WPS CLASSES OF 1998, 1999, AND 2000
STUDY BY ETHNIC GROUPS AND LANGUAGES

An Interactive Qualification Project Report
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Abstract

This project is a study of the aspirations of the poorest students (who got a free-lunch) in Worcester Public School (WPS) regarding higher education. We also wanted to know if the different ethnic backgrounds from the lower social class' students affect their aspiration toward continuing their studies. The data from the WPS classes of 1998, 1999, and 2000 were analyzed with the students who had a free lunch plan numbering about 887 for the 3 years combined. Our theory was that aspirations toward study in the future would depend on the social economic status (SES) and the ethnicity. The free lunch data was a way of presenting the social economic status based on our dataset, but of course it removed SES from the study as a variable to focus on the low income group. Then parents education and student aspiration come to the forefront of our theorizing. We decided that Asians would turn to education as a strategy to succeed more than poor Whites or Blacks. Hispanics we had no theory about. In fact, poor whites and Asians were similar in their aspiration and Blacks were more likely to go to some kind of college than Hispanics. The race and language were used to represent their ethnicity.

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Introduction

Many WPI project students have analyzed data provided by the Worcester Public Schools (WPS). The main data set that we had as a starting point was the study of the relationship between SAT scores and learning styles as measured by the MBTI. Ben Dean Kawamura took on the task of organizing the PSAT and SAT data for the study class of 1996-99 and he delegated the task of organizing the SES data on the 1995 survey filled out by the students at the time they took the MBTI to Matt Marino and Bai Lan Zhu. These data sets that were based on WPS information have focused on the SAT-MBTI by Ben Dean, the placement survey by Matt Marino, and the WPS to WSC (Worcester state college) Pilot Study by Sara Jeffers and Brian Mentz. The latter study of those local students who went to the local college and how they fared there was our initial point of interest in the subject of learning style.

Our original project was to study the SAT scores for the Worcester Public school students for whom we had MBTI data, and compare these scores with the grades that these students got in college by MBTI type since most go to WSC or QCC (Quinsigamond Community College). We needed the cooperation of at least one of those schools to do the study. This study was going to be our opportunity to see if SAT scores were good indicators for the students' future performance in college. An ominous sign was that Sarah and Brian had not been able to get WSC to cooperate, but the institutional researcher there claimed that the problem was temporary, and she would be able to do the project six months later. Unfortunately, we were not able to work on this initial project due to lack of corporation from the WSC staff since they were still busy revamping their

record system long after they thought they'd be through. Afterwards, we changed our project to compare the SAT's to the grades of Quinsigamond Community College students, since most of its students were from the Worcester Public schools. After visiting QCC several times and meeting with some administration advisors we realized that QCC does not care about the SAT scores. They are not required to enter a community college. They also were in disarray concerning records. Finally, we developed a new plan that based on the data already in hand from the WPS, without college outcomes.

Plan B was to find out whether there is a correlation between educational aspirations and middle or lower social class origins among students. Also, we wanted to find out if there is a relationship between the educational aspiration, and ethnicity of lower social class students. In other words, we would like a comparative analysis of what percentages of the lower income family students go to a four year college, two year college, or no college by ethnicity. We wanted to divide each ethic group by their languages so that we could have more specific results dealing with immigrant families. In order to answer these questions, we employed social class, educational aspiration, ethnicity, and language as our theoretical variables.

According to the research of Council of Ministers and Education in Canada, many children that live in low-income families have higher rates of emotional and behavioral disorders; thus, they are less likely to perform well in school. Therefore, we assumed that they would have more motivation to be upwardly mobile, or they would not take success for granted, as middle class children might. On the other hand the middle class is more likely to take education seriously. We, also, assumed that the White and Asian students of Worcester were more likely to go to four year colleges compared to Black and Hispanic students,

based on national figures suggesting that 30 percent of Whites ages 25-29 have done so, but only 15 percent of Blacks and 11 percent of Hispanics.

Worcester Public Schools have been collecting the following data on their students: Placement Survey, Course Level, Free Lunch Students, Ethnic Code, and Language Code. The senior placement survey of WPS was now the outcome variable to which we would predict using other data. One problem we faced was that the data of 1998 was coded differently from that of the prior year. Also, the number of the low-income family students in 1998's data was greatly different than the other years due to some changes in policy or recording. We tried to find the reason of these changes by checking the Massachusetts Department of education website. We didn't find any information regarding the 1998 data, so we assumed that the data given to us was not very accurate for the years when fewer people were getting free or reduced lunches. At some point the system must have encouraged students eligible to take part in the free lunch program.

This project considers the free lunch students as the ones from the low-income because families do have to qualify for this benefit, not just request it. Further, the percentage of free lunch students is almost equivalent to the percentage of the low-income families in Worcester, MA. We represent their desire as their placement survey. Also, we broke its result down by ethnic codes and language codes to see if there are the trends by them. When we were analyzing these at first, it was hard to do it because the ethnic codes of WPS are different from the ones of the state, and the language codes were changed between 1998, 1999 Data set and 2000 one. However, the assistance of Prof. Wilkes and the people concerned in WPS finally got our code definition questions

answered well enough to procedure using a few broad categories that are roughly comparable.

This project calls for further research which would represent the aspiration of the students who did not get the free lunch (namely the students from the mid or high social class) to compare with the results from this project.

In retrospect, we now think that a strategic error was made in planning this study because we were frustrated by the varying data quality of the WPS data from year to year. Faced with this problem we decided to hold onto as many cases as we could from the 3 years (classes of 1998-99-00) at the expense of reducing the pool of available variables. We lost the SAT and MBTI due to the class of 2000 limits and the class 1996-1997 due to lack of lunch data. We absolutely needed a social class variable, so we dropped 2 years and wanted very much not to lose the class of 2000. Reviewing the situation, it would have been better to do the study of variable relationships we were really interested in on studies of a single year of data, class of 1999, where we had all the variables we wanted that to give up our original research plan. We sacrificed too much information and too many variables to work with a larger data set. Our advice to future researches is to avoid this frustrating experience of seeing the study shrink over time as the data set variable list shrinks. It would have been possible to get more answers out of a smaller data set. If we had had it to do again, we would have gone about things differently.

Background

Prior Studies

The inspiration for this study grew out of the slow incremental improvement of the archive data set covering the Classes of 1996-99 in the main high schools of the Worcester Public schools. By 2003 it looked like one could study the high school to college transition if only the local college where the most WPS students were (WSC) would cooperate. The original justification for the WPS study was to look into the relationship between SAT scores and learning Styles as measured by the MBTI. Ben Dean Kawamura took on the task of organizing the PSAT and SAT data for his IQP and he delegated the task of organizing the SES data on the 1995 survey filled out by the students at the time they took the MBTI to Matt Marino and Bai Lan Zhu. Ben did some coding for them to push the job along, but Matt lost interest in the SES variable when he learned that the WPS had data on a Placement Survey. Bai Lan hit some delays as she could not finish the job alone in time for the SES variable to be of use to Ben, though it is an issue in the SAT debate.

Matt's project became to look at the students who were and were not going to college in terms of their HS transcript records and see if those who were college bound were the strongest students or not, on paper in terms of the SAT and their grades. He expressed concern that there were a lot of students who looked strong on paper but were not planning to go to college. He wanted to see if there was a certain type of learner that

was unlikely to aspire to college even if they had the grades, but never got that far in his analysis.

Ben's project focused on the test and re-test PSAT and SAT data, to see how much the different types of learners gained from prior practice on this type of aptitude test. Along the way he used the transcript data to estimate the relative degree of course difficulty in the HS program of each student. This was based on the AP, Honors, College and General level course codes in the Transcript data set for each year 1996-99. He found that each cohort of about 1000 students coming out of the 4 Worcester high schools each year took about 20,000 core courses (Eng, Math, Science and Social Studies). A transcript file was based on the course as the unit of analysis rather than the student, but each course had a student ID number. Ben did not calculate a GPA for each student, but did use the program difficulty variable to good effect, showing that it was highly related to SAT scores. However, within each group taking roughly comparable programs the Intuitive students on the MBTI outscored the Sensing students. Further, the Intuitive students of Worcester were more likely to take a challenging program than the Sensing students.

He also reported that both types benefited equally from retaking the test, but that the Intuitive students were more likely to actually retake the test. Hence, the differences already evident in the first round of PSAT or SAT scores increased if one took into account only the highest scores, since the Intuitives more likely to re- take it more often.

Later users of Ben's data criticized him for not linking the whole transcript to the file he created case by case. They wanted to be able to create other outcome variables based on the transcripts such as just look at math course grades and difficulty when

predicting a math SAT score. However, he could see no convenient way to do that. He felt that people should mine the Transcript file for summary estimates that they wanted and then link these to the main data set. Later, Will Z was hired to figure out how to do this for the Class of 2000-2003 WPS data sets that were being organized for a study of State achievement test results (MCAS scores). He found a way to do so, but had to do his own programming to accomplish this. The SPSS package was not up to the challenge. Even his results were suspect since he used the WPS department code used to sort the courses into core or not, was blank or wrong too often.

Finally, Bai Lan, finished her coding of the occupations listed for father, mother and guardian by the students in the class of 1996-99 who took a 1995 survey at the time the MBTI data was collected and looked up prestige scores for each occupation on a 1-100 scale (where a college professor is about 78 on the scale). She decided to stress this as her SES code, downplaying the parent's education. She had no income variable. She also coded some self report social class data from the students who took this survey. She found that only 994 of the 2434 students who had taken the MBTI had given her a codable occupational response. In order to get 994 cases she had to use the father's occupation if available, the mothers if it was not (or hers was higher), and the guardian's if neither father nor mother was present. In the end she split the scores into quintiles of top to bottom 20% and then split the top one to identify a top 10% group.

The response rates were better for Mother's education, as she had 1156 responses to that, and on the self reports she did even better with 1261 reporting their average grade performance in the 4 core fields of study. That was not as good as Matt reported for the Placement survey though. He had only the 1999 data, but on a proportional basis the

response rate to that official WPS survey was nearly twice as good as that of the one shot SES survey administered by John Pieper in 1995 and coded by Bai Lan in 2000-2001. Since the students had gone through the system and graduated, missing data case could not be reconstructed.

Given the limited coverage of Bai Lan's SES variable, an alternative was sought where there might be data on a larger proportion of the students. Standard practice at WPS was to use the "lunch" codes as a rough indicator of social class. This was an income based measure that did not take the education of the parents into account, as it was based on having one prove eligibility for a subsidy based on low income. The problem, of course, was that not everyone that qualified was willing to apply or accept this kind of charity. Those who were most proud and self reliant, but poor, would not show up as low SES by this measure.

Based on what had been learned about the WPS archives in the course of this study, the Lunch subsidy data was requested for Classes of 1996-99 and the Placement survey's for Class of 1998 and 2000 were requested to go along with the Class of 1999 data that Matt Marino had acquired and used. Unfortunately, the files that arrived covered only Class of 1998 and 1999 with lunch subsidy data, but a request for the class of 2000 lunch data was fulfilled.

Plans were made to compare the SES data of Bai Lan to the income based lunch subsidy qualification listing. Willz had already requested the Class of 2000 transcript data as well. The problem was that Ben Dean had not worked up the SAT or PSAT data for that year. Worse MBTI data was spotty. It had been collected by the guidance officers, not a team from WPI for the Class of 2000, and they did not do so well as in

terms of class coverage this first team in 1995 had done since they were doing their own data collection for their own anlysis.

Despite the remaining holes in the data set, it was clear that the next study would inherit a great deal of data organization work. However, without Placement data or Lunch data for the Classes of 1996 and 1997, only half of the archive assembled by Ben Dean and BaiLan could be used. The lack of SAT data and weak MBTI data collection put constraints on the use of the Class of 2000 data set as well. Unfortunately, there were more cases of Lunch subsidy recipients in the Classes of 1999 and 2000 than the prior class of 1998, so it was not clear which was the more accurate. The codes had also changed from a simple yes-no, to distinguishing between those that qualified for Free or to "Reduced" cost lunches. In the end, we pooled "F" and "R" back into a Yes-No code.

Clearly assessing the data received would have been a challenge and there would be problems to work around- even if the Colleges had cooperated and provided College performance data to go with the set of potential college performance predictors based on HS data. It was not clear whether to look upon the learning style (MBTI) data as a potential predictor or as a moderating variable. In a prior study of WPI student HS records and SAT scores as a predictor of freshman year WPI grades, the SAT had been correlated with GPA only for half of the MBTI types. In the other 8 types there was no relationship between the SAT score and how the freshman year went. So, there was a precedent to using the MBTI to moderate the relationship between two other variables as well as looking for correlation of other things within the MGTI variables.

In, summary Matt's project began to look at whether there were a lot of students who looked strong on paper but were not planning to go to college. He wanted to see if

there was a certain type of learner that was unlikely to aspire to college even if they had the grades, but Matt never got that far in his analysis. On the other hand, Ben's project focused on the test and re-test PSAT and SAT data, to see how much the different types of learners gained from prior practice on this type of aptitude test. He found that, the differences already evident in the first round of PSAT or SAT scores increased if one took only the highest scores, since the Intuitives likely to take it more often.

We were supposed to study the correlation between the SAT scores and academic performance in college with Matt's, Ben's, and academic performance data in college. However, we could not study it because the college academic performance data set were not available yet due to the lack of Worcester State College grade data. Therefore, we decided to change the project and set up the new plan. We used the social status data from Ben's project, and the placement from Matt's project to construct our own data to study the correlation between the lower income class students and their placements in college.

The Worcester Public schools (WPS) does not have a specific variable that indicates the family financial status of each student. Also, the parents' occupation data were not available when we started this project. Therefore, we employed the free lunch data to be an indicator of the social and economical status of the students.

We, also, divided each ethnic group by its different language by using language codes. In order for a student to get a free lunch, he/she should apply an application requesting free lunch because his/her parents can't afford it.

Thus, the new study question is how different the likelihood of going to college is by ethnic groups for the poorest families of Worcester, those that qualify for Free or

Reduced lunches in school. The learning styles (MBTI) of these students are sometimes available, but this analysis does not take cognitive diversity into account due to the weak coverage in the Class of 2000 data set. We encourage later student teams to look at the other socio-economic groups and access the significance of learning style variable and SAT scores, using just the Class of 1998 and 1999 data set.

Methodology

We studied whether there is a correlation between educational aspirations and social class. Also, we investigated the relationship between the educational aspirations and ethnicity of those in the lower social class. We divided each ethnic group by their languages so that we could have more specific results.

We used the free lunch data code to identify the lower social class and employed the college placement data as indicator of the educational aspirations. First, we sorted the students who had FREE LUNCH for each graduation year (1998, 1999, and 2000) into a separate data set so that we could focus on them in a managable analysis given that the variables available in each data set were not the same. Then we identified the students who went to two year colleges, four year colleges, and THE OTHERS who did not want to go to college or did not graduate from High School, and were not eligible for college admission. The placement data from the Worcester Public Schools made this possible. We referred to Ben Dean-Kawamura's data set to set up our own data set. His data set is compiled in Appendix 1, and was the source of our ethnic codes, but unfortunately it did not included Bai Lan's SES codes based on mothers and fathers education and occupation.

The WPS data coded each ethnic group by giving each one a number. The ethnic codes are tabulated in Table 1. We used the language codes to stand for the native countries though in many countries where the people speak Spanish. We studied the percentages of the languages for only 2000 data set because 1998 data set was missing the language codes and 1999 data set had a less inaccurate language data coding system.

For language codes, the WPS had two different set of codes. They used two digit numbers for the 1998 and 1999 graduates (Table 2). On the other hand, they used three digit numbers for the graduates of 2000 (Table 3). Most of the Hispanic- not white, and Hispanic- white students had the SPANISH language in the NATIVE LANGUAGE columns.

Table 1 Ethnic Codes

Ethnic Codes	Translation of Codes
1	NATIVE AMERICAN
2	ASIAN
3	HISPANIC NOT WHTE
4	HISPANIC WHITE
5	BLACK NON HISPANIC
6	WHITE

The code (02) is for the Spanish language in years 1998 and 1999 while the code (007) is Spanish in year 2000in 1998-1999 (07) is the code for Vietnamese; however, the code (825) is used for Vietnamese in 2000. The white students' languages varied between English, Russian, Albanian, Polish and a few Armenian, and Greek.

Table 2 Language Codes for 1998-1999

Language Codes	Translation of Codes
01	English
06	Russian
10	Albanian
33	Polish
04	Armenian
03	Greek

For 2000, the stateside language codes system was probably altered.

Table 3 Language Codes for 2000

Language Codes	Translation of Codes
ENG	English
665	Russian
115	Albanian
630	Polish
140	Armenian
004	Greek

We, also, investigated the average H.S. course difficulty. This variable had been calculated by Ben Dean-Kawamura but since he was only interested in those who took

the SAT, we found gaps in these data that could be filled by referring to the transcript data for each class. We compared these results with the ethnicity codes. We took this additional step to support the result of the placement versus ethnicity because some students might give false information on the placement survey. We averaged the COURSE DIFFICULTY LEVELS of each student. They varied from 1 to 4 and the lower numbers represented the hardest courses. For example a course level of '1' represents an ADVANCED CLASS (Advanced Placement), "2" means HONORS CLASS, "3" is a "College Prep" class, and "4" is a General or BASIC COURSE. Some of the students had 22 courses from the 9th grade to the 12th. Therefore, we added the course levels for each student and divided them by the number of courses they have taken. We did it manually since we could not get SPSS to average it. In principle it should be possible, but we think Ben Dean did his own programming outside of SPSS to get this number for his cases. The number of courses taken by students varied so much from one student to another, ~~We quite~~ that we just did it by hand. For example, some students had taken 4 core discipline courses in each year while others had 10 courses or 8 courses. We had to search for each student from our data (free lunch students') in the raw data. It was supposed to be possible to sort the data using the department code indicating whether it was in a core discipline like English, Math or Science, or not. However, all too often the department code was wrong, or blank. Luckily the level of difficulty codes were far more rarely blank.

After we were done averaging the course levels, we used the SPSS to get the percentages of the students who had lunch; the ones who went to two year college, the

ones who went to 4 year college. Also, we estimated the percentages of the different ethnic groups and their placement data.

Findings and Discussion

Table 4 represents the percentage of the students who had subdized lunches in the years 1998, 1999, 2000. In 1998, less people had a free or reduced cost lunch although the number of the graduates in 1998 is more that the number of the graduates in 1999 and 2000.

This could be a result of an incomplete data given to us from the WPS. But our advisor thinks it is a policy change that either improved their records in1999 or got more eligible students to request the subsidy. There were fewer qualified students not getting this subsidy in1999 for some reason. It is also possible that the 1998 data is strictly free lunches, and the Reduced Free group was added in 1999. While in years 1999, and 2000 the percentage of the people who had lunch is around 30% of the total number of the students, and probably right on target of the 1999 and 2000 class year.

As a result, we studied 887 students who had subsidized lunches in 1998, 1999, and 2000. We found this variable revealing because 26% of the total number of the students in years 1998, 1999 and 2000 had a free lunch, and that percentage is close to the percentage of the low income families in Worcester which is 30% according to a separate study of our advisor. This means that this data is probably an accurate reflection of the bottom income reveal in the city.

Table 5 Percentage of Placement of free-lunch students

	4 year school	2 year school	Others	Total
1998	45(24.0%)	90(49.2%)	50(26.8%)	185(100%)
1999	108(31.1%)	77(21.8%)	164(47.1%)	349(100%)
2000	122(34.6%)	93(26.3%)	138(39.1%)	353(100%)

Fig.1 2000 Percentage of Placement of Free-Lunch Students

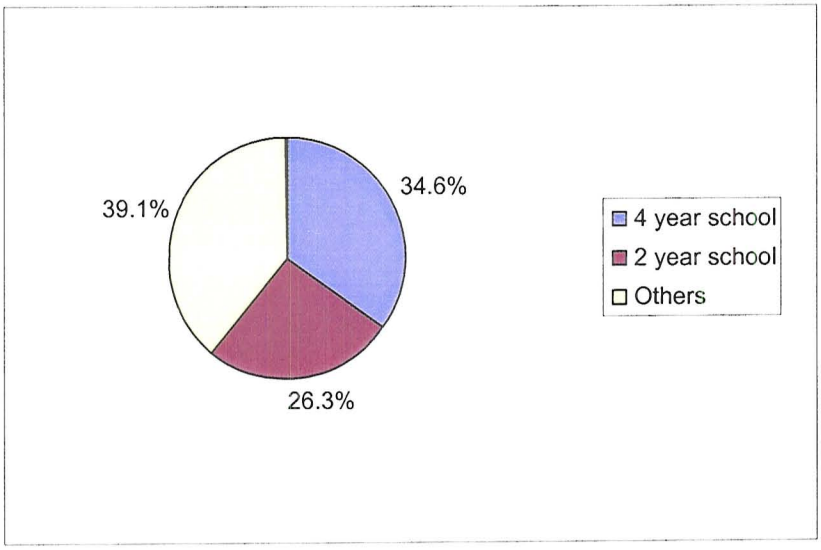


Fig.2 1999 Percentage of Placement of Free-Lunch Students

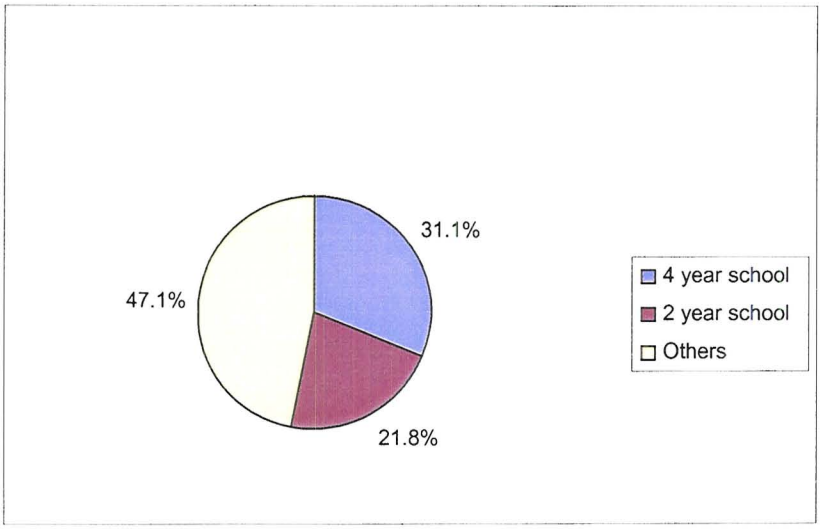
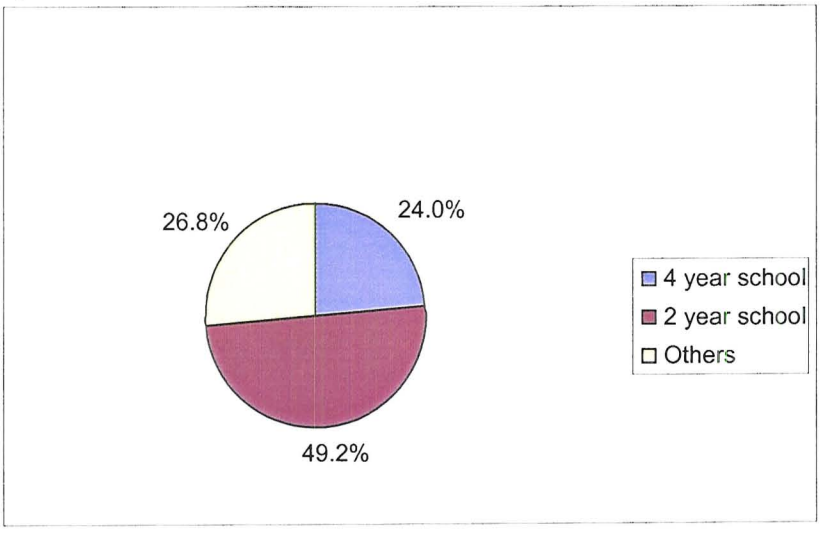


Fig.3 1998 Percentage of Placement of Free- lunch students



After taking the average from Table 6, 7 and 8, we found that about 55% of the students who have free lunch belong to the White group, while approximately 10% falls into the Asian group, the Hispanic White group, the Hispanic not white group, the black non Hispanic group, and the Native American group take about 15% , 7 % , 10% , and

0.3%, respectively . This is a distribution similar to that found in the entire WPS student body at the H.S level.

Table 6 Percentage of Ethnic Group in the Total Student Body (2000)

	Frequency	Percent	Cumulative Percent
Native American	5	0.4	0.4
Asian	123	10.9	11.3
Hispanic non white	66	5.9	17.2
Hispanic white	162	14.4	31.6
Black	112	10.0	41.6
White	659	58.4	100.0
Total	1127	100.0	

Table 7 Percentage of Ethnic Group in the Total Student Body (1999)

	Frequency	Percent	Cumulative Percent
Native American	4	0.4	0.4
Asian	10	10.4	10.8
Hispanic non white	65	6.2	17.0
Hispanic white	155	14.7	31.7
Black	123	11.7	43.4
White	596	56.6	100.0
Total	1053	100.0	

Table 8 Percentage of Ethnic Group in the Total Student Body (1998)

	Frequency	Percent	Cumulative Percent
Native American	2	0.2	0.2
Asian	96	7.8	8.0
Hispanic non white	106	8.7	16.7
Hispanic white	192	15.7	32.4
Black	149	12.2	44.6
White	678	55.4	100.0
Total	1223	100.0	

Fig.4 Percentage of Ethnics of Total Students (2000)

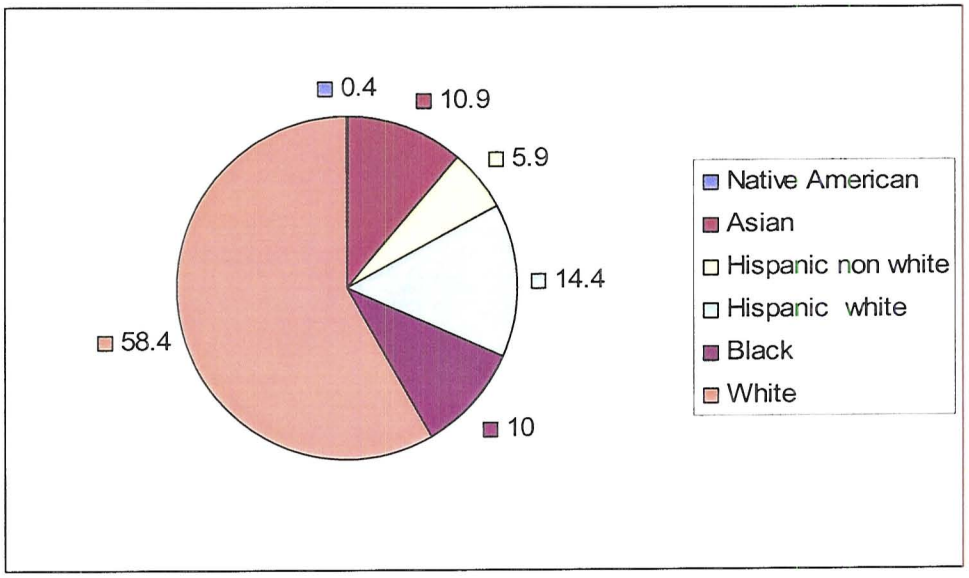


Fig.5 Percentage of Ethnics of Total Students (1999)

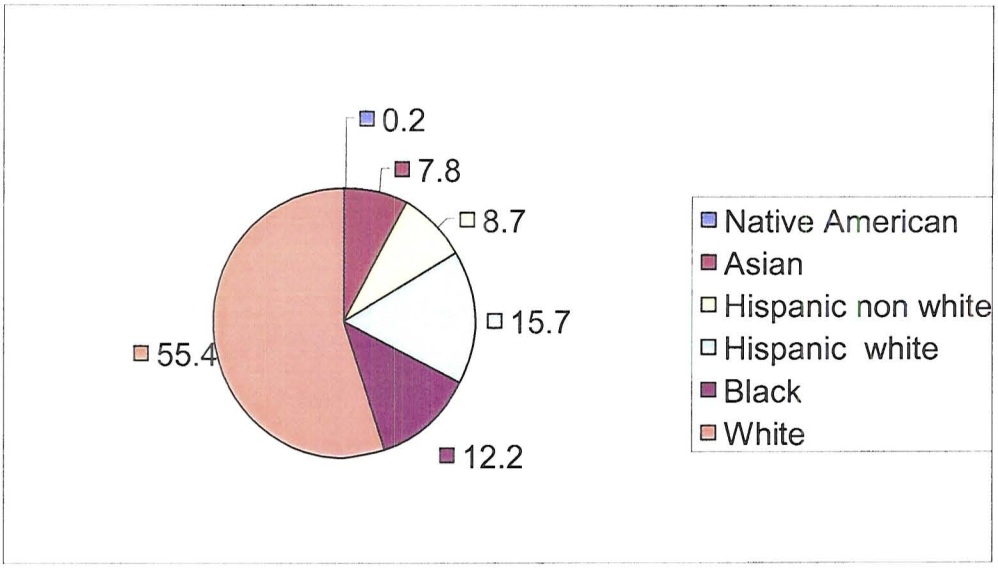
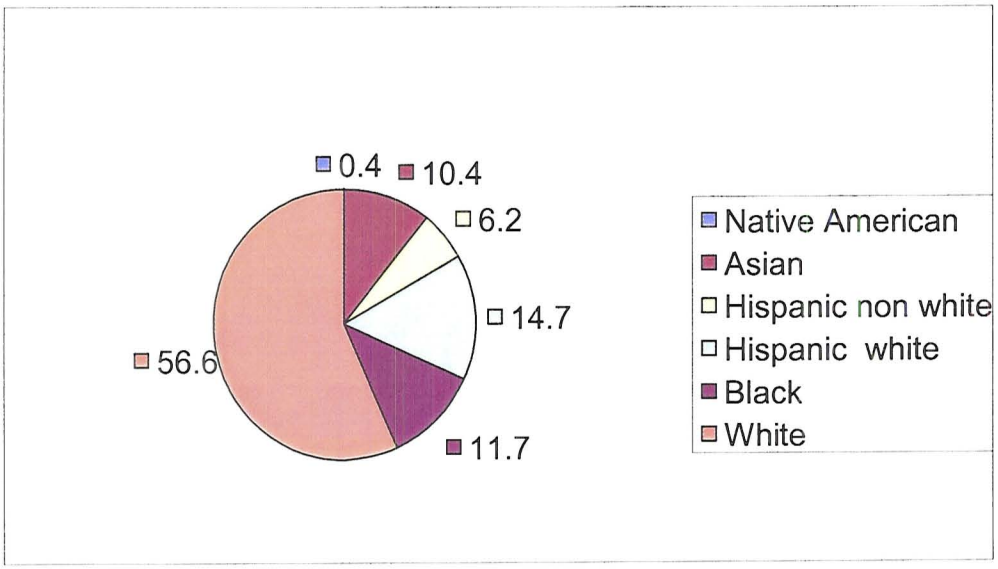


Fig.6 Percentage of Ethnics of Total Students (1998)



Tables 9, 10 and 11 show the percentages of the ethnic groups and their placements. We combined two data files to find the correlation between the placement and Ethnicity. However, there are the problems to match the students between the data set in a couple of schools in WPS; therefore, a couple of school's data were excluded. We

found that the majority of the students who go to four-year college are Asians, while the majority of the White students don't want to continue their education after high school. Also it shows that the less percentage of students who go to four-year school is the Hispanic not white group.

We found that most of the students in the Hispanic White group did not continue their education after high school. The Hispanic White students count as approximately 25% of the total number of the students in each group except for 1998 data.

The Hispanic not White group students were most likely not to continue their education except for1998 data where the majority of these students went to two-year college.

Most of the students from tended not to continue their education except in 1998. The majority of the White group wanted to go to four-year college in 1998 data.

The majority of the students who belonged to the poor Asian group tended to go to four year college. This was true in 1998, 1999, and 2000.

On the other hand, the Native Americans have a special case. We found only three students who are Native Americans in years 1998, 1999 and 2000, and two of them chose not to continue their education while the third one wanted to go to four year college.

Table 9 2000 Placement vs. Ethnicity

	HISPANIC-WHITE	HISPANIC NOT WHITE	WHITE	ASIAN	BLACK	NATIVE AMERICAN
2YEAR	26 (28%)	9(9.7%)	24(25.8%)	20(21.5%)	14(15%)	0(0%)
4YEARS	27(22.3%)	6(5%)	35(28.9%)	37(30.6%)	15(12.4%)	1(0.8%)
OTHERS	34(25.4%)	21(15.7%)	54(40.3%)	8(6%)	16(11.9%)	1(0.7%)
Total	87	36	113	65	45	2

Table 10 1999 Placement vs. Ethnicity

	HISPANIC-WHITE	HISPANIC NOT WHITE	WHITE	ASIAN	BLACK	NATIVE AMERICAN
2YEAR	23(30.7%)	12(16%)	24(32%)	9(12%)	7(9.3%)	0
4YEARS	21(19.6%)	10(9.3%)	24(22.4%)	29(27.1%)	23(21.5%)	0
OTHERS	44(27.2%)	19(11.7%)	66(40.7%)	13(8.0%)	19(11.7%)	1(0.6%)
Total	88	41	114	51	49	1

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Table 11 1998 Placement vs. Ethnicity

	HISPANIC-WHITE	HISPANIC NOT WHITE	WHITE	ASIAN	BLACK	NATIVE AMERICAN
2YEAR	17(37.8%)	12(26.7%)	10(13.3%)	6(13.3%)	4(8.9%)	0
4YEARS	13(14.1%)	5(5.4%)	30(20.7%)	29(42.4%)	16(17.4%)	0
OTHERS	12(24%)	5(10%)	47(34%)	4(8%)	12(24%)	0
Total	42	22	87	39	32	0

Fig. 7 Placement for 2-year college vs. Ethnicity (2000)

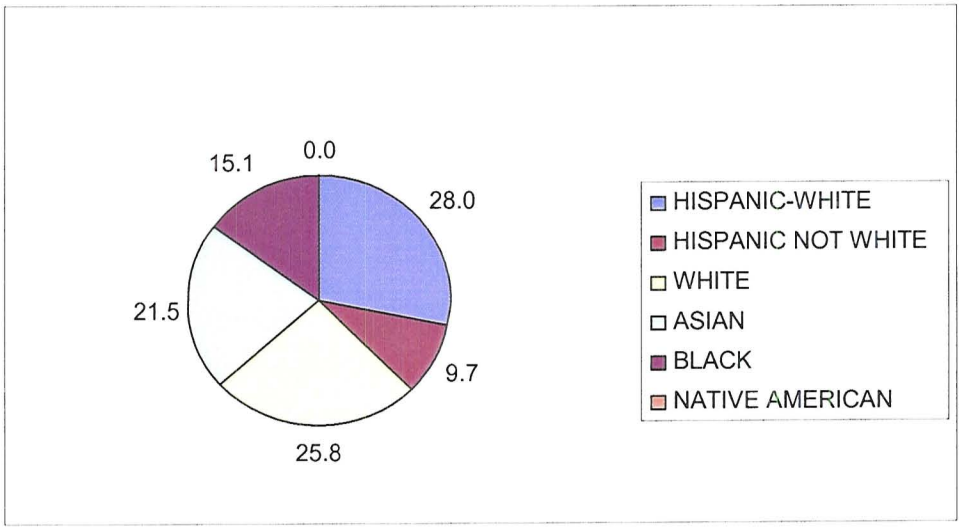


Fig. 8 Placement for 4-year college vs. Ethnicity (2000)

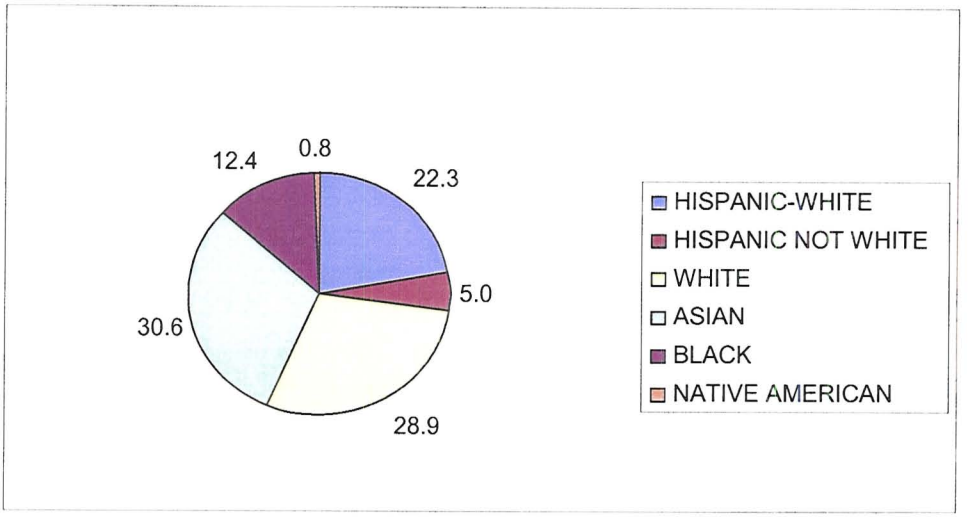
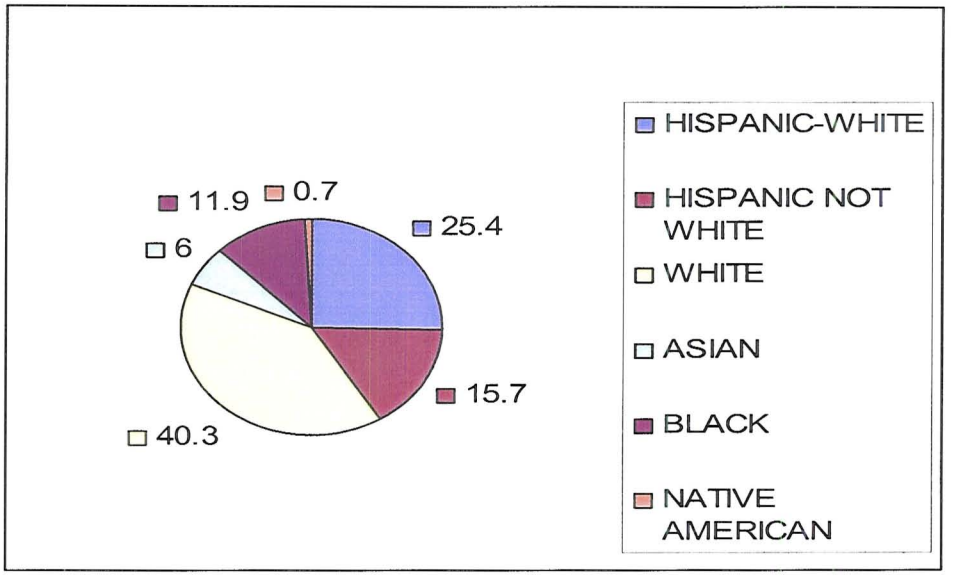


Fig. 9 Placement for Others vs. Ethnicity (2000)



Tables 12, 13 and 14 represent the percentages of the languages spoken by the students who had free lunch. The majority of the poor students in the three year data set spoke English, Spanish or Vietnamese. We found that the majority of the White ethnic group students speak English; some speak Polish, Russian, or Armenian while the

Hispanic White and the majority of the Hispanic not white speak Spanish, Portuguese, or English. Also, the majority of the Asian group speaks Vietnamese.

From tables 12, 13, and 14 we found that the majority of the students who don't wish to continue their education were English speaking students. The majority of the poor students who speak Vietnamese ~~tended~~ planned to go to four-year college. On the other hand, the majority of the poor Spanish speaking students ~~tended~~ planned to go to a two year college.

Table 12 shows that the majority of the students in year 2000 who wanted to go to two year college belonged to the English speaking group; similarly, the majority of the students who wanted to go to four year college, and the ones who didn't continue their education, also belong to the English speaking group.

Table 13 shows that the majority of the students who wanted to go to two year or four year college belonged to the Spanish speaking group. On the other hand, the majority of the students who did not wish to continue their education belong to the English speaking group.

Table 14 shows that the majority of the students who wanted to go to two year college fall into the Spanish speaking group in year 1998 while the majority of the students who wanted to go to four year college were Spanish and Vietnamese speaking students. On the other hand, the majority of the students who did not wish to continue their education belong to the English speaking group.

Table 12 2000 Placement vs. Language

	Spanish	Vietnamese	Eng.	Greek	Portuguese	Afrik.	Russ.	Albanian	Polish
2 yrs	30(32%)	18(19.1%)	37 (39.3%)	1 (1.1%)	2(2.1%)	1 (1.1%)	1 (1.1 %)	0	1 (1.1%)
4 yrs	30 (25%)	26(21.6%)	46 (38.3%)	0	0	2 (1.7%)	1 (0.8 %)	7(5.8%)	5 (4.2%)
Other	44 (33%)	5(3.8%)	82 (61.6%)	0	1(0.7%)	0	0	1(0.7%)	0

	Armenian	Chinese	Creole	Lao
2 yrs	1(1.1%)	0	2 (2.1%)	0
4 yrs	0	1(0.8%)	1 (0.8%)	1 (0.8%)
Other	0	0	0	0

Table 13 1999 placement vs. Language

	Spanish	Vietnamese	Eng.	Greek	Portuguese	Persian	Russ.	Albanian	Polish
2 yrs	42(56%)	9(12%)	17(22.7%)	0	0	0	0	3(4.0%)	0
4 yrs	43(40.2%)	26(24.3%)	23(21.5%)	0	0	2(1.8%)	0	3(2.8%)	3(2.8%)
Other	57(35.4%)	7(4.3%)	84(52.2%)	0	4(2.5%)	0	0	4(2.5%)	0

	Armenian	Chinese	Creole
2 yrs	4(5.3%)	0	0
4 yrs	4(3.7%)	2(1.8%)	0
Other	0	5(3.1%)	0

Table 14 1998 placement vs. language

	Spanish	Vietnames e	Eng.	Greek	Portuguese	Persian	Russ.	Albanian	Polish
2 yrs	31(68.9%)	5(11.1%)	7(22.7 %)	0	0	0	0	1(2.2%)	0
4 yrs	32 (34.8%)	30(32.6%)	23 (25%)	0	0	1 (1.1%)	2 (2.2%)	0	2 (2.2%)
Other	14 (28.6%)	4(8.2%)	28 (57.1 %)	0	0	0	0	1(2.0%)	2 (4.1%)

	Armenian	Chinese	Creole	Lao
2 yrs	1(2.2%)	0	0	0
4 yrs	0	1(1.1%)	0	1 (1.1%)
Other	0	0	0	0

Fig. 10 Placement for 2 year college vs. Primarily Language (2000)

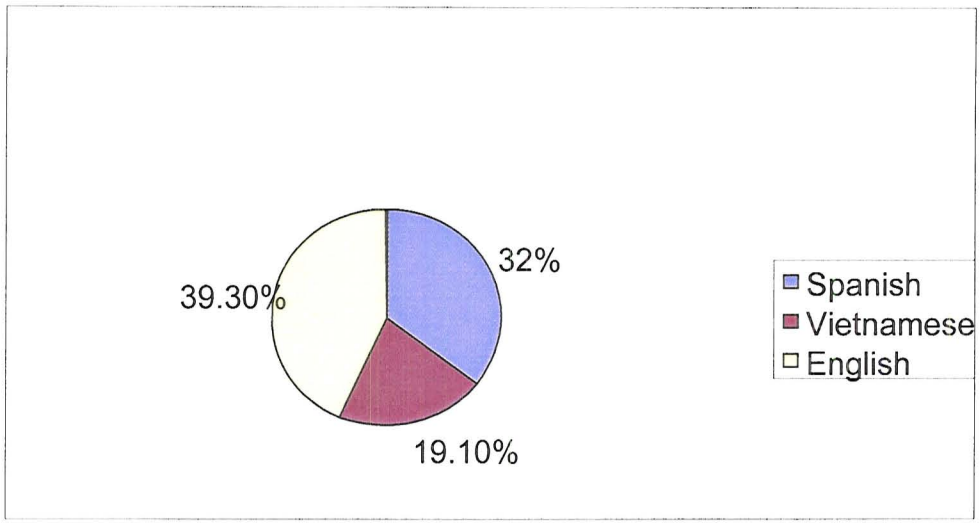


Fig. 11 Placement for 4 year college vs. Language (2000)

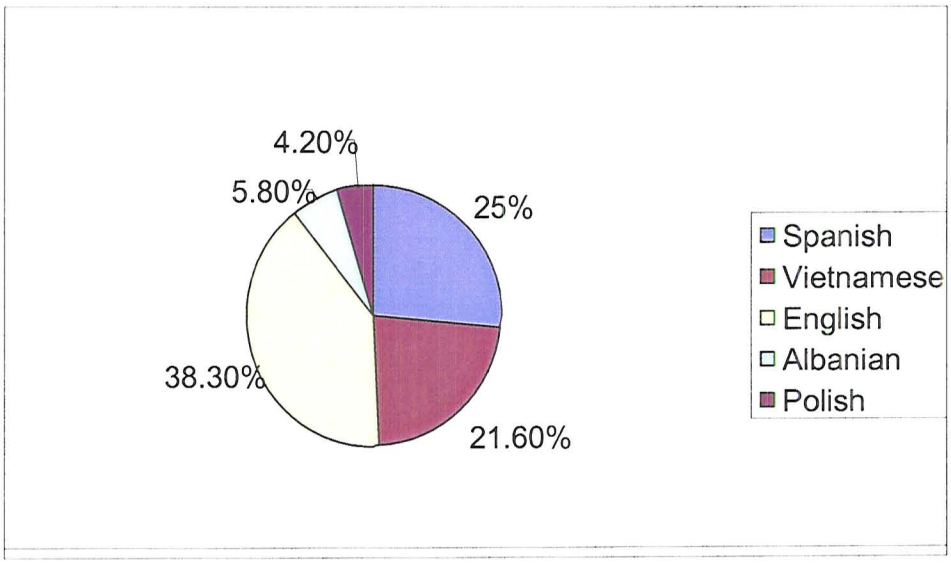
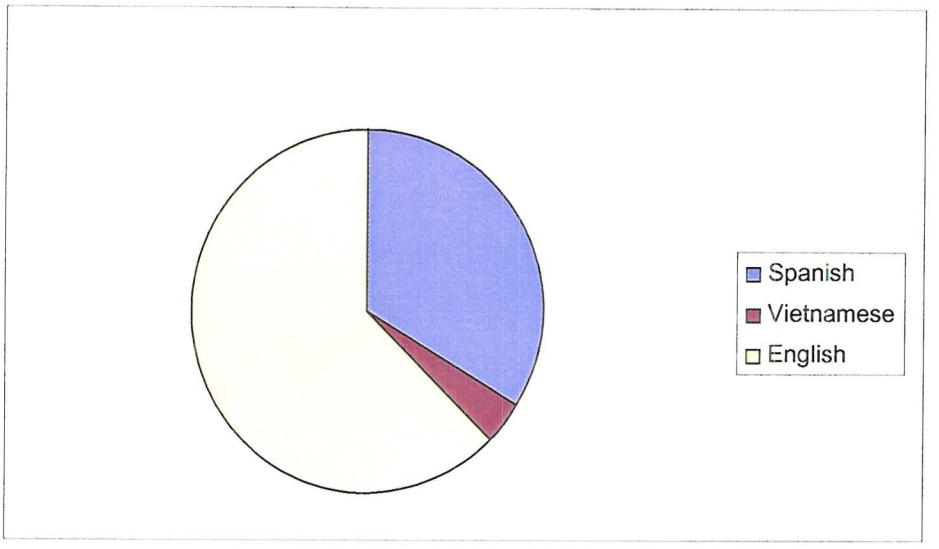


Fig. 12 Placement for Others vs. Language (2000)



Tables 15, 16 and 17 represent the percentages of the ethnic groups versus the course level average for students who wished to go to two-year college. We found that the majority of these students had a course level average between 2 and 3 except the Hispanic White group where the students' course level average was between 3 and 4.

Tables 18, 19 and 20 show the percentages of the ethnic groups versus the course level average for students who wished to go to four-year college. We found that the majority of these students had a course level average between 2 and 3, but we have students who have a course level average between 1 and 2, are Asians.

Tables 21, 22 and 23 say the percentages of the ethnic groups versus the course level average for students who wished not to continue their education. We found that the majority of the students in years 1998, 1999, and 2000 had a course level average between 3 and 4. Also, we found that the majority of the students who had this average belonged to the Hispanic white group, except in year 2000, where the majority belonged to the White group.

Table 15. 2000 Average course level vs. Ethnic for 2 year college

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	0	0	0	0	0	0
2~3	6(12.5%)	5(10.4%)	15(31.3%)	12(25%)	10(20.8%)	0
3~4	18(50%)	3(8.3%)	5(13.9%)	6(16.7%)	4(11.1%)	0

Table 16. 1999 Average course level vs. Ethnic for 2 year college

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	1(100%)	0	0	0	0	0
2~3	11(25%)	6(13.6%)	16(36.4%)	7(15.9%)	4(9.1%)	0
3~4	9(39.1%)	4(17.4%)	5(21.7%)	2(8.7%)	3(13%)	0

Table 17. 1998 Average course level vs. Ethnic for 2 year college

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	2(25%)	1(12.5%)	1(12.5%)	4(50%)	0	0
2~3	6(42.9%)	3(21.4%)	2(14.3%)	2(14.3%)	1(7.1%)	0
3~4	8(36.4%)	8(36.4%)	3(13.6%)	0	3(13.6%)	0

Table 18. 2000 Average course level vs. Ethnic for 4 year college

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	5(25%)	1(5%)	6(30%)	8(40%)	0	0
2~3	19(21.8%)	3(3.4%)	27(31%)	26(29.9%)	12(13.8%)	1(1.1%)
3~4	3(50%)	0	1(16.7%)	0	2(33.3%)	0

Table 19. 1999 Average course level vs. Ethnic for 4 year college

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	0	0	3(21.4%)	11(78.6%)	0	0
2~3	17(22.1%)	9(11.7%)	17(22.1%)	14(18.2%)	20(26%)	0
3~4	2(16.7%)	1(8.3%)	3(25%)	2(16.7%)	4(33.3%)	0

Table20. 1998 Average course level vs. Ethnic for 4 year college

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	6(17.1%)	1(2.9%)	8(22.9%)	17(48.6%)	3(8.6%)	0
2~3	3(11.1%)	2(7.4%)	5(18.5%)	11(40.7%)	6(22.2%)	0
3~4	3(15.8%)	2(10.5%)	4(21.1%)	4(21.1%)	6(31.6%)	1(5.3%)

Table21. 2000 Average course level vs. Ethnic for Others

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	0	1(50%)	0	1(50%)	0	?
2~3	9(34.6%)	1(3.8%)	6(23.1%)	6(23.1%)	4(15.4%)	?
3~4	11(17.7%)	9(14.5%)	32(51.6%)	1(1.6%)	9(14.5%)	?

Table 22. 1999 Average course level vs. Ethnic for Others

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	0	0	0	0	0	0
2~3	6(12.5%)	5(10.4%)	15(31.3%)	12(25%)	10(20.8%)	0
3~4	18(50%)	3(8.3%)	5(13.9%)	6(16.7%)	4(11.1%)	0

Table 23. 1998 Average course level vs. Ethnic for Others

Ave.Course level	Hispanic white	Hispanic not white	white	Asian	black	Native American
1~2	14(34.1%)	6(14.6%)	7(17.1%)	5(12.2%)	9(22%)	0
2~3	14(28%)	10(20%)	11(22%)	6(12%)	9(18%)	0
3~4	16(28.6%)	11(19.6%)	13(23.2%)	7(12.5%)	9(16.1%)	0

Fig. 13 Ave. Course level 1~2 vs. Ethnic for 4 year College (2000)

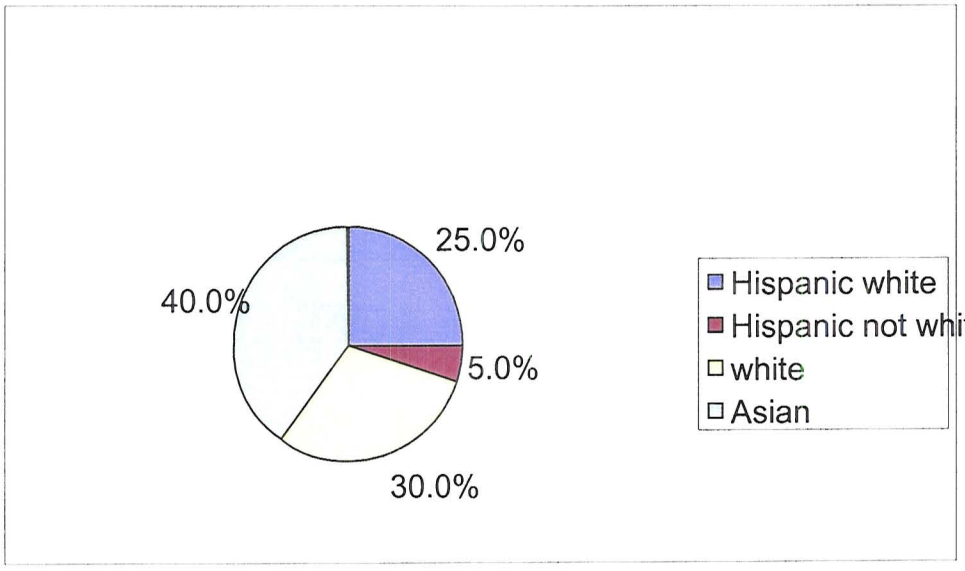
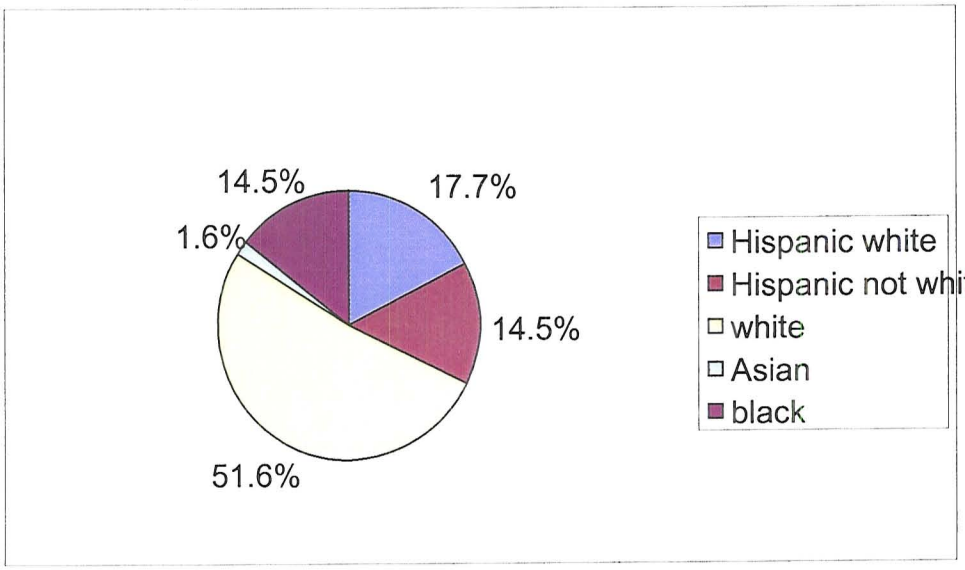


Fig. 14 Ave. Course level 3~4 vs. Ethnic for Others



Tables 24, 25 and 26 represent the percentages of the languages versus the course level averages for the year 2000. We found that the majority of the students had a course level average between 2 and 3 for two-year college, and four-year college, and the majority is from the English speaking group. On the other hand, the majority of the students who didn't wish to continue their education had a course level average between 3 and 4, and similarly, the majority of these students belonged to the English speaking group. The question mark represents the missing data.

Table24. Ave. course level vs. language(2000) for 2 year college

	Span	Vietn.	ENG	GREEK	PORTUGSE	Afric.	Russian	Alben.	Polish
1~2	0	0	0	0	0	0	0	0	0
2~3	8	10	26	?	1	1	0	0	1
3~4	16	6	8	?	?	1	1	0	0

Table25. Ave. course level vs. language(2000) for 4 year college

	Span	Vietn.	ENG	GREEK	PORTUGSE	Affric.	Russian	Alben.	Polish
1~2	4	6	7	0	0	0	0	1	1
2~3	22	19	34	0	0	1	1	5	4
3~4	3	0	2	0	0	1	0	1	0

Table26. Ave. course level vs. language(2000) for the others

	Span	Vietn.	ENG	GREEK	PORTUGSE	Affric.	Russian	Alben.	Polish
1~2	1	1	0	0	0	0	0	0	0
2~3	8	4	15	0	?	0	0	?	0
3~4	19	0	45	0	?	0	0	?	0

CONCLUSION

We found that approximately 30% of the Worcester public school students had a subsidized on free lunch, which means that they come from a low-income family. Also, almost 25% of these students continue to go to four-year college, and about 40% of them to two-year college, while the rest 35% don't want to continue their education.

We also found that the majority of the Asian group continues their education in a four year college. After comparing tables 9, 10, and 11 with tables 12, 13, and 14, we found that the majority of these Asians come from Vietnam. ~~Although that~~ The Asians represent only 10% of the students in the WPS, yet 50% of them continue to go to four year college. However, we couldn't find if these students were immigrants, or were born in the United States. On the other hand, 55% of the students who don't continue their education are from the white group. After comparing the language percentage tables with the ethnic percentages tables, we found that these students had English as their first language, and a few of them had Spanish as their first language. The other students who had Albanian, Russian or Polish as their first language wanted to continue their education mostly by going to four year college, but these students are only 10% of the White group. Most of the students who belonged to the Black group tended to go to two-year college. The number of the Hispanic White and the Hispanic not white students varied between the ones who wanted to go to two-year college and the ones who chose not to continue studying. On the other hand, the Native American students were very rarely in our dataset. We found only three students within three years that we studied. We found that the 1998

data was not reliable since the results of that year seemed to be fairly different than the results of years 2000 and 1999.

Future Work

We strongly recommend that future student teams study the placement data of the students who were not qualified for Free or Reduced lunch and compare their results with the results we have in this study. Also, we encourage that they take into account the SAT, and MBTI scores of the students.

This analysis is based on the placements data that we had from the WPS. For more accurate results, we require to continue this research by requesting further data that confirms that these students actually went by the placement data that we worked with. Furthermore, we suggest that a further research could be done about the low income family students to find if they were recent immigrants or not