Measures of Student Achievement and Related Outcomes

Group 1 Career Ladder School Districts

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Table of Contents

Overview of Findings 1

Introduction 2

Methodology and Data Issues 2
- Methodology 2
- Issues of Experimental Design 3
- Use of NCE Scores 4
- Use of Complete Composite and Subject-Specific Scores 4
- Calculation of Score Differentials 4
- Data Sources 6

Student Performance Measures 7
- Historical Dropout and Graduation Rates 7
- Student Achievement in CL and Non-CL Classrooms 9
- Aggregate Student Performance on the ITBS for CL and Non-CL Districts 11
- Pre/Post Career Ladder Student Performance Indicators 13
- Measures of Achievement on the Arizona Student Assessment Program (ASAP) Assessments 15
- 1991 Expected Versus Actual Test Scores for CL Districts 16
- Comparisons of 1991 Expected Versus Actual Test Scores for CL and Non-CL Districts 17
- Changing At-Risk Status 19

Appendix

Bibliography

Overview of Findings

1. Group 1 Career Ladder districts reported lower historical (1987 - 1992) dropout rates than Non-Career Ladder districts.

2. Dropout rates for each racial/ethnic group were uniformly lower in Group 1 Career Ladder districts than those found in Non-Career Ladder districts.

3. Graduation rates in Group 1 Career Ladder districts were 5 percent points above the state average in 1991 and 8 percent points above the state average in 1992. Comparatively, graduation rates for Non-Career Ladder districts were 1 percent point below the state average in 1991 and 2 percent points below the state average in 1992.

4. Between 1988 and 1992 Complete Composite Normal Curve Equivalent (NCE) scores on the ITBS for each grade, 2 through 6, were between 5 and 10 percent above those reported by Non-Career Ladder districts.

5. Group 1 Career Ladder NCE scores, aggregated across grades 2 through 6, were 7.95 percent higher in 1988, 8.14 percent higher in 1990 and 9.10 percent higher in 1991, than those in Non-Career Ladder districts. Between 1988 and 1991, the NCE score differential between Group 1 Career Ladder districts and Non-Career Ladder districts increased.

6. For grade 3 Reading and Mathematics and Grade 6 Reading, the score differential between Group 1 Career Ladder districts and Non-Career Ladder districts increased between 1986 (pre-Career Ladder program implementation) and 1991 (post-Career Ladder program implementation). However, this trend was not apparent for grade 3 Language and grade 6 Language and Mathematics.

7. In 1990, NCE scores for students in grades K - 6 who received instruction from teachers participating in the Career Ladder program were 1.72 percent above scores reported for students not receiving instruction from Career Ladder teachers. NCE scores for students receiving instruction from Career Ladder teachers were between 1.4 and 12.9 percent higher than those reported for students not receiving instruction from Career Ladder teachers in 10 out of 13 (77 percent) Group 1 Career Ladder districts. (Note: no data was available at the classroom level for one of the Group 1 districts.)

8. For the Group 1 Career Ladder districts, student performance in each subject area of the March 1993 ASAP Form D1 assessments for grades 3 and 8 was between 1.4 and 6.8 percent above Non-Career Ladder districts.

9. Student achievement (1991 ITBS Complete Composite NCE scores for grades K - 6) in Group 1 Career Ladder districts exceeded expected performance when adjusted for community wealth and student/district population characteristics. Expected performance in Non-Career Ladder districts was not significantly different from actual performance. (Note: evaluation of expected versus actual performance was significant at the 95 percent confidence level.)

10. Group 1 Career Ladder districts which were identified as **not** being at-risk performed at higher than expected levels, while Group 1 Career Ladder districts identified as being at-risk performed slightly below expectations.

11. Group 1 Career Ladder districts which were identified as **not** being at-risk in 1990 grew to be relatively more at-risk by 1992. Group 1 Career Ladder districts which were considered to be at-risk in 1990 did not become significantly more at-risk by 1992.

Introduction

At the request of the Arizona Department of Education (ADE) Career Ladder Office, staff of the ADE Research and Development Division were asked to investigate student outcome measures for Arizona school districts participating in the state's Career Ladder (CL) program. The investigation focused on identifying variations in selected outcome measures between participating and non-participating districts.

This report summarizes the empirical information and analytical findings of the project. Part 1, Methodology and Data Issues, discusses methodological assumptions and decisions made at the start of the project, including issues concerning achievement scores, presentation of comparative data and primary sources of information. Part 2, Student Performance Measures, presents tabulations and charts of comparative outcome measures organized by type of analysis.

Part 1
Methodology and Data Issues

Methodology. At the beginning of the project, staff from the ADE Research and Development Division and the Career Ladder Office met to identify the type and scope of the analysis and the availability of relevant data sets. The following parameters were defined to guide the study:

- First, it was initially agreed that an historical perspective would be important, tracking various outcome measures over time in an effort to delineate trend differences between CL and non-CL districts.
- Second, it was felt that while multiple outcome measures should be investigated, the emphasis would be placed on student achievement.
- Third, discussions among ADE staff and representatives from CL districts suggested that outcome measures should be looked at in a variety of ways, including within and between comparative CL districts as well as contrasted against non-CL districts.
- Fourth, because the primary concentration of teacher participation is at the elementary grade levels, the analysis of student achievement is restricted to grades K - 6. The exception to this would be Arizona Student Assessment Program (ASAP) assessment results which include grades 3 and 8.
- Fifth, it was decided **not** to focus on individual district outcomes. Therefore, most of the data presented in this report compare averages aggregated across all CL and non-CL districts.
- Finally, since participation in the CL program began in 1987, it was decided to limit the analysis to districts which have been in the program the longest. Thus, the study group was restricted to the following original 14 Group 1 CL districts.

Figure 1

Group 1 Career Ladder Districts

Amphitheater	Ganado
Apache Junction	Kyrene
Catalina Foothills	Litchfield
Cave Creek	Mesa
Creighton	Peoria
Dysart	Sunnyside
Flowing Wells	Window Rock

Due to limitations in staff resources and available data, the type of student outcome measures investigated were restricted to readily available indicators, including student performance on ITBS/TAP tests, the Arizona Student Assessment Program (ASAP) assessment scores and high school (grades 9-12) dropout and graduation rates.[1]

Analysis of student outcomes incorporated the following investigations using CL and non-CL district data:

- Aggregate student ITBS achievement data by grade,
- Student achievement on the ITBS by classroom,
- 1993 ASAP Form D1 student assessment results by subject and grade level,
- Pre/post ITBS achievement by grade level,
- Expected versus actual ITBS student achievement, and
- Trends in dropout and graduation rates.

District-level analyses of both ITBS and ASAP test scores were based on weighted average aggregations of student-level data.[2] A final decision was made to restrict the analysis of ITBS results to the elementary grades in order to construct comparable district- and classroom-level aggregations.[3]

Issues of Experimental Design. The focus of this report is necessarily limited to the observation of various student outcome indicators associated with Group 1 CL and non-CL districts. Since the Group 1 CL districts were determined prior to the start of this evaluation, it was not possible to utilize strict experimental methodologies which would allow for a complete understanding of the causal relationship between implementation of the CL program and variations in student performance measures.

Participation in the CL program by Arizona school districts, school sites and classroom teachers was not a random event. Application and awards of limited program funding restricted participation to those districts, schools and teachers who requested, and were allowed, to participate. Throughout the history of the program, additional districts and school sites have been incorporated. Thus, statistically motivated inferences based on pre-selected experimental and control group evaluations are not possible. For this analysis, too little is known about the characteristics of the Group 1 CL districts as they relate to non-CL districts to assume that differences in empirical measurements are due solely to the effects of the CL program. Factors such as the lack of available data on competing at-risk programs, student involvement in multiple education support programs, teacher/school/district characteristics which initiated application to the CL program, and student outcome measures attributable to each of these factors, make parsing of performance and outcome indicators to the CL **or any other education program** problematic.

The difficulty of attributing quantifiable variations in student outcome measures to broad-based education programs is not unique to the CL program. Evaluations of programs such as Chapter 1, Chapter 2, School Lunch, At-Risk, Dropout Prevention, etc., are all characterized by an inability to strictly measure their impacts on student achievement. Indeed, most public policy and programmatic evaluations are conducted with the understanding that the complexity of competing factors (human, policy or program) precludes any evaluation of effectiveness based purely on empirical findings. Rather, observations of measurable events are made to supply the evaluator with additional information which facilitates an understanding of a particular belief or hypothesis. When such empirical data are combined with other qualitative information, observations and understandings, it becomes possible to reach more informed conclusions about the causal impact of a particular program or activity.

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1 (ITBS/TAP) Iowa Tests of Basic Skills and Tests of Achievement and Proficiency, Riverside Publishing Company, Chicago, Illinois.

2 Calculations of *weighted average* achievement levels are used throughout this report. The number of students within an analysis group (such as a classroom, district or group of districts) serves as the weight. This weight (or student count) is applied to the average test score of the analysis group in order to reflect its relative importance compared to other group averages.

3 Students in grades 7 - 12 traditionally do not reside in self-contained classrooms, thus preventing a one-to-one link between tests scores and the teacher identifier available from the computer record.

This report is intended to provide a variety of empirical observations on the variation and relationship of student outcome indicators for Group 1 CL and non-CL districts. It is by no means comprehensive. Much of the analysis has been restricted due to the lack of available data and resources. Hopefully, the comparative evaluations presented will lead to additional questions and areas of interest and, ultimately, to the implementation of a more exacting experimental design.

Use of NCE Scores. For the purpose of this report, all ITBS student performance figures are based on normal curve equivalent (NCE) scores. NCE scores were utilized for their mathematical and computational properties which allow for within- and across-grade comparisons of student performance. Unlike percentile ranks and grade-equivalents, NCE scores may be averaged across subpopulations of students within specific grades, schools or districts or across multiple grade levels.

An NCE score indicates the relative performance of an individual compared to the distribution of test scores achieved by a national sample of students -- commonly called a norm group. NCE scores range between 0 and 100 points. For example, if an Arizona student in a specific grade achieves a score which is equal to the average score of students at the same grade level represented in the national norm group, the Arizona student would receive an NCE score of 50. If the Arizona student achieved an NCE score greater than the average score of the norm group, the Arizona student's NCE score would be above 50. Finally, if the Arizona student earned a score lower than the average of the norm group, the resulting NCE score would be less than 50. This interpretive quality of NCE scores holds for an individual student or for groupings of students, schools or districts.

Use of Complete Composite and Subject-Specific Test Scores. The focus of this study was to investigate the relative performance levels of students in CL and non-CL districts.[4] No a priori hypothesis was stated on the effect of the CL program on student performance within a particular subject area. Thus, emphasis was placed on analyzing the composite scores of students because they represent an overall relative performance level incorporating the subject areas of Reading, Mathematics, Language and a variety of smaller subdomains of knowledge and skills. In fact, it is assumed that if the CL program is effective, the effect will be shown across all subject areas.

In one instance, the use of Complete Composite scores was not possible. In compiling test-score information for the 1986 school year, it was found that computer-based files were no longer available. As a result, data for that year had to be extracted from published reports. Unfortunately, the Riverside Publishing Company, which publishes the Arizona ITBS/TAP test scores, did not provide accessible hard-copy reports of Complete Composite scores on a district-by-grade level for the 1986 school year.[5] The only information readily available was for the primary subject areas of Reading, Language and Mathematics. As a result, the section comparing student performance in 1986 to 1992 reports weighted average NCE scores by subject area.

Calculation of Score Differentials. Throughout this report, two methods of presenting weighted average NCE scores are used to compare CL and non-CL districts. In many instances, the actual NCE scores of these groups are reported. This tells the reader about each group's overall average achievement level. In addition, comparing average NCE scores gives some indication of the relative position of one group to the other. However, it does not clearly demonstrate the degree to which the scores differ. This becomes even more problematic when comparing actual NCE scores over time.

To view the relative performance levels of CL and non-CL districts, calculations of score differentials are used. Score differentials simply report the percentage difference in absolute NCE scores between the two groups. In all cases, the weighted average scores for CL districts are compared against non-CL districts. Thus, positive differentials indicate that CL average scores exceed those of non-CL districts, while negative differentials indicate that CL districts performed at a level below non-CL districts. For example, a score differential of +3.20 percent indicates that the actual NCE score for CL districts was 3.20 percent above that for non-CL districts. Similarly, a differential of -3.20 percent indicates that the score for CL districts was 3.20 percent below that for non-CL districts.

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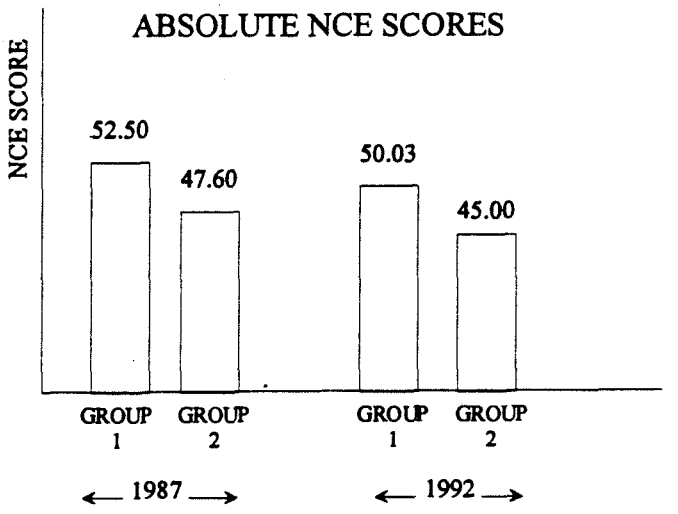
4 In essence, the empirical hypothesis being testing is that there is no difference in overall student performance between the two groups. Conventions and properties of classical statistical inference hold that a test of hypothesis be stated in terms of a "no difference" condition. This is commonly denoted as the "null" hypothesis.

5 Individual district reports retained in archives which contained additional subtest information were not retrieved due to an inability to manually compile and compute the Complete Composite scores across grades and subjects.

In the following illustration, Figure 2 reports the actual weighted average NCE scores of two hypothetical groups in 1987 and 1992.

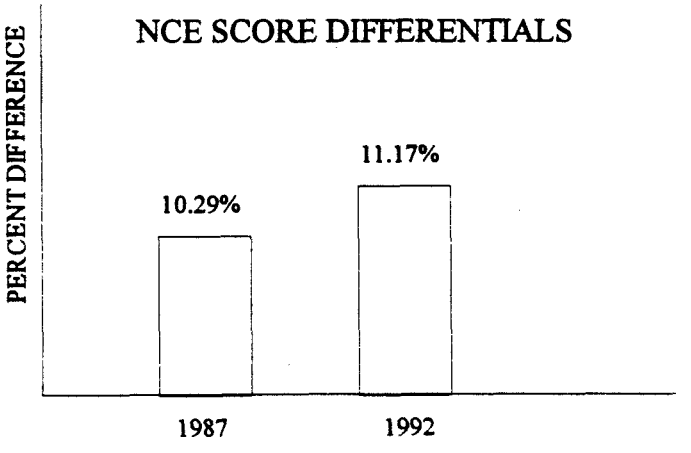
Figure 2



As shown above, the scores for Group 1 exceeded those of Group 2 in both years. In addition, the scores for both groups declined between the two time periods. However, from the information presented in Figure 2, it is difficult to ascertain both the relative achievement levels of the two groups for each year and how these achievement levels have changed over time.

In contrast, Figure 3 expresses the NCE scores for both groups as differentials. The positive differentials are interpreted as follows: (1) Group 1 scores exceeded Group 2 in both reference years; (2) in 1987, Group 1 scores were 10.29 percent higher than those for Group 2; (3) in 1992, Group 1 scores were 11.17 percent higher than Group 2 scores; and (4) the difference in Group 1 scores increased by .88 percent points between 1987 and 1992. Thus, while the level of achievement for Group 1 exceeded that for Group 2 in both years, the degree of this difference also increased.

Figure 3



Data Sources. To investigate ITBS achievement, historical information sets were constructed from computerized data files maintained by the ADE for the 1988, 1990 and 1991 school years. Changes in the ITBS testing program prevented the use of 1992 and 1993 data .[6] Each yearly data file contained student-specific information, including teacher's name, grade level, school designation, demographic data and standardized test scores.

Selection criteria were developed to extract ITBS scores only for grades K - 6, because it was not possible to link teacher identifiers with student test results for grades 7 - 12. District identifiers were then constructed which identified CL and non-CL districts for use in aggregate calculations. At the classroom level, teacher lists were obtained for each CL district. From these lists, the names of teachers participating in the CL program were matched to teacher names maintained on the individual student records.

To compare student achievement levels observed under the Career Ladder program with levels existing prior to its inception in 1987, data from the 1986 school year was used. Since no computer data files existed for this school year, staff extracted ITBS grade-equivalent scores for grades 3 and 6 by subject area from the *Appendix to the Statewide Report for Arizona Pupil Achievement Testing, June 1986.*[7] Resource limitations and computational difficulties prevented extraction of additional grade and subject information.

All of the ITBS analyses utilized 1988-normed NCE scores.[8] As mentioned above, it was preferable to use NCE scores due to their mathematical properties and ease of interpretation. All of the 1988 - 91 data were based on 1988 norms. However, the 1986 data were available originally only for 1982 norms. Thus, it was necessary to convert these data to the equivalent 1988 benchmark year. This was accomplished as follows:

1. Tabulate 1986 grade-equivalent scores by subject for grades 3 and 6 for each Group 1 CL district, and

2. Use conversion tables provided by the Riverside Publishing Company to map 1986 grade-equivalent scores to 1986 percentile ranks, map 1986 percentile ranks to 1988-norm percentile ranks, and map 1988-norm percentile ranks to NCE scores.

Student performance data on the Arizona Student Assessment Program (ASAP) March 1993 assessments were compiled for grades 3 and 8 from information sets maintained by the ADE Research and Development Division. Grade 12 assessment scores were not available for two of the Group 1 CL districts and three more districts did not have active 9-12 grade levels. In addition, high school teacher participation rates in the CL program for some of the districts were substantially lower than those found in the elementary grades. Finally, as with ITBS results, it is not possible to obtain comparative teacher participation and student assessment scores for grade 12. For these reasons, grade 12 ASAP assessment results were not included in the analysis.

In addition to looking at trends in actual student test scores, a predictive model of student performance was utilized. This model was developed by the ADE Research and Development Division to estimate the effects of numerous community, economic and population factors on variations in district-level ITBS test scores. The model incorporated information obtained from the U.S. Bureau of the Census and the ADE's report on the *At-Risk Status of Arizona School Districts.*[9]

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6 In 1992, Arizona law altered the structure of the Arizona Pupil Achievement Testing Program by moving the administration of standardized testing from the spring to the fall, reducing the number of grade levels tested and restricting the subject areas to selected subtests within Reading, Language and Mathematics. Due to these changes, no comparable Complete Composite ITBS scores for grades K - 6 could be constructed.

7 *Appendix to the Statewide Report for Arizona Pupil Achievement Testing,* Arizona Department of Education, Phoenix, Arizona, June 1986.

8 Refer to Part 1, Use of NCE Scores.

9 The Arizona Department of Education participated in a joint project with the U.S. Bureau of the Census and the U.S. Department of Education that electronically mapped school district boundaries throughout the state. The electronic boundary files were then merged with 1990 Census information to provide a wide variety of demographic and economic tabulations by school district. The Census data used in this report were extracted from the *School District Data Book CD-ROM*, U.S. Bureau of the Census, October 1993. Information on the at-risk status of school districts was obtained from *Ed.STAT: The At-Risk Status of Arizona's School Districts*, Arizona Department of Education Research and Development Division, March 1992.

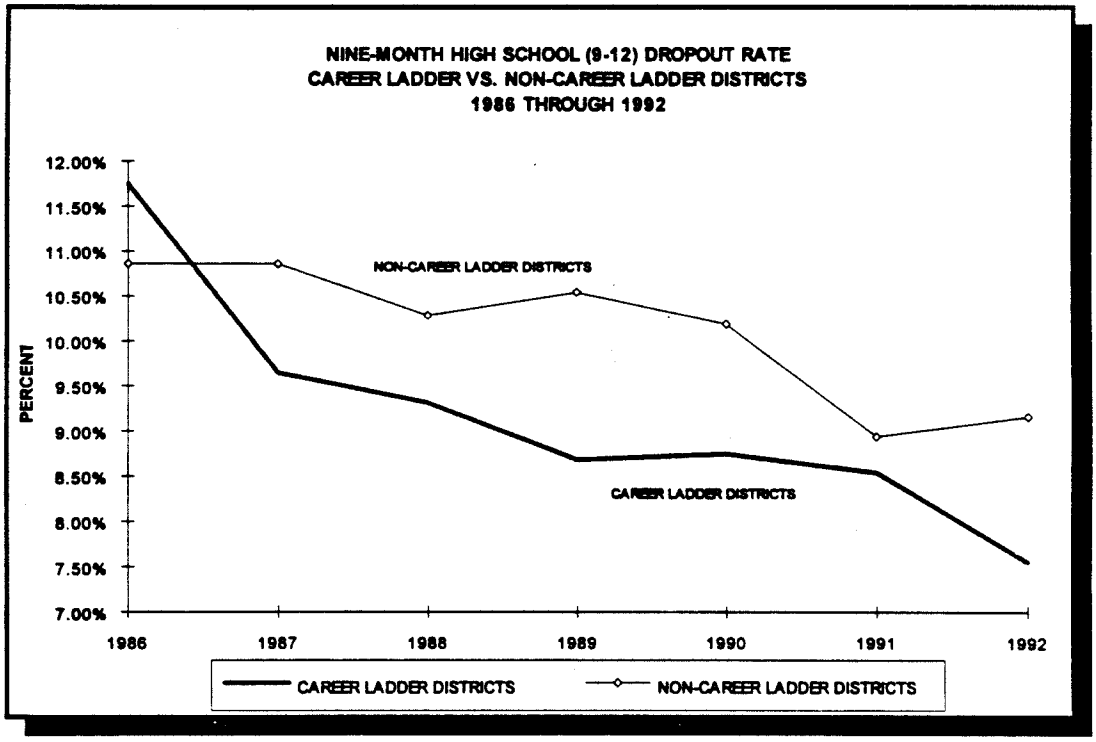
The predictor variables used in estimating aggregate test scores included the following:

Median Family Income
Median Value of Owner-Occupied Housing Units
Percent of Students Eligible for Participation in the Free/Reduced Price Lunch Program
Percent of Students Identified as Being Limited English Proficient
District Absentee Rate
District Index of Mobility
Percent of Minority Students in the District
Percent of Students Who Have a Computer at Home

Part 2
Student Performance Measures

Historical Dropout and Graduation Rates. Figure 4 displays weighted average annual high school (grades 9 - 12) dropout rates for CL and non-CL districts for 1986 through 1992.[10] The figures reported are calculated annually, based on a nine-month, fall-to-spring school year.

Figure 4



As shown above, with the exception of the 1986 school year, CL districts reported lower average nine-month high school dropout rates than non-CL districts. Beginning in 1987, CL district dropout rates steadily declined from a high of 9.65 percent to a low of 7.56 in 1992. The largest difference in dropout rates occurred in 1989 when the rate for CL districts was 1.86 percent points below that of non-CL districts. The detailed dropout figures are provided in Figure 5 below.

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10 Historical dropout rate information was provided by the ADE School Finance Unit. Detailed data for 1992 may be found in Caryn R. Shoemaker's *Dropout Rate Study, 1991-92*, A *Study of Annual Dropout Rates in Arizona Public Schools, Grades Seven Through Twelve*, Arizona Department of Education School Finance Unit, Phoenix, Arizona, February 1993.

Figure 5

Nine-Month High School Dropout Rate
(Percent)

Year	Group 1 Career Ladder Districts	Non-Career Ladder Districts	Difference
1985-86	11.75	10.86	0.89
1986-87	9.65	10.86	-1.21
1987-88	9.32	10.29	-0.97
1988-89	8.69	10.55	-1.86
1989-90	8.76	10.20	-1.44
1990-91	8.55	8.95	-0.04
1991-92	7.56	9.17	-1.67

Figure 6 reports 1992 nine-month high school dropout rates by race/ethnicity for CL and non-CL districts. As shown, both CL and non-CL districts displayed the same pattern of racial/ethnic dropout rates. For both groups, White and Asian student populations reported lower annual proportions of dropouts than Black, Hispanic or Native American populations. However, the data also indicated that CL districts displayed lower dropout rates within each racial/ethnic category than non-CL districts.

Figure 6

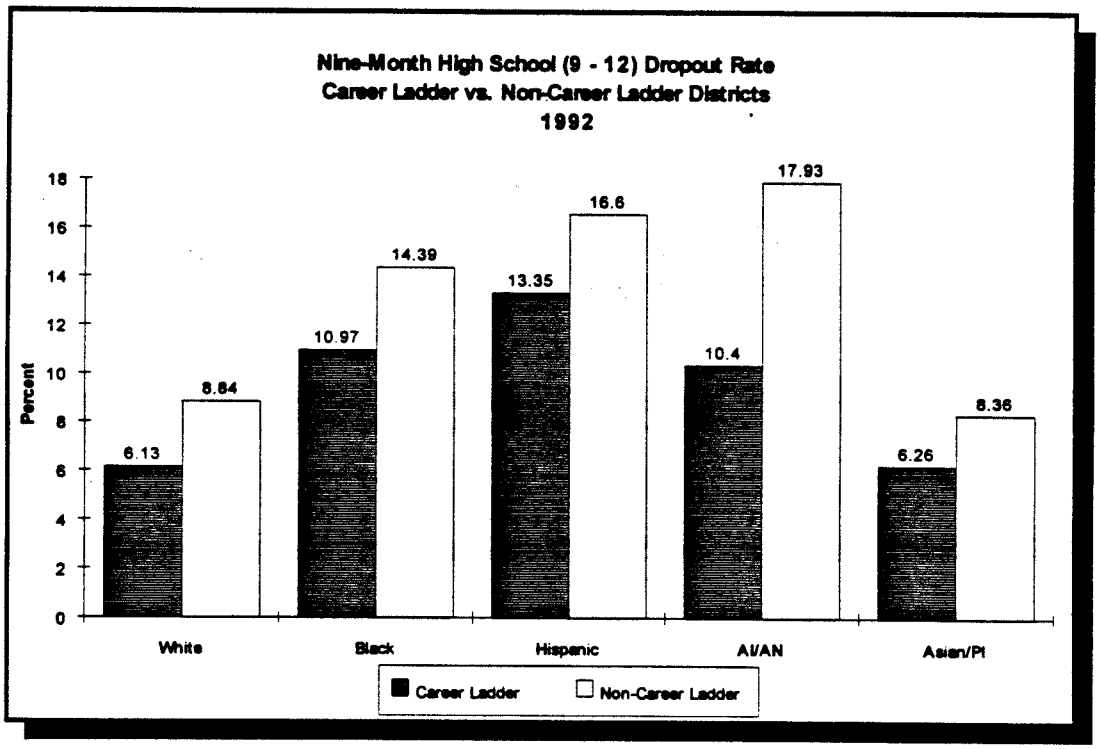

Figure 7 presents weighted average 1991 and 1992 graduation rates aggregated for CL and non-CL districts.[11] As indicated, high school graduation rates for CL districts exceeded those of non-CL districts in both years. In addition, CL district graduation rates exceeded the state average rate by 5 percent points in 1991 and by 8 percent points in 1992. Comparatively, non-CL districts declined from a 1 percent point advantage over the state average in 1991 to 2 percent points below the state average in 1992.

Figure 7

Weighted Average Graduation Rates[12]

	1991		1992	
	Percent	Difference From State	Percent	Difference From State
Group 1 Career Ladder Districts	70%	+5% Pts.	75%	+8% Pts.
Non-Career Ladder Districts	64%	-1% Pt.	65%	-2% Pts.
State Total	65%		67%	

Student Achievement in CL and Non-CL Classrooms. As part of the investigation into the impact of the CL program on student achievement, ADE R&D staff mapped within-district teacher participation to individual student performance records. This analysis was performed using 1990 ITBS computer data files for each of the 14 Group 1 CL districts. The data represents Complete Composite NCE scores aggregated across grades K - 6.

Figure 8, on the following page, reports the within-district difference between classrooms with and without participating CL teachers. As shown, 11 of 13 Group 1 CL districts reported that the classrooms with participating CL teachers have higher student achievement levels than those with non-participating teachers.[13]

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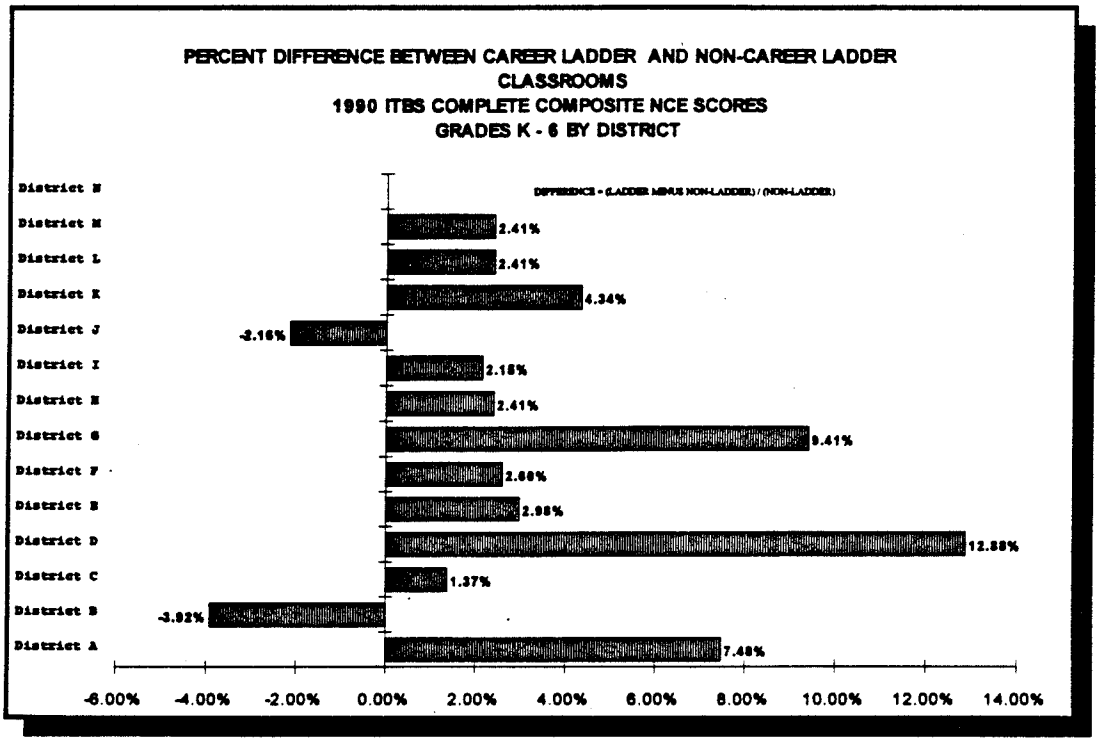
11 Information on district graduation rates was provided by the ADE School Finance Unit. Detailed district data are available in Caryn R. Shoemaker's *Class of 1992 Graduation Rate Study, A Study of Graduation Rates for Arizona Public High Schools,* Arizona Department of Education School Finance Unit, Phoenix, Arizona, March 1993.

12 Changes in data definitions over the two study years suggest comparison of the graduation rate figures over time should be done with caution.

13 No classroom data were available for one CL district. No adjustments were made for the level on which CL teachers participated in the program. Generally, teachers in lower levels of the program are less experienced. It is possible that student performance in CL districts with larger proportions of lower level CL teachers may not be impacted to the same degree as it is in districts with more higher level CL teachers.

Figure 8



In 1990, Group 1 CL districts were composed of approximately 86,369 K - 6 students, 29 percent (24,699) of whom were contained in classrooms with participating teachers (see Figure 9). The weighted average NCE score of students within CL classrooms was 51.775, while non-CL classroom students reported a weighted average score of 50.898. Thus, across all Group 1 CL districts, the NCE score for students receiving instruction from CL teachers was 1.7 percent higher than the NCE score for students in non-CL classrooms.

Figure 9

1990 ITBS Scores for Students in CL and Non-CL Classrooms
Group 1 Career Ladder Districts

	Number of Students	Percent	Weighted Average NCE Score[14]
K-6 Students Receiving Instruction from Teachers Participating in Group 1 CL Program:	**24,699**	**28.6%**	**52.470**
K-6 Students Receiving Instruction from Teachers Not Participating in Group 1 CL Program:	**61,662**	**71.4%**	**51.224**
Total:	**86,361**	**100.0%**	

[14] Figures reflect 1990 ITBS Complete Composite NCE scores.

Aggregate Student Performance on the ITBS for Career Ladder and Non-Career Ladder Districts. Figure 10 reports the weighted average NCE score for Group 1 Career Ladder and Non-Career Ladder districts for grades 2 through 6. Grade 1 scores were not reported due to changes in the ITBS program during the 1990 and 1991 school years which made aggregations at the substate level inappropriate.[15] All scores reflect ITBS Complete Composite achievement levels which combine subject area scores for Reading, Language and Mathematics.

Figure 10

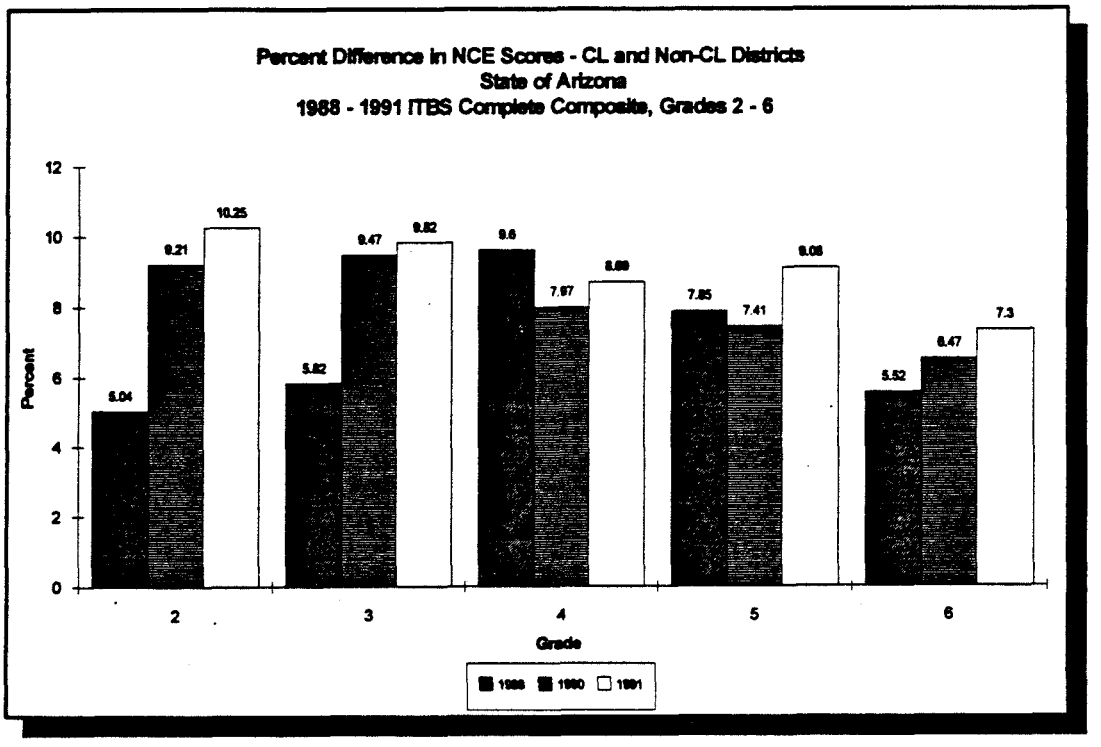
Weighted Average NCE Scores For Career Ladder and Non-Career Ladder Districts Based on Grades 2 - 6 ITBS Complete Composite Scores, Using 1988 Norms

School Year	Grade	Career Ladder Districts	Non-Career Ladder Districts	Percent Difference in NCE Scores
1988	2	56.24	53.54	5.04%
	3	50.82	48.02	5.83%
	4	52.62	48.01	9.60%
	5	52.70	48.86	7.86%
	6	51.04	48.37	5.52%
	Composite	55.14	51.08	7.95%
1990	2	52.30	47.89	9.21%
	3	49.26	45.00	9.47%
	4	49.72	46.05	7.97%
	5	51.19	47.66	7.41%
	6	50.54	47.47	6.47%
	Composite	50.61	46.80	8.14%
1991	2	51.63	46.83	10.25%
	3	49.20	44.80	9.82%
	4	49.83	45.85	8.68%
	5	51.73	47.42	9.09%
	6	50.54	47.10	7.30%
	Composite	50.60	46.38	9.10%

Figure 10 above shows that for all grades in each reference year, CL district scores exceeded those of non-CL districts. The "Percent Difference in NCE Scores" column reports the score differentials which were calculated to reflect the relative achievement levels of students within CL and non-CL districts. The positive values indicate that the average CL district scores are above the average non-CL district scores in all cases. Conversely, negative values would have indicated that CL districts performed at a level below non-CL districts. A grade-by-grade representation of this data is reported in Figure 11 for the 1988, 1990 and 1991 school years.

[15] In 1990, student achievement scores for grades 1 and 12 were estimated using a statewide sampling of students and schools; therefore, inferences are not valid at the substate level or when data are aggregated into district clusters.

Figure 11



As shown above, the relative difference in NCE scores between CL and non-CL districts grew between 1988 and 1991 for each grade except grade 4. The largest score differential, a 10.25 percent difference for CL over non-CL scores, occurred in grade 2 during 1991. Note that both the 1990 and 1991 score differentials tend to decline as the grade level increases.

By using NCE scores, it is possible to combine grade-specific achievement data into a single aggregate performance level representative of all students in grades 2 - 6 within a district. Figure 12 reports the aggregate weighted average NCE scores for CL and non-CL districts by school year.

Figure 12

Aggregate Weighted Average NCE Scores
CL and Non-CL Districts
Grades 2 - 6, ITBS Complete Composite

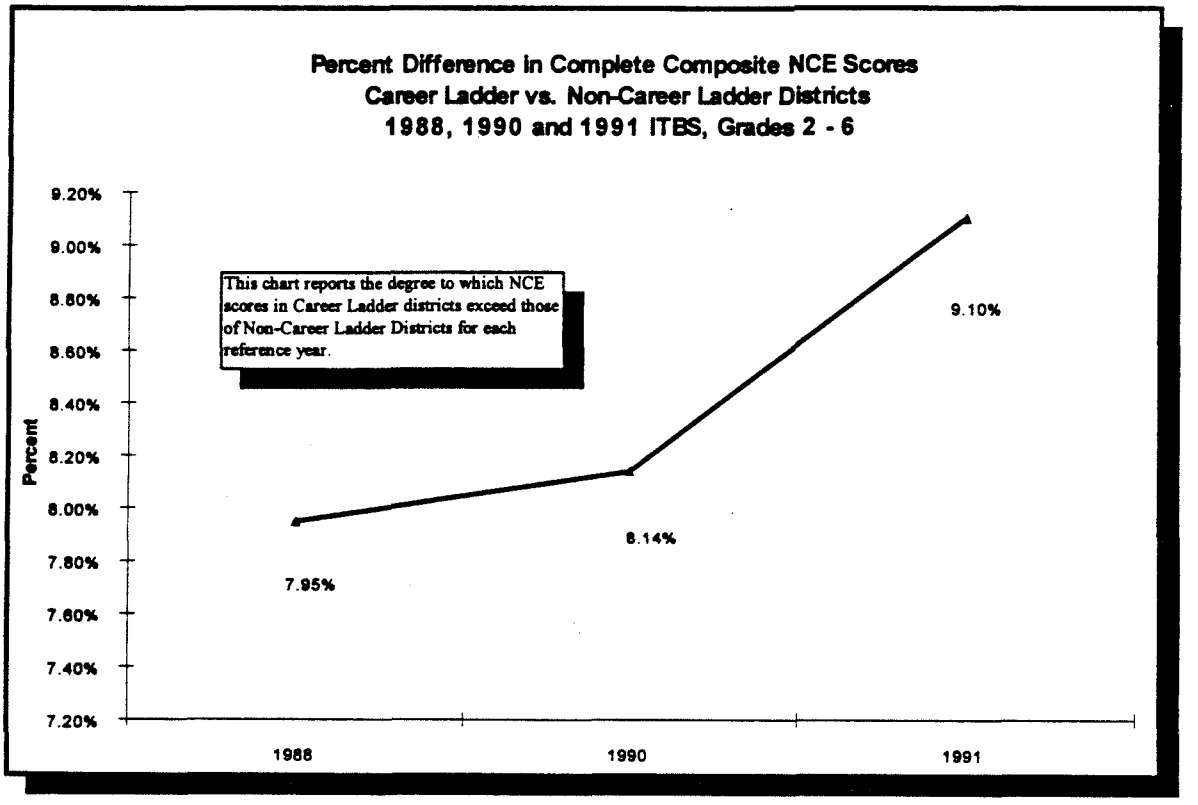
	Career Ladder Districts	Non-Career Ladder Districts	Percent Difference
1988	55.14	51.08	7.95%
1990	50.61	46.80	8.14%
1991	50.60	46.38	9.10%

Figure 13 on the next page reports the above information in terms of score differentials; it shows, on average, that:

1. Student ITBS performance in the elementary grades for CL districts exceeded that of non-CL districts for each referenced year, and

2. The degree to which CL districts outperformed non-CL districts has increased over time.

Figure 13



In summary, weighted average NCE scores in CL districts exceeded those of non-CL districts for grades 2 through 6. Further analysis shows that the differential in these scores has been increasing over time. Finally, aggregate student scores in the elementary grades in CL districts also have exceeded those of non-CL districts, with the differential growing from 7.95 percent in 1988 to 9.10 percent in 1991, as shown in Figure 13 above.

Pre/Post Career Ladder Student Performance Indicators. Program participation of the Group 1 Career Ladder districts began in 1987. In order to evaluate student performance in a pre/post CL participation framework, ADE R&D staff compiled ITBS Complete Composite test score information for grades 3 and 6 by primary subject areas (Reading, Language and Mathematics) for the 1986 and 1991 school years. Figure 14, on the following page, reports the comparative NCE scores for these two years.

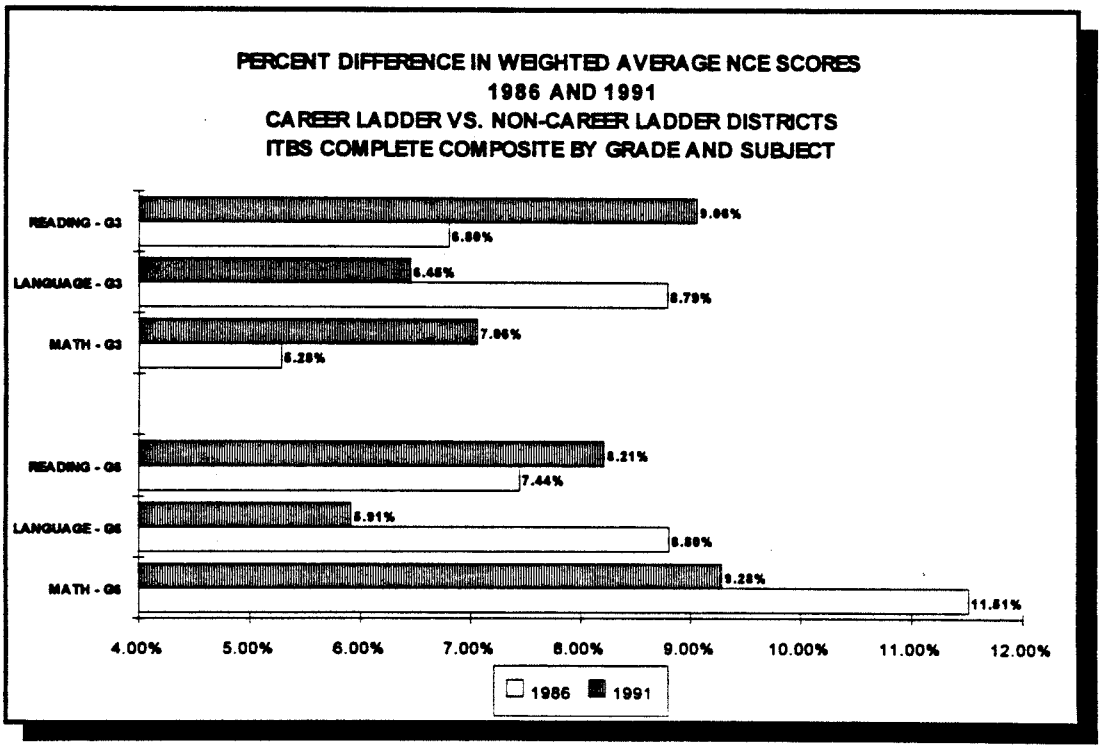
Figure 14

Student Performance by Subject for 1986 and 1991
ITBS Complete Composite Weighted Average NCE Scores

	1986			1991		
	CL Districts	Non-CL Districts	Percent Difference	CL Districts	Non-CL Districts	Percent Difference
Grade 3						
Reading	55.16	51.65	6.80%	50.32	46.14	9.06%
Language	56.21	51.67	8.79%	52.16	49.00	6.45%
Mathematics	51.29	48.72	5.28%	49.31	46.06	7.06%
Grade 6						
Reading	47.80	44.49	7.44%	52.85	48.84	8.21%
Language	50.92	46.80	8.80%	52.72	49.78	5.91%
Mathematics	50.46	45.25	11.51%	53.37	48.84	9.28%

As shown above, for each subject area CL district scores were higher than non-CL district scores in both 1986 and 1991. Figure 15 below displays the score differentials between the CL and non-CL districts. As stated before, the positive differentials indicate that CL district scores exceeded those of non-CL districts; negative differentials would have indicated the reverse.

Figure 15



In three of the six subject areas (grade 3 Reading and Math, and Grade 6 Reading) the degree to which CL district test scores exceeded non-CL district scores increased between 1986 and 1991. Relative performance levels for Group 1 CL districts appear to be higher for grade 3 than for grade 6. That is, score differentials for the CL districts were higher in 1991 in two of the three subject areas for grade 3. Comparatively, this trend was observed in only one of the three subject areas for grade 6.

Lower relative performance levels for the grade 6 subject areas compared to the grade 3 subject areas within Group 1 CL districts may be due to a difference in the instructional environments. In all districts, grade 3 students remain in a single classroom. However, in grade 6, some elementary schools allow students to move between classrooms throughout the day. This may mean that these students are instructed by several teachers, some of whom are not CL teachers. If this situation occurs more frequently in Group 1 CL districts, it may tend to mitigate the effect of CL-related instruction on the overall grade 6 student population. However, no explicit information on this situation or its potential effect is available.

Another possible explanation for lower relative performance in grade 6 subject areas may be that the impact of CL-related instruction declines as the age and grade of the students increase. That is, student performance may be less directly affected and influenced by CL-related strategies at higher age/grade levels in comparison to peer-, home-, community- and school-based factors.

Measures of Achievement on the Arizona Student Assessment Program (ASAP) Assessments. Using an analysis similar to the one used to investigate performance differences on the ITBS, R&D staff compiled student achievement scores on the 1993 ASAP Form D1 assessments for both CL and non-CL districts. Figure 16 reports the average student scores for CL and non-CL districts for each ASAP subject area. As shown, CL districts performed better than non-CL districts in both grades 3 and 8.

Figure 16

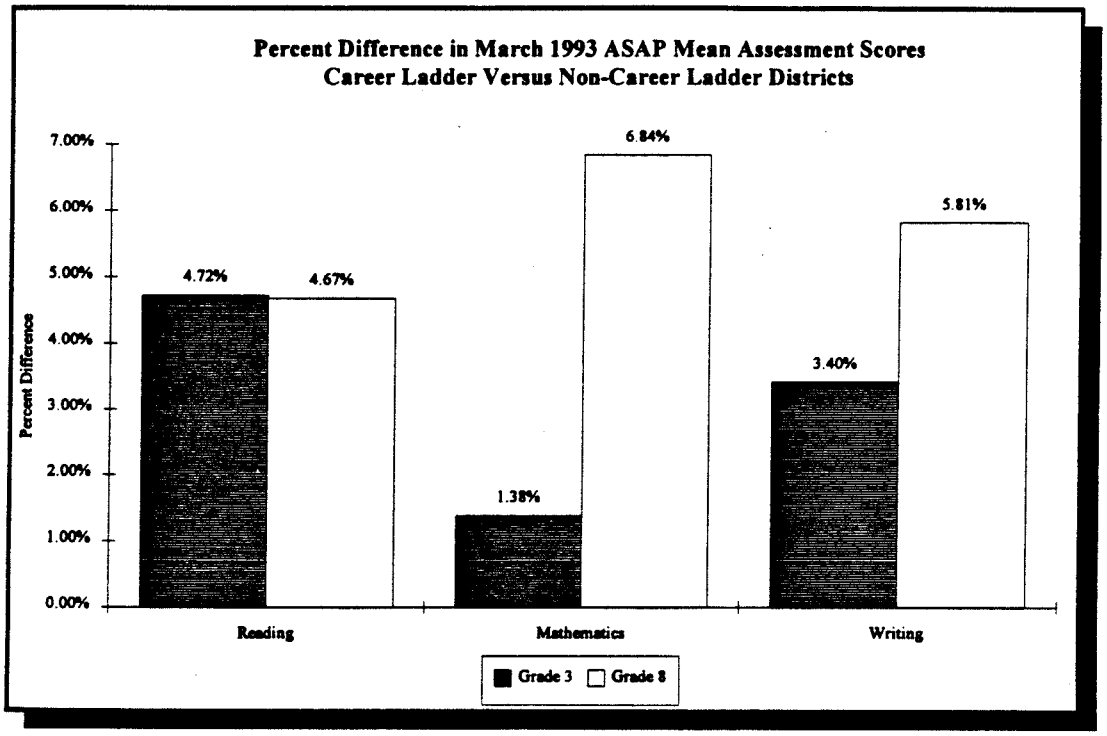
1993 ASAP Form D1 Assessments
Grades 3 and 8 Average Score by Subject Area
CL and Non-CL Districts

Grade 3	Reading (20 Pts. Possible)	Mathematics (20 Pts. Possible)	Writing (8 Pts. Possible)
Career Ladder	9.31	11.75	4.86
Non-Career Ladder	8.89	11.59	4.70
Percent Difference	4.72%	1.38%	3.40%

Grade 8	Reading (20 Pts. Possible)	Mathematics (16 Pts. Possible)	Writing (8 Pts. Possible)
Career Ladder	11.20	5.31	5.28
Non-Career Ladder	10.70	4.97	4.99
Percent Difference	4.67%	6.84%	5.81%

Figure 17 below reports the difference in mean ASAP Form D1 assessment scores by subject area for CL and non-CL districts. Positive values indicate higher mean scores for CL districts, while negative values indicate poorer performance compared to non-CL districts.

Figure 17



As shown above, CL districts outperformed non-CL districts in grades 3 and 8 for all subject areas. Additional analysis on the distribution of scores indicated that CL districts reported higher proportions of students scoring in the upper 50 percent of possible assessment points.

1991 Expected Versus Actual Test Scores for CL Districts. As part of the analysis, R&D staff utilized a statistical modeling framework which incorporated empirical information used in measuring at-risk student populations, non-test indicator information from the Arizona Student Assessment Program and data recently released from the U.S. Bureau of the Census. In this framework, variations in district ITBS test scores were associated with a variety of community wealth and district economic indicators such as *Median Family Income*, *Median Value of Owner-Occupied Housing Units* and *Percent of Students Who Have a Computer in the Home* as well as selected district and student population characteristics, including the *Percent of Students Eligible to Participate in the Free/Reduced Price Lunch Program*, *Percent of Students Identified as Being Limited English Proficient*, *Percent of Minority Students*, the district *Absentee Rate*, and district *Index of Mobility*.[16]

Using this information, predicted ITBS scores were generated and compared with actual observed student performance measures. A selected summary of this information generated for the Group 1 CL districts is provided in Figure 18, which follows.[17]

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16 Data sources included preliminary information from the *School District Data Book*, U.S. Bureau of the Census School District Census Mapping Project; *Ed.STAT: The At-Risk Status of Arizona's School Districts*, Arizona Department of Education Research and Development Division, March 1992; and *March 1993 Assessment Results, State of Arizona, Arizona Student Assessment Program*, Arizona Department of Education, September 28, 1993.

17 The table presented makes a distinction between at-risk and not-at-risk school districts. An at-risk district has a composite risk index greater than or equal to 0.00. A not-at-risk district has a composite risk index of less than 0.00.

Figure 18

SELECTED SUMMARY MODEL INFORMATION
GROUP 1 CAREER LADDER DISTRICTS
BASED ON ITBS 1991 NCE SCORES GRADES K - 6
(ALL FIGURES REFERENCED AS WEIGHTED AVERAGES)

CTD	DISTRICT	ACTUAL NCE SCORE	PREDICTED NCE SCORE	ACTUAL MINUS PREDICTED (NCE POINTS)	1990 MEDIAN FAMILY INCOME	1990 CUMULATIVE AT-RISK INDEX	
10-02-16	CATALINA FOOTHILLS	60.897	63.162	-2.265	$60,865	-7.11	NOT AT-RISK DISTRICTS
07-04-28	KYRENE	53.020	57.352	-4.332	$54,002	-4.68	
07-04-79	LITCHFIELD	53.660	52.801	0.859	$39,198	-4.44	
07-02-11	PEORIA	56.058	52.683	3.375	$40,792	-4.18	
07-02-03	CAVE CREEK	59.399	58.720	0.679	$52,053	-4.07	
07-02-04	MESA	52.898	50.925	1.974	$35,036	-3.68	
10-02-10	AMPHITHEATER	50.086	49.975	0.110	$31,731	-2.18	
10-02-08	FLOWING WELLS	46.991	47.796	-0.805	$27,014	-1.75	
11-02-43	APACHE JUNCTION	48.567	47.068	1.499	$24,127	-1.11	
07-02-09	DYSART	43.459	40.744	2.715	$23,775	0.89	AT-RISK DISTRICTS
10-02-12	SUNNYSIDE	31.115	37.316	-6.201	$21,946	1.46	
01-02-08	WINDOW ROCK	33.065	34.085	-1.020	$20,590	2.81	
01-02-20	GANADO	26.427	30.560	-4.133	$8,067	3.04	
07-04-14	CREIGHTON	46.084	37.658	8.425	$26,287	3.04	

DISTRICT CLASSIFICATION	ACTUAL NCE	PREDICTED NCE	ACTUAL MINUS PREDICTED	MEDIAN FAMILY INCOME	AT-RISK INDEX
NOT AT-RISK CL DISTRICTS	53.34	52.27	1.08	$38,723	-3.33
AT-RISK CL DISTRICTS	37.82	38.37	-0.55	$22,328	2.32

NOTE: At-risk districts defined by index values greater than zero.

The table above presents an ordered listing of districts according to their relative at-risk index (as indicated by the figures at far right). Districts with at-risk indexes of less than 0.00 are identified as being relatively **not-at-risk**. The opposite is true for districts with indexes greater than zero. The mathematical properties of the at-risk calculations position the state average at zero.

Among the individual Group 1 CL districts, 8 of 14 (57 percent) report actual performance levels **exceeding** predicted scores. That is, the predicted score is less than the actual score. This indicates that pupils in these districts performed better than expected given the characteristics of the community and student population. The CL districts that did not perform above expectations are distributed across the range of at-risk values.

The table above also segments the model information into two discrete categories: one for relatively not-at-risk districts (indexes less than 0.00), the other for comparatively at-risk districts (indexes greater than 0.00). Review of the model estimates suggests that CL districts which are relatively not-at-risk tend to perform at higher than expected performance levels. The reverse is true for comparatively at-risk districts.

Comparisons of 1991 Expected Versus Actual Test Scores for CL and Non-CL Districts. Results from the modeling process were also generated for non-CL districts. Comparisons of actual and predicted test scores as well as selected model variables are presented in Figure 19, which reveals that students in CL districts performed better on the ITBS than students in non-CL districts, receiving higher actual student achievement scores than those predicted by the model. In this case, actual 1991 ITBS performance for CL districts on the Complete Composite for grades K - 6 was 1.45 NCE points above model expectations. This is compared to .417 points for non-CL districts and .479 points for all districts combined.[18]

[18] Predicted NCE scores for non-CL districts are **not** significantly different at the 95 percent confidence level ($p = .05$) from actual scores. Differences in predicted and actual scores for CL districts are significant at the 95 percent level.

Figure 19

Selected Summary Indicators for Career Ladder vs. Non-Career Ladder Districts [19]
(1990 ITBS Model Estimates Information)[20]

1991 Expected Versus Actual Test Scores

		Predicted NCE Score[21]	Actual NCE Score	Difference (NCE Points)
Non-CL Districts	Mean	45.824	46.241	.417
	Count[22]	188,653	192,357	
	Std. Dev.	6.962	7.530	
CL Districts	Mean	49.727	51.177	1.450
	Count	86,357	86,357	
	Std. Dev.	5.789	6.898	
All Districts	Mean	46.728	47.208	.479
	Count	254,313	258,017	
	Std. Dev.	7.035	7.728	

Selected At-Risk Indicators

		At-Risk Index	F/R Lunch[23] Index	LEP Index	Minority Students (Percent)
Non-CL Districts	Mean	-0.64	-0.35	-0.12	41%
	Count	196,950	189,078	192,184	192,357
	Std. Dev.	2.61	0.88	0.71	.27
CL Districts	Mean	-2.13	-0.86	-0.36	27%
	Count	86,357	86,357	86,357	86,357
	Std. Dev.	2.51	0.71	0.32	.21

Selected Wealth and Income Indicators

		Median Family Income ($)	Median Housing Values ($)	M&O Per Pupil Expenditures ($)
Non-CL Districts	Mean	$30,967	$72,678	$2,893.86
	Count	192,357	191,749	196,950
	Std. Dev.	$8,900	$23,568	$296.83
CL Districts	Mean	$35,260	$84,717	$2,918.33
	Count	86,357	86,357	86,357
	Std. Dev.	$8,575	$22,020	$228.12

19 All values represent weighted averages based on K - 6 student counts.

20 Observations of Census estimates on family income and on housing values were restricted to districts having household sample sizes greater than 60 and a household sampling rate of greater than or equal to 10 percent.

21 1991 ITBS Complete Composite NCE Scores for grades K - 6.

22 Lack of complete information excluded some district records from the regression model, resulting in lower student counts than those reported for the actual NCE score.

23 F/R Lunch: an index for percentage of students eligible for federal Free and Reduced Price Lunch program.

It should be noted that the predicted score for non-CL districts is not statistically different from the actual score. However, the predicted and actual scores for the CL districts were significantly different from each other, supporting the conclusion that students in CL districts performed at higher than expected levels.

Reviewing some of the selected descriptive data used in the modeling process revealed that, as a group, CL districts:

1. May be considered to be relatively less at-risk than non-CL districts, reporting an average at-risk index of -2.13, compared to -.64 for the non-CL districts;
2. Contain lower proportions of students eligible for the Free or Reduced Price Lunch program than non-CL districts;
3. Contain lower proportions of limited English proficient (LEP) students;
4. May be characterized as having higher median family incomes and higher median housing values;
5. Contain lower proportions of minority students; and
6. Report about the same level of expenditures per pupil for maintenance and operations.

Changing At-Risk Status. In 1987, the ADE Research and Development Division constructed an empirical measure of relative at-risk conditions of student populations in Arizona school districts.[24] This measure is in the form of an index in which 0.00 indicates the state average, positive values reflect relatively higher (more) at-risk conditions and negative values indicate relatively lower (less) at-risk conditions. For this report, districts with at-risk indexes below 0.00 are considered **not-at-risk** while districts with indexes above 0.00 are considered **at-risk**.

Within a given year, comparisons of at-risk indexes provide a general understanding of the characteristics within different district student populations. Examined over time, these indexes reveal how these characteristics have changed. Figure 20 examines the change in the relative at-risk ranking for each of the Group 1 CL districts between 1990 and 1992.

Figure 20

At-Risk Status of Group 1 CL Districts in 1990 and 1992

CTD	DISTRICT	1990 At-Risk Index	1990 At-Risk Ranking	1992 At-Risk Ranking	Change in At-Risk Ranking
10-02-16	CATALINA FOOTHILLS	-7.1117	200	197	-3
07-04-28	KYRENE	-4.6842	192	193	1
07-04-79	LITCHFIELD	-4.4406	190	164	-26
07-02-11	PEORIA	-4.1746	187	181	-6
07-02-93	CAVE CREEK	-4.0674	185	183	-2
07-02-04	MESA	-3.6832	180	178	-2
10-02-10	AMPHITHEATER	-2.1789	151	135	-16
10-02-08	FLOWING WELLS	-1.7519	138	119	-19
11-02-43	APACHE JUNCTION	-1.1142	115	104	-11
07-02-89	DYSART	.8875	70	71	1
10-02-12	SUNNYSIDE	1.4591	54	51	-3
01-02-08	WINDOW ROCK	2.8142	35	44	9
07-04-14	CREIGHTON	3.0369	33	35	2
01-02-20	GANADO UNIFIED	3.0435	32	27	-5

24 *Ed.STAT: The At-Risk Status of Arizona School Districts*, Arizona Department of Education Research and Development Division, August 1991. Rankings based on 1987 data were not used in this analysis due to definitional changes in the at-risk variables.

During this time, 71 percent (10 of 14) of the Group 1 CL districts experienced an increase in their at-risk ranking, indicating that these districts became relatively more at-risk in 1992 than they were in 1990. Eight of these districts were initially considered to be relatively **not-at-risk** by virtue of their negative 1990 index. Only two of the 10 Group 1 CL districts which became relatively more at-risk began with an at-risk index in the positive range. Looked at in a slightly different way, there were nine CL districts that were considered to be **not-at-risk** in 1990. Eight of these districts grew more at-risk by 1992. In contrast, there were five CL districts considered to be at-risk in 1990. Two of these districts were more at-risk two years later.

These figures suggest that CL districts which **were not** considered **at-risk** initially, grew relatively **more** at-risk between 1990 and 1992, while CL districts which **were** considered **at-risk** grew **less so** over the same period. These results are not in and of themselves surprising. Ongoing research performed by the ADE R&D staff on factors affecting student achievement suggest that it may be easier to improve the overall achievement levels of student populations which are considered to be relatively more disadvantaged compared to those that are not.[25] That is, it may be more difficult to raise test scores in districts where student achievement levels are already high than to improve the scores in districts where students perform substantially below average.

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25 These remarks are based on preliminary results obtained from statistically modeling district aggregate achievement levels using U.S. Bureau of the Census, at-risk and other related student and district characteristics. Based on incremental changes in the explanatory variables, model elasticities indicate that larger marginal increases in aggregate test scores are observed for districts displaying higher at-risk and lower socioeconomic status. Model documentation is available upon request from the Research and Development Division, Arizona Department of Education, 1535 W. Jefferson, Phoenix, Arizona 85007, or call (602) 542-5031.

Appendix

Supplemental Tables

Weighted Student Counts for Group 1 Career Ladder Districts
1990 ITBS Complete Composite Record Information File
Research and Development, Arizona Department of Education

District Name	Total K-6 Students	Group 1 K-6 Students	Percent	Non-Group 1 K-6 Students	Percent
Amphitheater	4,827	1,162	24.07%	3,665	75.93%
Apache Junction	1,884	1,198	63.59%	686	36.41%
Catalina Foothills	1,328	772	58.13%	556	41.87%
Cave Creek	562	516	91.81%	46	8.19%
Creighton	3,472	563	16.22%	2,909	83.78%
Dysart	1,517	279	18.39%	1,238	81.61%
Flowing Wells	1,819	418	22.98%	1,401	77.02%
Ganado		Classroom data not available			
Kyrene	7,566	3,527	46.62%	4,039	53.38%
Litchfield	1,071	286	26.70%	785	73.30%
Mesa	46,158	11,005	23.84%	35,153	76.16%
Peoria	9,529	2,371	24.88%	7,158	75.12%
Sunnyside	5,393	2,287	42.41%	3,106	57.59%
Window Rock	1,269	315	24.82%	954	75.18%
Total	86,395	24,699	28.59%	61,696	71.41%

Note: The information presented above represents weighted average student counts compiled from 1990 Iowa Tests of Basic Skills (ITBS) computer data files maintained by the Arizona Department of Education (ADE) Research and Development Division. The figures presented were used to generate weighted average normal curve equivalent (NCE) scores for Group 1 Career Ladder Districts. Missing student identifier and/or achievement scores may result in inconsistent comparisons with enrollment, average daily membership and/or average daily attendance data reported on the ADE School Year 1990 Year End Enrollment Report. In addition, missing data points which result in the exclusion of student records from statistical operations may also be cause for inconsistent comparisons.

Group 1 Career Ladder Districts
Teacher Participation Rates

Percent of Total Teachers - All Grades

CTD Code	District Name	1993	1992	1991	1990	1989	1988	1987	1986
100210	AMPHITHEATER	30.64%	36.71%	37.84%	32.70%	29.17%	7.57%	0.00%	
110243	APACHE JUNCTION	75.00%	87.67%	88.21%	88.94%	85.05%	83.85%	75.00%	72.22%
100216	CATALINA FOOTHILL	88.18%	95.32%	94.48%	90.21%	94.89%	56.91%		
70293	CAVE CREEK	36.89%	35.29%	43.01%	56.18%	64.56%	56.72%	58.18%	
70414	CREIGHTON	19.26%	15.56%	11.19%	23.04%	8.79%			
70289	DYSART	28.82%	20.43%	17.98%	12.32%	13.94%			
100208	FLOWING WELLS	54.15%	58.10%	56.49%	52.94%	48.40%	37.84%	38.89%	
10220	GANADO	26.40%	24.80%	16.06%	17.76%	17.76%			
70428	KYRENE	74.62%	86.89%	84.22%	99.34%	99.52%	99.47%	99.67%	100.00%
70479	LITCHFIELD	44.30%	48.65%	56.16%	19.12%	18.57%			
70204	MESA	40.99%	37.46%	35.68%	25.80%	15.39%	14.31%		
70211	PEORIA	40.41%	43.52%	41.27%	35.20%	30.96%	23.01%	23.80%	
100212	SUNNYSIDE	58.87%	61.79%	62.31%	61.45%	61.29%	54.66%	52.85%	
10208	WINDOW ROCK	25.36%	33.33%	26.00%	22.40%	25.44%	14.67%		

Percent of Teachers Eligible for Career Ladder Program

CTD Code	District Name	1993	1992	1991	1990	1989	1988	1987	1986
100210	AMPHITHEATER	41.00%	49.00%	55.00%	43.00%	40.00%	12.00%	2.00%	
110243	APACHE JUNCTION	87.00%	88.00%	88.00%	89.00%	85.00%	84.00%	75.00%	72.00%
100216	CATALINA FOOTHILL	100.00%	100.00%	100.00%	95.56%	96.30%	93.33%		
70293	CAVE CREEK	46.00%	53.00%	56.00%	60.00%	68.00%	62.00%	60.00%	
70414	CREIGHTON	27.00%	17.00%	14.00%	45.00%	23.00%			
70289	DYSART	33.00%	23.00%	20.00%	16.00%	18.00%			
100208	FLOWING WELLS	71.80%	75.60%	71.00%	68.00%	66.00%	53.00%	52.00%	
10220	GANADO	29.00%	27.00%	19.00%	18.00%	18.00%			
70428	KYRENE	89.50%	99.00%	99.00%	99.00%	99.00%	99.00%	99.00%	100.00%
70479	LITCHFIELD	55.00%	57.00%	75.00%	18.00%	19.00%			
70204	MESA	41.00%	38.00%	36.00%	26.00%	17.00%	15.00%		
70211	PEORIA	45.00%	48.00%	50.00%	45.00%	36.00%	28.00%	28.00%	
100212	SUNNYSIDE	64.00%	63.00%	64.00%	64.00%	64.00%	56.00%	54.00%	
10208	WINDOW ROCK	30.00%	39.00%	31.00%	26.00%	30.00%	18.00%		

Descriptive Statistics and Estimated Parameters
Career Ladder Test Score Model

Model Variables

	Mean	Std Dev	Descriptive Label
CNCE_1	435.380	88.123	**COMPLETE COMPOSITE - WEIGHTED AVERAGE NCE SCORES**, 1990 ITBS (expressed as NCE points)
ABSENTEE	.159	.683	**ABSENTEE RATE** (expressed in standardized units)
INCOME	25920.586	9824.575	**MEDIAN FAMILY INCOME**, 1990 CENSUS (expressed in dollars)
LEP	.049	1.024	**LIMITED ENGLISH PROFICIENT** (expressed in standardized units)
LUNCH	.006	.977	Percent of students in **FREE AND REDUCED PRICE LUNCH** program (expressed in standardized units)
MVOOH	62818.536	29861.250	**MEDIAN HOUSING VALUE**: OWNER OCCUPIED HOUSING UNITS, 1990 CENSUS (expressed in dollars)
NTI7_1	28.555	14.077	**PERCENT OF STUDENTS WITH COMPUTER IN HOME** (1993 ASAP FORM D1, expressed as a percent)
PCTNWHT	.444	.309	**PERCENT NON-WHITE ENROLLMENT**, K-12, 1991 (expressed as a percent)

Total number of Cases in model = 140

Correlation Matrix of Model Variables with 1-tailed Significance Levels

	CNCE_1	ABSENTEE	INCOME	LEP	LUNCH	MVOOH	NTI7_1	PCTNWHT
CNCE_1	1.000	-.383	.750	-.751	-.764	.748	.788	-.803
	.	.000	.000	.000	.000	.000	.000	.000
ABSENTEE	-.383	1.000	-.300	.240	.338	-.199	-.347	.194
	.000	.	.000	.002	.000	.009	.000	.011
INCOME	.750	-.300	1.000	-.532	-.768	.860	.820	-.581
	.000	.000	.	.000	.000	.000	.000	.000
LEP	-.751	.240	-.532	1.000	.621	-.512	-.604	.757
	.000	.002	.000	.	.000	.000	.000	.000
LUNCH	-.764	.338	-.768	.621	1.000	-.741	-.784	.728
	.000	.000	.000	.000	.	.000	.000	.000
MVOOH	.748	-.199	.860	-.512	-.741	1.000	.780	-.667
	.000	.009	.000	.000	.000	.	.000	.000
NTI7_1	.788	-.347	.820	-.604	-.784	.780	1.000	-.709
	.000	.000	.000	.000	.000	.000	.	.000
PCTNWHT	-.803	.194	-.581	.757	.728	-.667	-.709	1.000
	.000	.011	.000	.000	.000	.000	.000	.

Estimated Regression Parameters

Estimation Method: Ordinary Least Squares
Dependent Variable: CNCE_1 (COMPLETE COMPOSITE NCE SCORE, GRADES K - 6)

Multiple R	.90489
R Square	.81882
Adjusted R Square	.80921
Standard Error	38.49167

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	7	883856.02398	126265.14628
Residual	132	195572.39100	1481.60902

F = 85.22164 **Signif F =** .0000

---------- Variables in the Equation ----------

Variable	B	Std. Error B	Beta	Tolerance	VIF	T	Sig T
PCTNWHT	-87.765355	21.008076	-.307741	.252955	3.953	-4.178	.0001
ABSENTEE	-18.272694	5.267327	-.141603	.823797	1.214	-3.469	.0007
INCOME	.001641	8.0180E-04	.182979	.171776	5.822	2.047	.0426
LEP	-20.872280	5.083863	-.242583	.393163	2.543	-4.106	.0001
LUNCH	-1.570439	6.433036	-.017418	.269619	3.709	-.244	.8075
NTI7_1	.624389	.486821	.099740	.226974	4.406	1.283	.2019
MVOOH	4.18584E-04	2.4276E-04	.141841	.202841	4.930	1.724	.0870
(Constant)	391.603558	18.387972				21.297	.0000

Collinearity Diagnostics

		Cond.	---------- Variance Proportions ----------							
Number	Eigenval	Index	Constant	ABSENTEE	INCOME	LEP	LUNCH	MVOOH	NTI7_1	PCTNWHT
1	4.38665	1.000	.00155	.00152	.00108	.00006	.00036	.00180	.00211	.00234
2	2.25475	1.395	.00014	.04294	.00006	.05548	.04174	.00021	.00043	.00571
3	.80213	2.339	.00007	.81942	.00001	.04793	.00305	.00005	.00002	.00486
4	.37384	3.426	.00150	.04256	.00003	.54220	.30636	.00069	.00003	.00272
5	.10439	6.482	.00171	.02067	.00154	.21529	.51774	.04849	.03077	.40720
6	.03970	10.511	.02362	.02896	.02288	.03382	.00209	.36543	.58310	.01530
7	.02327	13.730	.95447	.04225	.07431	.04278	.10626	.00025	.20910	.30508
8	.01526	16.954	.01694	.00168	.90008	.06244	.02242	.58308	.17445	.25679

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