.41 | 700.71 |
| | | Both | 691.59 | 702.55 | 704.41 | 700.71 |
| | Never LEP | LEP ≥ 10 | ---- | ---- | ---- | ---- |
| | | LEP < 10 | 714.58 | 715.58 | 716.87 | 715.75 |
| | | Both | 714.58 | 715.58 | 716.87 | 715.57 |
| | All | LEP ≥ 10 | ---- | ---- | ---- | ---- |
| | | LEP < 10 | 714.45 | 715.43 | 716.75 | 715.61 |
| | | Both | 714.45 | 715.43 | 716.75 | 715.61 |

## Table 2b

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Fourth Grade English Language Arts (ELA-8), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| Whole State | At or above 30th | LEP ≥ 10 | 656.23 | 661.60 | 663.72 | 658.08 |
| | | LEP < 10 | 685.23 | 681.95 | 679.31 | 681.95 |
| | | Both | 657.85 | 665.91 | 667.75 | 660.25 |
| | Below 30th | LEP ≥ 10 | 657.92 | 646.86 | 650.43 | 649.66 |
| | | LEP < 10 | 675.48 | 669.29 | 678.20 | 674.13 |
| | | Both | 659.53 | 647.45 | 651.10 | 650.47 |
| | Former LEP | LEP ≥ 10 | 694.18 | 689.82 | 690.46 | 691.40 |
| | | LEP < 10 | 688.17 | 685.63 | 687.86 | 687.11 |
| | | Both | 694.09 | 689.74 | 690.41 | 691.31 |
| | Never LEP | LEP ≥ 10 | 691.74 | 687.90 | 688.97 | 689.52 |
| | | LEP < 10 | 704.99 | 703.84 | 704.78 | 704.52 |
| | | Both | 700.63 | 698.87 | 699.84 | 699.76 |
| | All | LEP ≥ 10 | 690.13 | 685.58 | 686.83 | 687.47 |
| | | LEP < 10 | 704.90 | 703.73 | 704.67 | 704.42 |
| | | Both | 698.97 | 696.67 | 697.76 | 697.77 |

## Table 2c

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Fourth Grade Mathematics (Math-4), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| New York City | At or above 30th | LEP ≥ 10 | 609.92 | 612.16 | 616.01 | 612.38 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 609.92 | 612.16 | 616.01 | 612.38 |
| | Below 30th | LEP ≥ 10 | 594.96 | 598.41 | 605.64 | 599.79 |
| | | LEP < 10 | 552.00 | 577.00 | 577.00 | 570.75 |
| | | Both | 594.96 | 598.41 | 605.64 | 599.78 |
| | Former LEP | LEP ≥ 10 | 644.83 | 641.90 | 648.29 | 645.02 |
| | | LEP < 10 | 606.00 | 601.33 | ---- | 603.20 |
| | | Both | 644.83 | 641.89 | 648.29 | 645.02 |
| | Never LEP | LEP ≥ 10 | 637.26 | 633.83 | 639.42 | 636.86 |
| | | LEP < 10 | 593.50 | 581.00 | 575.82 | 582.48 |
| | | Both | 637.23 | 633.79 | 639.38 | 636.83 |
| | All | LEP ≥ 10 | 635.15 | 632.09 | 638.15 | 635.16 |
| | | LEP < 10 | 593.03 | 582.30 | 575.87 | 582.04 |
| | | Both | 635.13 | 632.07 | 638.12 | 635.13 |
| Big Four | At or above 30th | LEP ≥ 10 | 629.14 | 620.58 | 635.83 | 626.87 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 629.14 | 620.58 | 635.83 | 626.87 |
| | Below 30th | LEP ≥ 10 | 605.97 | 598.21 | 622.55 | 615.78 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 605.97 | 598.21 | 622.55 | 615.78 |
| | Former LEP | LEP ≥ 10 | 646.94 | 632.89 | 649.73 | 640.37 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 646.94 | 632.89 | 649.73 | 640.37 |
| | Never LEP | LEP ≥ 10 | 636.14 | 632.39 | 638.09 | 635.51 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 636.14 | 632.39 | 638.09 | 635.51 |
| | All | LEP ≥ 10 | 635.17 | 631.17 | 637.65 | 634.81 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 635.17 | 631.17 | 637.65 | 634.81 |
| High Need Urb/Sub | At or above 30th | LEP ≥ 10 | 626.63 | 646.71 | 653.45 | 639.77 |
| | | LEP < 10 | 648.50 | 643.42 | 631.11 | 642.75 |
| | | Both | 628.46 | 646.11 | 651.95 | 640.07 |
| | Below 30th | LEP ≥ 10 | 618.67 | 623.66 | 627.05 | 623.33 |
| | | LEP < 10 | 619.79 | 621.67 | 633.26 | 624.93 |
| | | Both | 618.72 | 623.59 | 627.29 | 623.39 |
| | Former LEP | LEP ≥ 10 | 643.69 | 643.13 | 648.19 | 644.87 |
| | | LEP < 10 | 642.29 | 645.50 | 655.17 | 645.05 |
| | | Both | 643.63 | 643.19 | 648.29 | 644.88 |
| | Never LEP | LEP ≥ 10 | 644.72 | 643.65 | 651.31 | 646.49 |
| | | LEP < 10 | 650.45 | 648.66 | 655.30 | 651.45 |
| | | Both | 646.80 | 645.53 | 652.82 | 648.34 |
| | All | LEP ≥ 10 | 643.21 | 642.64 | 649.88 | 645.18 |
| | | LEP < 10 | 650.28 | 648.54 | 655.17 | 651.31 |
| | | Both | 645.62 | 644.72 | 651.75 | 647.32 |

## Table 2c

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Fourth Grade Mathematics (Math-4), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| High Need Rural | At or above 30th | LEP ≥ 10 | 620.64 | 624.60 | 634.22 | 626.66 |
| | | LEP < 10 | 631.00 | 635.21 | 652.17 | 638.15 |
| | | Both | 622.86 | 628.97 | 637.93 | 629.95 |
| | Below 30th | LEP ≥ 10 | 622.13 | 616.64 | 624.32 | 621.63 |
| | | LEP < 10 | 628.74 | 626.11 | 638.48 | 631.59 |
| | | Both | 625.82 | 621.02 | 629.66 | 626.10 |
| | Former LEP | LEP ≥ 10 | 646.66 | 643.11 | 654.88 | 647.47 |
| | | LEP < 10 | 646.09 | 644.36 | 643.54 | 644.60 |
| | | Both | 646.55 | 643.57 | 649.79 | 646.59 |
| | Never LEP | LEP ≥ 10 | 653.92 | 650.49 | 654.53 | 652.97 |
| | | LEP < 10 | 653.34 | 651.01 | 656.41 | 653.56 |
| | | Both | 653.38 | 650.97 | 656.29 | 653.52 |
| | All | LEP ≥ 10 | 652.42 | 649.06 | 652.86 | 651.45 |
| | | LEP < 10 | 653.28 | 650.95 | 656.12 | 653.50 |
| | | Both | 653.22 | 650.82 | 664.16 | 653.36 |
| Average | At or above 30th | LEP ≥ 10 | 657.46 | 637.43 | 647.55 | 649.33 |
| | | LEP < 10 | 649.50 | 652.85 | 652.71 | 651.56 |
| | | Both | 655.14 | 642.97 | 649.06 | 650.01 |
| | Below 30th | LEP ≥ 10 | 630.37 | 628.19 | 623.96 | 627.79 |
| | | LEP < 10 | 633.45 | 633.74 | 638.29 | 635.11 |
| | | Both | 631.10 | 629.29 | 627.58 | 629.46 |
| | Former LEP | LEP ≥ 10 | 647.85 | 648.83 | 649.47 | 648.71 |
| | | LEP < 10 | 657.34 | 652.36 | 654.92 | 654.92 |
| | | Both | 650.76 | 649.69 | 650.97 | 650.41 |
| | Never LEP | LEP ≥ 10 | 662.63 | 658.11 | 665.65 | 661.99 |
| | | LEP < 10 | 662.97 | 658.84 | 666.39 | 662.72 |
| | | Both | 662.89 | 658.67 | 666.23 | 662.56 |
| | All | LEP ≥ 10 | 661.35 | 657.01 | 664.16 | 660.71 |
| | | LEP < 10 | 662.85 | 658.76 | 666.29 | 662.62 |
| | | Both | 662.50 | 658.34 | 665.81 | 662.18 |
| Low Need | At or above 30th | LEP ≥ 10 | 672.73 | 669.70 | 657.52 | 667.68 |
| | | LEP < 10 | 663.38 | 662.93 | 665.77 | 663.89 |
| | | Both | 667.41 | 666.17 | 662.53 | 665.57 |
| | Below 30th | LEP ≥ 10 | 656.73 | 642.70 | 659.60 | 652.97 |
| | | LEP < 10 | 651.38 | 648.04 | 642.90 | 647.66 |
| | | Both | 653.54 | 646.39 | 647.42 | 649.44 |
| | Former LEP | LEP ≥ 10 | 672.30 | 674.16 | 683.85 | 676.33 |
| | | LEP < 10 | 664.05 | 663.90 | 673.83 | 666.10 |
| | | Both | 666.27 | 666.53 | 677.40 | 669.02 |
| | Never LEP | LEP ≥ 10 | 683.83 | 680.10 | 692.41 | 684.31 |
| | | LEP < 10 | 677.98 | 672.64 | 681.57 | 677.26 |
| | | Both | 678.56 | 673.29 | 682.20 | 677.84 |
| | All | LEP ≥ 10 | 682.49 | 678.82 | 690.28 | 682.85 |
| | | LEP < 10 | 677.68 | 672.42 | 681.31 | 676.99 |
| | | Both | 678.18 | 673.01 | 681.87 | 677.50 |

## Table 2c

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Fourth Grade Mathematics (Math-4), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| Whole State | At or above 30th | LEP ≥ 10 | 621.89 | 622.59 | 629.07 | 624.22 |
| | | LEP < 10 | 655.20 | 656.06 | 657.74 | 656.28 |
| | | Both | 624.65 | 626.25 | 631.89 | 627.30 |
| | Below 30th | LEP ≥ 10 | 600.10 | 602.14 | 609.44 | 604.02 |
| | | LEP < 10 | 639.25 | 638.93 | 639.32 | 639.17 |
| | | Both | 601.75 | 603.40 | 610.46 | 605.31 |
| | Former LEP | LEP ≥ 10 | 645.03 | 641.86 | 648.49 | 645.12 |
| | | LEP < 10 | 660.17 | 658.75 | 664.84 | 660.79 |
| | | Both | 645.38 | 642.20 | 648.72 | 645.42 |
| | Never LEP | LEP ≥ 10 | 643.53 | 640.13 | 645.41 | 643.01 |
| | | LEP < 10 | 665.07 | 661.06 | 668.39 | 664.80 |
| | | Both | 654.43 | 650.77 | 656.97 | 654.03 |
| | All | LEP ≥ 10 | 640.70 | 637.61 | 643.18 | 640.49 |
| | | LEP < 10 | 664.95 | 660.98 | 668.28 | 684.69 |
| | | Both | 651.54 | 648.11 | 654.30 | 651.29 |

## Table 2d

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Eighth Grade Mathematics (Math-8), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| New York City | At or above 30th | LEP ≥ 10 | 647.99 | 659.21 | 658.00 | 649.54 |
| | | LEP < 10 | 613.00 | 665.00 | 684.00 | 621.79 |
| | | Both | 647.87 | 659.23 | 658.28 | 649.45 |
| | Below 30th | LEP ≥ 10 | 660.74 | 653.95 | 654.54 | 655.48 |
| | | LEP < 10 | 647.50 | 621.29 | 622.67 | 627.94 |
| | | Both | 660.72 | 653.92 | 654.51 | 655.45 |
| | Former LEP | LEP ≥ 10 | 694.62 | 695.43 | 695.10 | 695.06 |
| | | LEP < 10 | 643.93 | 662.23 | 656.70 | 654.52 |
| | | Both | 694.53 | 695.37 | 695.02 | 694.98 |
| | Never LEP | LEP ≥ 10 | 684.18 | 686.68 | 685.48 | 685.45 |
| | | LEP < 10 | 656.45 | 657.46 | 659.30 | 657.80 |
| | | Both | 684.00 | 686.49 | 685.29 | 685.26 |
| | All | LEP ≥ 10 | 683.60 | 685.33 | 684.77 | 684.58 |
| | | LEP < 10 | 653.82 | 657.13 | 658.52 | 656.48 |
| | | Both | 683.45 | 685.19 | 684.63 | 680.79 |
| Big Four | At or above 30th | LEP ≥ 10 | 662.84 | 653.27 | 660.79 | 658.04 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 662.84 | 653.27 | 660.79 | 658.04 |
| | Below 30th | LEP ≥ 10 | 647.79 | 651.17 | 659.89 | 654.67 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 647.79 | 651.17 | 659.89 | 654.67 |
| | Former LEP | LEP ≥ 10 | 677.58 | 680.56 | 678.67 | 679.40 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 677.58 | 680.56 | 678.67 | 679.40 |
| | Never LEP | LEP ≥ 10 | 682.88 | 683.78 | 679.53 | 682.06 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 682.88 | 683.78 | 679.53 | 682.06 |
| | All | LEP ≥ 10 | 681.48 | 682.38 | 678.56 | 680.79 |
| | | LEP < 10 | ---- | ---- | ---- | ---- |
| | | Both | 681.48 | 682.38 | 678.56 | 680.79 |
| High Need Urb/Sub | At or above 30th | LEP ≥ 10 | 661.81 | 651.80 | 696.53 | 666.07 |
| | | LEP < 10 | 690.18 | 681.86 | 677.54 | 681.64 |
| | | Both | 666.08 | 660.21 | 688.67 | 670.31 |
| | Below 30th | LEP ≥ 10 | 644.72 | 664.61 | 659.74 | 656.88 |
| | | LEP < 10 | 659.19 | 667.33 | 665.42 | 664.71 |
| | | Both | 645.55 | 664.85 | 660.18 | 657.46 |
| | Former LEP | LEP ≥ 10 | 682.02 | 688.46 | 689.12 | 686.66 |
| | | LEP < 10 | 679.60 | 690.88 | 699.60 | 690.38 |
| | | Both | 681.98 | 688.60 | 689.28 | 686.77 |
| | Never LEP | LEP ≥ 10 | 684.99 | 691.44 | 690.69 | 688.98 |
| | | LEP < 10 | 698.07 | 701.36 | 699.46 | 699.68 |
| | | Both | 693.12 | 698.02 | 696.33 | 695.86 |
| | All | LEP ≥ 10 | 682.72 | 689.59 | 688.33 | 686.83 |
| | | LEP < 10 | 697.97 | 701.21 | 699.27 | 699.54 |
| | | Both | 691.81 | 697.02 | 695.01 | 694.65 |

## Table 2d

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Eighth Grade Mathematics (Math-8), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| High Need Rural | At or above 30th | LEP ≥ 10 | 666.40 | 671.00 | ---- | 668.44 |
| | | LEP < 10 | 677.25 | 662.08 | 693.55 | 677.15 |
| | | Both | 671.22 | 664.31 | 693.55 | 674.97 |
| | Below 30th | LEP ≥ 10 | 632.00 | 621.00 | 660.00 | 652.31 |
| | | LEP < 10 | 662.90 | 680.57 | 664.78 | 669.60 |
| | | Both | 655.77 | 676.60 | 662.87 | 664.83 |
| | Former LEP | LEP ≥ 10 | 662.29 | ---- | 627.00 | 657.88 |
| | | LEP < 10 | 676.75 | 682.00 | 682.77 | 682.05 |
| | | Both | 667.55 | 682.00 | 680.97 | 678.18 |
| | Never LEP | LEP ≥ 10 | 688.78 | 689.44 | 690.48 | 689.55 |
| | | LEP < 10 | 703.44 | 707.40 | 706.47 | 705.77 |
| | | Both | 703.16 | 707.07 | 706.17 | 705.46 |
| | All | LEP ≥ 10 | 687.18 | 688.91 | 688.91 | 688.30 |
| | | LEP < 10 | 703.40 | 707.32 | 699.27 | 705.69 |
| | | Both | 703.06 | 706.98 | 695.01 | 705.35 |
| Average | At or above 30th | LEP ≥ 10 | 706.74 | 692.23 | 700.53 | 698.12 |
| | | LEP < 10 | 704.69 | 703.42 | 699.56 | 702.28 |
| | | Both | 705.88 | 694.98 | 700.08 | 699.62 |
| | Below 30th | LEP ≥ 10 | 658.45 | 668.16 | 669.39 | 666.43 |
| | | LEP < 10 | 681.34 | 690.37 | 688.39 | 687.52 |
| | | Both | 664.50 | 674.92 | 673.96 | 672.07 |
| | Former LEP | LEP ≥ 10 | 687.81 | 697.75 | 699.99 | 696.28 |
| | | LEP < 10 | 693.65 | 703.09 | 702.20 | 699.91 |
| | | Both | 690.26 | 699.71 | 700.70 | 697.60 |
| | Never LEP | LEP ≥ 10 | 706.93 | 712.69 | 713.44 | 711.08 |
| | | LEP < 10 | 711.96 | 716.22 | 715.07 | 714.50 |
| | | Both | 711.29 | 715.79 | 714.86 | 714.07 |
| | All | LEP ≥ 10 | 705.78 | 711.09 | 711.66 | 709.59 |
| | | LEP < 10 | 711.90 | 716.16 | 715.00 | 714.44 |
| | | Both | 711.07 | 715.52 | 714.56 | 713.80 |
| Low Need | At or above 30th | LEP ≥ 10 | 675.86 | 699.30 | 702.00 | 692.87 |
| | | LEP < 10 | 718.33 | 724.55 | 709.19 | 717.28 |
| | | Both | 713.21 | 721.14 | 708.57 | 714.50 |
| | Below 30th | LEP ≥ 10 | 675.79 | 681.28 | 687.50 | 683.03 |
| | | LEP < 10 | 699.38 | 699.40 | 708.87 | 702.58 |
| | | Both | 695.45 | 694.96 | 702.53 | 697.83 |
| | Former LEP | LEP ≥ 10 | 689.90 | 712.00 | 690.80 | 696.43 |
| | | LEP < 10 | 706.68 | 722.73 | 725.08 | 720.39 |
| | | Both | 703.11 | 722.02 | 722.66 | 717.99 |
| | Never LEP | LEP ≥ 10 | 720.30 | 722.50 | 722.47 | 721.80 |
| | | LEP < 10 | 729.08 | 732.63 | 732.66 | 731.52 |
| | | Both | 728.44 | 731.90 | 731.90 | 730.81 |
| | All | LEP ≥ 10 | 719.52 | 721.53 | 721.58 | 720.92 |
| | | LEP < 10 | 728.90 | 732.41 | 732.48 | 731.33 |
| | | Both | 728.21 | 731.62 | 731.66 | 730.56 |

## Table 2d

## Mean Scale Scores for Students, by LEP Status, LEP Representation in Testing, Needs Resource Category, and Year of Test Administration, Eighth Grade Mathematics (Math-8), 1999-2001

| Needs/Resource | LEP Status | District LEP Representation | 1999 | 2000 | 2001 | All |
|---|---|---|---|---|---|---|
| Whole State | At or above 30th | LEP ≥ 10 | 649.93 | 661.11 | 666.06 | 653.36 |
| | | LEP < 10 | 698.78 | 706.25 | 699.60 | 701.57 |
| | | Both | 651.41 | 667.79 | 673.19 | 656.87 |
| | Below 30th | LEP ≥ 10 | 658.96 | 654.89 | 655.88 | 656.11 |
| | | LEP < 10 | 686.99 | 690.03 | 690.58 | 689.45 |
| | | Both | 660.30 | 656.11 | 657.12 | 657.37 |
| | Former LEP | LEP ≥ 10 | 694.17 | 694.88 | 694.58 | 694.55 |
| | | LEP < 10 | 685.65 | 703.48 | 699.89 | 697.76 |
| | | Both | 694.10 | 694.98 | 694.64 | 694.59 |
| | Never LEP | LEP ≥ 10 | 687.98 | 691.06 | 690.03 | 689.69 |
| | | LEP < 10 | 713.47 | 717.42 | 716.70 | 715.93 |
| | | Both | 703.41 | 707.51 | 706.59 | 705.88 |
| | All | LEP ≥ 10 | 686.25 | 688.58 | 688.01 | 687.63 |
| | | LEP < 10 | 713.37 | 717.31 | 716.58 | 715.82 |
| | | Both | 700.68 | 704.26 | 703.60 | 702.89 |

Score Range Analysis Results

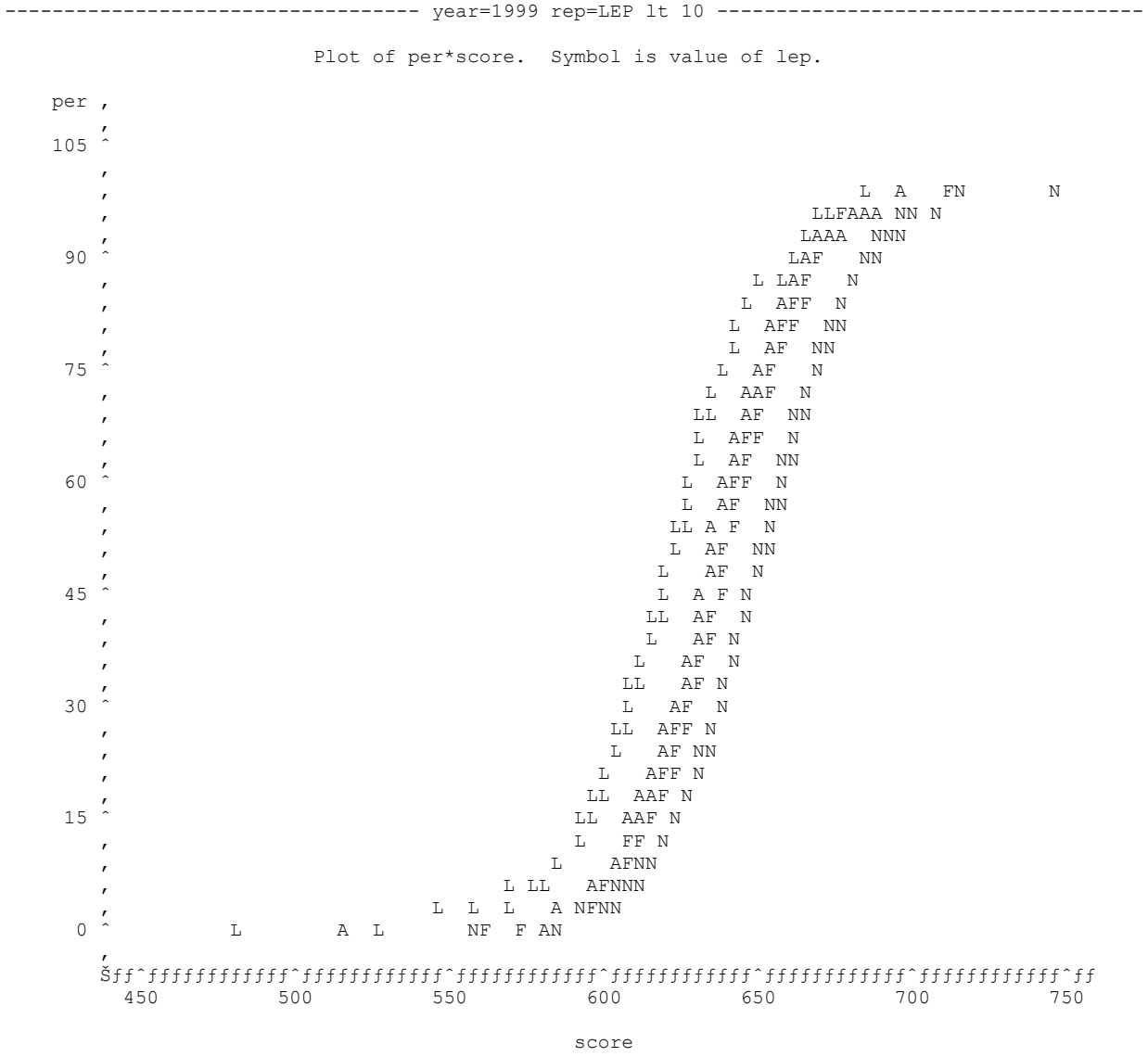
Results of the score range analysis are shown in Figures 1a (low LEP representation and high LEP representation for each year for ELA-4) through Figures 1d (low LEP representation and high LEP representation for each year for Math-8). In these figures, the performance of each LEP status group is indicated by the letters A, L, N, and F, indicating At or above the 30$^{th}$ percentile, Less than the 30$^{th}$ percentile, Never identified as a LEP student, and Former LEP student, respectively.

What is particularly strongly illustrated, is that the scoring advantage realized by the students who have never been identified as being LEP students in schools where there has been low LEP representation disappears in schools where there is larger LEP representation. Moreover, this effect is most especially true for the lower parts of the distribution of each population. The reader is reminded that the percentiles are conditioned by year of test administration, LEP representation, and LEP status, so that the 50$^{th}$ percentile, for example, represents the 50$^{th}$ scoring percentile of students in schools having high or low LEP representation, for that LEP status group for that year. Tables 3a (ELA-4) through 3d (Math-8) provide the mean scores in support of the figures.

For the sake of comprehensibility of this phenomena, a secondary series of analyses was made of scoring patterns, but this time consolidating the data into deciles conditioned on year of administration, district LEP representation (high or low), and LEP status . These data consolidations were effected to reduce the huge number of possible means for the reader to consider.

Figure 1a

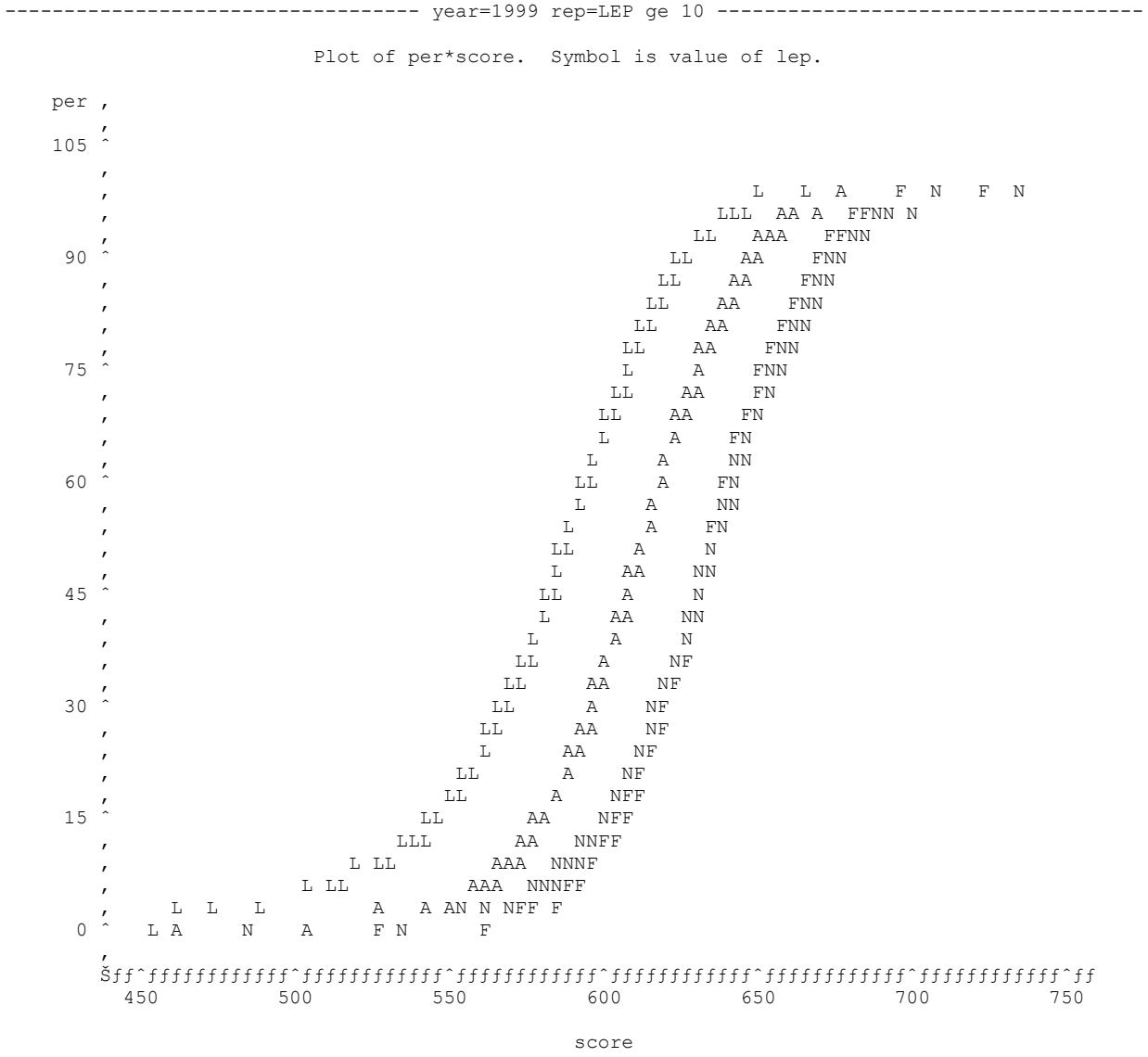
Ela-4 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status




NOTE: 126 obs hidden.

Figure 1a

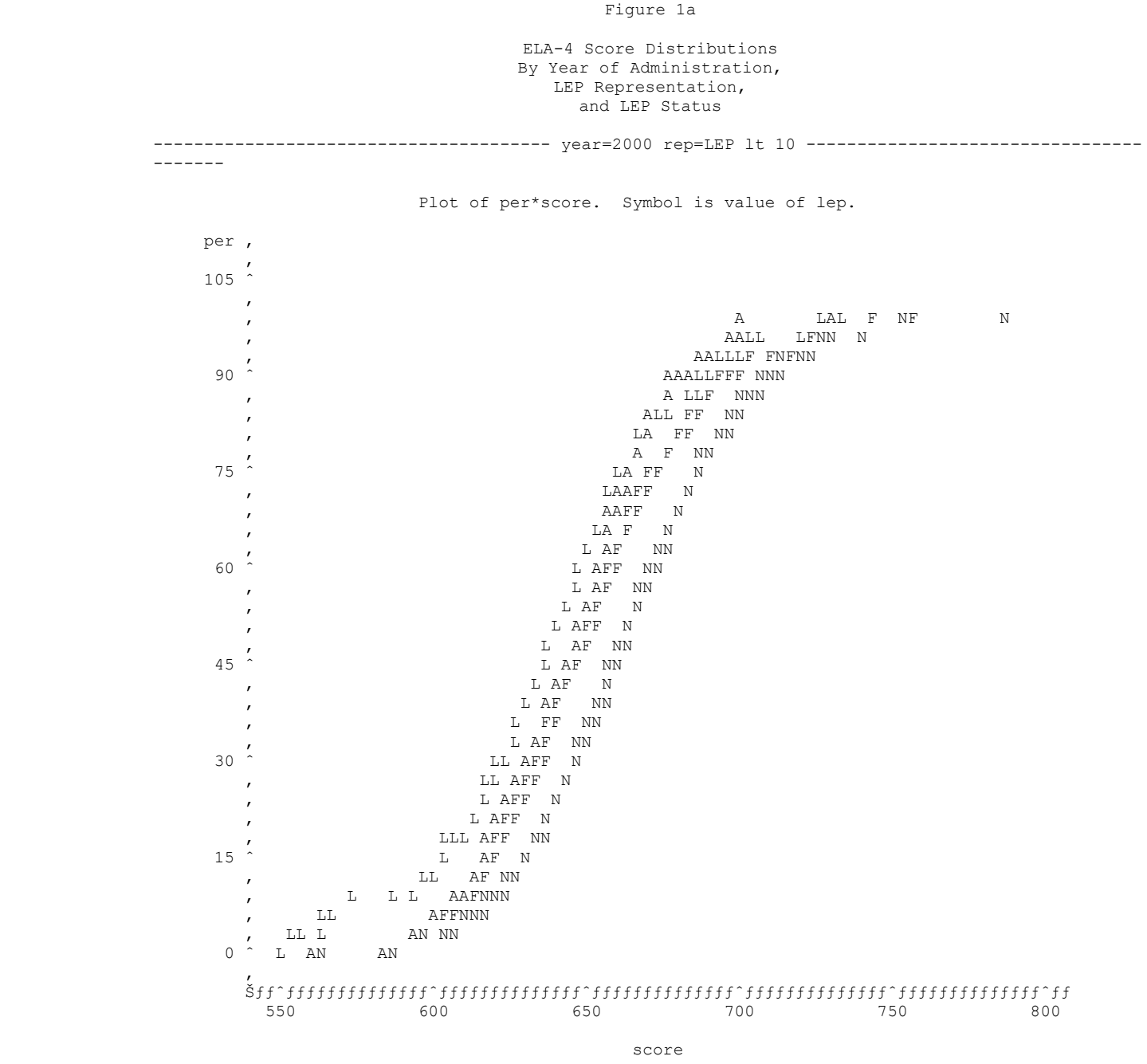
Ela-4 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status




NOTE: 145 obs hidden.

Figure 1a

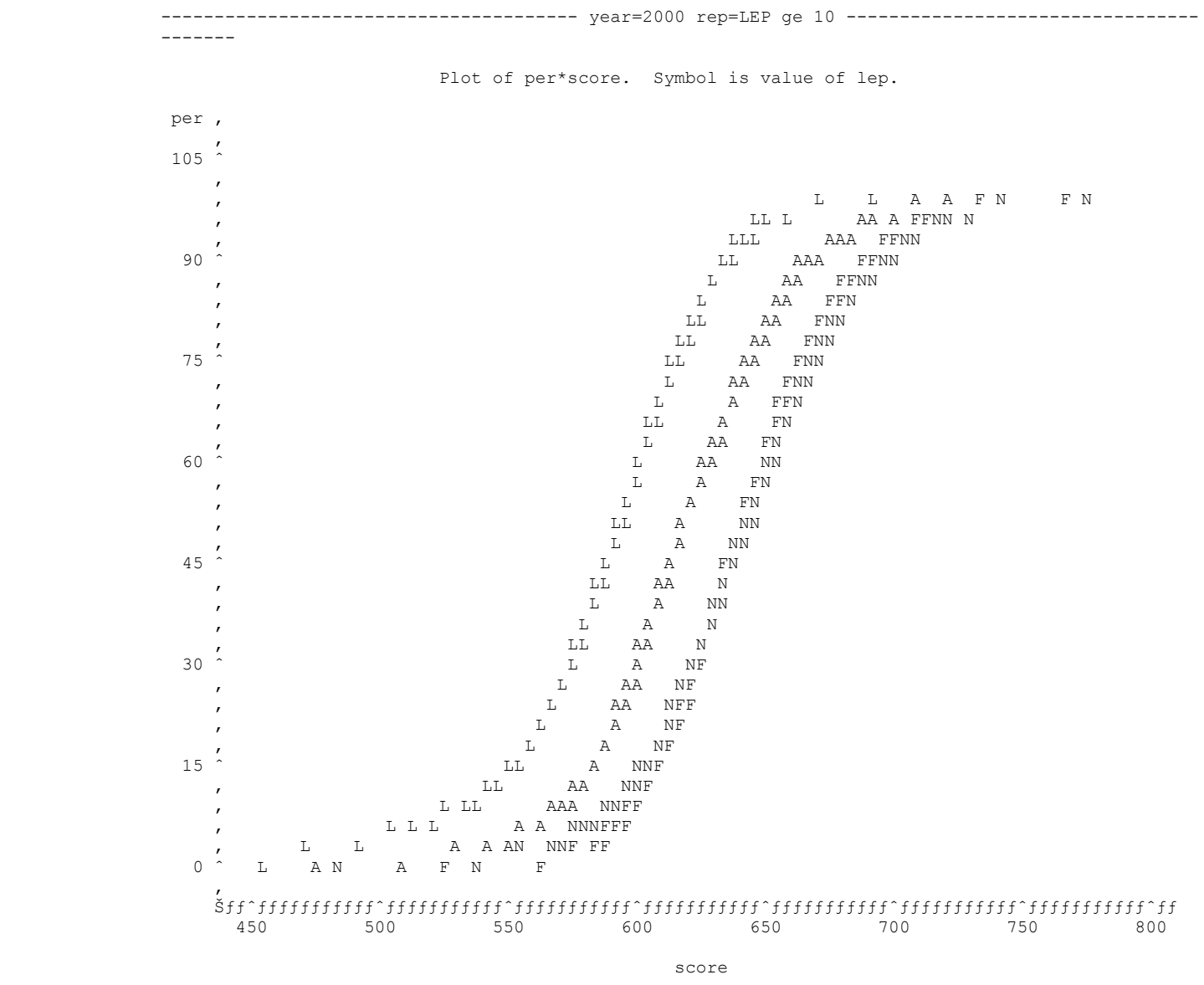
ELA-4 Score Distributions
By Year of Administration,
LEP Representation,
and LEP Status




NOTE: 135 obs hidden.

Figure 1a

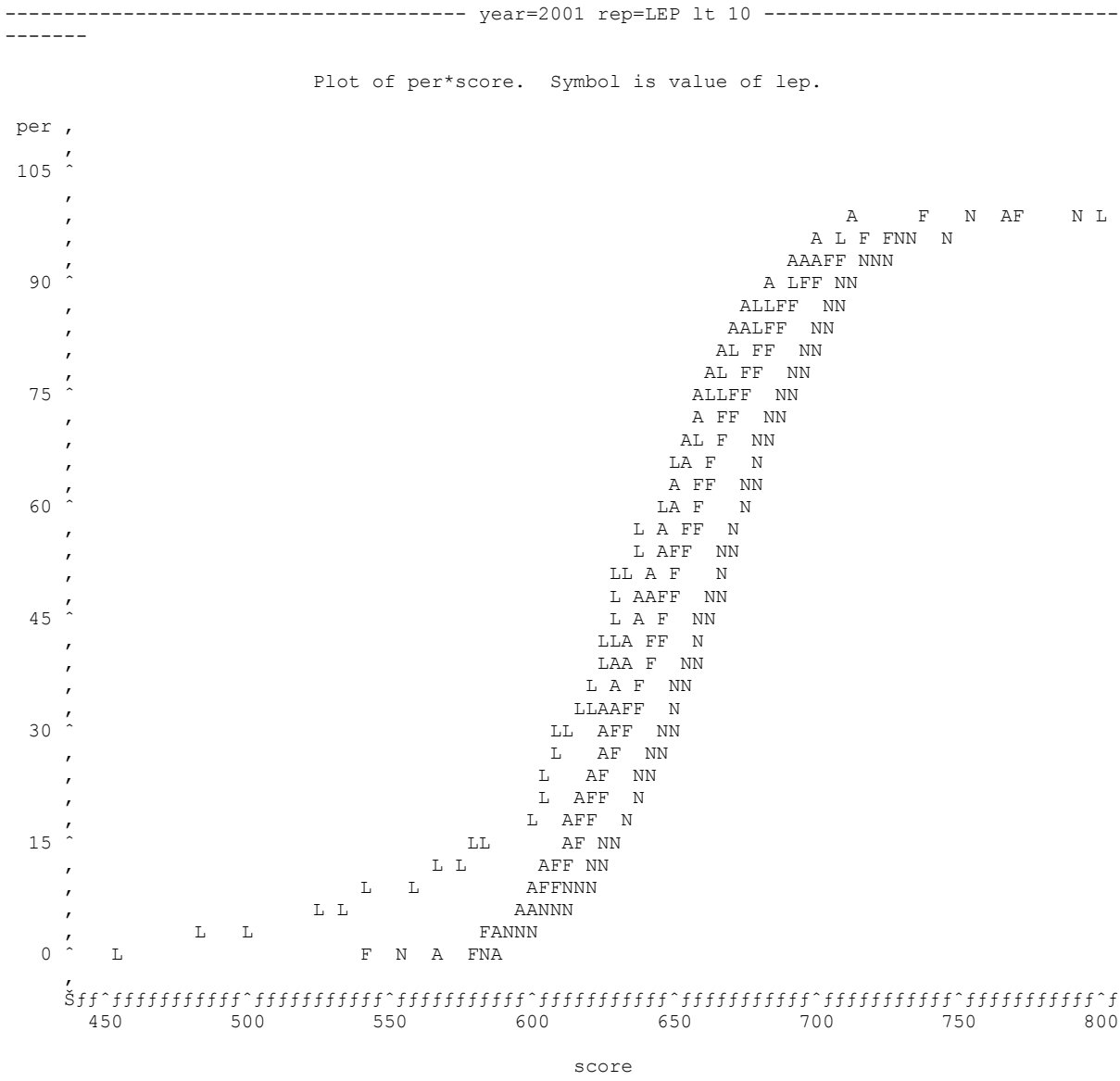
ELA-4 Score Distributions
By Year of Administration,
LEP Representation,
and LEP Status




NOTE: 171 obs hidden.

Figure 1a

ELA-4 Score Distributions
By Year of Administration,
LEP Representation,
and LEP Status



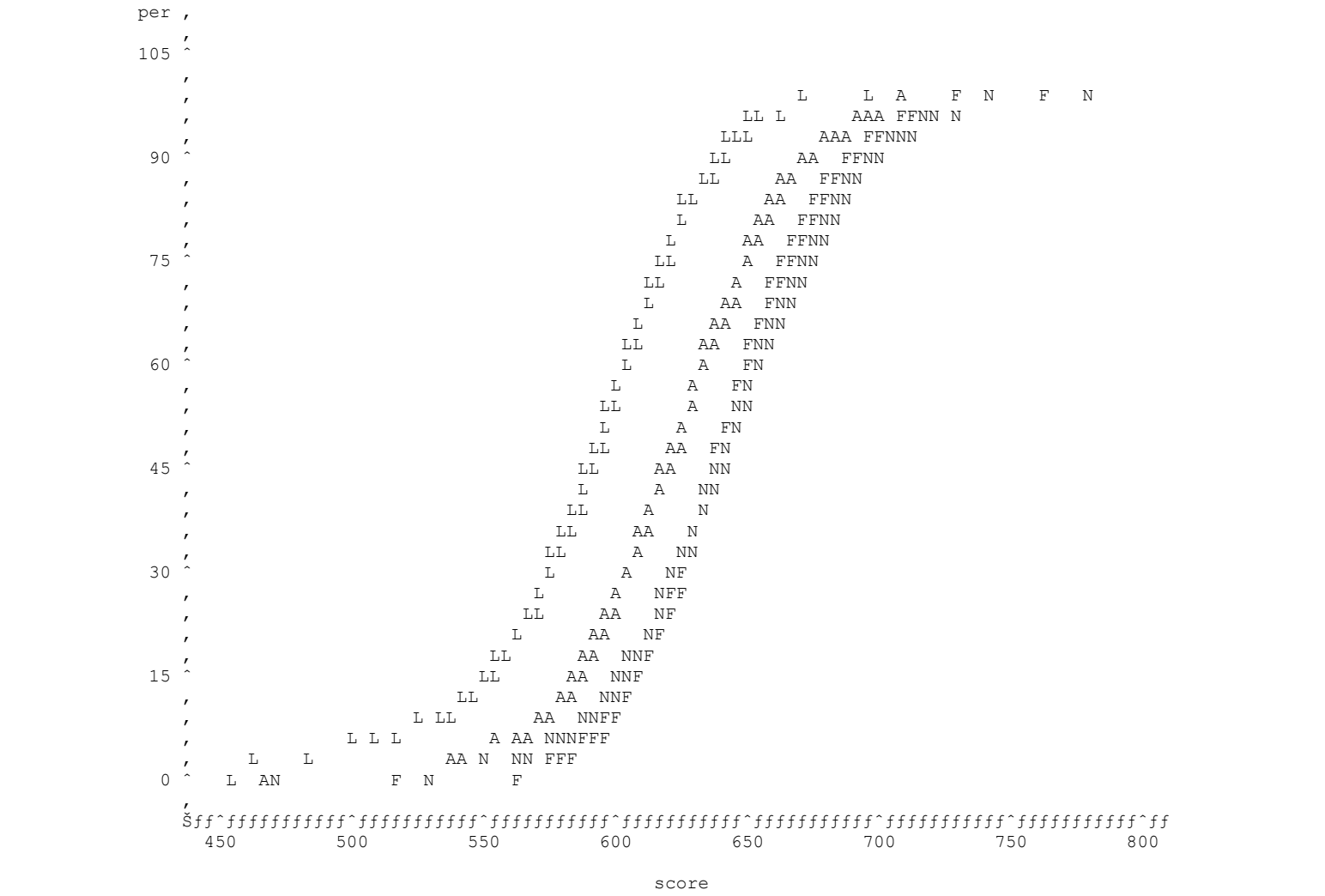

NOTE: 121 obs hidden.

Figure 1a

ELA-4 Score Distributions
By Year of Administration,
LEP Representation,
and LEP Status

---------- year=2001 rep=LEP ge 10 ----------
---

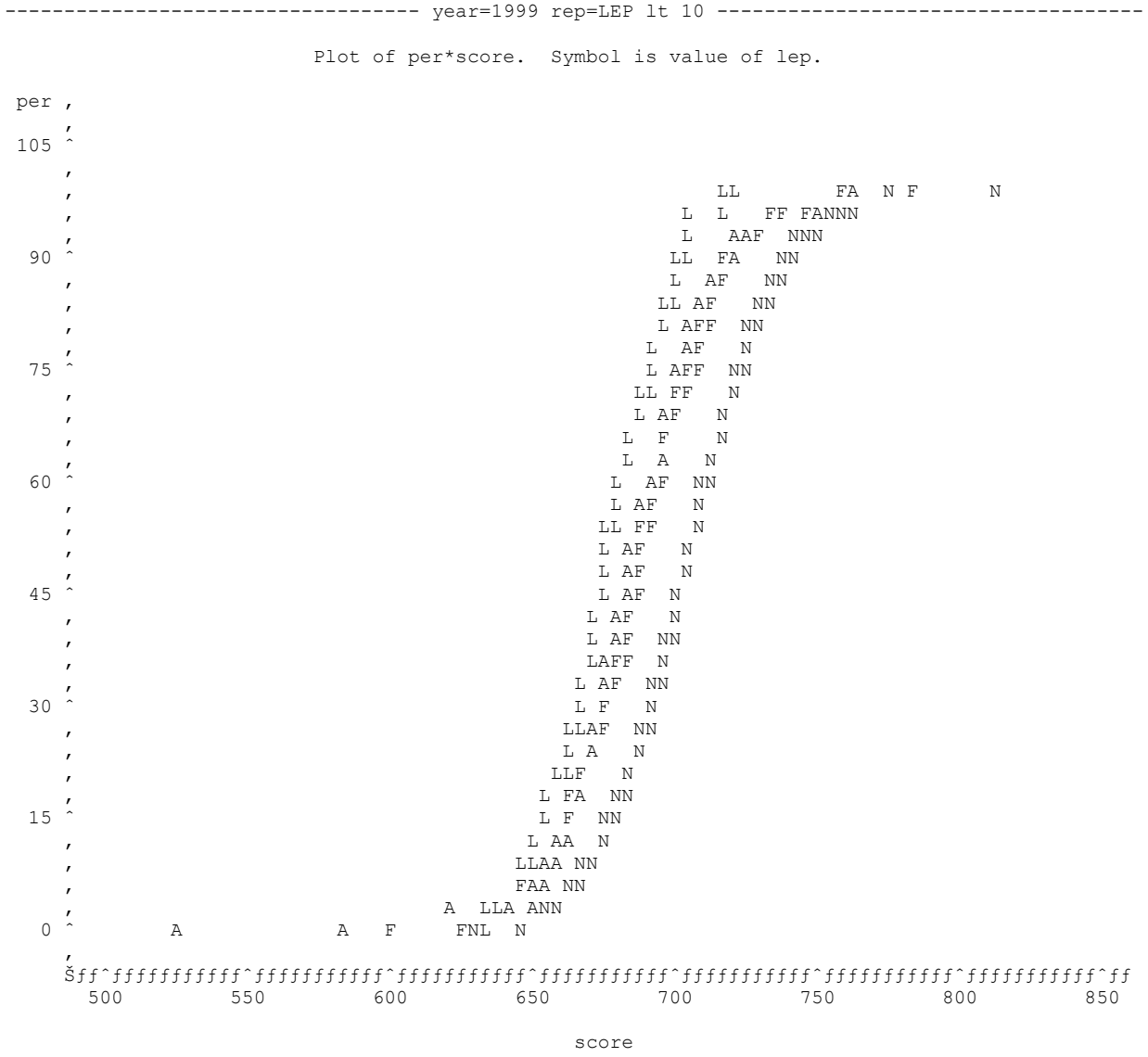
Plot of per*score. Symbol is value of lep.




NOTE: 159 obs hidden.

Figure 1b

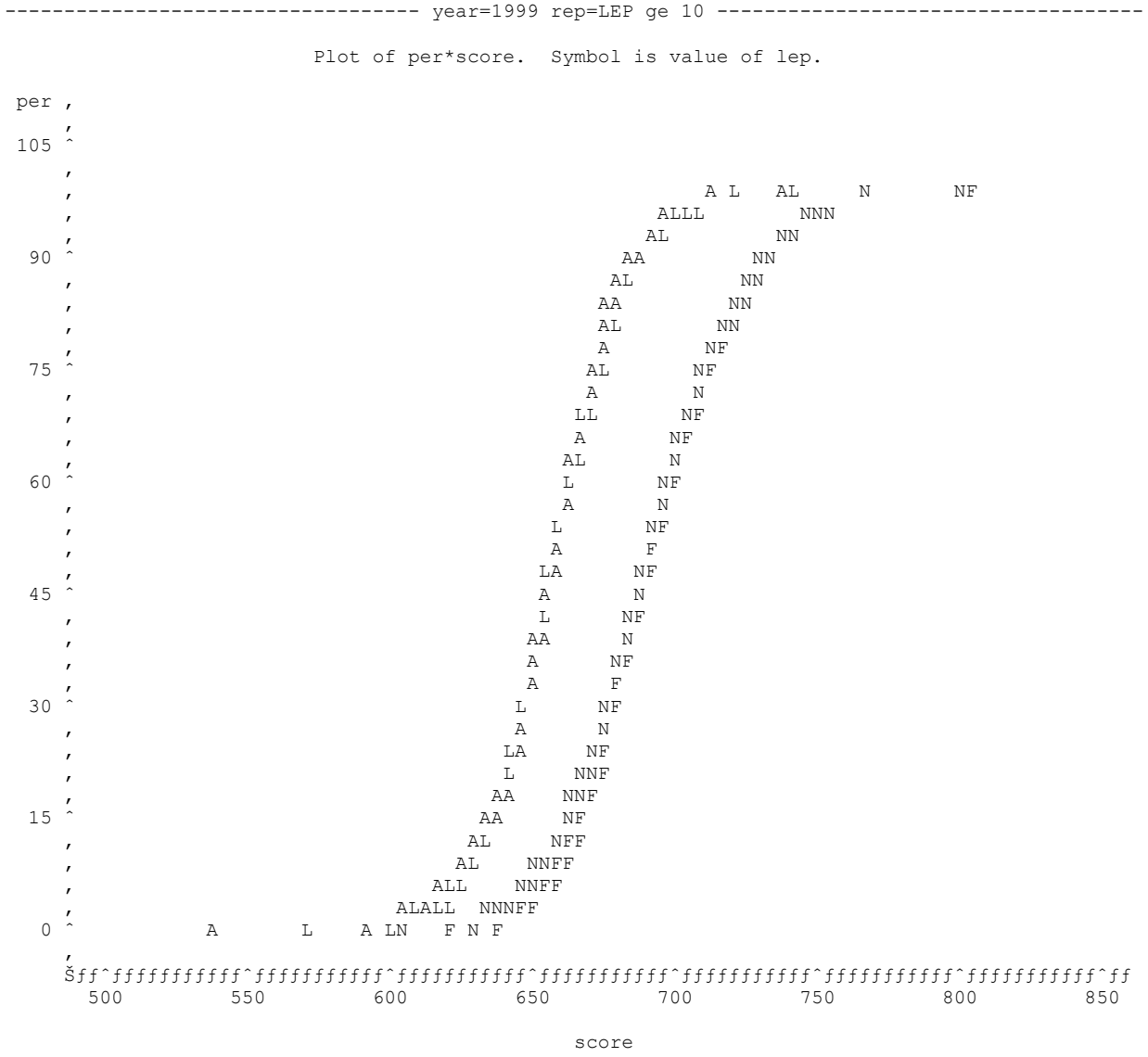
Ela-8 Score Distributions
by Year of Administration
LEP Representation,
and LEP Status




NOTE: 116 obs hidden.

Figure 1b

Ela-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status



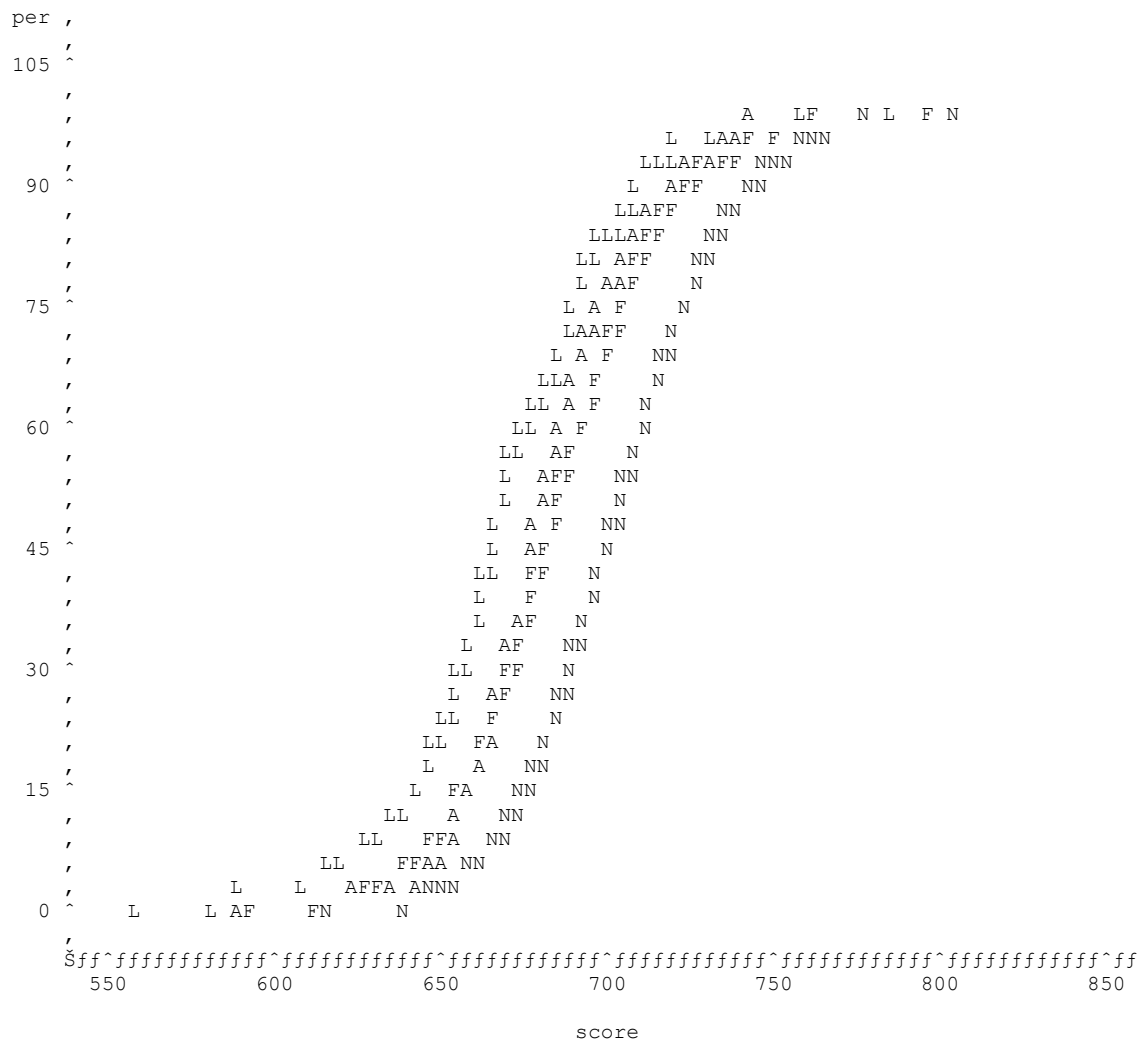

NOTE: 182 obs hidden.

Figure 1b

Ela-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status

---------- year=2000 rep=LEP lt 10 ----------

Plot of per*score. Symbol is value of lep.



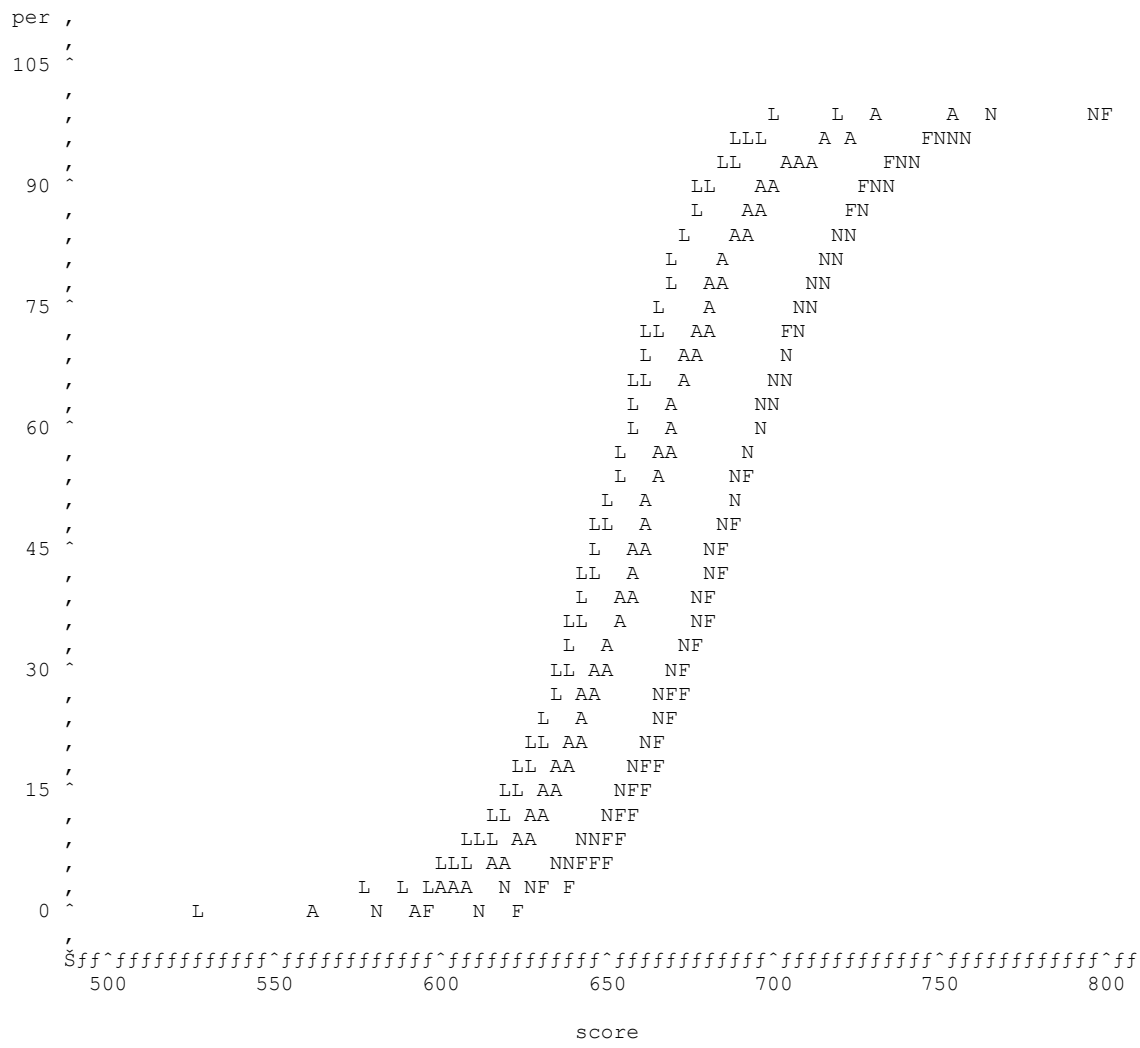

NOTE: 106 obs hidden.

Figure 1b

Ela-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status

---------- year=2000 rep=LEP ge 10 ----------

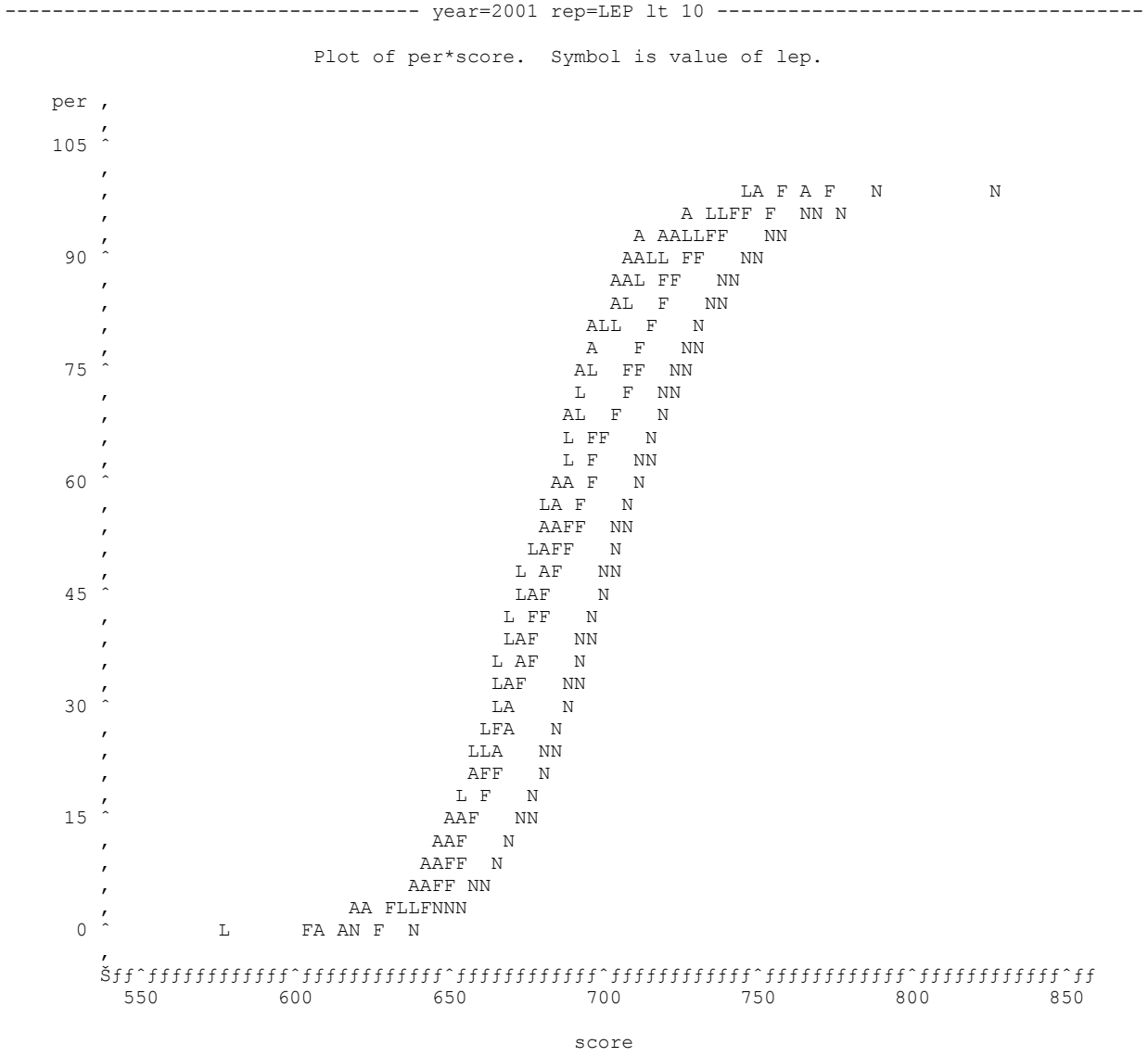
Plot of per*score. Symbol is value of lep.




NOTE: 151 obs hidden.

Figure 1b

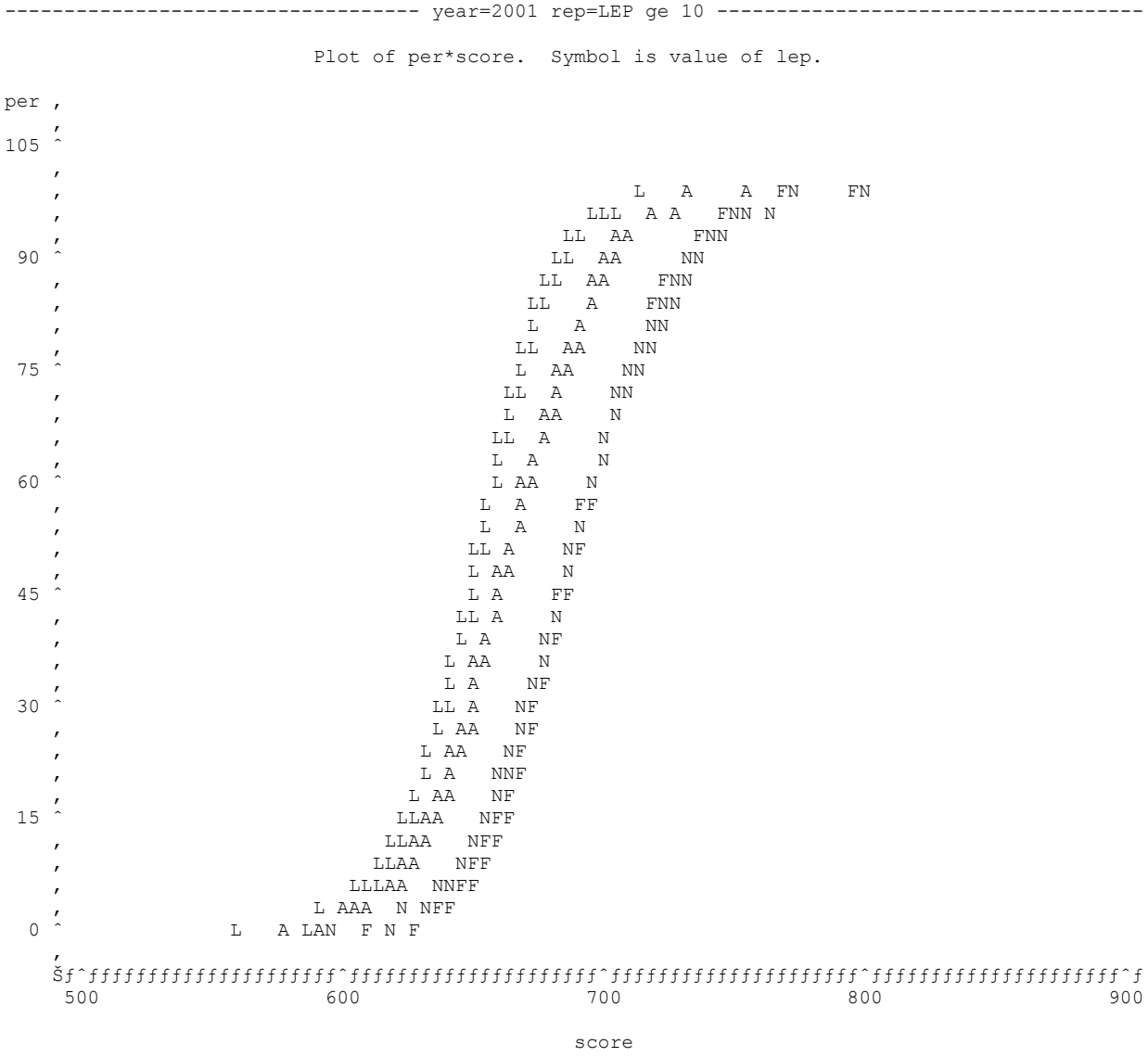
Ela-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status




NOTE: 126 obs hidden.

Figure 1b

Ela-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status



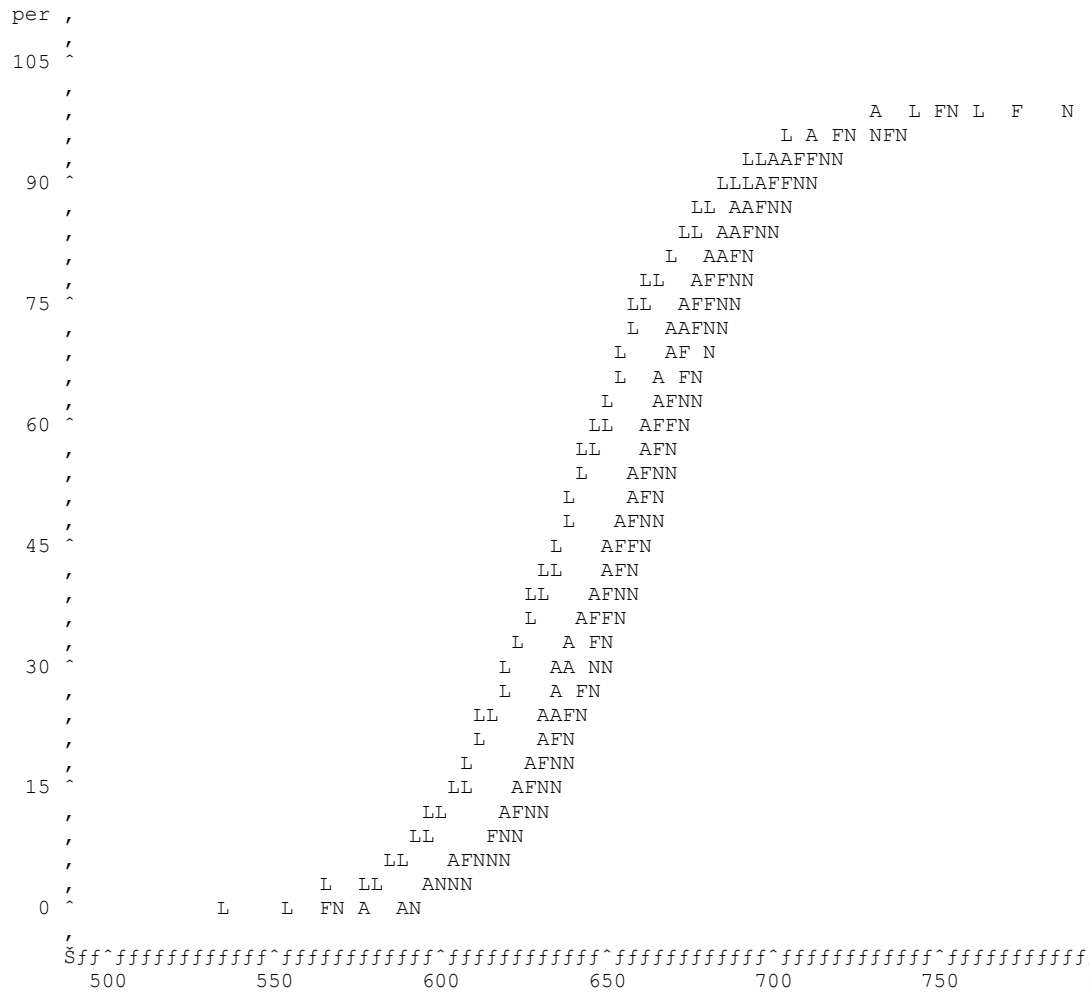

NOTE: 162 obs hidden.

Figure 1c

Math-4 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status

---------- year=1999 rep=LEP lt 10 ----------

Plot of per*score. Symbol is value of lep.



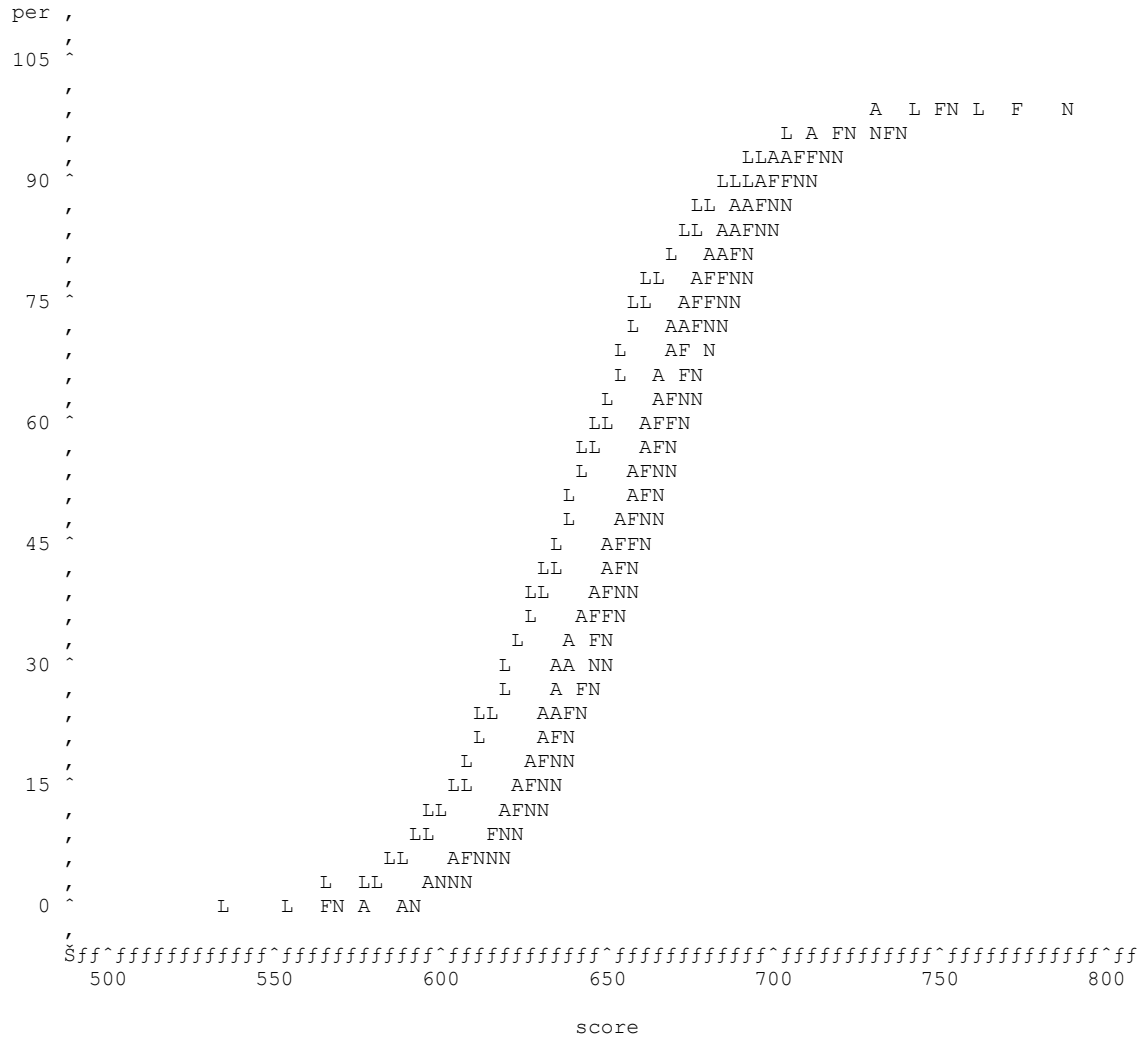

NOTE: 144 obs hidden.

Figure 1c

Math-4 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status

---------- year=1999 rep=LEP lt 10 ----------

Plot of per*score. Symbol is value of lep.



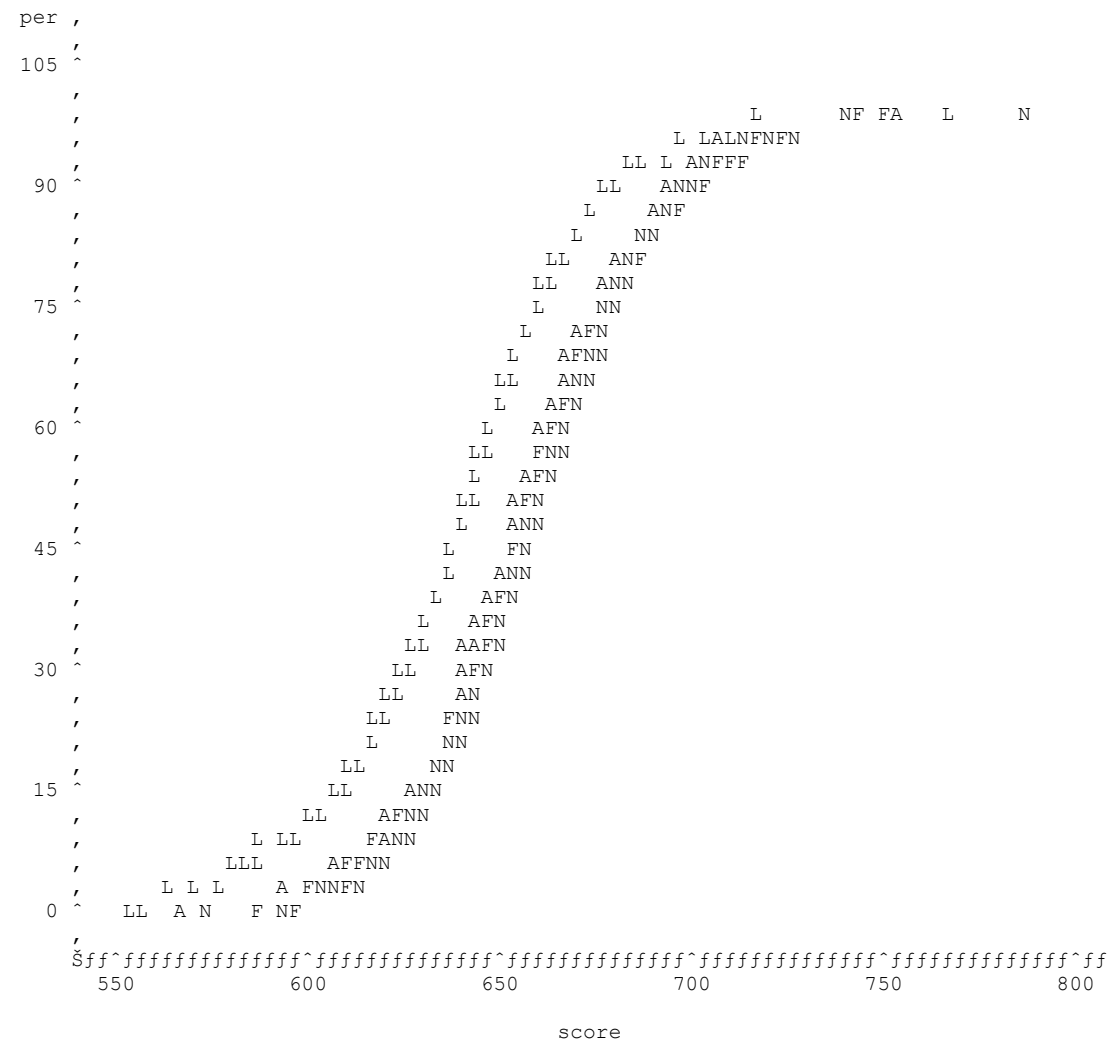

NOTE: 144 obs hidden.

Figure 1c

Math-4 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status

---------- year=2000 rep=LEP lt 10 ----------

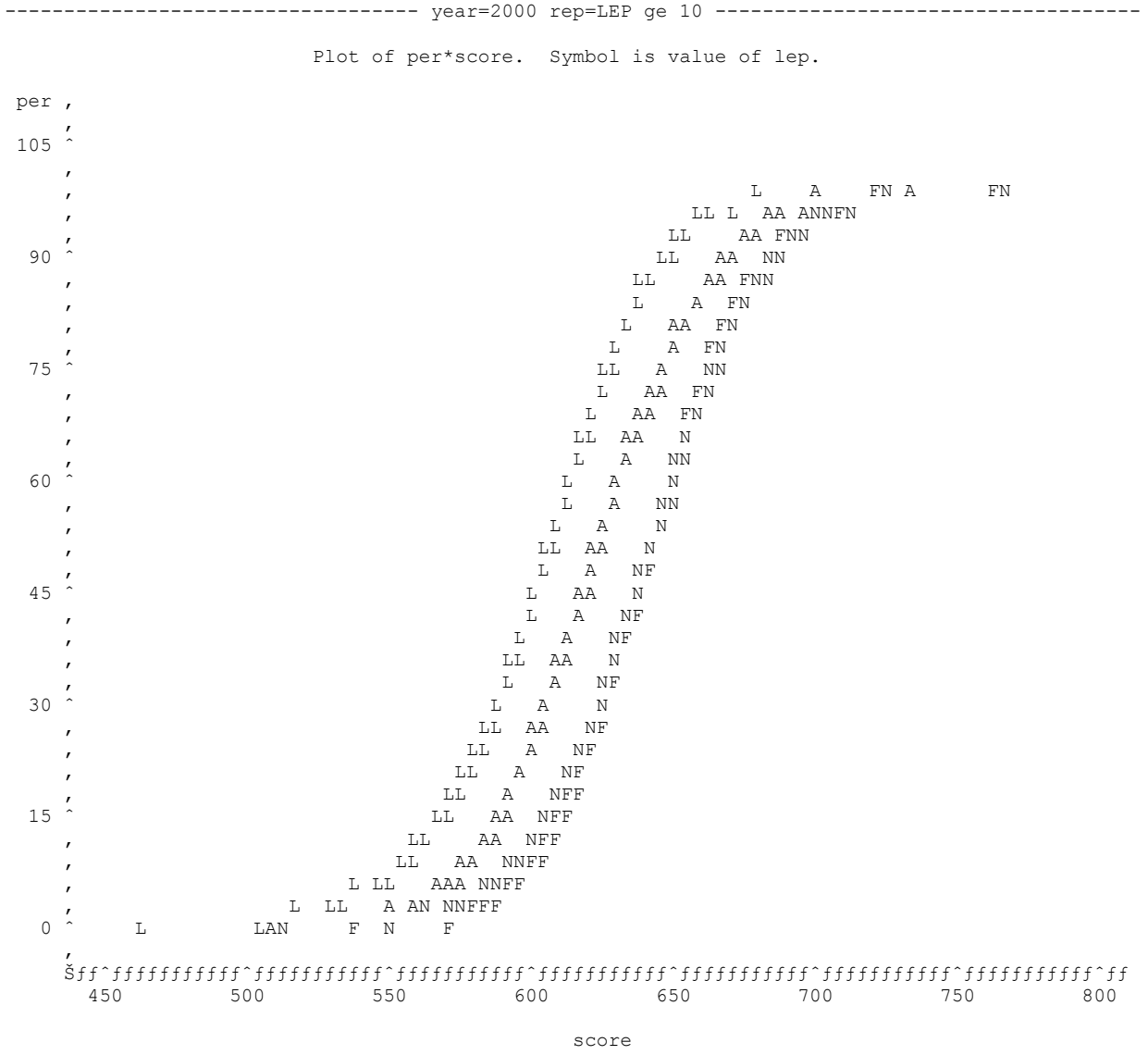
Plot of per*score. Symbol is value of lep.




NOTE: 152 obs hidden.

Figure 1c

Math-4 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status



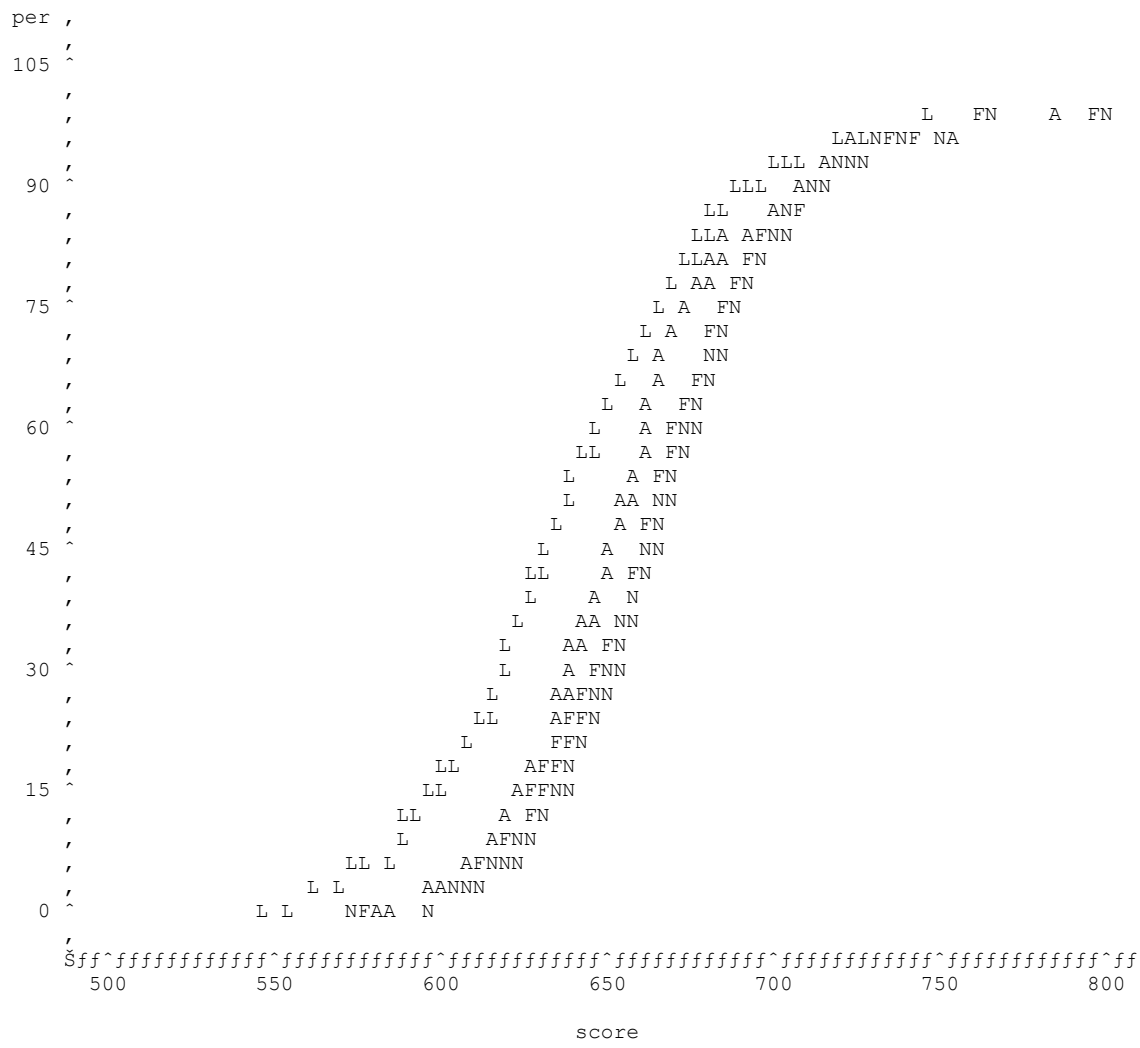

NOTE: 180 obs hidden.

Figure 1c

Math-4 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status

---------- year=2001 rep=LEP lt 10 ----------

Plot of per*score. Symbol is value of lep.




NOTE: 156 obs hidden.

Figure 1c

Math-4 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status

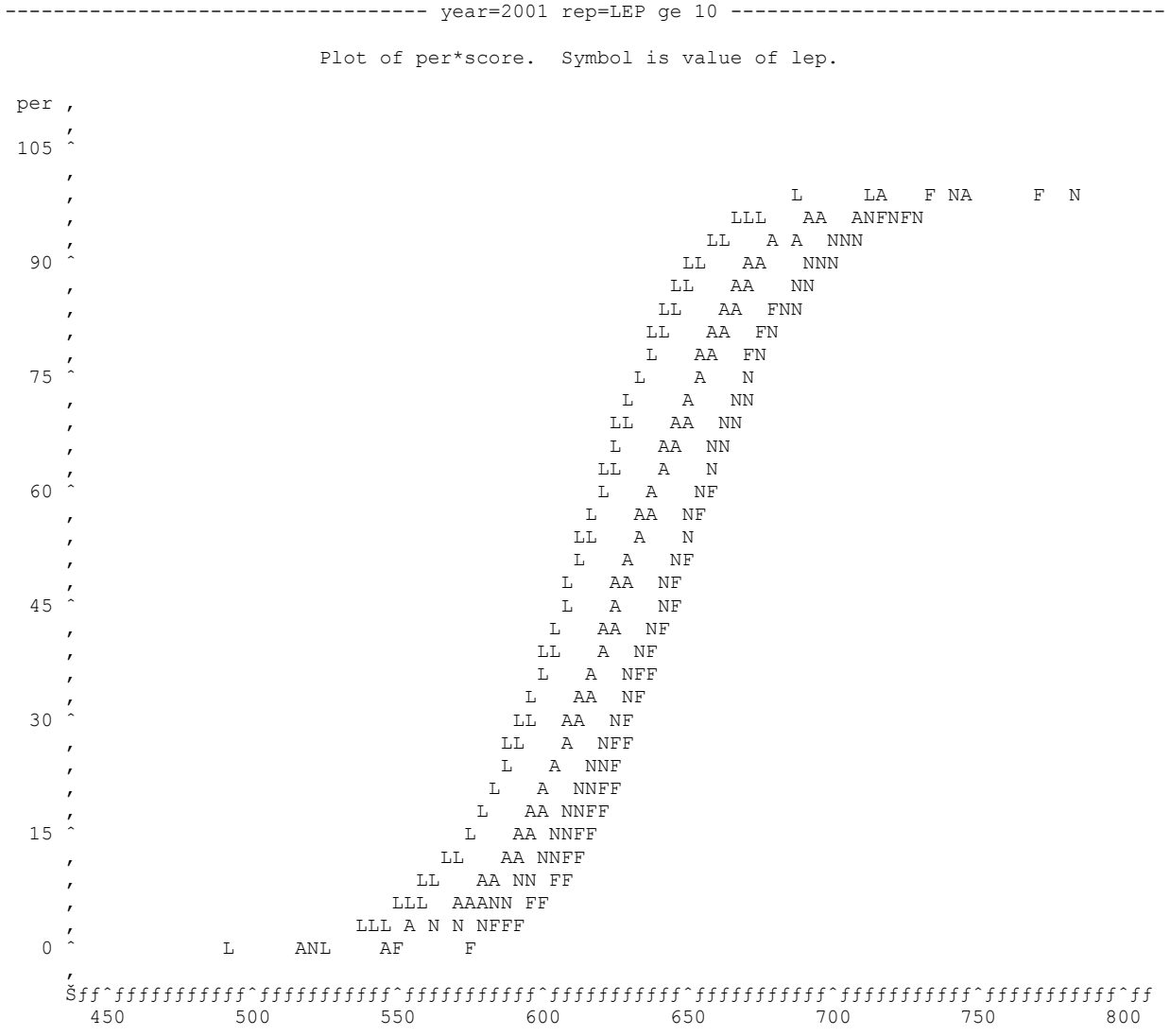
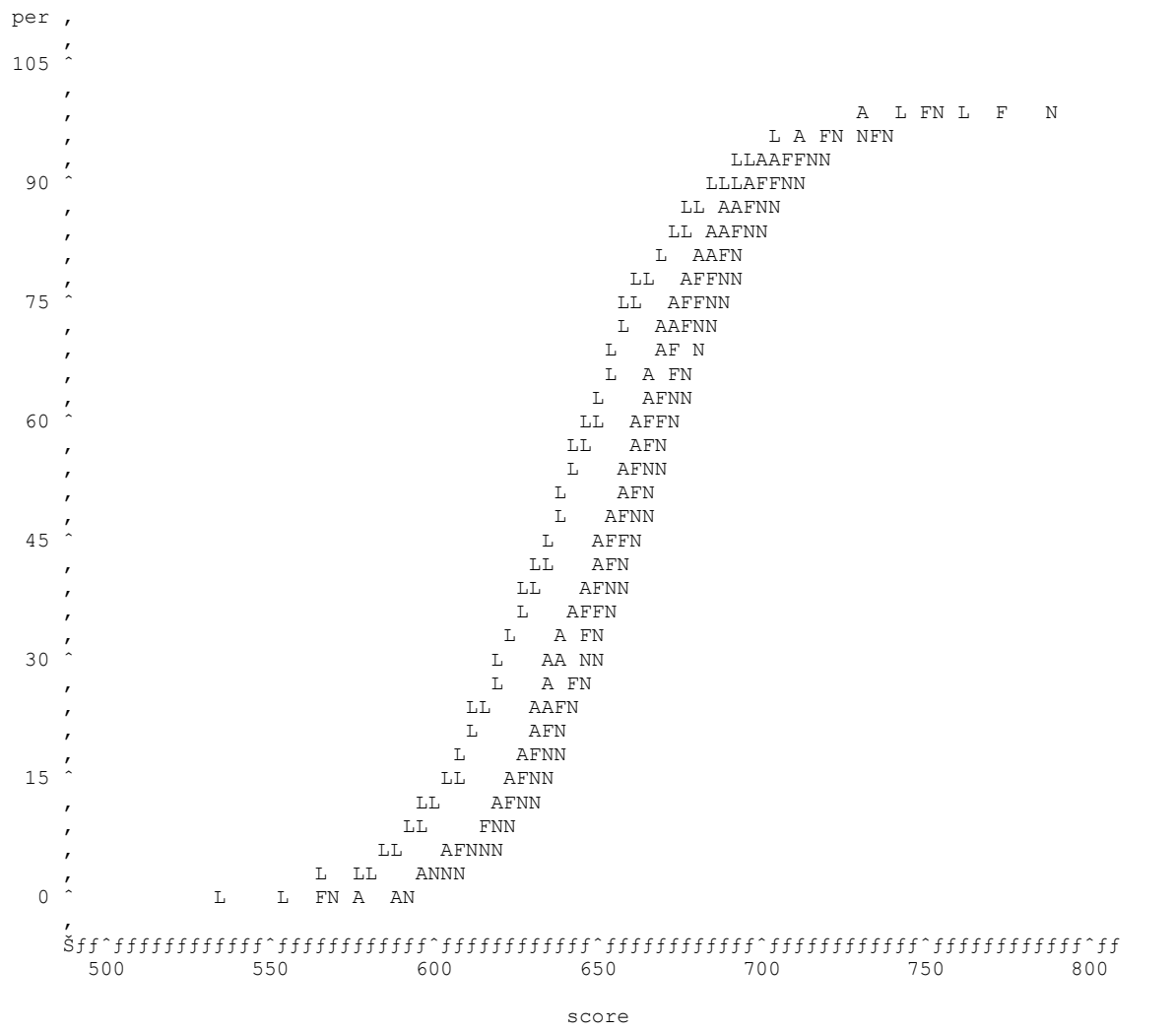


Figure 1d

Math-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status

---------- year=1999 rep=LEP lt 10 ----------

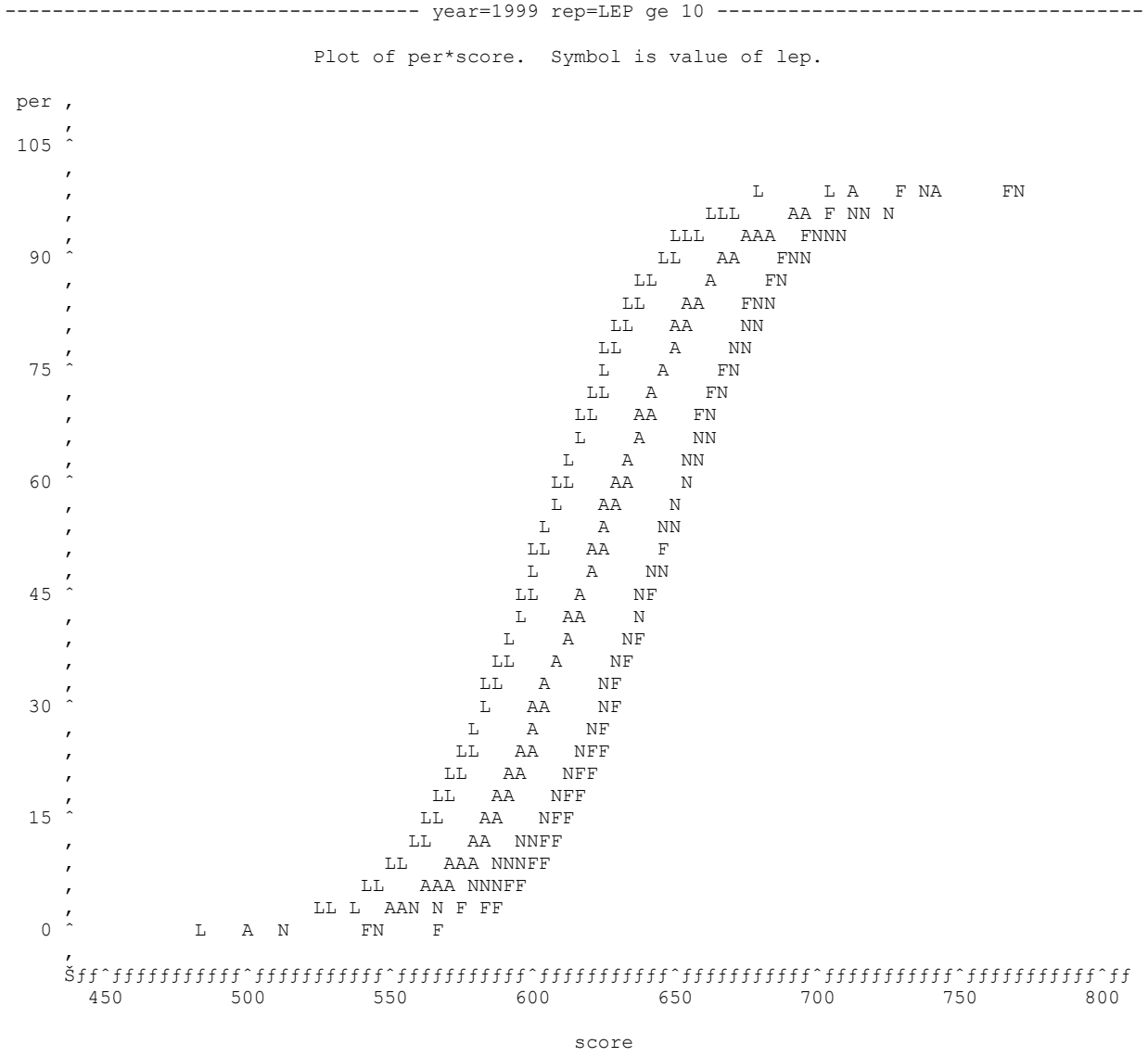
Plot of per*score. Symbol is value of lep.




NOTE: 144 obs hidden.

Figure 1d

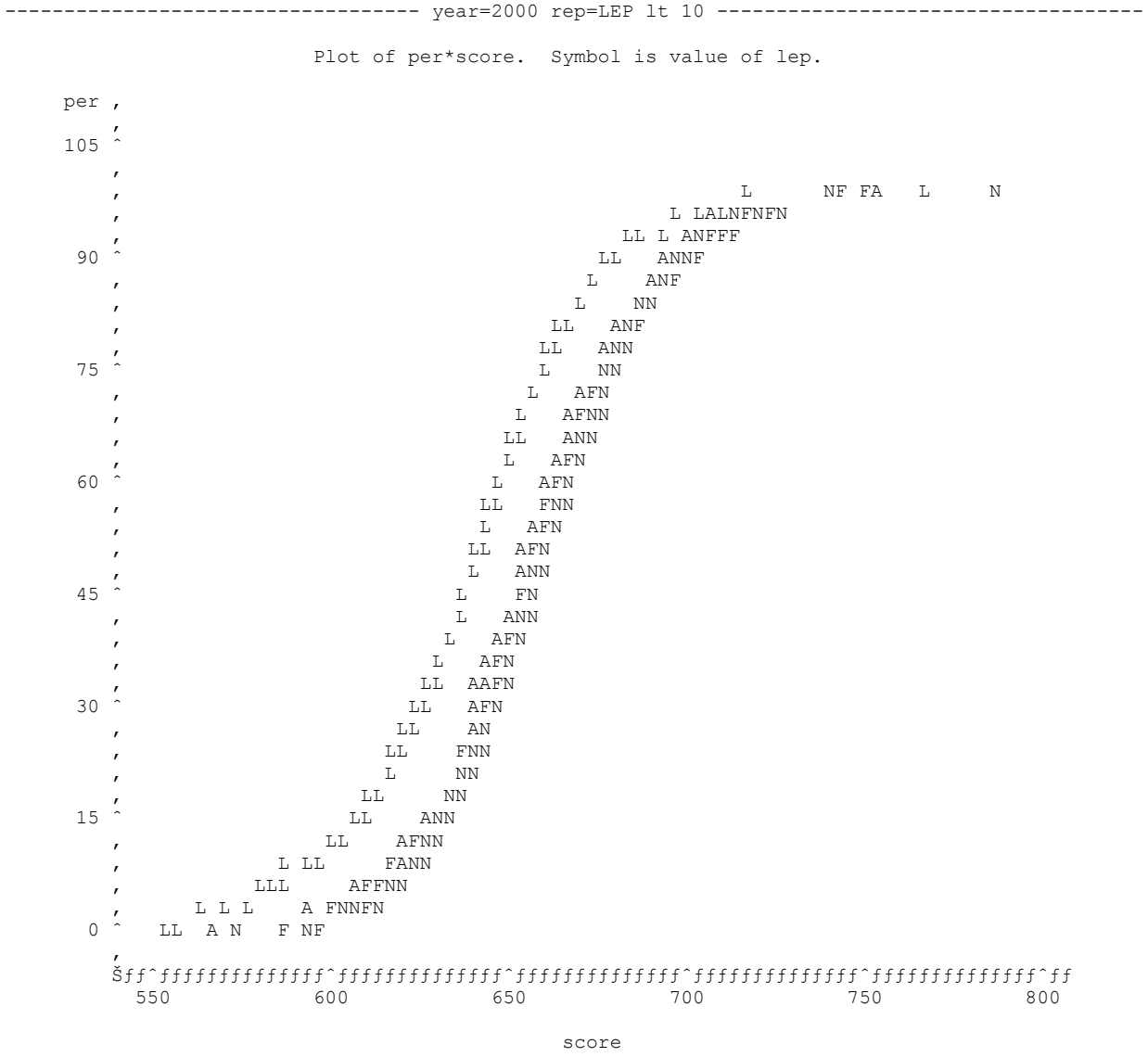
Math-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status




NOTE: 176 obs hidden.

Figure 1d

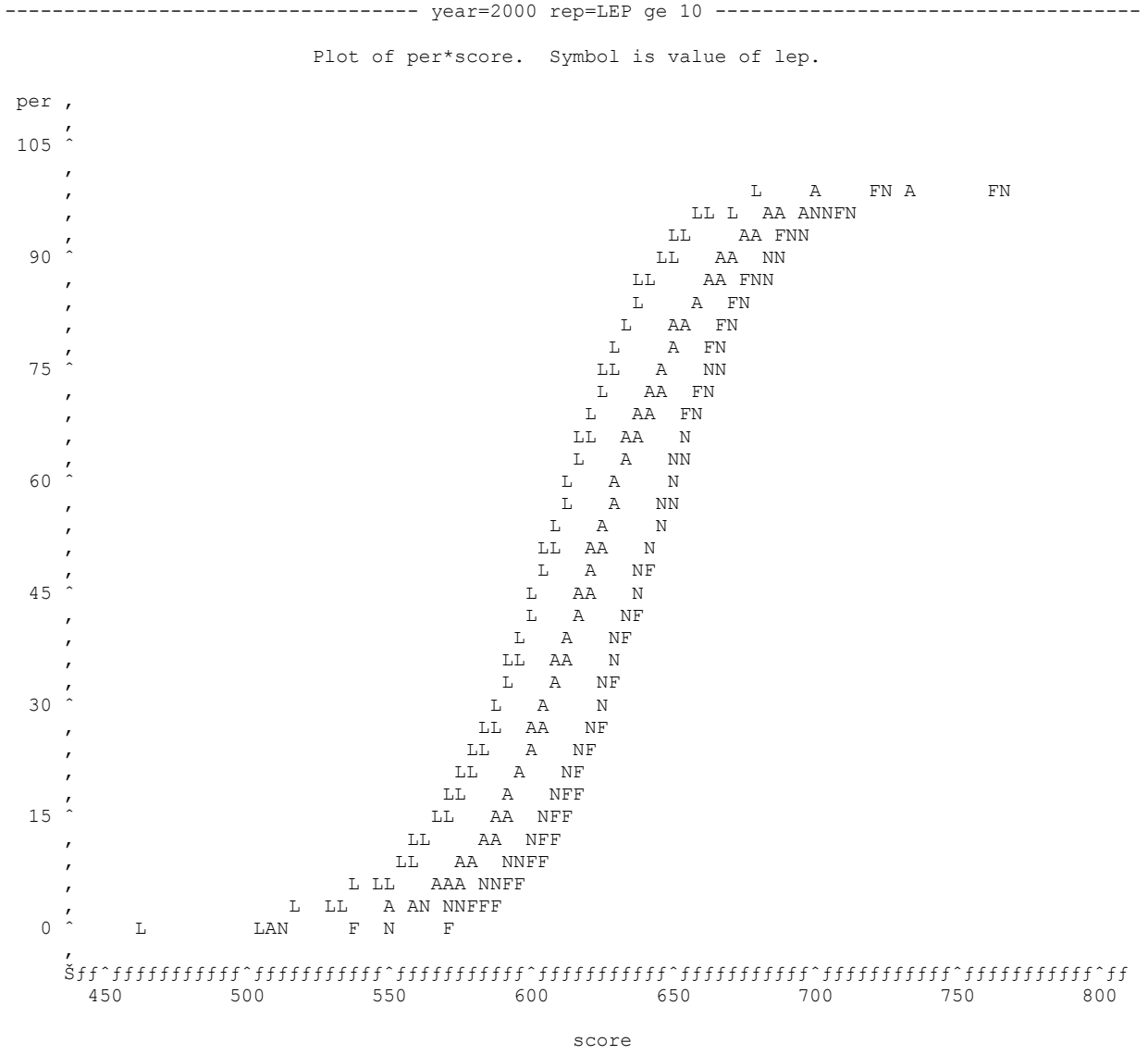
Math-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status




NOTE: 152 obs hidden.

Figure 1d

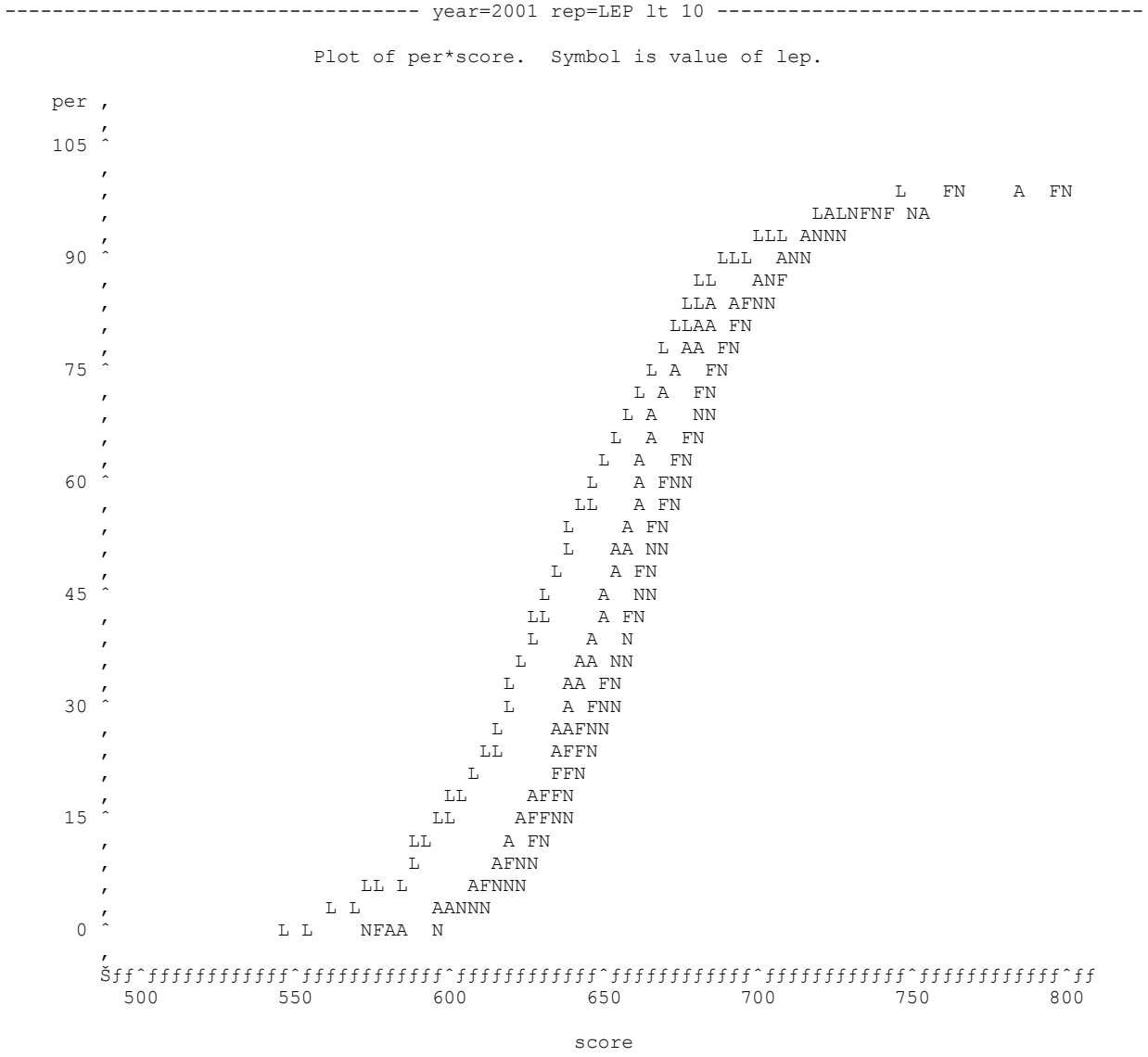
Math-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status




NOTE: 180 obs hidden.

Figure 1d

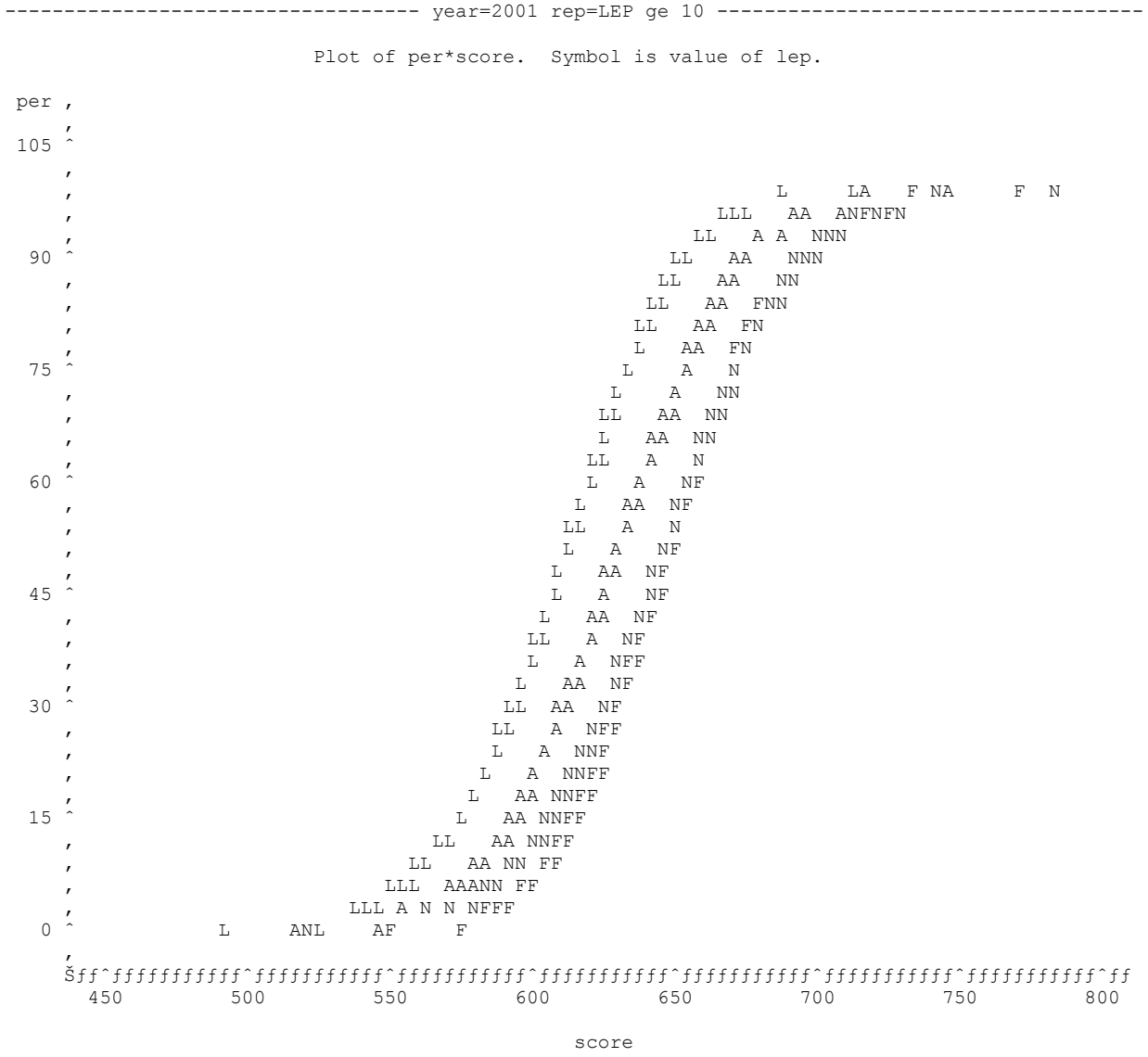
Math-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status




NOTE: 156 obs hidden.

Figure 1d

Math-8 Score Distributions
by Year of Administration,
LEP Representation,
and LEP Status




NOTE: 178 obs hidden.

Table 3a

ELA-4 Means across All Three Years
by Decile, LEP Representation,
and LEP Status

| Decile | LEP Reprentation | Below 30th Pct. | 30th + Pct. | Former LEP | Never LEP | All |
|---|---|---|---|---|---|---|
| 1 | LEP lt 10 | 536.00 | 590.04 | 583.01 | 600.75 | 600.46 |
| 2 | LEP lt 10 | 593.46 | 612.43 | 609.95 | 627.61 | 627.33 |
| 3 | LEP lt 10 | 610.73 | 623.19 | 621.11 | 639.67 | 639.38 |
| 4 | LEP lt 10 | 620.18 | 634.14 | 629.52 | 649.08 | 648.82 |
| 5 | LEP lt 10 | 628.86 | 642.33 | 638.06 | 657.52 | 657.21 |
| 6 | LEP lt 10 | 638.21 | 649.29 | 647.17 | 665.46 | 665.16 |
| 7 | LEP lt 10 | 647.67 | 655.62 | 655.38 | 674.35 | 674.10 |
| 8 | LEP lt 10 | 656.79 | 663.14 | 664.08 | 684.82 | 684.47 |
| 9 | LEP lt 10 | 672.07 | 673.15 | 678.81 | 698.71 | 698.40 |
| 10 | LEP lt 10 | 702.54 | 696.04 | 708.83 | 731.72 | 731.35 |
| All | LEP lt 10 | 630.93 | 644.14 | 643.60 | 662.99 | 662.69 |
| 1 | LEP ge 10 | 491.64 | 542.01 | 580.31 | 562.66 | 561.35 |
| 2 | LEP ge 10 | 549.67 | 581.56 | 607.32 | 601.40 | 599.10 |
| 3 | LEP ge 10 | 567.33 | 593.54 | 618.56 | 615.73 | 613.26 |
| 4 | LEP ge 10 | 578.62 | 603.63 | 627.48 | 626.54 | 623.66 |
| 5 | LEP ge 10 | 588.17 | 612.09 | 635.47 | 636.48 | 633.10 |
| 6 | LEP ge 10 | 596.45 | 620.84 | 644.02 | 645.98 | 642.37 |
| 7 | LEP ge 10 | 605.06 | 630.98 | 652.90 | 655.88 | 652.06 |
| 8 | LEP ge 10 | 614.37 | 642.14 | 663.22 | 668.22 | 664.17 |
| 9 | LEP ge 10 | 625.96 | 656.09 | 678.10 | 684.15 | 679.14 |
| 10 | LEP ge 10 | 651.63 | 686.60 | 712.70 | 719.48 | 714.13 |
| All | LEP ge 10 | 586.80 | 617.09 | 642.03 | 641.54 | 638.15 |
| 1 | All | 492.71 | 552.59 | 580.54 | 587.13 | 584.10 |
| 2 | All | 550.68 | 589.21 | 607.55 | 618.35 | 615.61 |
| 3 | All | 568.56 | 600.16 | 618.77 | 631.05 | 628.33 |
| 4 | All | 579.48 | 610.75 | 627.65 | 641.28 | 638.57 |
| 5 | All | 589.15 | 618.57 | 635.71 | 649.75 | 646.87 |
| 6 | All | 597.59 | 627.32 | 644.28 | 658.83 | 655.82 |
| 7 | All | 605.95 | 636.93 | 653.11 | 667.93 | 665.15 |
| 8 | All | 615.51 | 647.26 | 663.30 | 678.65 | 675.73 |
| 9 | All | 627.09 | 659.88 | 678.16 | 693.78 | 690.66 |
| 10 | All | 652.88 | 688.74 | 712.37 | 727.32 | 724.10 |
| All | All | 587.88 | 623.31 | 642.16 | 655.39 | 652.48 |

Table 3b

ELA-8 Means across All Three Years
by Decile, LEP Representation,
and LEP Status

| Decile | LEP Reprentation | Below 30th Pct. | 30th + Pct. | Former LEP | Never LEP | All |
|---|---|---|---|---|---|---|
| 1 | LEP lt 10 | 619.33 | 629.45 | 640.05 | 652.86 | 652.73 |
| 2 | LEP lt 10 | 644.44 | 655.36 | 660.28 | 674.60 | 674.49 |
| 3 | LEP lt 10 | 654.65 | 666.07 | 670.91 | 684.64 | 684.51 |
| 4 | LEP lt 10 | 662.40 | 672.58 | 679.64 | 692.55 | 692.45 |
| 5 | LEP lt 10 | 668.55 | 677.79 | 687.38 | 699.99 | 699.87 |
| 6 | LEP lt 10 | 673.88 | 683.43 | 695.31 | 706.99 | 706.88 |
| 7 | LEP lt 10 | 682.05 | 689.09 | 703.38 | 713.98 | 713.85 |
| 8 | LEP lt 10 | 690.49 | 696.64 | 712.25 | 722.09 | 721.99 |
| 9 | LEP lt 10 | 699.85 | 706.93 | 723.41 | 734.00 | 733.88 |
| 10 | LEP lt 10 | 723.68 | 732.02 | 752.58 | 762.68 | 762.56 |
| All | LEP lt 10 | 671.78 | 680.94 | 692.44 | 704.51 | 704.39 |
| 1 | LEP ge 10 | 595.28 | 607.79 | 641.26 | 632.45 | 632.17 |
| 2 | LEP ge 10 | 623.64 | 634.54 | 661.45 | 656.49 | 655.51 |
| 3 | LEP ge 10 | 633.58 | 643.82 | 670.61 | 667.71 | 666.39 |
| 4 | LEP ge 10 | 641.57 | 650.71 | 678.51 | 676.54 | 674.79 |
| 5 | LEP ge 10 | 648.52 | 656.06 | 686.00 | 684.49 | 682.75 |
| 6 | LEP ge 10 | 654.47 | 661.43 | 692.99 | 692.42 | 690.03 |
| 7 | LEP ge 10 | 660.39 | 666.94 | 700.44 | 700.90 | 698.38 |
| 8 | LEP ge 10 | 666.92 | 673.01 | 709.69 | 710.73 | 707.73 |
| 9 | LEP ge 10 | 675.41 | 682.25 | 722.48 | 723.39 | 719.97 |
| 10 | LEP ge 10 | 695.80 | 704.91 | 750.22 | 751.77 | 747.96 |
| All | LEP ge 10 | 649.63 | 658.08 | 691.37 | 689.48 | 687.43 |
| 1 | All | 596.21 | 609.76 | 641.22 | 646.18 | 644.47 |
| 2 | All | 624.31 | 636.66 | 661.42 | 669.18 | 667.44 |
| 3 | All | 634.48 | 645.64 | 670.62 | 678.79 | 676.95 |
| 4 | All | 642.18 | 652.86 | 678.54 | 687.79 | 685.79 |
| 5 | All | 649.41 | 658.18 | 686.04 | 695.06 | 693.18 |
| 6 | All | 655.07 | 663.23 | 693.06 | 702.44 | 700.39 |
| 7 | All | 661.27 | 669.26 | 700.53 | 709.49 | 707.42 |
| 8 | All | 667.81 | 675.30 | 709.76 | 718.64 | 716.53 |
| 9 | All | 676.29 | 684.48 | 722.51 | 730.81 | 728.66 |
| 10 | All | 696.77 | 707.41 | 750.28 | 759.17 | 756.78 |
| All | All | 650.44 | 660.20 | 691.40 | 699.75 | 697.76 |

Table 3c

Math-4 Means across All Three Years
by Decile, LEP Representation,
and LEP Status

| Decile | LEP Reprentation | Below 30th Pct. | 30th + Pct. | Former LEP | Never LEP | All |
|---|---|---|---|---|---|---|
| 1 | LEP lt 10 | 573.84 | 602.60 | 606.14 | 607.72 | 607.60 |
| 2 | LEP lt 10 | 601.89 | 625.00 | 627.65 | 632.12 | 632.01 |
| 3 | LEP lt 10 | 615.28 | 635.74 | 638.95 | 643.15 | 643.03 |
| 4 | LEP lt 10 | 624.52 | 642.49 | 647.39 | 651.57 | 651.45 |
| 5 | LEP lt 10 | 634.34 | 650.71 | 655.39 | 659.51 | 659.41 |
| 6 | LEP lt 10 | 642.37 | 658.04 | 662.03 | 666.99 | 666.87 |
| 7 | LEP lt 10 | 651.64 | 664.09 | 669.63 | 674.86 | 674.76 |
| 8 | LEP lt 10 | 660.85 | 673.63 | 678.86 | 684.23 | 684.13 |
| 9 | LEP lt 10 | 674.37 | 688.67 | 692.96 | 696.73 | 696.63 |
| 10 | LEP lt 10 | 711.30 | 719.57 | 722.95 | 730.19 | 730.09 |
| All | LEP lt 10 | 638.83 | 656.01 | 660.11 | 664.74 | 664.63 |
| 1 | LEP ge 10 | 534.23 | 559.21 | 585.45 | 570.44 | 570.00 |
| 2 | LEP ge 10 | 567.33 | 587.87 | 611.04 | 604.37 | 602.69 |
| 3 | LEP ge 10 | 581.70 | 600.16 | 622.65 | 618.77 | 616.65 |
| 4 | LEP ge 10 | 592.60 | 609.86 | 631.61 | 629.58 | 627.09 |
| 5 | LEP ge 10 | 601.52 | 619.15 | 640.05 | 639.03 | 636.70 |
| 6 | LEP ge 10 | 609.97 | 627.75 | 648.47 | 647.98 | 645.01 |
| 7 | LEP ge 10 | 618.87 | 637.31 | 656.89 | 657.40 | 654.55 |
| 8 | LEP ge 10 | 628.29 | 647.80 | 666.34 | 667.82 | 664.74 |
| 9 | LEP ge 10 | 640.20 | 660.66 | 678.73 | 681.26 | 677.86 |
| 10 | LEP ge 10 | 666.17 | 692.07 | 710.23 | 713.95 | 710.08 |
| All | LEP ge 10 | 604.02 | 624.22 | 645.12 | 643.01 | 640.49 |
| 1 | All | 535.71 | 563.25 | 585.87 | 589.24 | 586.69 |
| 2 | All | 582.92 | 603.61 | 622.97 | 630.75 | 628.07 |
| 4 | All | 593.78 | 613.00 | 631.94 | 640.61 | 637.91 |
| 5 | All | 602.91 | 622.09 | 640.32 | 649.77 | 647.21 |
| 6 | All | 611.09 | 630.93 | 648.75 | 657.32 | 654.45 |
| 7 | All | 620.16 | 639.55 | 657.14 | 666.46 | 663.82 |
| 8 | All | 629.39 | 650.74 | 666.60 | 676.19 | 673.49 |
| 9 | All | 641.49 | 663.17 | 679.01 | 689.02 | 686.16 |
| 10 | All | 667.84 | 694.72 | 710.48 | 722.17 | 719.03 |
| All | All | 605.32 | 627.30 | 645.41 | 654.01 | 651.28 |

Table 3d

Math-8 Means across All Three Years
by Decile, LEP Representation,
and LEP Status

| Decile | LEP Reprentation | Below 30th Pct. | 30th + Pct. | Former LEP | Never LEP | All |
|---|---|---|---|---|---|---|
| 1 | LEP lt 10 | 600.43 | 608.49 | 619.26 | 647.77 | 647.55 |
| 2 | LEP lt 10 | 642.15 | 662.21 | 655.63 | 681.31 | 681.14 |
| 3 | LEP lt 10 | 657.88 | 677.18 | 672.62 | 694.24 | 694.09 |
| 4 | LEP lt 10 | 671.03 | 687.78 | 682.41 | 704.09 | 703.95 |
| 5 | LEP lt 10 | 681.59 | 697.50 | 691.46 | 712.52 | 712.37 |
| 6 | LEP lt 10 | 695.15 | 707.03 | 700.82 | 720.49 | 720.37 |
| 7 | LEP lt 10 | 705.94 | 718.15 | 711.94 | 728.91 | 728.80 |
| 8 | LEP lt 10 | 719.51 | 731.13 | 724.11 | 738.80 | 738.72 |
| 9 | LEP lt 10 | 736.95 | 747.89 | 740.76 | 751.41 | 751.35 |
| 10 | LEP lt 10 | 770.22 | 773.26 | 774.95 | 779.55 | 779.51 |
| All | LEP lt 10 | 688.03 | 701.04 | 697.39 | 715.85 | 715.73 |
| 1 | LEP ge 10 | 566.48 | 574.11 | 623.14 | 608.62 | 607.80 |
| 2 | LEP ge 10 | 616.51 | 616.63 | 656.34 | 649.00 | 647.53 |
| 3 | LEP ge 10 | 633.92 | 630.71 | 669.18 | 664.30 | 662.45 |
| 4 | LEP ge 10 | 645.74 | 641.79 | 679.06 | 675.56 | 673.60 |
| 5 | LEP ge 10 | 655.23 | 651.05 | 688.00 | 685.55 | 683.38 |
| 6 | LEP ge 10 | 663.99 | 659.95 | 697.42 | 695.45 | 693.07 |
| 7 | LEP ge 10 | 672.91 | 668.79 | 707.90 | 705.38 | 702.92 |
| 8 | LEP ge 10 | 682.94 | 678.78 | 719.80 | 717.21 | 714.76 |
| 9 | LEP ge 10 | 695.69 | 691.84 | 735.78 | 732.81 | 730.02 |
| 10 | LEP ge 10 | 724.86 | 722.32 | 769.45 | 763.56 | 761.16 |
| All | LEP ge 10 | 656.05 | 653.30 | 694.63 | 689.75 | 687.69 |
| 1 | All | 567.82 | 576.58 | 623.09 | 632.80 | 629.34 |
| 2 | All | 617.47 | 619.89 | 656.33 | 669.10 | 665.84 |
| 3 | All | 634.85 | 634.06 | 669.22 | 682.72 | 679.57 |
| 4 | All | 646.69 | 645.25 | 679.11 | 693.46 | 690.36 |
| 5 | All | 656.33 | 654.32 | 688.04 | 701.72 | 698.63 |
| 6 | All | 665.15 | 663.47 | 697.46 | 710.66 | 707.51 |
| 7 | All | 674.25 | 672.65 | 707.95 | 720.21 | 717.18 |
| 8 | All | 684.33 | 682.58 | 719.86 | 730.36 | 727.68 |
| 9 | All | 697.31 | 695.76 | 735.85 | 744.33 | 741.58 |
| 10 | All | 726.56 | 726.11 | 769.52 | 773.45 | 771.09 |
| All | All | 657.29 | 656.79 | 694.66 | 705.84 | 702.85 |

Deciles Analysis

Tables 3a – 3d should be considered as a whole. Appendix 2 presents the summary tables of these analyses. Among schools testing at least 10 LEP students in any of the past three years, former LEP students scored significantly higher than students never-LEP on the ELA-8, Math-4, and Math-8 examinations across the past three years. On the ELA-4 examination, the two groups were not statistically distinguishable on the whole, but interactions discussed below show complex interactions hidden by this main effect. The tables show what is evident from Figures 1a – 1d. That is, in the lower levels of skills on each examination in districts testing 10 or more LEP students in any year, the differences favor the former LEP students are large.

On the other hand, in districts testing fewer LEP students, the differences favored students who were never identified as being LEP students. In fact, among students on the lower end of the score distributions, the LEP students above the 30$^{th}$ percentile actually scored higher than the former LEP students in these districts. Taken together, these results suggest that LEP students in these low LEP representation districts may be exiting from programs before they are fully prepared because there is some falling back. This hypothesis is examined more carefully for all students in the discussion section that follows, but it may well be that where there are few students, the programs may not prepare students as well for mainstreaming.

Very conservative Scheffe post hoc contrasts revealed that on the ELA-4, among students in districts in which there were fewer than 10 LEP students tested on any of the three years, there were no significant scoring differences between former LEP students and high-skilled current LEP students (above the 30$^{th}$ percentile) in any of the 10 deciles. However, never-LEP students scored significantly higher than former LEP students in each of the ten deciles except the first where there were no significant differences.

The picture was quite different in districts where 10 or more LEP students had been tested at one or more of the three test administrations. At each decile, the former LEP students scored significantly higher than the high-skilled current LEP students. The former LEP students also scored significantly higher than never-LEP students in each of the first three deciles, and significantly lower in the top five deciles. At the fourth and fifth deciles there were no discernible scoring differences.

Scheffe post hoc contrasts revealed on the ELA-8 that among students from districts with low LEP student representation, the differences at any decile between former LEP students and high-skill LEP students were not statistically significant. In those districts, at each decile, the never-LEP students scored significantly higher than former LEP students. In districts that tested at least LEP students in any year, at each decile the former LEP students scored significantly higher than the high-skilled current LEP students. These students also scored significantly higher at each of the first four deciles than the never-LEP students, and significantly lower than these students only at the very highest decile.

On the Math-4 examination, the results were similar. In districts where there was low LEP student representation, there were no significant differences in any of the deciles either between high-skill LEP students and former LEP students or between former LEP students and the never-LEP students.

On the other hand, in districts where at least 10 LEP students had been tested in any of the three years, the former LEP students scored higher in each decile than the high-skill LEP students. Moreover, the former LEP students scored significantly higher than the never-LEP students in the first four deciles, while the latter group scored significantly higher than the former LEP students only in the top two deciles.

On the Math-8 examination, in districts where fewer than 10 LEP students were tested in each of the three years, the former LEP students could not be statistically distinguished from the

high-skill LEP students in any of the deciles. In these low LEP representation districts, former LEP students scored lower than never-LEP students in the first six deciles, and not statistically different from the never identified students in the top four deciles.

Again, a very different picture emerges in the districts with higher representations of LEP students, that is, where at least 10 LEP students had been tested in one of the years. In these districts, former LEP students scored significantly higher than high-skilled current LEP students in each of the 10 deciles, and significantly higher than never-LEP students in each of the 10 deciles except the seventh.

## Conclusion

The data analyses suggest that there are no simple characterizations of the performance of LEP students on New York's examinations of English language arts and mathematics, but for the most part, the hypotheses were supported. These students are performing very well with respect to monolingual English curriculum peers, especially in the lower score ranges, where among former LEP students, the lowest scoring students seem to be most advantaged by the program intervention, as compared to the lowest scoring never-LEP group. This observation might be easily overlooked if the impact of residence had not been considered.

Two possible (and not exclusive) hypotheses to explain these findings are:

a. The more affluent districts score higher, and are less likely to have LEP student representation, therefore statewide comparisons between former- and never-LEP students are biased in favor of the never-LEP group because they are disproportionately represented in more affluent school districts;

b. The greater the representation of ESL students in a district, the more likely that comprehensive bilingual education programs exist which improve the student's achievement, and when statewide data are controlled for LEP representation, former LEP students are more likely to have been advantaged by better program services.

To test these two hypotheses a secondary series of analyses was undertaken. First, the variance attributable to needs/resource category was partialled out of the scale scores within each administration year, to control for socioeconomic impact. Analyses within each test was then made of the residual scale score. Then, the same process was used to control for program intervention, using numbers of LEP students as a proxy to program intervention. Again, analyses followed on the residual scale scores. Finally, both needs/resource and numbers of LEP students tested were partialled out and analyses were made of the residual scale scores. In all cases, the residual analyses estimated the effects of LEP status and year of test administration. The results, presented in Table 4, reveal in the r-square values that the needs/resource variable influences the scores more than numbers of LEP students tested, and once controlled, former

LEP students score significantly higher than both never-LEP students and current LEP students on all examinations. All hypotheses are confirmed once socioeconomic status is addressed. This is also true of the residual analysis controlling for both numbers of LEP students tested and needs/resource categories. Appendix 3 present the analysis of variance summaries.

There is one final caveat. Any screening, even program exit, defines a successful population, and tends to bias the results in favor of former LEP students. Clearly the research needs to continue, but there is every indication here, that by the time students meet program exit criteria, the program impact on achievement of the State Learning Standards in elementary and intermediate English language arts and in mathematics is very positive.

## Table 4

## Analysis of Residuals of Scale Scores, Controlling for District Needs/Resource Category and Numbers of LEP Students Tested

| Test | Control Condition | Year | R-Square | Less than 30th | 30th + | Former | Never |
|---|---|---|---|---|---|---|---|
| ELA-4 | Needs/Resource | 1999 | 0.123 | -47.14 | -21.21 | 4.29 | 1.10 |
| | | 2000 | 0.130 | -49.18 | -23.60 | 4.45 | 1.14 |
| | | 2001 | 0.127 | -49.39 | -20.84 | 3.72 | 1.04 |
| | | All | | -48.59 | -21.65 | 4.15 | 1.09 |
| | LEP Tested | 1999 | 0.070 | -45.45 | -19.98 | 2.25 | 1.22 |
| | | 2000 | 0.067 | -46.90 | -21.59 | 1.01 | 1.37 |
| | | 2001 | 0.057 | -47.84 | -21.18 | 0.37 | 1.30 |
| | | All | | -46.73 | -20.77 | 1.18 | 1.30 |
| | N/R + LEP | 1999 | 0.130 | -44.25 | -18.97 | 5.55 | 0.89 |
| | | 2000 | 0.136 | -45.57 | -21.29 | 5.76 | 0.91 |
| | | 2001 | 0.131 | -46.39 | -19.30 | 5.01 | 0.84 |
| | | All | | -45.40 | -19.69 | 5.44 | 0.88 |
| ELA-8 | Needs/Resource | 1999 | 0.083 | -32.10 | -32.90 | 3.72 | 0.57 |
| | | 2000 | 0.102 | -38.55 | -24.65 | 4.05 | 0.78 |
| | | 2001 | 0.097 | -36.38 | -23.65 | 3.24 | 0.74 |
| | | All | | -36.84 | -30.56 | 3.66 | 0.71 |
| | LEP Tested | 1999 | 0.036 | -32.72 | -31.96 | 2.08 | 0.74 |
| | | 2000 | 0.043 | -37.73 | -26.77 | 1.31 | 1.04 |
| | | 2001 | 0.039 | -36.07 | -25.94 | 1.07 | 0.96 |
| | | All | | -36.41 | -30.46 | 1.46 | 0.92 |
| | N/R + LEP | 1999 | 0.086 | -30.88 | -31.09 | 4.50 | 0.47 |
| | | 2000 | 0.106 | -36.52 | -23.79 | 4.84 | 0.64 |
| | | 2001 | 0.099 | -34.81 | -22.92 | 4.00 | 0.62 |
| | | All | | -35.11 | -29.03 | 4.45 | 0.58 |
| Math-4 | Needs/Resource | 1999 | 0.151 | -37.62 | -17.79 | 8.44 | 0.97 |
| | | 2000 | 0.162 | -32.32 | -13.73 | 8.45 | 0.77 |
| | | 2001 | 0.150 | -31.16 | -14.98 | 9.22 | 0.70 |
| | | All | | -33.60 | -15.64 | 8.70 | 0.81 |
| | LEP Tested | 1999 | 0.073 | -35.53 | -18.36 | 4.27 | 1.27 |
| | | 2000 | 0.075 | -30.55 | -14.58 | 4.17 | 1.08 |
| | | 2001 | 0.071 | -29.68 | -14.75 | 5.24 | 0.99 |
| | | All | | -31.82 | -16.07 | 4.56 | 1.11 |
| | N/R + LEP | 1999 | 0.159 | -34.24 | -15.80 | 9.73 | 0.70 |
| | | 2000 | 0.167 | -29.68 | -12.09 | 9.44 | 0.55 |
| | | 2001 | 0.155 | -28.39 | -13.44 | 10.44 | 0.45 |
| | | All | | -30.67 | -13.90 | 9.87 | 0.57 |
| Math-8 | Needs/Resource | 1999 | 0.143 | -26.65 | -33.46 | 10.13 | 0.43 |
| | | 2000 | 0.169 | -31.82 | -26.18 | 9.11 | 0.62 |
| | | 2001 | 0.156 | -30.66 | -20.37 | 9.39 | 0.48 |
| | | All | | -30.60 | -30.31 | 9.52 | 0.52 |
| | LEP Tested | 1999 | 0.058 | -26.59 | -34.27 | 5.47 | 0.90 |
| | | 2000 | 0.077 | -32.11 | -31.90 | 3.55 | 1.23 |
| | | 2001 | 0.063 | -31.83 | -25.02 | 4.65 | 1.01 |
| | | All | | -30.87 | -32.70 | 4.53 | 1.05 |
| | N/R + LEP | 1999 | 0.145 | -24.62 | -31.46 | 11.10 | 0.25 |
| | | 2000 | 0.171 | -30.13 | -25.44 | 9.87 | 0.47 |
| | | 2001 | 0.157 | -29.54 | -19.95 | 10.05 | 0.37 |
| | | All | | -28.77 | -29.00 | 10.31 | 0.36 |

## Appendix 1

## Analysis of Variance (ANOVA) Summary Tables, by Test

**Test = ELA-4** (R-Square = 0.185)

| Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F. Ratio |
|---|---|---|---|---|
| (a) Year | 80,022.80 | 2 | 4,011.40 | 29.27*** |
| (b) LEP Stat. | 179,332.26 | 3 | 59,777.42 | 43.73*** |
| (c) N/Res. | 543,660.70 | 5 | 108,732.14 | 79.55*** |
| (d) LEP Rep. | 21,754.10 | 1 | 21,754.10 | 15.92*** |
| a × b | 2,283.05 | 6 | 380.51 | 0.28 |
| a × c | 30,492.31 | 10 | 3,049.23 | 2.23* |
| a × d | 1,534.35 | 2 | 767.18 | 0.56 |
| b × c | 268,188.15 | 15 | 17,879.21 | 13.08*** |
| b × d | 4,202.89 | 3 | 1,400.96 | 1.02 |
| c × d | 10,960.35 | 4 | 2,740.09 | 2.00 |
| a × b × c | 89,459.52 | 30 | 2,981.98 | 2.18*** |
| a × b × d | 4,816.08 | 6 | 802.68 | 0.59 |
| a × c × d | 10,581.00 | 8 | 1,322.62 | 0.97 |
| b × c × d | 46,081.02 | 12 | 3,840.09 | 2.81*** |
| a × b × c × d | 55,014.80 | 21 | 2,619.75 | 1.92** |
| Error | 871,164,750.00 | 637,364 | 1,367.00 | ---- |
| Total | 1,069,405,162.00 | 637,492 | ---- | ---- |

## Appendix 1

## Analysis of Variance (ANOVA) Summary Tables, by Test

**Test = ELA-8** (R-Square = 0.131)

| Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F. Ratio |
|---|---|---|---|---|
| (a) Year | 8,031.04 | 2 | 4,015.52 | 4.19* |
| (b) LEP Stat. | 327,084.41 | 3 | 109,028.14 | 113.64*** |
| (c) N/Res. | 221,682.24 | 5 | 44,336.45 | 46.21*** |
| (d) LEP Rep. | 1,395.22 | 1 | 1,395.22 | 1.45 |
| a × b | 2,048.79 | 6 | 341.46 | 0.36 |
| a × c | 11,472.37 | 10 | 1,147.24 | 1.20 |
| a × d | 1,895.60 | 2 | 947.80 | 0.99 |
| b × c | 70,471.37 | 15 | 4,698.09 | 4.90*** |
| b × d | 3,325.70 | 3 | 1,108.09 | 1.16 |
| c × d | 21,792.34 | 3 | 7,264.11 | 7.57*** |
| a × b × c | 48,123.32 | 30 | 1,604.11 | 1.67* |
| a × b × d | 5,646.10 | 6 | 941.02 | 0.98 |
| a × c × d | 6,101.89 | 6 | 1,016.98 | 1.06 |
| b × c × d | 37,570.02 | 9 | 4,174.45 | 4.35*** |
| a × b × c × d | 12,183.40 | 13 | 937.18 | 0.98 |
| Error | 546,220,931.80 | 569,330 | 959.40 | ---- |
| Total | 628,377,233.30 | 569,444 | ---- | ---- |

## Appendix 1

## Analysis of Variance (ANOVA) Summary Tables, by Test

**Test = Math-4** (R-Square = 0.193)

| Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F. Ratio |
|---|---|---|---|---|
| (a) Year | 11,407.18 | 2 | 5,703.59 | 4.48* |
| (b) LEP Stat. | 248,953.95 | 3 | 82,984.65 | 65.22*** |
| (c) N/Res. | 1,332,989.97 | 5 | 266,597.99 | 209.54*** |
| (d) LEP Rep. | 17,525.75 | 1 | 17,525.75 | 13.78*** |
| a × b | 3,857.83 | 6 | 642.97 | 0.51 |
| a × c | 40,558.22 | 10 | 4,055.82 | 3.19*** |
| a × d | 344.42 | 2 | 172.21 | 0.14 |
| b × c | 335,904.43 | 15 | 22,393.63 | 17.60*** |
| b × d | 6,075.49 | 3 | 2,025.16 | 1.59 |
| c × d | 85,503.50 | 4 | 21,375.87 | 16.80*** |
| a × b × c | 110,795.61 | 30 | 3,693.19 | 2.90*** |
| a × b × d | 1,538.14 | 6 | 256.36 | 0.20 |
| a × c × d | 7,636.05 | 8 | 954.51 | 0.75 |
| b × c × d | 19,222.82 | 11 | 1,747.53 | 1.37 |
| a × b × c × d | 39,422.39 | 21 | 1,877.26 | 1.48 |
| Error | 824,321,385.00 | 647,907 | 1,272.00 | ---- |
| Total | 1,022,048,131.00 | 648,034 | ---- | ---- |

## Appendix 1

## Analysis of Variance (ANOVA) Summary Tables, by Test

**Test = Math-8** (R-Square = 0.187)

| Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F. Ratio |
|---|---|---|---|---|
| (a) Year | 14,343.29 | 2 | 7,171.64 | 4.81** |
| (b) LEP Stat. | 652,560.11 | 3 | 217,520.04 | 145.74*** |
| (c) N/Res. | 669,051.39 | 5 | 133,810.28 | 89.65*** |
| (d) LEP Rep. | 12,957.37 | 1 | 12,957.37 | 8.68** |
| a × b | 9,416.89 | 6 | 1,569.48 | 1.05 |
| a × c | 12,619.81 | 10 | 1,261.98 | 0.85 |
| a × d | 761.22 | 2 | 380.61 | 0.26 |
| b × c | 108,289.92 | 15 | 7,219.33 | 4.84*** |
| b × d | 8,522.96 | 3 | 2,840.99 | 1.90 |
| c × d | 72,854.00 | 4 | 18,213.50 | 12.20*** |
| a × b × c | 63,817.66 | 30 | 2,217.26 | 1.43 |
| a × b × d | 7,466.01 | 6 | 1,244.34 | 0.83 |
| a × c × d | 7,464.22 | 8 | 933.03 | 0.63 |
| b × c × d | 46,275.59 | 12 | 3,856.30 | 2.58* |
| a × b × c × d | 30,370.59 | 22 | 1,380.48 | 0.92 |
| Error | 867,849,762.00 | 581,460 | 1,493.00 | ---- |
| Total | 1,067,265,893.00 | 581,589 | ---- | ---- |

## Appendix 2

## ANOVA Summary Tables of Decile Analyses, by Test

**Test = ELA-4** (R-Square = 0.928)

| Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F. Ratio |
|---|---|---|---|---|
| (a) Year | 369,540.09 | 2 | 184,770.04 | 1,526.70*** |
| (b) LEP Rep. | 1,717,124.94 | 1 | 1,717,124.94 | 14,188.10*** |
| (c) LEP Stat. | 3,523,097.24 | 3 | 1,174,365.75 | 9,703.41*** |
| (d) Decile | 14,397,657.05 | 9 | 1,599,739.67 | 13,218.10*** |
| a × b | 18,420.91 | 2 | 9,210.45 | 76.10*** |
| a × c | 10,980.50 | 6 | 1,830.08 | 15.12*** |
| a × d | 200,681.91 | 18 | 11,148.99 | 92.12*** |
| b × c | 491,835.84 | 3 | 163,945.28 | 1,354.63*** |
| b × d | 95,964.77 | 9 | 10,662.75 | 88.10*** |
| c × d | 283,115.35 | 27 | 10,485.75 | 88.64*** |
| a × b × c | 18,020.64 | 6 | 3,003.44 | 24.82*** |
| a × b × d | 14,900.97 | 18 | 827.78 | 6.84*** |
| a × c × d | 22,832.85 | 54 | 422.83 | 3.49*** |
| b × c × d | 59,522.68 | 27 | 2,204.54 | 18.22*** |
| a × b × c × d | 29,058.16 | 54 | 538.11 | 4.45*** |
| Error | 77,124,237.00 | 637,253 | 121.00 | ---- |
| Total | 1,069,405,162.00 | 637,492 | ---- | ---- |

## Appendix 2

## ANOVA Summary Tables of Decile Analyses, by Test

**Test = ELA-8** (R-Square = 0.934)

| Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F. Ratio |
|---|---|---|---|---|
| (a) Year | 18,154.08 | 2 | 9,077.04 | 123.80*** |
| (b) LEP Rep. | 429,945.07 | 1 | 429,945.07 | 5,863.88*** |
| (c) LEP Stat. | 2,647,428.39 | 3 | 882,4776.13 | 12,035.80*** |
| (d) Decile | 7,148,759.99 | 9 | 794,306.67 | 10,833.30 |
| a × b | 288.37 | 2 | 144.18 | 1.97 |
| a × c | 13,765.60 | 6 | 2,294.27 | 31.29*** |
| a × d | 37,969.74 | 18 | 2,109.43 | 28.77*** |
| b × c | 363,638.82 | 3 | 121,212.94 | 1,653.18*** |
| b × d | 4,865.60 | 9 | 540.62 | 7.37*** |
| c × d | 77,136.32 | 27 | 2,856.90 | 38.96*** |
| a × b × c | 19,425.82 | 6 | 3,237.64 | 44.16*** |
| a × b × d | 2,610.76 | 18 | 145.04 | 1.98* |
| a × c × d | 15,867.40 | 54 | 293.84 | 4.01*** |
| b × c × d | 12,602.68 | 27 | 466.77 | 6.37*** |
| a × b × c × d | 13,874.28 | 54 | 256.93 | 3.50*** |
| Error | 41,734,661.80 | 569,205 | 73.30 | ---- |
| Total | 628,377,233.30 | 569,444 | ---- | ---- |

## Appendix 2

## ANOVA Summary Tables of Decile Analyses, by Test

**Test = Math-4** (R-Square = 0.929)

| Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F. Ratio |
|---|---|---|---|---|
| (a) Year | 65,256.36 | 2 | 32,628.18 | 293.28*** |
| (b) LEP Rep. | 2,389,993.42 | 1 | 2,389,993.42 | 21,482.30*** |
| (c) LEP Stat. | 3,915,371.89 | 3 | 1,305,123.96 | 11,731.00** |
| (d) Decile | 16,425,317.54 | 9 | 1,825,035.28 | 16,404.20*** |
| a × b | 4,965.06 | 2 | 2,482.53 | 22.31*** |
| a × c | 19,197.54 | 6 | 3,199.59 | 28.76*** |
| a × d | 33,469.81 | 18 | 1,859.43 | 16.71*** |
| b × c | 225,196.72 | 3 | 75,065.57 | 674.72*** |
| b × d | 42,757.76 | 9 | 4,750.86 | 42.70*** |
| c × d | 40,109.54 | 27 | 1,485.54 | 13.35*** |
| a × b × c | 23,422.55 | 6 | 3,903.76 | 35.09*** |
| a × b × d | 11,332.63 | 18 | 629.59 | 5.66*** |
| a × c × d | 13,829.21 | 54 | 256.10 | 2.30*** |
| b × c × d | 60,333.98 | 27 | 2,234.59 | 20.09*** |
| a × b × c × d | 14,952.29 | 54 | 276.89 | 2.49*** |
| Error | 72,069,674.00 | 647,795 | 111.00 | ---- |
| Total | 1,022,048,131.00 | 648,034 | ---- | ---- |

## Appendix 2

## ANOVA Summary Tables of Decile Analyses, by Test

**Test = Math-8** (R-Square = 0.924)

| Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F. Ratio |
|---|---|---|---|---|
| (a) Year | 53,876.07 | 2 | 26,938.03 | 194.21*** |
| (b) LEP Rep. | 1,623,240.99 | 1 | 1,623,240.99 | 11,703.00*** |
| (c) LEP Stat. | 3,135,790.05 | 3 | 1,045,263.35 | 7,535.98*** |
| (d) Decile | 16,621,519.57 | 9 | 1,846,835.51 | 13,315.00*** |
| a × b | 12,877.66 | 2 | 6,438.83 | 46.42*** |
| a × c | 27,753.59 | 6 | 4,625.60 | 33.35*** |
| a × d | 24,679.12 | 18 | 1,371.06 | 9.88*** |
| b × c | 414,671.85 | 3 | 138,223.95 | 996.55*** |
| b × d | 5,445.94 | 9 | 605.10 | 4.36*** |
| c × d | 127,093.30 | 27 | 4,70716 | 33.94*** |
| a × b × c | 42,001.39 | 6 | 7,000.23 | 50.47*** |
| a × b × d | 33,236.88 | 18 | 1,846.49 | 13.13*** |
| a × c × d | 19,097.64 | 54 | 353.66 | 2.55*** |
| b × c × d | 154,145.30 | 27 | 5,709.09 | 41.16*** |
| a × b × c × d | 36,432.77 | 54 | 674.68 | 4.86*** |
| Error | 80,634,982.00 | 581,350 | 139.00 | ---- |
| Total | 1,067,265,893.00 | 581,589 | ---- | ---- |

## Appendix 3

### General Linear Models Controlling for Needs/Resource Category, Number of LEP Students Tested, and Both Resource Category and Numbers of LEP Students Tested

**Test = ELA-4**

| Partialled Variable | Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F-Ratio |
|---|---|---|---|---|---|
| Needs/Res. | (a) Year | 8,481.36 | 2 | 4,240.68 | 3.09* |
| | (b) LEP Stat. | 38,977,163.81 | 3 | 12,992,387.94 | 9,459.07*** |
| | a × b | 22,486.93 | 6 | 3,747.82 | 2.73 |
| | Error | 875,603,719.40 | 637,481 | 1,373.50 | ---- |
| | Total | 914,816,982.70 | 637,492 | ---- | ---- |
| No. LEP | (a) Year | 18,208.42 | 2 | 9,014.21 | 6.08** |
| | (b) LEP Stat. | 35,675,997.51 | 3 | 11,891,999.17 | 8,016.07*** |
| | a × b | 45,475.60 | 6 | 7,579.27 | 5.11*** |
| | Error | 945,715,475.60 | 637,481 | 1,487.50 | ---- |
| | Total | 981,603,225.90 | 637,492 | ---- | ---- |
| Both | (a) Year | 7,967.05 | 2 | 3,983.52 | 2.90 |
| | (b) LEP Stat. | 34,547,237.08 | 3 | 11,515,745.69 | 8,397.04*** |
| | a × b | 18,271.25 | 6 | 3,045.21 | 2.22* |
| | Error | 874,245,244.00 | 637,481 | 1,371.40 | ---- |
| | Total | 908,962,658.80 | 637,492 | ---- | ---- |

## Appendix 3

## General Linear Models Controlling for Needs/Resource Category, Number of LEP Students Tested, and Both Resource Category and Numbers of LEP Students Tested

**Test = ELA-8**

| Partialled Variable | Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F-Ratio |
|---|---|---|---|---|---|
| Needs/Res. | (a) Year | 7,223.34 | 2 | 3,611.67 | 3.75* |
| | (b) LEP Stat. | 12,384,832.22 | 3 | 4,128,277.41 | 4,287.38*** |
| | a × b | 119,119.86 | 6 | 19,853.31 | 20.62*** |
| | Error | 548,301,327.90 | 569,433 | 962.90 | ---- |
| | Total | 568,350,768.60 | 569,444 | ---- | ---- |
| No. LEP | (a) Year | 1,541.22 | 2 | 770.61 | 0.75 |
| | (b) LEP Stat. | 12,067,818.40 | 3 | 4,022,606.13 | 3,923.60*** |
| | a × b | 68,754.85 | 6 | 11,459.14 | 11.18*** |
| | Error | 583,801,759.60 | 569,433 | 1,025.20 | ---- |
| | Total | 603,040,888.90 | 569,444 | ---- | ---- |
| Both | (a) Year | 5,163.62 | 2 | 2,581.81 | 31.10*** |
| | (b) LEP Stat. | 11,617,973.04 | 3 | 3,872,657.68 | 8,710.28*** |
| | a × b | 93,561.47 | 6 | 15,593.58 | 28.56*** |
| | Error | 547,887,020.50 | 569,433 | 962.20 | ---- |
| | Total | 566,367,945.30 | 569,444 | ---- | ---- |

## Appendix 3

## General Linear Models Controlling for Needs/Resource Category, Number of LEP Students Tested, and Both Resource Category and Numbers of LEP Students Tested

**Test = Math-4**

| Partialled Variable | Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F-Ratio |
|---|---|---|---|---|---|
| Needs/Res. | (a) Year | 79,434.96 | 2 | 39,717.48 | 31.10*** |
| | (b) LEP Stat. | 3,336,947.01 | 3 | 11,122,315.67 | 8,710.28*** |
| | a × b | 218,802.25 | 6 | 36,467.04 | 28.56*** |
| | Error | 827,472,603.60 | 648,023 | 1,276.90 | ---- |
| | Total | 860,960,060.70 | 648,034 | ---- | ---- |
| No. LEP | (a) Year | 77,877.50 | 2 | 38,936.25 | 27.57*** |
| | (b) LEP Stat. | 28,071,369.64 | 3 | 9,357,123.21 | 6,625.28*** |
| | a × b | 193,860.82 | 6 | 32,310.14 | 22.88*** |
| | Error | 915,226,328.80 | 648,023 | 1,412.30 | ---- |
| | Total | 943,418,721.80 | 648,034 | ---- | ---- |
| Both | (a) Year | 60,569.96 | 2 | 30,284.98 | 23.77*** |
| | (b) LEP Stat. | 29,368,690.31 | 3 | 9,789,563.44 | 7,683.53*** |
| | a × b | 177,626.54 | 6 | 29,604.42 | 23.24*** |
| | Error | 825,643,714.60 | 648,023 | 1,274.10 | ---- |
| | Total | 855,108,500.00 | 648,034 | ---- | ---- |

## Appendix 3

### General Linear Models Controlling for Needs/Resource Category, Number of LEP Students Tested, and Both Resource Category and Numbers of LEP Students Tested

**Test = Math-8**

| Partialled Variable | Source of Variance | Sum of Squares | Deg. Of Freedom | Mean Square | F-Ratio |
|---|---|---|---|---|---|
| Needs/Res. | (a) Year | 31,587.46 | 2 | 15,793.73 | 10.53*** |
| | (b) LEP Stat. | 21,988,281.39 | 3 | 7,329,427.13 | 4,884.78*** |
| | a × b | 201,016.25 | 6 | 33,502.71 | 22.33*** |
| | Error | 872,635,116.00 | 581,578 | 1,500.50 | ---- |
| | Total | 899,854,733.30 | 581,589 | ---- | ---- |
| No. LEP | (a) Year | 22,548.37 | 2 | 11,274.19 | 6.74** |
| | (b) LEP Stat. | 20,056,899.65 | 3 | 6,685,633.22 | 3,998.08*** |
| | a × b | 178,993.85 | 6 | 29,832.31 | 17.84*** |
| | Error | 972,521,477.70 | 581,578 | 1,672.20 | ---- |
| | Total | 998,013,079.80 | 581,589 | ---- | ---- |
| Both | (a) Year | 16,381.38 | 2 | 8,190.69 | 5.46** |
| | (b) LEP Stat. | 20,936,895.69 | 3 | 6,978,965.23 | 4,653.67*** |
| | a × b | 192,598.57 | 6 | 32,099.76 | 21.40*** |
| | Error | 872,174,170.30 | 581,578 | 1,499.70 | ---- |
| | Total | 897,877,889.20 | 581,589 | ---- | ---- |

**For all Appendices:**

* Exceeds the $p < .05$ level of significance
** Exceeds the $p < .01$ level of significance
*** Exceeds the $p < .001$ level of significance

*Endnotes*

[1] Cummins, J. "Linguistic interdependence and the educational development of bilingual children." *Review of Educational Research*. V49, n2, Spring, 1979, pp. 221-251

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[3] Holland, P.W. "Measuring Progress in Student Achievement: Changes in Scores and Score-Gaps Over Time." Report of the Planning Work Group of the National Assessment Governing Board, November, 2001