Appendix F.
Student Socioeconomic Status Additional Results

1. Effects of Class Size on Free Lunch and Non-Free Lunch Students

The information in this section is based upon students' designation as free lunch or non-free lunch. Although overall the two groups were about equal, only in the rural schools were they close with 60 percent non-free lunch and 40 percent free lunch.

Socioeconomic status is strongly related to students' achievement scores. In every instance in all four grades the non-free lunch students out-scored the free lunch students. (TABLE F-1)

TABLE F-1

Comparison of Stanford Achievement Total Reading Scaled Score Average for All Free Lunch and Non-Free Lunch Students by Grade Level

Total Reading	Free Lunch		Non-Free Lunch	
Kindergarten	428.0	(N=2787)	444.8	(N=2981)
Grade 1	500.8	(N=3145)	541.2	(N=3087)
Grade 2	567.0	(N=2869)	600.1	(N=2956)
Grade 3	602.6	(N=2841)	627.8	(N=2984)

Comparison of Stanford Achievement Total Math Scaled Score Average for All Free Lunch and Non-Free Lunch Students by Grade Level

Total Math	Free Lunch		Non-Free Lunch	
Kindergarten	473.3	(N=2821)	496.6	(N=3029)
Grade 1	516.7	(N=3271)	544.9	(N=3156)
Grade 2	566.5	(N=2862)	594.1	(N=2953)
Grade 3	605.2	(N=2892)	630.4	(N=3010)

In kindergarten math there was a 24 point difference in average scaled scores of free lunch and non-free lunch students (473 to 497) and in reading there was a 17 point difference (428 to 445). The greatest difference was found in first grade reading. The difference between free lunch and non-free lunch in reading was 40 scaled score points and in math the non-free lunch students were 28 scaled score points higher than the free lunch students. In second grade, the free lunch students had an average reading scaled score of 567 and the students not on free lunch had an average reading scaled score of 600 which is 33 points higher. In math the non-free lunch students scored 27 scaled score points higher than the free lunch students. The scaled score for non-free lunch students in third grade was 25 points higher than free lunch students in both math and reading.

The next question to be asked was, "Do free lunch students score higher in small classes than in regular and regular/aide classes?" Tables F-2 through F-6 provide an affirmative answer in all grades and all locations with four exceptions. Free lunch students scored higher in urban reading second grade regular/aide and third grade regular; rural math first grade regular/aide and second grade regular/aide. Based on this information the difference between free-lunch and non-free lunch students' scores in small classes should be less than the difference between free lunch and non-free lunch students in regular classes and also in regular/aide classes. The difference was less in all grade levels except first grade. In the first grade regular class the difference was .7 points less than the small class difference and in the regular/aide the difference was 1.8 less than the small class difference.

Table F-2

A Comparison of Stanford Achievement Total Reading and Math Scaled Score Average for Free Lunch and Non-Free Lunch Students by Grade Level by Class Type

READING

Grade	SMALL			REGULAR			REGULAR/AIDE		
	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference
K	432.0 (N=819)	448.2 (N=912)	16.2	425.5 (N=950)	443.0 (N=1051)	17.5	427.2 (N=1018)	443.7 (N=1018)	16.5
1	508.5 (N=856)	549.4 (N=929)	40.9	494.4 (N=1242)	534.6 (N=1145)	40.2	502.0 (N=1047)	541.1 (N=1013)	39.1
2	574.4 (N=806)	604.0 (N=927)	29.6	562.4 (N=1006)	596.6 (N=962)	32.2	565.7 (N=1057)	599.9 (N=1067)	34.2
3	608.1 (N=872)	632.0 (N=996)	23.9	599.7 (N=872)	625.3 (N=869)	25.6	600.4 (N=1097)	626.1 (N=1119)	25.7

MATH

Grade	SMALL			REGULAR			REGULAR/AIDE		
	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference
K	478.8 (N=828)	502.0 (N=912)	23.2	471.4 (N=963)	493.8 (N=1064)	22.4	470.8 (N=1030)	494.5 (N=1039)	23.7
1	523.5 (N=883)	552.5 (N=949)	29.0	512.0 (N=1291)	540.2 (N=1167)	28.2	516.8 (N=1097)	543.2 (N=1066)	26.4
2	572.0 (N=803)	598.5 (N=925)	26.5	563.7 (N=1005)	591.9 (N=962)	28.2	565.1 (N=1054)	592.1 (N=1066)	27.0
3	609.8 (N=884)	633.9 (N=1007)	24.1	604.6 (N=888)	628.0 (N=871)	23.4	602.1 (N=1120)	629.1 (N=1132)	27.0

Table F-3

A Comparison of Stanford Achievement Total Reading and Math Scaled Score Average for Inner-City FreeLunchand Non-FreeLunch Students by Grade Level by Class Type

READING

Grade	SMALL Free Lunch	Non-Free Lunch	Difference	REGULAR Free Lunch	Non-Free Lunch	Difference	REGULAR/AIDE Free Lunch	Non-Free Lunch	Difference
K	429.9 (N=316)	440.5 (N=46)	10.6	423.2 (N=389)	432.9 (N=60)	9.7	427.6 (N=435)	438.0 (N=39)	10.4
1	498.1 (N=321)	501.6 (N=47)	3.5	480.0 (N=496)	517.7 (N=43)	37.7	484.6 (N=373)	523.7 (N=26)	39.1
2	565.2 (N=305)	583.2 (N=58)	18.0	549.3 (N=424)	557.4 (N=26)	8.1	553.2 (N=196)	580.7 (N=42)	27.5
3	604.8 (N=315)	618.0 (N=42)	13.2	590.0 (N=338)	611.1 (N=32)	21.1	592.8 (N=431)	614.6 (N=43)	21.8

MATH

Grade	SMALL Free Lunch	Non-Free Lunch	Difference	REGULAR Free Lunch	Non-Free Lunch	Difference	REGULAR/AIDE Free Lunch	Non-Free Lunch	Difference
K	475.8 (N=319)	490.0 (N=45)	14.2	466.4 (N=399)	477.5 (N=60)	11.1	465.6 (N=438)	486.3 (N=39)	20.7
1	516.5 (N=322)	519.3 (N=47)	2.8	502.2 (N=500)	524.1 (N=43)	21.9	506.8 (N=377)	529.7 (N=26)	22.9
2	564.4 (N=303)	582.4 (N=57)	18.0	555.1 (N=425)	571.4 (N=26)	16.3	554.7 (N=423)	582.4 (N=42)	27.7
3	607.4 (N=315)	621.3 (N=41)	13.9	596.7 (N=336)	612.0 (N=32)	15.3	594.8 (N=426)	614.9 (N=43)	20.1

Table F-4

A Comparison of Stanford Achievement Total Reading and Math Scaled Score Average for Suburban FreeLunch and Non-Free Lunch Students by Grade Level by Class Type

READING

Grade	SMALL			REGULAR			REGULAR/AIDE		
	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference
K	437.8 (N=107)	449.5 (N=294)	11.7	425.8 (N=109)	445.7 (N=289)	19.9	427.0 (N=121)	443.5 (N=326)	16.5
1	517.8 (N=133)	550.3 (N=301)	32.5	499.7 (N=227)	529.3 (N=383)	29.6	494.7 (N=151)	535.8 (N=310)	41.1
2	572.2 (N=155)	600.1 (N=300)	27.9	563.1 (N=160)	592.9 (N=338)	29.8	553.5 (N=195)	595.2 (N=365)	41.7
3	603.7 (N=144)	630.5 (N=302)	26.8	598.0 (N=179)	623.9 (N=332)	25.9	599.1 (N=205)	626.4 (N=355)	27.3

MATH

Grade	SMALL			REGULAR			REGULAR/AIDE		
	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference
K	484.7 (N=110)	500.4 (N=309)	15.7	485.0 (N=110)	498.4 (N=297)	13.4	478.8 (N=125)	497.9 (N=341)	19.1
1	525.7 (N=135)	554.0 (N=302)	28.3	512.5 (N=233)	537.5 (N=389)	25.0	507.9 (N=153)	537.0 (N=316)	29.1
2	572.2 (N=155)	597.5 (N=299)	25.0	554.6 (N=166)	585.2 (N=339)	30.6	549.6 (N=195)	584.1 (N=363)	34.5
3	601.3 (N=144)	633.6 (N=299)	332.3	599.5 (N=178)	625.7 (N=319)	26.2	596.8 (N=206)	627.0 (N=331)	27.3

TableF-5

A Comparison of Stanford Achievement Total Reading and Math Scaled Score Average for Rural Free Lunch and Non-Free Lunch Students by Grade Level by Class Type

READING

Grade	SMALL			REGULAR			REGULAR/AIDE		
	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference
K	432.3 (N=329)	447.0 (N=472)	14.7	427.8 (N=398)	441.6 (N=603)	13.8	427.5 (N=368)	443.0 (N=549)	15.5
1	515.7 (N=810)	551.9 (N=323)	36.2	506.4 (N=434)	538.3 (N=611)	31.9	520.9 (N=404)	544.2 (N=579)	23.3
2	584.0 (N=292)	609.0 (N=490)	25.0	575.1 (N=377)	600.5 (N=558)	25.4	583.1 (N=381)	603.0 (N=593)	19.9
3	612.7 (N=344)	633.1 (N=557)	20.4	609.7 (N=317)	627.8 (N=486)	18.1	609.3 (N=373)	627.2 (N=631)	17.9

MATH

Grade	SMALL			REGULAR			REGULAR/AIDE		
	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference
K	481.4 (N=331)	503.4 (N=472)	22.0	473.7 (N=398)	492.8 (N=606)	19.1	474.6 (N=372)	495.0 (N=553)	20.4
1	529.3 (N=345)	552.7 (N=507)	23.4	521.6 (N=490)	542.2 (N=627)	20.6	530.9 (N=447)	546.8 (N=597)	15.9
2	580.7 (N=291)	601.0 (N=490)	20.3	577.4 (N=375)	597.4 (N=557)	20.0	584.3 (N=381)	597.4 (N=594)	13.1
3	615.0 (N=356)	634.1 (N=572)	19.1	614.5 (N=338)	631.2 (N=491)	16.7	611.7 (N=400)	632.1 (N=648)	20.4

TableF-6

A Comparison of Stanford Achievement Total Reading and Math Scaled Score Average for Urban Free Lunch and Non-FreeLunch Students by Grade Level by Class Type

READING

Grade	SMALL			REGULAR			REGULAR/AIDE		
	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference
K	431.0 (N=67)	453.9 (N=100)	22.9	425.0 (N=54)	449.3 (N=99)	24.3	423.9 (N=94)	449.9 (N=104)	26.0
1	514.2 (N=79)	557.8 (N=94)	43.6	504.0 (N=85)	539.3 (N=188)	35.3	502.2 (N=117)	544.8 (N=98)	42.6
2	581.0 (N=54)	603.3 (N=79)	22.3	577.7 (N=39)	600.2 (N=40)	22.5	583.1 (N=56)	610.0 (N=67)	26.9
3	609.3 (N=67)	636.2 (N=95)	26.9	613.1 (N=35)	615.1 (N=29)	2.0	602.9 (N=88)	623.0 (N=90)	20.1

MATH

Grade	SMALL			REGULAR			REGULAR/AIDE		
	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference	Free Lunch	Non-Free Lunch	Difference
K	470.5 (N=68)	505.9 (N=100)	35.4	463.8 (N=56)	495.6 (N=101)	31.8	468.8 (N=94)	493.7 (N=106)2	4.9
1	23.72 (N=80)	562.8 (N=93)	39.1	515.4 (N=88)	544.9 (N=108)	29.5	507.3 (N=120)	544.7 (N=99)	37.4
2	566.5 (N=54)	598.9 (N=79)	32.4	563.7 (N=39)	585.3 (N=40)	21.6	566.0 (N=55)	595.1 (N=67)	16.4
3	611.8 (N=67)	638.9 (N=79)	27.1	610.7 (N=35)	615.8 (N=29)	5.1	606.3 (N=88)	622.7 (N=90)	29.1

With affirmative answers to these two questions, the next assumption is that achievement differences between small classes and regular classes should be greater for free lunch students than for non-free lunch students. In order to determine the advantage (achievement difference) that free lunch students in small classes have over free lunch students in regular classes the scaled scores were compared (Table F-7). This table also includes the advantage that non-free lunch students in small classes have over non-free lunch students in regular classes. In kindergarten the advantage was 6.5 for the free lunch population in small over regular, while the advantage for non-free lunch was 5.2 for the small class over the regular class. This is a very small difference in the value of a small class for free lunch students over non-free lunch students. In first grade the advantage was .7 in favor of the non-free lunch regular class students.

Table F-7

A Comparison of the Advantage of a Small Class over a Regular Class for Free Lunch and Non-Free Lunch Students in Reading and Math

TOTAL READING

Grade	Total Population		Inner-City		Suburban		Rural		Urban	
	Free	Non-Free	Free	Non-Free	Free	Non-Free	Free	Non-Free	Free	Non-Free
K	6.5	5.2	6.7	7.6	12.0	3.8	4.5	5.4	6.0	4.9
1	14.1	14.8	18.1	-16.1	18.1	21.0	9.3	13.6	10.2	18.5
2	12.0	7.4	15.9	25.8	9.1	7.2	8.9	8.5	3.3	3.1
3	8.4	6.7	14.8	6.9	5.7	6.6	3.0	5.3	-3.8	21.1

TOTAL MATH

Grade	Total Population		Inner-City		Suburban		Rural		Urban	
	Free	Non-Free	Free	Non-Free	Free	Non-Free	Free	Non-Free	Free	Non-Free
K	7.4	8.2	9.4	12.5	-0.3	2.0	7.7	10.6	6.7	10.3
1	11.5	12.3	14.3	-4.8	13.2	16.5	7.7	10.5	8.3	17.9
2	8.3	6.6	18.0	11.0	17.9	12.3	3.3	3.6	2.8	13.6
3	5.2	5.9	-13.9	9.3	1.8	7.9	0.5	2.9	1.1	23.1

The advantage scores were obtained by subtracting the scaled score average of the Free Lunch students in a regular class from the score of the Free Lunch students in a small class. The advantage score for the non-free lunch students was obtained in the same way. Tables F-2 through F-6 have the scaled scores from which these advantages were computed.

The advantage (4.6) of the small class over regular class for the free lunch students was greater than for the non-free lunch students in second grade. It was also 1.7 greater in third grade. The regular/aide produced less advantage (Table F-8) than the small class except in first grade where the regular/aide difference was 1.1. In second grade when the small class advantage was the highest of all, the regular/aide was at 0 and in third grade at -.1.

Table F-8

A Comparison of the Advantage of a Regular/Aide Class over a Regular Class for Free Lunch and Non-Free Lunch Students in Reading and Math

TOTAL READING

Grade	Total Population		Inner-City		Suburban		Rural		Urban	
	Free	Non-Free	Free	Non-Free	Free	Non-Free	Free	Non-Free	Free	Non-Free
K	1.7	0.7	4.4	5.1	1.2	-2.2	-0.3	1.4	-1.1	0.6
1	7.6	6.5	4.6	6.0	-5.0	6.5	14.5	5.9	1.8	5.5
2	3.3	3.3	3.9	23.3	-9.6	2.3	8.0	2.5	5.4	9.8
3	0.7	0.8	2.8	3.5	1.1	2.5	-0.4	-0.6	-10.2	7.9

TOTAL MATH

Grade	Total Population		Inner-City		Suburban		Rural		Urban	
	Free	Non-Free	Free	Non-Free	Free	Non-Free	Free	Non-Free	Free	Non-Free
K	-0.6	0.7	-0.8	8.8	-6.2	-0.5	0.9	2.2	5.0	-1.9
1	4.8	3.0	4.6	5.6	-4.6	-0.5	9.3	4.6	-8.1	-0.2
2	1.4	0.2	-1.9	2.9	-5.0	-1.1	6.9	0.0	2.3	9.8
3	-2.5	1.1	-0.4	11.0	-2.7	1.3	-2.8	0.9	-4.4	6.9

The advantage scores were obtained by subtracting the scaled score average of the Free Lunch students in a regular class from the score of the Free Lunch students in a regular/aide class. The advantage score for the non-free lunch students was obtained in the same way. Tables F-2 through F-6 have the scaled scores from which these advantages were computed.

When students were grouped by location and by class type, in only two instances did the regular non-free lunch group have an advantage over the non-free lunch group in small class. In the inner city first grade reading and math the non-free lunch regular class had an advantage score of -16.1 in reading and -4.8 in math. In only three instances did the regular class free lunch students have a greater advantage than the small class free lunch students: Reading in urban schools in third grade; math in the inner city in third grade; math in suburban kindergarten.