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Gender-Based Comparative Survey of Public HS Students

An Interactive Qualifying Project Report:

Submitted to the Faculty

of the

WORCESTER POLYTECHNIC INSTITUTE

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Degree of Bachelor of Science

By

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Date: June 1, 2005

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June 1, 2005

Professor John M. Wilkes
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Dear Professor Wilkes:

Enclosed is a copy of our report titled Gender-Based Comparative Survey of High School Students. It was completed at Worcester Polytechnic Institute during the period October 26, 2004 to June 1, 2005. Upon review, the original copy of this report will be catalogued at the Gordon Library at Worcester Polytechnic Institute. We appreciate the time you have devoted to us.

Sincerely,

Laura Handler Patrick Hogan

Abstract

Design and implementation of a career aspirations survey administered to current juniors in the Worcester Public High Schools is discussed. Purposes of the survey included gender, ethnicity and school based analysis of occupational interest areas. Analyses revealed that gender and ethnic stereotypes continue to exist today, but to different extents among Worcester's seven public schools. Projects and programs related to career interests and concerns are coordinated and proposed.

Acknowledgements

First, we would like to thank Dr. Patty Mostue for her approval of our survey and her fierce support of our project from within the public schools. Other public school administration members that we would like to thank are Burt Vasquez and Judy Thompson for allowing our survey to be distributed within the public schools.

We would like to thank all the guidance counselors at each of the public schools for the response rate of the survey and their expedient results. Within the guidance departments, we would specifically like to thank Rick Connoli at A.L.L., Bill Abraham at Burncoat, Dayle Reynolds at Doherty, Margarita DelGado at North, Janelle Person at South, Betty Fryberg at Worcester Vocational and Mary O'Sullivan at University Park for corresponding with us and assuming responsibility of the distribution of our survey.

We would also like to thank our sponsor, the members of the Worcester City Manager's Advisory Committee on the Status of Women, for their encouragement and support during the course of our project.

We would like to thank all of the professors, faculty and professionals who participated in/or helped with FACES@*WPI*. Specifically, we would like to thank Jen Cluett for sharing her experience in organizing events and Phillip Clay for his generous donation.

We would finally like to thank our project advisors for all of their advice, support and guidance throughout the project. We would specifically like to thank Liz for all of her positive feedback and her help with the organization of FACES. We would like to thank Professor Wilkes for teaching us about political capital and his relentless encouragement.

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1. Introduction

1.1 Objectives

The overall objective of this project is to gather and organize information on the aspirations of the students in the Worcester Public High Schools (WPS) Class of 2006. This information, once gathered, can also be used as a means of identifying students with specific aspirations.

The project sponsor, the Worcester City Manager's Committee on the Status of Women (ACSW), is particularly interested in identifying students with counter stereotypical aspirations so that recommendations can be made to the City Manager regarding gender-based career stereotypes within the Worcester Public Schools. Encouragement can be provided to those students, in the form of awards, mentors and specialized information programs. Additionally, the ACSW was hoping to increase the number and quality of applicants of their Annual Young Women of Consequence Award.

The research team conducting the study intends to analyze the students' aspirations from the collected data based on several variables including primarily: gender, ethnicity and school. The aspiration by gender and ethnicity analysis allows the group to see if common gender and ethnicity stereotypes prevail in the Worcester Public Schools, an indicator of the impacts these stereotypes will have on the future work force of America and Worcester. An aspiration by school comparison assesses the success of the cluster system in the Worcester Public High Schools as well as the student culture of each of the schools in terms of gender stereotypes. Other variables analyzed are the concurrent interests of students as well as relationship between gender and ethnicity to perceived career obstacles.

Through this analysis, the research team intends to increase awareness of the existence and importance of gender and ethnicity-stereotypes in the Worcester Public Schools, so that the faculty and administration can make appropriate improvements in current curriculum and related policies. In addition, the research team intends to demonstrate practical applications of the survey beyond analysis. These practical applications will prove the benefits of the survey to individual students, hopefully ensuring the survey's annual distribution.

The culmination of the project will be a formal presentation of the group's findings to the Worcester Public High School Guidance Department and the ACSW, in both written and oral formats.

2. Methodology

2.1 Survey Development

The foremost obstacle at the beginning of the study was to develop a means of collecting the aspirations data from the students. This required the development of a survey instrument to be distributed and administered by the guidance departments of each public high school in Worcester. The decision on the best way to distribute the survey was left to each individual guidance department, whether this was the distribution of surveys in homerooms, junior English classes or a class assembly. The research team allowed each high school guidance department to choose their own distribution method with the hope that it would maximize the response rates. Of concern, however, was the sample surveyed at each school.

Surveys are generally used when systematic observation is impractical or impossible. Floyd J. Fowler cites the case: "For example, although some crimes are reported to the police, many are not. The best way to estimate the rate at which people are victims of crime is to ask a sample of people about their victimization experiences" (Fowler, 1995). In the case of this study, it was certainly impossible to directly observe or interview each student due to the large population in the Worcester Public Schools. If the guidance departments in the Worcester Public Schools had already collected the data through individual meetings with the students, the research team would only have to obtain access to the data to complete the study. However, this would have raised serious comparability and data quality issues. To avoid these, a standardized method of data collection was deemed the most practice method; the research team decided to use the survey instrument as the method of data collection.

Constraints

The development of the survey was subject to several constraints. Foremost among these constraints was the necessity to keep the survey at a length of no more than one page, front and back, for primarily two reasons. First, the research team assumed that the Worcester Public School administrators would not approve a longer survey, especially in early January. The guidance departments are already pressed for time with college application deadlines and the preparation for the MCAS, and wouldn't be able to dedicate an excessive amount of time to distributing and collecting a survey. Secondly, the cost of printing approximately 1500 surveys of a length greater than one page would have been prohibitive. To conserve resources, the length was limited to no

more than one page. This was later changed to one piece of paper, with a list of extracurricular activities added to the back of the page. The motivation for this change is discussed later in this section.

Other problems arose due to this length restriction. The interests of three groups needed to be addressed by the survey instrument. The ACSW's interest was in comparing career aspirations (especially political) by gender to analyze the prevalence of gender stereotypes in Worcester, as well as in finding candidates for its Young Woman of Consequence Award. For the analysis of the data, the research team was interested in comparing aspirations not only by gender but by ethnicity, school and parental occupation. Furthermore, in order to give each school's guidance department an incentive to administer the survey, the research team wanted to include something which would enhance their knowledge of how well their students were developing a career focus, so that information could be provided and connections could be made to appropriate groups in the city. In particular the research team wanted to reveal any barriers that the students saw as standing between them and achieving their dreams. Developing questions that covered the interests of each of the three groups was a difficult task.

Background Research

Several important guidelines should be followed when writing survey questions to ensure their usefulness. The guidelines may seem simple or obvious, but it is important to keep them in mind. Overall, the goal of a survey question is that it be understood consistently by the intended audience and that that understanding is what the writer's intended for that question. Unless otherwise noted, the guidelines for writing survey questions, which are discussed below, were taken from literature on the subject written by Arlene Fink (1995).

The questions must be kept concrete in order to get the desired response. If care is not taken to keep the questions precise and unambiguous, respondents may interpret questions incorrectly or inconsistently and respond with information that is useless for the purposes of the survey. In order to achieve this, a fine balance between level of detail and readability is required (Fowler, 1995). Enough details must be given to ensure the reliability of the question, but each question should not become too wordy, which could potentially result in the respondents becoming confused. Concrete questions also increase the validity of the survey. If questions are kept concise and are clear in what they are asking, the survey will gain face validity. Furthermore, when

dealing with a diverse population, such as the student body of the Worcester Public Schools, asking questions directly and to the point is vital to minimize necessary interpretation.

Use of conventional language can mean the difference between a successful question and an invalid one. Defining 'conventional language' can be difficult to do beyond some obvious basic precautions. In general, no abbreviations, slang (either ethnic or age-related) or technical expressions should be used. Use of these increases the chance that two respondents may interpret the same question differently.

Even after these common precautions are taken, the survey should be tested on a few respondents from the intended demographic pool to ensure that the questions are understood, the time taken to complete it is acceptable, and that the information yielded is useful and reliable. The survey was tested on two groups, all of them high school students.

Using conventional language is sometimes not enough. Some words which are familiar to everyone can mean different things to several respondents, depending on that respondent's background. If there is any doubt that the majority of respondents will identify a term to mean exactly what the survey intends it to mean necessary precautions should be taken to make sure that the term is understood correctly. Otherwise, the validity of the survey will diminish.

In preliminary drafts of the survey each of the careers which the research team were gauging interest in were not followed by examples. This could have led to much confusion had the survey been administered without clearing this up. To prevent this, many of the occupational interest areas which could be interpreted in several ways such as business, trade and the distinction between medical practice and medical support, are now followed by examples. Beyond that, the area where the respondent could list any specific career interests can potentially clear up any misunderstandings. If the respondent indicated interest in a specific career in an occupational interest area which they did not indicate interest in, this can be taken into account, and used to help analyze some of the data returned by the survey.

Using these guidelines, the writers of a survey can write a questionnaire which produces information which is useful and reliable. This second characteristic is quite important because the answers are not only interesting for their own sake; in some cases the answers are used to tell us about something else. Care needs to be taken to ensure the reliability and validity of all questions, especially of those whose responses

are not taken at face value. For example, knowing the parental occupations of a student can give insight to social class information. If the question which asks for parental occupation information is poorly written, the error may compound once any inferences are made to the respondent's social class.

How the questions are to be answered can be just as important as how they are asked. An important consideration to make is whether the questions are left open or closed. A closed question is one in which possible answers are listed for the respondent to choose, whereas an open question leaves a space for the respondent to leave his/her own answer, based on their interpretation of the question. This may present a problem in cataloguing the answers for further use. It relies on the judgment of the interpreter to categorize an answer to be used in analysis of the data (Fowler, 1995). However, much more can be learned from answers to an open question than if the question were closed.

Closed questions are "the simplest way to give respondents the same perceptions of what constitutes an adequate answer" (Fowler, 2002). However "closed questions are not suitable in all instances. The range of possible answers may be more extensive than it is reasonable to provide" (Fowler, 2002). Respondents are also more likely to answer a closed question, whereas they may leave an open question blank. Data collected from closed questions is easily categorized and can be used confidently and conveniently in a statistical analysis.

The majority of questions used in the survey are closed. The research team used two major types of answering systems for these closed questions: categorical and ordinal. Categorical answers assign no preferences or numerical values, they are simply a list of potential answers with a check box or other like space in which the respondent should indicate his/her answers for each. Ordinal responses involve numerical preferences and ask the respondent to indicate to what extent a level of measure applies to them. An example of categorical answers is the ethnicity question, while an example of ordinal would be the 1-5 scale for each career interest.

The best method can be a compromise between an open question and a closed question, if the survey formatting and any length constraints permit. This involves a closed question - giving a variety of responses which are anticipated to be the most widely used - yet leaves space for an additional written response if the respondent has an answer which is not included in the given answers (Fowler, 1995). This gives the respondent an idea of the types of answers which are acceptable for the question, but allows them to give their own individual or more detailed response if necessary.

Much discussion was given to the inclusion of open or closed sections in the survey. The benefit of open questions, from this study's point of view, was the saving of space. If every option need not be listed for each question, with a blank left for answers to be listed instead, space can be saved. However, after discussions with Dr. Patty Mostue, Director of Testing and Assessment in the Worcester Public Schools, regarding this matter, many of the open questions were changed back to closed. Dr. Mostue was insistent on this point, saying that the students would not want to take the time to answer any questions which required them to write anything.

Personal Information Section

The first section of the survey collects personal information from the respondent. The respondents are prompted to fill out the name of their guidance counselor, the occupations of their parents/guardians and to check the appropriate box to indicate their ethnicity and gender. This information is used to analyze the data demographically later in the study. In addition to these variables, the student is asked to give their student ID number. This number is either a previously number given to each student at their school, or a number fabricated for this study only. This ID number allows each school to identify the student upon receiving their survey back from the project group. This is important so the guidance counselors can use the survey to identify each student's needs and to notify them of events in the future which they would be interested in.

The question of how to identify the student for the purpose of the guidance counselors was addressed over the course of the survey's development. The research team would have preferred to have the student fill out his/her name directly on the survey. This would have been the easiest way for the guidance counselors to identify the students once receiving the surveys from their school back. This was the method used for the parallel study at the private high schools in Worcester. Unfortunately, this raised confidentiality issues in the public schools, and it was determined that each student could not put his/her name directly on the survey. Initials and birth date were another suggested solution, but this was changed in favor of student identification numbers already in the student records of each school, after the suggestion of this by several guidance counselors.

Occupational Interest Areas Section

The second section of the survey is used to gauge the student's interest in a variety of careers. A series of occupational interest areas are listed, along with a 5-point Likert scale (5-very interested …. 1-no interest) for each. The respondent indicates their

interest on this scale for each of the occupational interest areas. Along with some of the occupational interest areas, several specific careers are listed to be sure the student is clear what is meant by some terms such as Civil Service or Business.

At the end of this section, the respondent is prompted to list any specific careers they are interested in. This can indicate seriousness beyond selecting five on the interest scale. Knowing what specific career each student is interested in, other responses can be analyzed to find how prepared the student is to pursue this career. This is also of great importance for each guidance counselor, who can give better counseling to a student if they know exactly what field the student is interested in entering.

After this, a section is included which gauges the student's interest in running for political office on a similar 5-point Likert scale. If the student is interested in politics, a separate question asks which level they would be interested in holding office at: local, state or national. The political question is separated from the other career areas to make clear that the follow-up question refers to holding political office. The follow-up question is included for the case of political office interest because the ACSW is very interested in finding how the political aspirations of female students compare to those of male students. In addition, political interest is often an indication of leadership in a high school student, despite the fact that they may not hold student government positions (where elections often are popularity contests); and further interest in running for political office can be used as an indicator of potential candidates for the Young Woman of Consequence Award.

Post-Graduation Plans Section

In order to assess how prepared each respondent is to pursue their career interests, the next section deals with plans after high school. First, the respondent is asked to indicate what they intend to do immediately after graduation. The choices range from what type of college they plan to attend, joining the military or entering directly into the workforce. This question gives an indication of how serious/informed each respondent is about his/her career interests and of course can once again be used by guidance counselors and to develop statistics on post-high school plans at each school.

Career Concerns Section

Following this is a section that should be of great interest to the guidance counselors. This set of questions is intended to discover what barriers the student feels

may prevent him/her from going into a career which they are interested in. This is broken down into a series of four statements with three possible responses. The respondent checks as many of these as they choose to indicate the obstacles which are preventing them from pursuing their choice career.

The first statement refers to gender related barriers. The respondent would check any of these if they think that their gender is a significant force holding them back from pursuing the career of his/her choice. The second statement regards reasons why the respondent may not be accepted to college. These include low grades/test scores or a feeling of uncertainty about handling the rigors of college. The third statement deals with any reasons why, if the student were accepted, they would not attend; for example, a lack of finances to pay for college. The fourth statement regards uncertainties the student has in pursuing their preferred career. This includes not knowing anyone in the profession, not knowing where to start to achieve their goals or feeling unsure that he/she could succeed in that profession. In order to combine the benefits of open and closed questions, the student has the option of listing additional concerns if the respondent feels that their concern is not covered in the above four statements. It is hoped that the responses to this question may uncover reasons behind why some groups of students - whether that be gender, ethnicity or any other characteristic – do not proceed into their preferred careers regardless of interest.

Extracurricular Activities Section

On the back of the survey is a list of extracurricular activities. The student is asked to check any activity he/she is involved in along with listing any leadership positions held in the activities. This is included primarily for the purpose of finding applicants for the Young Woman of Consequence Award, as the ACSW is looking for women with strong records of leadership to be considered for the award. Beyond that, it may be interesting to see what clubs students with a similar interest are involved in. This may hopefully lead to a school beginning a club/organization if that school's students express a good deal of interest in an area without and applicable club.

Originally, space was left at the bottom of the survey for each student to list their extracurricular activity involvement in. However, the research team agreed with Dr. Mostue's suggestion that a list of all activities normally offered by a Worcester school would be preferable to ensure a higher response rate and to prevent memory lapses which would eliminate some potentially useful information.

A copy of the survey used is included in Appendix A.

2.2 Survey Analysis

The survey instrument was the greatest asset in completing the aspirations study. The research team had no other way of obtaining the data necessary for its completion than retrieving it from the answers given by the respondents. However, it could also be considered an obstacle to the research team's analysis. Data from questions interpreted incorrectly may not only be useless, but in some cases misleading, resulting in false assumptions. Before the analysis of the data can be applied to any further means, it is necessary to analyze any flaws in the survey and how these may have affected the integrity of the data. The reliability and validity of the survey must be addressed along with an analysis of the content.

Reliability

"Reliability is a statistical measure of how reproducible the survey instrument's data are" (Litwin, 1995). In other words, a reliable survey will return the same data time and time again if the same group is tested. Due to the nature of the survey however, reliability is very difficult to measure. It was not possible to retest any of the students, which eliminates many forms of reliability measurement. More so, because of the short length of the survey, there are not any sets of questions which measure nearly the same variable. If such questions are included in survey, they assist in a test for consistency (Litwin, 1995).

Despite the lack of means to test for validity, the research team can be somewhat confident in the reliability of the survey. This is due to the fact that much of the analyzed data had trends which the research team expected. For example, the majority of the gender ratios match those of the BLS CPS data.

Validity

Validity indicates that the answers can be used as intended without any false assumptions being made. Many sections within the survey have what is referred to as 'face validity'. A question which reads "Gender: (Check one) ÎMale ÎFemale" is asking for an indication of gender; no interpretation is required of the respondent or the research team. Most of the questions within the survey are phrased so that they simply and directly asked for the desired information.

Content Analysis & Future Recommendations

Critically evaluating the performance of the survey instrument will help future research teams revise the survey to optimize their analysis. Future generations of the

survey will be based on the pilot that the research team distributed. The following is an analysis of the survey, including problems related to the reproduction, distribution, format and comprehension of the survey.

There was one problem with the survey related to its reproduction; the copied version was missing check-boxes. These boxes (□) were used in almost every question and were excluded due to a minute oversight during the printing stage of the project. The character used for the boxes in writing the survey was not recognized by the version of Word used to print the survey, and thus wasn't included in the distributed copy.

The research team is unsure the extent the missing boxes affected the responses. The validity of the questions was not adversely affected because of this lack of boxes. The meanings of the questions are still clear, and students were able to find alternate ways to record their responses, whether this was through circling, checking or another method.

It is more likely that the lack of the boxes led to a lower response rate to some questions. 6 percent of students did not indicate their gender; 4 percent did not indicate their ethnicity. These percentages are not high, but the research team expected higher response rates for the straightforward questions at the very beginning of the survey. This can be compared to 3.4 percent of the students who did not indicate any plans after college, which is considered a significantly more detailed and thought-provoking question. The research team hypothesized that had the boxes been included near the response options to the gender and ethnicity questions, the questions and answers would have been more noticeable and led to fewer students leaving these blank. The correction of this error and the inclusion of the check boxes could improve this response rate in further studies.

The low-response rate to those initial questions regarding person information might be related to the format of the survey or the issue of confidentiality. It is possible that students were more reluctant to give personal information than general information. The responses to questions relating to post-high school plans and concerns cannot identify individuals, which may have been a concern for some students. Also, in order to deal with space constraints (as discussed in section 2.1), some sections of the survey are not given sufficient space. This appears to be the case with the personal information section, and even if check boxes had been included, the crowding in this section may have resulted in the overlooking of these questions.

Unfortunately, the missing data is significant to the analysis of the data, particularly in the gender and ethnicity comparisons. Without the gender or ethnicity of the respondent, the individual survey had to be eliminated from the analysis.

For future generations of the survey, the research team suggests that the questions in the personal information section are emphasized in order to generate a better response rate.

The extracurricular activities section at the end of the survey was also affected by the lack of check-boxes, which led to irregular indication of participation in activities. Many students did not indicate participation in any of the listed activities, perhaps due to confusion regarding how to designate their answer when there was no obvious place to do this.

As in the case of the personal information section, the lack of response may have derived from many other sources as well. Students might not be involved in any activities, might not have noticed the section (as it was on the back of the survey) or might not have wanted to fill out a seemingly lengthy section. However, without statistics on the rate of student involvement in extracurricular activities, the relative response rate cannot be determined for the section. Fortunately, the primary use of the extracurricular section is in the identification of candidates for the ACSW's Young Woman of Consequence Award. It is unfortunate if a candidate was overlooked because she became confused with this section and left it blank, but no validity questions are raised in terms of data analysis.

The survey distribution method affected the extracurricular activity section, as well. In the interest of creating one survey to be printed approximately 1500 times in order to take care of printing all at once, extracurricular activities from all schools were compiled into one list, making the list extremely lengthy. However, a late change in the survey led to the name of each school being included on each survey, which eliminated the opportunity to print all 1500 at once.

Although the pilot survey included the complied list, future generations of the survey can use lists customized for each school, which will reduce the length of the list. This will make the section quicker and easier for the student to respond to, hopefully raising the percentage of students who complete it.

Another possibly option for the second generation is the elimination of this extracurricular section entirely. The inclusion of this section derived directly from the objective to identify female students for the Young Woman of Consequence Award.

Students with high involvement and leadership positions were to be considered candidates; this identification was carried out successfully. However, the research team hopes that with the publicity planned for this year's Young Woman of Consequence Award winners, that next year the guidance departments will need no help in identifying candidates at their school. If the section is eliminated, it will either both reduce copying costs and decrease the amount of time required for the student to take the survey or leave room for the expansion of more relevant sections.

The follow-up question to the interest in a career in political office was also included in the pilot survey for the ACSW's Young Woman of Consequence Award. Like the extracurricular activity section, the follow-up question could be eliminated in the future to save space and avoid any validity issues associated with students' responses.

The follow-up question was supposed to be answered by students who indicated a positive response (in this instance, selected an interest level of 3 or higher) to the prior question. However, students who answered the question gave a wide variety of responses to the previous question. Almost half (48.6%) of the students who indicated the specific level they would like to run for political office at were not interested in running for political office. The research team assumed that the phrase 'If interested' must have been interpreted not as a screening criterion, but as a hypothetical situation. If this question is not eliminated in future generations of the survey, the phrasing should be revised. For instance, it could read 'If you circled 3 or higher on the previous question...' to eliminate validity issues.

Comprehension related issues affect the utilization of several sections. There appeared to be a fundamental lack of understanding of the parental occupations section. 33.2 percent of students did not respond with an occupation for any of the three choices: Father, Mother or Guardian. Approximately half of the 33.2 percent responded with the names of their parents or guardians instead of their occupations. In future generations of the survey, more care should be taken to highlight the fact that the intended response is the occupation, not the names, of their parents or guardians. However, validity is not a concern among the 66.8 percent who did respond with the occupations of their parents.

Within the perceived career barriers section, there are validity issues which caused the research team to exclude the responses to a set of questions from the analysis. Equal rates of males and females indicated concern regarding their gender. There was little correlation found between gender concerns, gender of the student and

interest in gender-unbalanced careers. There are many possible explanations for this; however, in any case, the validity of the section is questionable. Therefore, the responses to the gender-related perceived career barriers are not considered in the analysis.

It is possible that one gender understood the series of questions more than the other, and therefore some useful information could be extracted from the responses of that gender by disregarding those of the other gender. However, there is no way of determining this. Based on the doubt surrounding the validity of the series of questions, the research team chose not to perform any analysis on the responses. The three remaining concern statements appeared to have been understood correctly to students and were included in the analysis.

An additional proposed change to the survey is to further elaborate on the meanings of interest levels (1-5) given for each occupational interest area. Thirty-seven students did not select anything above a three in any category, and many students indicated a four or better in more than five categories. The research team suggests that a set of statements or descriptions for each interest level is listed on the survey (see Table 1for an example). These statements would eliminate discrepancy between the interpretations of individual students, increasing the validity of the section of the survey.

Table 1: Interest Level Statements

Interest Level	Corresponding Statement
1	I have high interest in pursuing a career in this occupational interest area
2	I have considerable interest in pursuing a career in this occupational interest area
3	I have some interest in pursuing a career in this occupational interest area
4	I have moderate interest in pursuing a career in this occupational interest area
5	I have no interest in pursuing a career in this occupational interest area

The survey instrument worked well for the research team's purposes; although, it was not without its flaws. However, the length of this section should not be construed to indicate that the survey is deeply flawed, rather as an indication of the care which the research team took in assuring that the data which was collected is useful, since many groups are depending on the data set for their purposes. It is intended that the previous

information be used by future groups furthering this study in the effort to perfect the instrument. A copy of the survey with revision comments is included in Appendix A.

2.3 Data Entry

To be of any use, the written survey responses had to be entered into a database. Before the data entry process, each survey question had to be converted into a unique variable, with numerical values to correspond to the answers.

Each survey was given a unique identification number, based on the school that the respondent attended. The first two characters of the identification number are a 2-letter code that corresponds to each school (See Table 2). The rest of the identification number is a unique 4-digit number.

Table 2: Survey Identification Number School Codes

School Name	Code
Alternative Learning Laboratory	AL
Burncoat High School	BC
Doherty High School	DO
North High School	NO
South High School	SO
Worcester Vocational High School	WV
University Park	UP

If available, local student ID number, learning community and guidance counselor were entered into the spreadsheet as strings. Gender was recorded as a "1" for males and a "2" for females. Ethnicity was recorded according to Table 2.

Table 3: Ethnicity Codes

Ethnicity	Code
African American	1
Asian	2
Caucasian	3
Hispanic	4
Brazilian	5
Native American	6
Other	7

Written responses for parental occupations had to be grouped into categories to be an analyzed variable (See Table 3). The initial occupation list included the list of career aspirations on the survey. Some categories were further decomposed to better record the written responses.

Teaching was decomposed into teaching and professor to distinguish between the levels of education required for each profession. Engineering/ physical science remained a category, but was broken down into engineering and physical science as additional categories for clarification.

Business was broken down into three categories: business, management and office/administrative assistant. Business includes careers in marketing, accounting, finance, executive management and economics, as well as ownership. Management includes upper and lower level management positions as well as supervisors and foremen.

Receptionists, secretaries and clerks were considered as office/administrative assistants.

Since the Worcester economy is largely based on manufacturing, categories were added for manufacturing and labor. Manufacturing includes any career in a specific manufacturing process. Labor includes construction work, general factory work, daycare provider and cashier, as well as jobs of similar status. Occupations included in trade are plumbing, carpentry, cosmetology and other professions that require certification or formal training.

Finally, categories were added for the military and religious professions, as well as for homemakers and the unemployed.

Table 4: Parental Occupation Codes

Occupation	Code
Teaching	1
Engineering	2
Physical Science	3
Engineering/Physical Science	4
Computer/IT	5
Business	6
Management	7
Office/Administrative Assistant	8
Service Industry	9
Medical Practice	10
Medical Support	11
Law	12
Art	13
Social Service	14
City Administration	15
Civil Services	16
Officer Training	17
Military	18
Manufacturing	19
Trade	20
Labor	21
Religious	22
Homemaker	23
Unemployed	24
Professor	25

Each occupational interest area was considered a variable, with a possibly response of a number between one (indicating no interest) and five (indicating high interest). A non-response was considered a one. Ten variables were used to code

specific careers that the survey responder listed. Each variable represented one of the listed specific careers; the responses were entered as strings.

The political interest question was coded in the same method as the occupational interest area system. Three variables were used to record what level of politics the student was interested: a variable to represent an interest in each city politics, state politics and national politics. A zero was entered for no response; a one indicates interest in that level of politics.

Each future career option was translated into a variable: 4-year college, 2-year college, vocational school, work, military, marriage and other. For all of them, a non-response was coded as a zero, indicating no intention to further pursue that option. For the first six variables, a one indicates that the responder specified intention. Other written responses were noted as strings; however, if a student wrote in a cosmetology school, it was recorded as an intention to attend a vocational school.

Thirteen variables were used to code the concerns section. Each possibly concern was considered a variable. A zero indicated no response and a one indicated concern about the corresponding issue. Written concerns and additional comments were entered as strings.

Each extracurricular activity was translated into a corresponding variable. To record information about leadership positions held, the input option for each variable included values to represent different positions. (See Table 4)

Table 5: Extracurricular Codes

Extracurricular Member Status	Code
Not a member of the club	1
Member without leadership position	2
President	3
Vice president	4
Captain	5
Manager	6
Secretary	7
Historian	8
Editor	9
Instructor	10
Treasurer	11

3. Analysis

The central part of the project is the data analysis. The sections that follow analyze the student aspirations by several variables including gender, ethnicity, school, parental occupation and concurrent interests. Students' concerns will also be explored. The data set is a sample of the class of 2006 at each of the public schools; it will be assumed that their responses represent the responses of the entire class of 2006 and the general response of the students at the Worcester Public Schools (WPS). The group feels confident in using the data set as a representation of the class of 2006 because of the characteristics of the sample. (See Table X)

Overall, 62 percent of the class of 2006 completed the survey. Forty-eight percent of the students are male, 45 percent are female and approximately 7 percent did not indicate gender. The only school that returned less than half of their surveys is Burncoat (47%). University Park, A.L.L. and North returned the highest percentage of surveys (83%, 74% and 71%, respectively). At most schools, the gender-split of surveys was approximately 1:1 (male: female). Worcester Vocational is the only school that exhibits an extreme male: female ratio; 61 percent of the respondents are male compared to 36 percent female.

Table 6: Data Set Response Rates

	Population	Sample	Response %	Male	% Male	Female	% Female
ALL	34	25	74%	12	48%	13	52%
BC	325	154	47%	66	43%	86	56%
DO	347	214	61%	109	51%	91	43%
NO	282	201	71%	85	42%	101	50%
SO	373	223	60%	109	49%	91	41%
WV	235	164	70%	100	61%	59	36%
UP	30	25	83%	10	40%	15	60%
Total	1626	1006	62%	491	49%	456	45%

These gender-splits are very comparable to the gender ratios of each of the schools, as given in the schools' profiles on the Massachusetts Department of Education website, as shown in Table 2:

Table 7: Sample Male: Female Ratio vs. DOE Statistics

	Sample Male %	DOE Male %
ALL	48%	50%
BC	43%	48%
DO	51%	50%
NO	42%	52%
SO	49%	53%
WV	61%	55%
UP	40%	46%
Total	49%	52%

The only school which differs by more than a small margin from the DOE statistics is North, where only 42% of respondents were male, not the 52% as suggested by the school's DOE profile. It is important to note that the DOE percentages are those of the entire school, not solely the 11th grade.

The numbers of students from each of the four largest ethnic/racial groups in the Worcester Public Schools who responded to the survey are given in Table 3:

Table 8: Ethnicity/Race of Survey Respondents

	Sample #	Sample %	DOE %
African American	155	15%	13%
Asian	79	8%	8%
Caucasian	451	45%	47%
Hispanic	251	25%	32%
Other	76	8%	1%
Total	1006		

As this table reveals, the percentage of the surveys taken by each of these ethnic/racial groups is very close to what one would expect given the distribution of these groups in the Worcester Public Schools. Again, the Department of Education numbers represent the Worcester Public Schools as a whole, not solely the 11th grade. Tables similar to Table 3 for each of the seven public schools are given in Appendix B.

After examining the response rate and the characteristics of the sample, the research team decided that it is acceptable to generalize the statistics to the entire Worcester Public School population.

Within the analysis, the schools will often be referred to as the codes assigned in Table X. The occupational interest areas will be referred to as the codes assigned in Table X. The total population of students in the class of 2006 will be referred to as 'the overall students' or the Worcester Public School students.

Table 9: Occupational Interest Area Codes

Occupational Interest	Code
Teaching	TCH
Engineering/Physical Science	EPS
Computers/IT	CIT
Business	BUS
Trade	TRA
Medical Practice	MdP
Medical Support	MdS
Law	LAW
Art	ART
Service Industry	SRV
Social Services	SCL
Civil Services	CVL
City Administration	CTY
Political Office	POL

Occupational interest areas will sometimes be grouped based on similar qualities that certain careers have. For instance, city administration and political office are often grouped together as political careers; medical practice and support as medical careers; engineering/physical science and computers/IT as technical careers.

Law, business, medical careers and engineering/physical science are referred to as professional careers and are considered prestigious. Political office is also considered prestigious. Within medical careers, medical practice is considered a more professional and prestigious career. Teaching, medical careers and social services are often grouped as nurturing careers. Teaching, medical careers, law, service industry, social services and civil services are often grouped as service careers.

Students are often grouped by their interest in an occupational interest area. A student who indicated an interest level of either "4" or "5" is considered interested in a career; those who indicated a "5" are considered to have a high interest.

In several of the following analysis sections the research team has compared the interests of the sample to the current ratio of males and females in today's United States work force, in order to determine if the current junior classes in Worcester Public Schools are mirroring gender stereotypes found in the rest of society.

The Bureau of Census conducts a monthly survey of households for the Bureau of Labor Statistics (BLS) called the Current Population Survey (CPS). The CPS provides data on the labor force, employment and unemployment. Using data from this survey, the BLS compiles an annual average on the workforce as a whole. A table of the number of workers by detailed occupation, gender and the weekly earnings associated with each gender is provided on the BLS site for the year of 2003. It is assumed that these numbers have not changed significantly from 2003 to the present day, so the statistics are used as if they were characteristic of the current work force.

In order to make the statistics comparable, the research team assumes that the gender-splits found in the work force today are indicative of the gender-splits in interest

in those professions when today's workers were in high school. Thus, male to female ratios of expressed interest in the survey are comparable to male to female ratios of workers in today's work force.

Unfortunately, the occupational interest areas the survey uses do not perfectly correlate to the categories used by the BLS. Due to this problem, it was necessary to search the CPS data table (Appendix C) for the careers which fit into the categories the survey used. A summary of how the team grouped BLS occupations into each of the occupational interest areas is given in Appendix C.

For the interests of comparing these ratios and percentages, the research team decided to define several ranges for the ratios, which defines how strongly dominated they are by one gender.

Table 10: Ratio Comparison Definitions

% Female	Definition	Ratio
0-15	Strongly Male Dominated	1:0 - 5.67:1
15-30	Male Dominated	5.67:1 - 2.33:1
30-43	Slightly Male Dominated	2.33:1 - 1.33:1
44-56	Equal	1.33:1 - 1:1.33
57-70	Slightly Female Dominated	1:1.33 - 1:2.33
70-85	Female Dominated	1:2.33 - 1:5.67
86-100	Strongly Female Dominated	1:5.67 - 0:1

Any two percentages which are defined the same way are said to be comparable. It is important to note that these ranges are not concrete, and that up to a reasonable point (2 to 3 percentage points), they may be extended to show that two percentages are comparable.

3.1 Analysis of Career Aspirations by Gender

Women have made incredible leaps forward in many professional fields since the start of the women's movement. The percentage of professional degrees achieved by women has increased dramatically, and is especially apparent in traditionally male careers such as engineering and computer science. However, gender equity still has not been achieved; there is still a large gap between the number of men who earn degrees in these fields and the number of women who earn them.

Similarly, females continue to be the primary work force in nurturing careers. The ACSW and the administrators and faculty at the Worcester Public Schools are interested in seeing how the interests of the students at the Worcester Public Schools compare to national numbers, especially in careers where the employees are primarily of one gender.

Thus, the first and foremost analysis the research team completed was a gender based comparison of aspirations. By comparing the student's career interests to national employment statistics, the research team can determine if the public high school students in Worcester are being encouraged to enter counter stereotypical careers. In this section, those surveys whose respondents failed to indicate their gender are not included in the analysis, leaving 947 surveys which were used for analysis.

The research team expected to find very similar numbers between the ratio of males to females among each profession in the work force and the ratio of male students to female students interested in the corresponding occupational interest area. This is referred to as the null hypothesis. This null hypothesis will be supported when these two ratios are defined in the same way, as set forth in Table 10.

The following table shows the number of interested males and the number of interested females in each of the occupational interest areas. These numbers will be compared to national Bureau of Labor Statistics Current Population Survey statistics in the following sections, with the attempt to prove the null hypothesis.

Table 11: Frequency of High Interest, by Gender

	Male	Male %	Female	Female %	Total	Total %
Teaching	50	10.2%	88	19.3%	138	13.7%
Eng/Phys. Science	161	32.8%	39	8.6%	200	19.9%
Computers/IT	194	39.5%	61	13.4%	255	25.3%
Business	214	43.6%	207	45.4%	421	41.8%
Trade	155	31.6%	31	6.8%	186	18.5%
Medical Practice	75	15.3%	175	38.4%	250	24.9%
Medical Support	52	10.6%	167	36.6%	219	21.8%
Law	120	24.4%	159	34.9%	279	27.7%
Art	150	30.5%	165	36.2%	315	31.3%
Service Industry	49	10.0%	150	32.9%	199	19.8%
Social Service	44	9.0%	162	35.5%	206	20.5%
Civil Service	117	23.8%	44	9.6%	161	16.0%
City Admin.	45	9.2%	28	6.1%	73	7.3%
Political Office	34	6.9%	23	5.0%	57	5.7%
Totals	491		456		1006	

Teaching

According to BLS CPS data, there are 5,884,000 people holding jobs relating to education in the US in 2003; 4,258,000 of which are women. This means that roughly 72 percent of all people holding jobs in education are women (BLS, 2003), which defines teaching, by national work force statistics, a female dominated profession. For the null hypothesis is to be supported in this case, the ratio of interested females to interested males in teaching should be approximately three to one.

Table 12 shows interest in careers in teaching by gender.

Table 12: Teaching

Interest	Gender		Total
	Male	Female	
1- None	284	174	458
% within Gender	58%	38%	48%
2- Some	72	104	176
% within Gender	15%	23%	19%
3- Moderate	85	90	175
% within Gender	17%	20%	19%
4- Considerable	33	47	80
% within Gender	7%	10%	8%
5- High	17	41	58
% within Gender	4%	9%	6%

The interest levels in the left column of the chart represent the respondent's

interest in teaching by their selection from 1-5 on the corresponding Likert scale from the survey. The percentage below each number is the percentage of either all males, females or all students (in order of columns from left to right) who indicated that level of interest on the survey.

From Table 12 it can be seen that of the 138 students interested in teaching (4 or 5 on the Likert scale), 88 (64%) are females, which makes teaching a slightly female dominated occupational interest area. However, the percentage of national workers who are female is 72 percent, which is very nearly in the slight female dominated range, and can be assumed to be close enough to be considered slightly female dominated. Thus, the null hypothesis is supported and teaching should continue to be a slightly female dominated career in the future.

When analyzing only those students who indicated a high interest level on the survey, the team found that 41 of 58 students are female (71%). This figure more closely supports the null hypothesis, indicating that teaching will remain a slightly female dominated area or female dominated area in the future if these students are to follow through on their interests in equal likelihood.

Engineering & Physical Science

The male to female ratio in engineering and physical science is quite large despite the fact that women have increased their involvement steadily since 1970. In 1970, only 0.8 percent of bachelor's degrees and 1.1 percent of master's degrees in engineering were awarded to women (Alm & Cox, 2005). By 2001-2002 these numbers had increased to 18.9 percent and 21.4 percent, respectively (Alm & Cox, 2005).

Women gain a slightly larger percentage of physical science degrees than engineering degrees. In 2001-2002, 22.6 percent of bachelor's degrees in physics were earned by women, as well as 44.7 percent of geology and 48.4 percent of chemistry bachelor's degrees (Alm & Cox, 2005). Of master's degrees in physics, 20.9 percent were earned by women in 2001-2002, 39.7 percent in geology and 45.6 percent in chemistry (Alm & Cox, 2005). These percentages are all roughly 2-4 times as great as they were in 1970.

BLS statistics show that 83.5 percent of engineering, architecture and physical science jobs are held by men (2003). This defines engineering and physical science as a male dominated career, nearly a strongly male dominated career.

The majority of students interested in engineering and physical science are also men. About four interested males per interested female are expected out of the data in

order to support the null hypothesis. Table 13 shows this to be true, with males accounting for 161 of 200 interested students, 81%, also defining interest in engineering & physical science among Worcester Public School students as male dominated, supporting the null hypothesis.

Table 13: Engineering or Physical Science

Interest	Gender		Total
	Male	Female	
1-None	159	293	452
% within Gender	32%	64%	48%
2-Some	85	77	162
% within Gender	17%	17%	17%
3-Moderate	86	47	133
% within Gender	18%	10%	14%
4-Considerable	81	24	105
% within Gender	17%	5%	11%
5-High	80	15	95
% within Gender	16%	3%	10%

Table 13 shows the interest in engineering or physical science by gender. As with teaching, the gender ratio increases to about 84 percent when only those students who selected 5 on the interest scale are considered.

Computers or Information Technology

Similar trends are found in interest in computers/IT. Of the roughly 2,790,000 computer related jobs in the country, just over 2 million (72%) are held by men (BLS, 2003). Table 14 shows that 73 percent of students interested in careers in computers or information technology are male. Therefore, the workers employed in computers/IT jobs and students interest in these jobs are both male dominated, supporting the null hypothesis.

Table 14: Computers/IT

Interest	Gender		Total
	Male	Female	
1-None	132	222	354
% within Gender	26.9%	48.7%	37.4%
2-Some	61	96	157
% within Gender	12.4%	21.1%	16.6%
3-Moderate	104	77	181
% within Gender	21.2%	16.9%	19.1%
4-Considerable	102	38	140
% within Gender	20.8%	8.3%	14.8%
5-High	92	23	115
% within Gender	18.7%	5.0%	12.1%

This percentage is even higher (80%) among students with high interest. National workforce data is similar to this gender distribution.

Of recent degrees awarded in computer science, 27.6 percent of bachelor's degrees were awarded to women, along with 33.2 percent of master's degrees (Alm & Cox, 2005). These numbers correlate well with the gender ratio in computer science interest among Worcester Public School students, but unfortunately show that in Worcester, males dominate interest in computers/IT even more than national data suggests.

Clearly, female students attending the Worcester Public Schools are not considering engineering, physical science or computers as potential careers with unusual frequency. This is not good news for anyone who considers the current difference in male and female participation in engineering and science as problematic. As an institution which does consider this a problem, WPI attempts to increase female enrollment and to foster interest in technical careers among Worcester Public School females.

Business

Worcester Public School students, on the whole, show an overwhelming interest in pursuing careers in business related areas. Of the students surveyed, over 45% of them indicated that they would be interested in pursuing a career in business, with nearly an equal ratio of males to females (50.8% to 49.2%), so interest in business is the first which was found, upon analysis, to be equal between males and females.

Table 15: Business

Interest	Gender		Total
	Male	Female	
1-None	91	101	192
% within Gender	18.5%	22.1%	20.3%
2-Some	71	49	120
% within Gender	14.5%	10.7%	12.7%
3-Moderate	114	99	213
% within Gender	23.2%	21.7%	22.5%
4-Considerable	94	95	189
% within Gender	19.1%	20.8%	20.0%
5-High	121	112	233
% within Gender	24.6%	24.6%	24.6%

In fact, the percentage of males who indicated 5 on the interest scale is the same percentage (24.6%) of females who indicated 5 on the interest scale

Looking at the BLS statistics, business (which the research team interpreted to mean management and financial operations, see Appendix C) does nearly show this trend in today's work force. 55.5 percent of workers in business are male, defining the business work force as equal and supporting the null hypothesis.

Hopefully this indicates that the same opportunity for success is available for the females interested in business as the males, and this has led to gender equity among interested students.

In the future, it is hoped that similar interests among today's students will lead to more women in positions of power in large companies. The gender problems one encounters with respect to business careers are not interest but instead equal advancement and pay opportunities. Indeed, It is estimated that in industry today, only 5 percent of senior managers in Fortune 1000 & 500 companies are women (Rhode, 1997). Only one third of corporate managerial positions overall are women (Rhode, 1997). These managers entered the work force several decades ago, however, when most students graduating with business degrees were surely men. Indeed, among students graduating with master's degrees from business schools in 2002, 41.1 percent were women, up from 3.6 percent in 1970 (Alm & Cox, 2005). Hopefully thirty years from now when today's graduating students are holding high-level management positions, the percentage of females in these positions will be much greater.

Trade

Of the careers considered, none have as great a gender bias in today's work

force as trade occupations. 97% of these jobs - which include electricians, plumbers, and most types of construction and maintenance workers (according to the groupings of BLS data) - are held by men (BLS, 2003). This defines trade as a strongly male dominated field. Similarly, no occupational interest area in the survey generated as overwhelming a gender gap as trade.

Table 16: Trade

Interest	Gender		Total
	Male	Female	
1-None	169	343	512
% within Gender	34.4%	75.2%	54.1%
2-Some	85	58	143
% within Gender	17.3%	12.7%	15.1%
3-Moderate	81	25	106
% within Gender	16.5%	5.5%	11.2%
4-Considerable	63	14	77
% within Gender	12.8%	3.1%	8.1%
5-High	93	16	109
% within Gender	18.9%	3.5%	11.5%

Over 80% of students (83%) who have a high interest in trade are male. Additionally, 85% of students who are very interested in trade (those who selected 5) are male.

Both of these percentages are high enough to, like the BLS data, be considered strongly male dominated. Therefore, the null hypothesis is supported, and males should continue to be the vast majority of workers in trade professions.

Medical Practice & Medical Support

Interest in medical practice and medical support are very similar in the data. Data from our concurrent interests section further reveals this trend.

Table 17: Medical Practice

Interest	Gender		Total
	Male	Female	
1-None	224	139	363
% within Gender	45.6%	30.5%	38.3%
2-Some	123	64	187
% within Gender	25.1%	14.0%	19.7%
3-Moderate	68	78	146
% within Gender	13.8%	17.1%	15.4%
4-Considerable	44	64	108
% within Gender	9.0%	14.0%	11.4%
5-High	32	111	143
% within Gender	6.5%	24.3%	15.1%

Almost 70 percent of students interested in pursuing medical practice careers are female (78% of students with high interest). This is somewhat in accordance with data regarding recent graduates. Women earn approximately two thirds of all veterinary and pharmacy degrees received today (Alm & Cox, 2005). This data indicates that medical practice is a female dominated occupational interest area.

Table 18: Medical Support

Interest	Gender		Total
	Male	Female	
1-None	272	132	404
% within Gender	55.4%	28.9%	42.7%
2-Some	104	69	173
% within Gender	21.2%	15.1%	18.3%
3-Moderate	62	77	139
% within Gender	12.6%	16.9%	14.7%
4-Considerable	28	66	94
% within Gender	5.7%	14.5%	9.9%
5-High	25	112	137
% within Gender	5.1%	24.6%	14.5%

Similarly, 77 percent of students interested in medical support are female. This number increases to over 81 percent when only highly interested students are considered. This defines medical support as a female dominated occupational interest area as well.

Despite this similarity and female dominance of the field in terms of the aspirations survey, men still are the primary workers in many high-level medical careers. Approximately 56 percent of workers in professional medical practice positions are male

(BLS, 2003) and 60 percent of degrees in medicine (presumed different from veterinary and pharmacy degrees in the article cited) are earned by men (Alm & Cox, 2005). Thus, jobs in medical practice are equal or slightly male dominated, and the null hypothesis is not supported.

This is compared to 87.6 percent of medical support workers being women (BLS, 2003). This number is close enough to be considered female dominated, so the null hypothesis is supported.

Thus, medical support should continue to be a female dominated field, perhaps becoming slightly more so. If the survey data holds true, however, more women should begin to take practicing medical careers, and the work force should move towards gender.

This strong female interest could indicate many things. Perhaps Worcester is a very progressive community (perhaps due to the local medical school), and is encouraging its female students to become practicing physicians at a rate far above the average. Or maybe other factors, such as the pressure to have a family, are discouraging women from undertaking such a lengthy commitment as going to medical school, and they are falling back to more traditional female occupations in medical support despite having been strongly interested in more prestigious medical careers in high school.

Law

57 percent of students aspiring to careers in Law are female, making Law nearly equal in terms of gender distribution.

Table 19: Law

Interest	Gender		Total
	Male	Female	
1-None	197	129	326
% within Gender	40.1%	28.3%	34.4%
2-Some	72	75	147
% within Gender	14.7%	16.4%	15.5%
3-Moderate	101	93	194
% within Gender	20.6%	20.4%	20.5%
4-Considerable	68	86	154
% within Gender	13.8%	18.9%	16.3%
5-High	53	73	126
% within Gender	11%	16%	13%

Likewise, 52.2 percent of workers in Law-related occupations are male (BLS, 2003). This supports the null hypothesis that interest in Law and workers in Law are nearly equal in terms of gender-splits. In the 1990s roughly 45 percent of bar exam entrants were female, up from 3 percent in the 60s (Rhode, 1997).

Law shows similar gender issues to business in the work force, however. Despite near gender equity in the entrants to the bar exam, only 13 percent of partners in the nation's 250 largest law firms are women (Rhode, 1997). In addition, only 16 percent of full professors at law schools are women, and only 8 percent of federal judges (Rhode, 1997). Hopefully, the number of women entering the field of law now can increase these percentages in the coming years.

This lack of females in high positions in law professions is perhaps one of the reasons why so few females are high ranking politicians and city administrators (see below), who very often hold law degrees. With a growing number of female students pursuing law degrees, there is hope that some of them will obtain these positions and help them strive towards better female representation in politics.

Art

54.3 percent of workers in Art-related occupations are male (BLS, 2003). The null hypothesis is supported with regards to art when it is revealed that 52.4 percent of aspiring students are female, as both of these percentages mean that the distribution of jobs among the sexes is nearly equal.

Table 20: Art

Interest	Gender		Total
	Male	Female	
1-None	196	134	330
% within Gender	40%	29%	35%
2-Some	67	59	126
% within Gender	14%	13%	13%
3-Moderate	78	98	176
% within Gender	16%	22%	19%
4-Considerable	61	70	131
% within Gender	12%	15%	14%
5-High	89	95	184
% within Gender	18%	21%	19%

Service Industry

There is near gender equity in the work force in the Service Industry where 48.1% of workers are female (BLS, 2003). However, three times as many females as males are interested in pursuing Service Industry careers (75.3%). The null hypothesis is not supported since the BLS data suggests that service industry is equal in the work force, whereas the survey shows that interest in service industry careers is female dominated.

Table 21: Service Industry

Interest	Gender		Total
	Male	Female	
1-None	265	141	406
% within Gender	54%	31%	43%
2-Some	89	78	167
% within Gender	18%	17%	18%
3-Moderate	88	87	175
% within Gender	18%	19%	19%
4-Considerable	26	68	94
% within Gender	5%	15%	10%
5-High	23	82	105
% within Gender	5%	18%	11%

The Service Industry is the rare case where gender equity is the norm in the work force, yet according to trends discovered in the survey, there is danger of losing that equity. Male students need to be encouraged to consider the Service Industry as a career option in order to maintain gender equity.

Social Services

Social Services, which include occupations such as social workers and counselors, are a predominantly female career.

Table 22: Social Services

Interest	Gender		Total
	Male	Female	
1-None	285	128	413
% within Gender	58%	28%	44%
2-Some	117	54	171
% within Gender	24%	12%	18%
3-Moderate	45	113	158
% within Gender	9%	25%	17%
4-Considerable	30	75	105
% within Gender	6%	16%	11%
5-High	14	86	100
% within Gender	3%	19%	11%

Both sets of statistics, both the BLS and the survey data support this. 70.7 percent of workers in social services are female (BLS, 2003), compared to 78.6 percent of interested Worcester Public School students, defining both of these ratios as female dominated. Thus, the null hypothesis is supported.

Civil Services

BLS data shows that 78.5 percent of workers in civil service careers are male. Thus the work force in the civil services is male dominated. Only a slightly lower percentage, 72.7, percent of interested students, is male (BLS, 2003). This supports the null hypothesis, since interest in civil services careers is male dominated as well.

Table 23: Civil Services

Interest	Gender		Total
	Male	Female	
1-None	212	269	481
% within Gender	43%	59%	51%
2-Some	76	91	167
% within Gender	16%	20%	18%
3-Moderate	86	52	138
% within Gender	18%	11%	15%
4-Considerable	56	28	84
% within Gender	11%	6%	9%
5-High	61	16	77
% within Gender	12%	4%	8%

The Wprcester Public Schools will have to do more to encourage women to enter the Civil Services to reduce the magnitude of male dominance in the work force.

City Administration & Political Office

Unfortunately, the BLS data does not include statistics for jobs in city administration or political office, so the team has no real basis for comparison other than to suggest trends. Some sources indicate that women are generally not very involved in high civil service, and those who are generally are most visible in local and state offices (Nelson & Chowdhury, 1994). In 1990, only 16 percent of mayors, 14 percent of other municipal officials and 17 percent of state legislators were women (Nelson & Chowdhury, 1994).

Very few Worcester Public School students are interested in either city administration or in running for political office, but when they are, they generally are male

(although this trend is much more noticeable for city administration than political office).

Table 24: City Administration

Interest	Gender		Total
	Male	Female	
1-None	300	328	628
% within Gender	61%	72%	66%
2-Some	80	67	147
% within Gender	16%	15%	16%
3-Moderate	66	32	98
% within Gender	13%	7%	10%
4-Considerable	25	22	47
% within Gender	5%	5%	5%
5-High	20	7	27
% within Gender	4%	2%	3%

Only 7.9 percent of students show considerable or greater interest in a city administration job. Even fewer students show considerable or high interest in running for political office (6.2%).

Table 25: Political Office

Interest	Gender		Total
	Male	Female	
1-None	323	330	653
% within Gender	66%	72%	69%
2-Some	68	65	133
% within Gender	14%	14%	14%
3-Moderate	65	38	103
% within Gender	13%	8%	11%
4-Considerable	19	11	30
% within Gender	4%	2%	3%
5-High	16	12	28
% within Gender	3%	3%	3%

Within these very small groups of students, males show more interest than females. Of the 74 respondents who are interested in city administration, 45 are male (61%). Of the 58 respondents interested in political office, 35 are male (60%).

Gender inequity is not the main concern when it comes to political office, however. Before addressing the fact that slightly more males than females are interested, the Worcester Public School administration and faculty should focus on

creating more political awareness among its student body, and making a case for politics as an interesting and desirable career goal for more of their students. A large number of students show great leadership potential, yet are not considering running for political office, a seemingly concurrent interest. With some encouragement, it may be possible to get these students to use their leadership skills in the political arena.

On the other hand, having 40 percent of political office interest female is encouraging. The USA clearly does not have nearly this percentage of women holding office. If the next generation follows through and achieves this, it will be an incredible gain, despite the fact that males will still hold the majority of political offices. The applicants which the survey identified for the Young Woman of Consequence Award are perfect examples of strong young female leaders who could really make a difference if they use their leadership skills in political offices.

The overwhelmingly important factor in whether or not these students will be able to achieve their goals and pursue work in careers related to their aspirations is their plans for after high school. Table 26 shows the responses to the post-graduation plans segment of the survey by the gender of the respondent.

Table 26 reveals the number of students of each gender who are interested in each of the following post-graduation plans. For example, 85 male students plan to promptly enter the work force after graduation; 17.3 percent of the male respondents to this survey indicated this intent. Among the female students, 52 will directly enter the work force; 11.4 percent of the females who took the survey.

Table 26: Post-Graduation Plans by Gender

	Males	Male %	Females	Female %
4-year College	330	67.2%	360	78.9%
2-year College	66	13.4%	73	16.0%
Vocational	29	5.9%	13	2.9%
Work	85	17.3%	52	11.4%
Military	45	9.2%	13	2.9%
No Response	30	6.1%	17	3.7%

It is important to note that in this section of the survey, it was possible for each respondent to indicate two plans. For example, if a student planned to enter an ROTC program and attend college, they could check off two of the plans, and are thus included twice in the analysis. Therefore, the percentages do not add up to a total of 100.

The table reveals that female students in the Worcester Public Schools are

looking to further their education at a four-year college more frequently than male students. 78.9 percent of the female students plan to attend a four-year college, a greater percentage than the 67.2% of male students who plan to attend a four-year college.

This is offset by a greater percentage of male students planning to enter the work force (17.3% of males; 11.4% of females). Indeed there are 30 more females planning to go to a four-year college than males, and approximately 30 more males planning of entering the work force than females.

3.2 Analysis of Career Aspirations by Ethnicity

3.2.1 Analysis by Ethnicity

The Worcester Public High Schools have a very diverse student population. Of the sample surveyed, 451 are Caucasian (46.7%), 251 Hispanic (26.0%), 155 African American (16.0%) and 79 are Asian (8.2%). The remaining 70 students either do not fit into any of these racial/ethnic groups or did not indicate their ethnicity. The analysis of career interests by ethnicity can help reveal any significant trends within these four major ethnic groups. For the analysis, the interests of each ethnic subgroup are compared. Graphs of the percent interest of each of the ethnic groups compared to the percent interest of all students not in that group can be found in Appendix D.

Table 27shows these percentages for each of the ethnic/racial groups. The percentages of students interested will be analyzed for each of the occupational interest areas, in the attempt to prove the null hypothesis.

Table 27: Frequency of High Interest, by Ethnicity/Race

Occupational Interest Area	African Amer. %	Asian %	Caucasian %	Hispanic %	Total %
Teaching	15%	14%	16%	12%	14%
Eng/Phys. Science	22%	31%	18%	22%	20%
Computers/IT	26%	46%	22%	30%	25%
Business	49%	48%	41%	47%	42%
Trade	13%	10%	21%	23%	19%
Medical Practice	29%	26%	25%	29%	25%
Medical Support	36%	18%	21%	27%	22%
Law	36%	13%	30%	31%	28%
Art	31%	43%	32%	34%	31%
Service Industry	29%	33%	18%	19%	20%
Social Service	29%	13%	21%	25%	21%
Civil Service	11%	13%	17%	21%	16%
City Admin.	8%	12%	6%	12%	7%
Political Office	6%	4%	7%	5%	6%

The research team expected to find no difference in the interests of the four ethnic groups. In order to test this hypothesis, the percentages of students interested in each of the occupational interest areas were compared for each of the groups. The null hypothesis was supported when there was very little variation in these percentages. The research team decided that a significant difference was when the percent interest of one of the ethnic/racial groups differed from the percent interest of all students excluding that ethnicity/race by more than 25 percent.

The reason this analysis is preferred over a comparison to the average interest of the students is in order to prevent comparison of students to another group which includes these same students. Especially in the case of the Caucasian students, who represent nearly half of the sample, comparison to the average overall percentage dampens any significant differences.

Teaching

Table 28 shows the percent interests for each of the ethnic/racial groups in the occupational interest area of teaching (Ethnicity %), compared to the percentage of students not of that ethnicity/race who indicated interest in teaching (! Ethnicity%).

For example, as shown in Table 28 15 percent of African American students are interested in pursuing a career in teaching in some capacity. 15 percent of students who are not African American are also interested in a teaching career, a zero percent difference.

Table 28: Frequency of High Interest in Teaching, by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	15%	15%	0%
Asian	14%	15%	7%
Caucasian	16%	14%	14%
Hispanic	12%	15%	20%

The analysis illustrated in this table reveals that there is not significant variance in interest in teaching careers between the ethnic groups, since none of the percent differences exceed 20 percent. Therefore, the null hypothesis is supported for the occupational interest area of teaching.

Engineering & Physical Science

Table 29 gives the percentage of students among the groups which expressed interest in engineering/physical science careers.

Table 29: Frequency of High Interest in Engineering & Physical Science, by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	22%	21%	5%
Asian	31%	20%	55%
Caucasian	18%	24%	25%
Hispanic	22%	21%	5%

The null hypothesis is not supported for the occupational interest area of engineering & physical science. There is a very large difference in interest in engineering & physical science among Asian students to the rest of the Worcester Public School sample (55%). Asian students are more likely to be interested in engineering and physical science than other students, which disproves the null hypothesis for this case.

Computers/Information Technology

Table 30 gives the percentage of students among the groups which expressed interest in computers or information technology careers.

Table 30: Frequency of High Interest in Computers/Information Technology, by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	26%	27%	4%
Asian	46%	25%	84%
Caucasian	22%	31%	29%
Hispanic	30%	26%	15%

The null hypothesis is not supported since the differences among the Asian students and the rest of the Worcester Public School sample and the Caucasian students and the rest of the Worcester Public School sample are 84 percent and 29 percent respectively. The Asian students, like in the case of engineering & physical science, are more likely to be interested, even more so this time. The Caucasian students are less likely to be interested in pursuing a career in this area.

From the previous two analyses, one can see that the Asian students in the Worcester Public Schools are more likely to be interested in technical careers than the average Worcester Public High School student.

Business

Table 31 gives the percentage of students among the groups which expressed interest in business careers.

Table 31: Frequency of High Interest in Business by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	49%	44%	11%
Asian	48%	44%	9%
Caucasian	41%	47%	13%
Hispanic	47%	44%	7%

The null hypothesis is supported by this analysis, as illustrated by Table X. None of the percent differences is greater than 25 percent. This means that there is not significant difference in interest among the four ethnic/racial groups in the Worcester Public Schools.

Trade

Table 32 gives the percentage of students among the groups which expressed interest in a career in a professional trade.

Table 32: Frequency of High Interest in Trade, by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	13%	21%	38%
Asian	10%	21%	52%
Caucasian	21%	18%	17%
Hispanic	23%	19%	21%

The null hypothesis is not supported by this data. African American students and Asian students are less likely than expected to be interested in pursuing a career in a professional trade. Therefore, there is significant variance among the ethnic groups in the Worcester Public Schools.

Medical Practice

Table 33 gives the percentage of students among the groups which expressed interest in medical practice careers.

Table 33: Frequency of High Interest in Medical Practice, by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	29%	26%	12%
Asian	26%	26%	0%
Caucasian	25%	27%	7%
Hispanic	29%	26%	12%

There is no significant variance in interest in medical practice among the four groups. The null hypothesis is supported.

Medical Support

Table 34 gives the percentage of students among the groups which expressed interest in medical support careers.

Table 34: Frequency of High Interest in Medical Support, by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	36%	21%	71%
Asian	18%	24%	25%
Caucasian	21%	25%	16%
Hispanic	27%	22%	23%

As the table illustrates, African American students are more interested than expected in medical support careers, when compared to the interest level of the rest of the sample. The null hypothesis is not supported for interest in medical support careers.

Law

Table 35 gives the percentage of students among the groups which expressed interest in law careers.

Table 35: Frequency of High Interest in Law by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	36%	28%	29%
Asian	13%	31%	58%
Caucasian	30%	29%	3%
Hispanic	31%	29%	7%

The null hypothesis is not supported for the occupational interested area of Law. African American students are interested in law careers at a higher rate than expected when compared to the rest of the Worcester Public School sample. Asian students are much less likely to be interested then their peers.

Art

Table 36 gives the percentage of students among the groups which expressed interest in careers in the arts.

Table 36: Frequency of High Interest in Art by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	31%	34%	9%
Asian	43%	32%	34%
Caucasian	32%	34%	6%
Hispanic	34%	33%	3%

The null hypothesis is not supported for the occupational interest area of art since Asian students are more likely than expected to be interested in pursuing a career in art.

Service Industry

Table 37 gives the percentage of students among the groups which expressed interest in careers in the service industry.

Table 37: Frequency of High Interest in Service Industry by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	29%	20%	45%
Asian	33%	20%	65%
Caucasian	18%	24%	25%
Hispanic	19%	22%	14%

The null hypothesis is not supported in the occupational interest area of the service industry since both African American students and Asian students are more likely than expected to be interested in the service industry.

Social Services

Table 38 gives the percentage of students among the groups which expressed interest careers in the social services.

Table 38: Frequency of High Interest in Social Services by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	29%	21%	38%
Asian	13%	23%	43%
Caucasian	21%	22%	5%
Hispanic	25%	21%	19%

The null hypothesis is not supported for this occupational interest area. African American students are more likely than expected to be interested in the social services, whereas Asian students are less likely than expected to have interest.

Civil Services

Table 39 gives the percentage of students among the groups which expressed interest in careers in civil service.

Table 39: Frequency of High Interest in Civil Services by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	11%	18%	39%
Asian	13%	17%	24%
Caucasian	17%	17%	0%
Hispanic	21%	16%	31%

The null hypothesis is not supported for the civil service occupational interest area. Hispanic students are more likely than expected to be interested, and African American students are less likely than expected to be interested, when compared to the interests of the rest of the Worcester Public School sample.

City Administration

Table 40 gives the percentage of students among the groups which expressed interest in careers in city administration.

Table 40: Frequency of High Interest in City Administration by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	8%	8%	0%
Asian	12%	7%	71%
Caucasian	6%	9%	33%
Hispanic	12%	6%	100%

The null hypothesis is not supported for the city administration occupational interest area. Asian and Hispanic students are both more likely than expected to be interested in careers in city administration. Caucasian students are less likely than expected to be interested.

Political Office

Table 41 gives the percentage of students among the groups which expressed interest in Law careers.

Table 41: Frequency of High Interest in Political Office by Ethnicity/Race

Ethnicity	Ethnicity %	! Ethnicity %	|Difference|
African American	6%	6%	0%
Asian	4%	6%	33%
Caucasian	7%	5%	40%
Hispanic	5%	7%	40%

The null hypothesis is not supported for the political office occupational interest area. Caucasian students are more likely to be interested in running for political office

than expected. Asian and Hispanic students are both less likely to be interested than expected.

3.2.2 Analysis by Ethnicity & Gender

The research team also expected that the gender splits analyzed in section 3.1 remain the same for each of the ethnic groups. To analyze this, the ratio of interested males to interested females in each ethnic group was analyzed, with the ratios compared as defined in Table X in the analysis intro.

Table 42 shows each of these ratios:

Table 42: Male: Female Ratios of High Interest, By Ethnicity

	Sample	African Amer.	Asian	Caucasians	Hispanics
Teaching	1:1.75	1:1.10	1:2.63	1:1.79	1:2.22
Engineering/PS	4.13:1	4.33:1	3.80:1	3.88:1	5.50:1
Computers/IT	3.18:1	1.85:1	2.18:1	3.22:1	4.92:1
Business	1.03:1	1:1.28	1:1.64	1.08:1	1.08:1
Trade	5.00:1	5.33:1	7.00:1	4.17:1	5.75:1
Medical Practice	1:2.33	1:2.44	1:1.22	1:3.03	1:2.04
Medical Support	1:3.23	1:3.33	1:3.70	1:5.00	1:2.38
Law	1:1.33	1:1.47	1:4.00	1:1.45	1:1.03
Art	1:1.10	1:1.25	1:1.06	1:1.39	1.19:1
Service Industry	1:6.67	1:7.14	1:2.17	1:3.70	1:2.22
Social Services	1:3.70	1:2.70	1:9.09	1:3.85	1:3.85
Civil Services	2.66:1	3.00:1	1:1	2.80:1	3.45:1
City Admin	1.61:1	1.75:1	2.00:1	2.00:1	1.55:1
Political Office	1.48:1	1:2.00	1:2.00	2.10:1	2.67:1

The research team expected not to find any significant variation in these ratios, this was the null hypothesis. Therefore, each of the ratios for the four major ethnic groups should be defined in the same way. If any of the four ratios fell was defined differently than the others, the null hypothesis was disproved.

Teaching

Table 43, which is taken from Table 42 above, gives the ratio of male students interested in teaching to female students interested in teaching for each of the four main ethnic groups. For example, there are 1.10 interested females per interested male among the African American students, 2.63 interested females per interested male among the Asian students, 1.79 females per male among the Caucasian students and 2.22 females per male among the Hispanic students.

Table 43: Male: Female Ratios of High Interest in Teaching, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:1.10	1:2.63	1:1.79	1:2.22

The null hypothesis is disproved for interest in teaching. The ratios for Caucasian students and Hispanic students define the gender splits in those two ethnic/racial groups as slightly female dominated. However, the African American ratio is defined as equal, and the Asian ratio is defined as female dominated.

Thus, there is significant variation in the ratios to show that there are differences in gender-splits among the ethnic groups. Asian females are interested in teaching careers at a greater rate than Asian males than is expected. Likewise, African American males are interested in teaching careers at a greater rate than expected, when their interest is compared to female African American students.

Engineering & Physical Science

Table 44 gives the male to female ratios of student interest in engineering and physical science careers for the four major ethnic/racial groups.

Table 44: Male: Female Ratios of High Interest in Engineering & Physical Science, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
4.33:1	3.80:1	3.88:1	5.50:1

The null hypothesis is supported by these ratios. Each of the male to female ratios is defined as male dominated. Therefore, in each of the ethnic/racial groups, male students are considerably more likely to be interested than female students.

Computers/Information Technology

Table 45 gives the male to female ratios of student interest in computers/IT careers for the four major ethnic/racial groups.

Table 45: Male: Female Ratios of High Interest in Computers/IT, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1.85:1	2.18:1	3.22:1	4.92:1

The null hypothesis is not supported for interest in computers & information technology. While the ratios among Caucasian and Hispanic students show interest to be male dominated, among African American and Asian students the ratios are only

slightly male dominated. Females in the latter two ethnic groups are more interested than expected when compared to the interests of their male counterparts.

Business

Table 46 gives the male to female ratios of student interest in computers/IT careers for the four major ethnic/racial groups.

Table 46: Male: Female Ratios of High Interest in Business, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:1.28	1:1.64	1.08:1	1.08:1

The null hypothesis is not supported for interest in business. Asian females slightly dominate interest in business, whereas among the remaining three ethnic groups, interest is nearly equal between the male and female students.

Trade

Table 47 gives the male to female ratios of student interest in careers in a professional trade for the four major ethnic/racial groups.

Table 47: Male: Female Ratios of High Interest in Trade, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
5.33:1	7.00:1	4.17:1	5.75:1

The null hypothesis is not supported for interest in the trades. Male students are considerably more interested than female students among each of the four ethnic groups. However, the ratios for Asian students and Hispanic students reveal that interest among these students is strongly male dominated. The ratios of African American students and Caucasian students show that interest among these students is only male dominated, thus dominated to a lesser extent than among the former two groups.

Medical Practice

Table 48 gives the male to female ratios of student interest in medical practice careers for the four major ethnic/racial groups.

Table 48: Male: Female Ratios of High Interest in Medical Practice, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:2.44	1:1.22	1:3.03	1:2.04

The null hypothesis is not supported for interest in medical practice careers. Data from the entire sample shows that this interest is a slightly female dominated interest. This is reflected in the ratios of the Hispanic students and the African American students.

However, the ratio among Asian students is nearly equal, as male students are more interested than expected when compared to female Asian students. Conversely, Caucasian females dominate this interest in a larger ratio than among the other three ethnic/racial groups.

Medical Support

Table 49 gives the male to female ratios of student interest in medical practice careers for the four major ethnic/racial groups.

Table 49: Male: Female Ratios of High Interest in Medical Support, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:3.33	1:3.70	1:5.00	1:2.38

The null hypothesis is supported for interest in medical support. Each of the four ratios for the ethnic/racial groups is defined as female dominated; there is no variance among the four ethnic groups.

Law

Table 50 gives the male to female ratios of student interest in law for the four major ethnic/racial groups.

Table 50: Male: Female Ratios of High Interest in Law, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:1.47	1:4.00	1:1.45	1:1.03

The null hypothesis is not supported for the interest in law. Among the African American students, Caucasian students and Hispanic students, the ratios are equal or only slightly female dominated. However, among the Asian students, there are four females interested in pursuing a career in law for every interested male, making this occupational interest area female dominated, and much different than the gender splits among the rest of the Worcester Public School sample population.

Art

Table 51 gives the male to female ratios of student interest in careers in art for the four major ethnic/racial groups.

Table 51: Male: Female Ratios of High Interest in Law, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:1.25	1:1.06	1:1.39	1.19:1

The null hypothesis is supported for careers in art. Each of the ratios is defined as equal (or is close enough to be assumed so, as in the case of Caucasian students). This means that among the four ethnic groups, males and females are considering art careers at nearly the same rate.

Service Industry

Table 52 gives the male to female ratios of student interest in careers in the service industry for the four major ethnic/racial groups.

Table 52: Male: Female Ratios of High Interest in Service Industry, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:7.14	1:2.17	1:3.70	1:2.22

The null hypothesis is not supported for interest in service industry. African American females strongly dominate this career interest, with more than seven interested females per interested male. The other three ethnic groups have ratios which define their interest as simply female dominated.

Social Services

Table 53 gives the male to female ratios of student interest in careers in the social services for the four major ethnic/racial groups.

Table 53: Male: Female Ratios of High Interest in Social Services, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:2.70	1:9.09	1:3.85	1:3.85

The null hypothesis is not supported for interest in the social services. Asian females strongly dominate this career interest, with more than nine interested females per interested male. The other three ethnic groups have ratios which define their interest as simply female dominated.

Civil Services

Table 54 gives the male to female ratios of student interest in careers in the civil services for the four major ethnic/racial groups.

Table 54: Male: Female Ratios of High Interest in Civil Services, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
3.00:1	1:1	2.80:1	3.45:1

The null hypothesis is not supported for interest in the civil services. Among Asian students, there is an equal ratio of interested males to interested females. This contrasts the other three ethnic groups where interest in a career in the civil services is defined as male dominated. Asian females must be considering this career with a greater frequency than one would expect, when compared to Asian males' interests.

City Administration

Table 55 gives the male to female ratios of student interest in city administration for the four major ethnic/racial groups.

Table 55: Male: Female Ratios of High Interest in City Administration, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1.75:1	2.00:1	2.00:1	1.55:1

The null hypothesis is supported for interest in city administration. For each of the four ethnicities, the gender ratio is defined as slightly male dominated, with somewhere between one and a half or two males per interested female.

Political Office

Table 56 gives the male to female ratios of student interest in running for a political office for the four major ethnic/racial groups.

Table 56: Male: Female Ratios of High Interest in Political Office, By Ethnicity

African Amer.	Asian	Caucasians	Hispanics
1:2.00	1:2.00	2.10:1	2.67:1

The null hypothesis is not supported for interest in running for political office. This occupational interest area is a special case where in some of the ethnic groups the interest is slightly female dominated (African American and Asian) and in others is slightly male dominated (Caucasian and Hispanic). This is really the only occupational interest area to show differences in which gender dominates interest when the ethnic

groups are compared. This may be due to the fact that very few students indicated interest in political office, so the sample size for students interested in each ethnic group is very small.

3.2.3 Analysis of Post-Graduation Plans

The overwhelmingly important factor in whether or not these students will be able to achieve their goals and pursue work in careers related to their aspirations is their plans for after high school. Table 57 shows the responses to the post-graduation plans segment of the survey by the ethnicity which the respondents identified themselves as.

The table gives the percentage of students in each of the four largest ethnic groups in the Worcester Public Schools who intend to follow each of five possible post-graduation plans. For example, 11.6 percent of African American students plan to immediately work after college, 5.1 percent of Asian students plan to work, as well as 14 percent of Caucasian students and 18.7 percent of Hispanic students.

Table 57: Post-Graduation Plans by Ethnicity

	African American %	Asian %	Caucasian %	Hispanic %
4-year College	78.7%	83.5%	74.3%	65.3%
2-year College	16.8%	11.4%	12.6%	16.3%
Vocational	4.5%	2.5%	4.7%	4.0%
Work	11.6%	5.1%	14.0%	18.7%
Military	2.6%	2.5%	6.9%	6.8%
No Response	3.9%	2.5%	4.9%	7.2%

The table reveals that the students who identified themselves as Asian are most likely to attend a four-year college (83.5%). African American students are second most likely (78.7%), followed by Caucasian students (74.3%) and Hispanic students (65.3%). The exact opposite is true of the likelihood of students planning to work immediately after high school, where Hispanic students are most likely to work (18.7%), followed by Caucasian students (14.0%), African American students (11.6%) and Asian students (5.1%).

3.3 Analysis of the Cluster System in the Worcester Public Schools

In a recent review of the organization of American secondary schools, they were likened to factories where children are "put on a conveyor belt and move [ed] from one overloaded teacher to the next, from 45 minutes class period to 45 minute class period, to be stamped with separate, disconnected lessons six or seven or eight times a day (Darling-Hammond, 1997)." To counter the criticisms, many schools are redesigning their structure and curriculum. Like many other school systems, the Worcester Public Schools offer cluster programs within the seven public schools to alter their pattern. Students can attend the high school which offers a program in the subject of their interest, regardless of the location the high school compared to the student's school district. However, in order to take advantage of a cluster program outside of a student's district, the student must be able to handle transportation to that school on his/her own. This factor could limit the number of students who can successfully take advantage of the program.

3.3.1 Analysis of Effectiveness

Table 58 shows each Worcester Public High School along with the cluster programs located at each. Each of these clusters is also listed with the corresponding occupational interest area from the survey. For example, Burncoat is host of the Performing & Visual Magnet. After reviewing the details of this cluster, the team decided that students who indicated interest in a career in the arts should consider attending Burncoat. However, South hosts the Academy of Arts & Humanities, which also corresponds to an interest in a career in the arts. Therefore, both South and Burncoat's clusters for the arts were associated with an interest in a career in the arts.

Table 58: Cluster System

Schools	Cluster Title	Corresponding Interests
Burncoat	North Worcester Business Association	Business
	Performing & Visual Magnet	Art
	Fallon Medical Clinic	Medical Support
Doherty	Engineering & Technology Academy	Engineering/Physical Science
		Computers/IT
North	Health & Science Academy	Medical Practice
		Medical Support
	Social Systems & Justice Magnet	Law
	School of Technology & Business	Business
		Computers/IT
South	Academy of Education, Service & Government	Teaching
		Service Industry
		Political Office
		City Administration
	Information Technology Academy	Computers/IT
	Academy of Arts & Humanities	Art
Worcester Vocational	Alden Design & Engineering School	Trade (Machining)
		Computers/IT (CAD, Drafting)
	Allied Health & Human Services	Teaching
		Service Industry (Cosmetology)
		Medical Support
	Coughlin Construction Technology	Trade
	IT/Business Services	Service Industry
		Business
		Computers/IT

The data set was used to test the effectiveness of the cluster system within the Worcester Public School System. In this instance, effectiveness is defined as the placement of students with a certain career interest within an appropriate high school with a program design to support and develop that interest. The null hypothesis that was tested with the data set conjectures that each of the schools has a proportional percentage of interested students, based on the size of the school. These proportions are listed in the table below, based on both the population and the sample.

Table 59: Proportion of Students Attending Each School, By Sample and Population

	A.L.L.	Burncoat	Doherty	North	South	Voke	U.P.C.S
Sample	2%	15%	21%	20%	22%	16%	2%
Population	2%	20%	21%	17%	23%	14%	2%

The research team expected that the null hypothesis would be disproved. Factors that limit the students' attendance at a specific school, despite the cluster system, were considered. These factors include transportation issues, the age of the cluster, and the development of new interests after the eighth grade, as well as other

social factors. To disprove the null hypothesis, there would have to be a 30 percent difference between the percentage of interested-students attending and the proportional percentage of the school.

However disproving the null hypothesis does not test the effectiveness of the cluster system. The school(s) with the clusters should have at least 30 percent more interested students than its proportional percentage of overall students to be considered affective

Each of the occupational interest areas was related to one or more cluster programs, based on the judgment of the research team. (See Table 58) Each occupational interest area was analyzed by school, to gage the effectiveness of the cluster system.

A.L.L. and U.P.C.S

A.L.L. and U.P.C.S. were removed from the hypothesis testing regarding the cluster system because neither of the schools have any clusters. The following table shows the percentage of interested-students who attend A.L.L. and U.P.C.S, respectively. The first line of the table gives the percentage of overall students who attend each of the schools.

Table 60: Percent Attendance of Interested Students at A.L.L. % U.P.C.S.

	% Attending A.L.L.	% Attending U.P.C.S.
Overall	2%	2%
Teaching	2%	1%
Engineering/Phys. Science	6%	3%
Computers/IT	6%	2%
Business	4%	3%
Trade	5%	1%
Medical Practice	5%	3%
Medical Support	4%	1%
Law	2%	2%
Art	4%	3%
Service Industry	5%	1%
Social Services	4%	3%
Civil Services	5%	2%
City Administration	5%	1%
Political Office	3%	5%

From this table, it can be seen that for most of the occupational interest areas, a greater percentage of interested-students attend the school than overall students (2%). This was interpreted to mean that A.L.L. students tend to have indicated a wide variety of occupational interests. U.P.C.S. has a mix between a greater, less and equal

percentage of interested-students when compared to the percentage of overall attending students (2%).

Teaching

Teaching clusters are offered at both South (Academy of Education, Service & Government) and Worcester Vocational (Allied Health & Human Services). The percentages of students interested in careers in teaching attending each school are found in the table below, along with the percent change from the sample proportion.

Table 61: Percent Attendance of Teaching-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
% Interested Attending	20%	25%	20%	22%	9%
% Difference	+33%	+19%	0%	0%	-44%

For the occupational interest area of teaching, the null hypothesis is disproved. Burncoat has 33 percent more of teaching-interested students than overall attending students and Worcester Vocational has 44 percent less.

At South, there is a 0 percent change between the percent of teaching-interested students and overall attending students; Worcester Vocational has 44 percent less teaching-interested students then overall attending students. Therefore, both the teaching clusters are considered ineffective.

Engineering/Physical Science

Doherty is the only high school which offers a cluster program for students interested in engineering: the Engineering & Technology Academy. The percentages of students interested in careers in engineering or physical science attending each school are found in the table below, along with the percent change from the sample proportion.

Table 62: Percent Attendance of Engineering/Physical Science-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
% Interested Attending	13%	28%	18%	22%	12%
% Difference	-13%	+33%	-10%	0%	-25%

For the occupational interest area of engineering/physical science, the null hypothesis is disproved. Doherty has 33 percent more of engineering/physical science-interested students than overall attending students. Because Doherty has over 30 percent of engineer/physical science-interested students, the Engineering & Technology Academy is considered an effective cluster.

Computers/Information Technology

There are several high schools with clusters associated with an interest computers/information technology: Doherty's Engineering & Technology Academy, North's School of Technology & Business, South's Information Technology Academy and Worcester Vocational's Alden Design & Engineering School and Information Technology & Business Services. The percentages of students interested in careers in computers or information technology attending each school are found in the table below, along with the percent change from the sample proportion.

Table 63: Percent Attendance of Computer/Information Technology-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	11%	26%	21%	22%	11%
% Difference	-27%	+24%	+5%	0%	-31%

For the occupational interest area of computers/IT, the null hypothesis is supported. None of the schools exhibits greater than a 30 percent different between the percentage of attending and interested students. Since the null hypothesis is supported, all of the computer/IT clusters are considered ineffective.

Business

Business clusters are offered at North (School of Technology & Business), Worcester Vocational (Information Technology & Business Services) and Burncoat (North Worcester Business Association). The percentages of students interested in careers in business attending each school are found in the table below, along with the percent change from the sample proportion.

Table 64: Percent Attendance of Business-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	15%	23%	19%	19%	19%
% Difference	0%	10%	-5%	-14%	+19%

For the occupational interest area of business, the null hypothesis is supported. None of the schools exhibits greater than a 30 percent different between the percentage of attending and interested students. Since the null hypothesis is supported, all of the business clusters are considered ineffective.

Trade

Worcester Vocational is the only high school which offers several clusters for students interested in trade: the Alden Design & Engineering School and the Coughlin Construction Technology. The percentages of students interested in careers in trade attending each school are found in the table below, along with the percent change from the sample proportion.

Table 65: Percent Attendance of Trade-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	9%	16%	9%	18%	43%
% Difference	-40%	-24%	-55%	-28%	+169%

For the occupational interest area of trade, the null hypothesis is disproved. Worcester Vocational has 169 percent more of trade-interested students than overall attending students. Because Worcester Vocational has over 30 percent of trade-interested students, the trade clusters there are considered effective.

Civil Services

There is no cluster in place for students interested in careers in the civil services. The percentages of students interested in careers in the civil services attending each school are found in the table below, along with the percent change from the sample proportion.

Table 66: Percent Attendance of Civil Services-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	11%	25%	16%	18%	23%
% Difference	-27%	+19%	-20%	-18%	+44%

For the occupational interest area of the civil services, the null hypothesis is disproved. Worcester Vocational has 44 percent more of civil service-interested students than overall attending students.

Art

Art clusters are offered at both Burncoat (Performing & Visual Magnet) and South (Academy of Arts & Humanities). The percentages of students interested in careers in business attending each school are found in the table below, along with the percent change from the sample proportion.

Table 67: Percent Attendance of Art-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	18%	19%	18%	25%	15%
% Difference	+20%	-10%	-10%	+14%	-6%

For the occupational interest area of art, the null hypothesis is supported. None of the schools exhibits greater than a 30 percent different between the percentage of attending and interested students. Since the null hypothesis is supported, all of the art clusters are considered ineffective.

Service Industry

Service industry clusters are offered at both South (Academy of Education, Service & Government) and Worcester Vocational (Information Technology & Business Services). The percentages of students interested in careers in business attending each school are found in the table below, along with the percent change from the sample proportion.

Table 68: Percent Attendance of Service Industry-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	19%	22%	17%	21%	16%
% Difference	+27%	+5%	-15%	-5%	0%

For the occupational interest area of the service industry, the null hypothesis is supported. None of the schools exhibits greater than a 30 percent different between the percentage of attending and interested students. Since the null hypothesis is supported, both of the service industry clusters are considered ineffective.

Social Services

There is no cluster in place for students interested in careers in the social services. The percentages of students interested in careers in the social services attending each school are found in the table below, along with the percent change from the sample proportion.

Table 69: Percent Attendance of Social Services-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	15%	26%	21%	20%	11%
% Difference	0%	+24%	+5%	+9%	+31%

For the occupational interest area of the social services, the null hypothesis is disproved. Worcester Vocational has 31 percent more of civil service-interested students than overall attending students.

Medical Practice

North is the only high school which offers a cluster for students interested in careers in medical practice: the Health & Science Academy. The percentages of students interested in careers in medical practice attending each school are found in the table below, along with the percent change from the sample proportion.

Table 70: Attendance of Medical Practice-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	16%	20%	25%	18%	14%
% Difference	+7%	-5%	+25%	-18%	-12%

For the occupational interest area of medical practice, the null hypothesis is supported. None of the schools exhibits greater than a 30 percent different between the percentage of attending and interested students. Since the null hypothesis is supported, the Health & Science Academy is considered ineffective.

Medical Support

There are several high schools with clusters associated with an interest medical support: Burncoat's relationship with Fallon Medical Clinic, North's Health & Science Academy and Worcester Vocational's Allied Health & Human Services. The percentages of students interested in careers in medical support attending each school are found in the table below, along with the percent change from the sample proportion.

Table 71: Attendance of Medical Support-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	16%	20%	24%	21%	14%
% Difference	+7%	-5%	+20%	-5%	-12%

For the occupational interest area of medical support, the null hypothesis is supported. None of the schools exhibits greater than a 30 percent different between the percentage of attending and interested students. Since the null hypothesis is supported, all of the medical support clusters are considered ineffective.

Law

North is the only high school which offers a cluster for students interested in careers in law: the Social Systems & Justice Magnet. The percentages of students interested in careers in law attending each school are found in the table below, along with the percent change from the sample proportion.

Table 72: Attendance of Law-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	16%	20%	21%	19%	20%
% Difference	+7%	-5%	+5%	-14%	+25%

For the occupational interest area of law, the null hypothesis is supported. None of the schools exhibits greater than a 30 percent different between the percentage of attending and interested students. Since the null hypothesis is supported, the Social Systems & Justice Magnet is considered ineffective.

City Administration

South is the only high school which offers a cluster program for students interested in city administration: the Academy of Education, Service & Government. The percentages of students interested in careers in city administration attending each school are found in the table below, along with the percent change from the sample proportion.

Table 73: Percent Attendance of City Administration-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	16%	28%	12%	19%	18%
% Difference	+7%	+33%	-40%	-14%	+13%

For the occupational interest area of the social services, the null hypothesis is disproved. Doherty has 33 percent more of city administration-interested students than overall attending students, and North has 40 percent less.

South has 14 percent less city administration-interested students then overall attending students. Therefore, the city administration cluster is considered ineffective.

Political Office

South is the only high school which offers a cluster for students interested in political office: the Academy of Education, Service & Government. The percentages of students interested in careers in political office attending each school are found in the table below, along with the percent change from the sample proportion.

Table 74: Percent Attendance of Political Office-Interested Students, By School

	Burncoat	Doherty	North	South	Voke
% Sample Attending	15%	21%	20%	22%	16%
%Interested Attending	17%	29%	21%	19%	5%
% Difference	+13%	+38%	+5%	-14%	-69%

For the occupational interest area of the social services, the null hypothesis is disproved. Doherty has 38 percent more of city administration-interested students than overall attending students, and Worcester Vocational has 69 percent less.

South has 14 percent less political office-interested students then overall attending students. Therefore, the political office cluster is considered ineffective.

3.3.2 Analysis of Gender Ratios, By School

The data set was also used to speculate the degree to which gender stereotypes are discouraged at each school. As with the overall gender analysis, (See Section 3.1) the research team expected to find similar numbers between the ratio of males to females among each profession in the work force and the ratio of male to female students at each school interested in the corresponding career interest. This is referred to as the null hypothesis. This null hypothesis will be supported when these two ratios are defined in the same way, as set forth in Table 10.

The ratios of interested males to interested females in each school were compared. The following table shows those ratios.

Table 75: Gender Ratio (M:F) by School & Occupational Interest Area

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Trade	5.00:1	8.00:1	1.43:1	1:0	15.0:1	3.71:1	1:0	4.71:1
Eng/Phys. Sci.	4.13:1	3.00:1	2.57:1	8.17:1	4.00:1	3.00:1	4:1	5.00:1
Computers/IT	3.18:1	2.75:1	1.42:1	3.40:1	3.15:1	4.70:1	5:1	3.67:1
Civil Service	2.66:1	3.00:1	2.00:1	3.56:1	1.50:1	1:1.42	2.00:1	8.25:1
City Admin.	1.61:1	1:0	1:2.00	2.50:1	1:1.25	1:1	0:1	5.50:1
Political Office	1.48:1	1:1	1:1	2.40:1	1.40:1	1:1.20	2.00:1	1:0
Business	1.03:1	1:1.29	1.07:1	1:1.07	1:1.02	1.42:1	1:2.67	1.19:1
Art	1:1.10	1.40:1	1:2.11	1:1.11	1:1.67	1.60:1	1:3.00	1.30:1
Law	1:1.33	1:1.25	1:2.14	1.19:1	1:2.11	1:1.21	1.50:1	1.07:1
Teaching	1:1.75	0:1	1:2.00	1:1.50	1:1.70	1:2.88	1:1	1.60:1
Med. Practice	1:2.33	1:1	1:3.44	1:2.40	1:2.26	1:2.67	1:2.50	1:1.69
Service Ind.	1:3.06	1:2.00	1:3.22	1:3.00	1:2.30	1:2.82	0:1	1:5.20
Med. Support	1:3.23	1:1.25	1:3.00	1:3.27	1:3.31	1:4.33	0:1	1:3.57
Social Service	1:3.70	1:2.00	1:6.50	1:3.82	1:3.30	1:3.67	0:1	1:2.14

A.L.L. and U.P.C.S.

The gender ratios for A.L.L. and U.P.C.S. are given in the overall analysis, but will not be considered as factors in the hypothesis testing because of their small population ($n_{A.L.L.}$=34 and $n_{U.P.C.S.}$=30) and sample size ($n_{A.L.L.}$=25 and $n_{U.P.C.S.}$=25) compared to the population and sample sizes at the rest of the schools.

Trade

Based on the BLS data, trade was defined as a strongly male dominated field; overall in the Worcester Public Schools, it is considered a male dominated occupational interest area (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in trade, within each school.

Table 76: Gender Ratio (M:F) for Trade, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Trade	5.00:1	8.00:1	1.43:1	1:0	15.0:1	3.71:1	1:0	4.71:1

For the occupational interest area of trade, the null hypothesis is disproved. The male to female ratios for students interested in trade vary from strongly male dominated at A.L.L., Doherty, North and U.P.C.S. to slightly male dominated at Burncoat.

At Worcester Vocational, the school with the cluster program for students interested in trade, the male to female ratio is considered male dominated.

Engineering/Physical Science

Based on the BLS data, engineering/physical science was defined as a male dominated field; overall in the Worcester Public Schools, it is also considered a male dominated occupational interest area (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in engineering/physical science, within each school.

Table 77: Gender Ratio (M:F) for Engineering/Physical Science, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Eng/Phys. Sci.	4.13:1	3.00:1	2.57:1	8.17:1	4.00:1	3.00:1	4:1	5.00:1

For the occupational interest area of engineering/physical science, the null hypothesis is disproved. The male to female ratios for students interested in engineering/physical science vary from strongly male dominated at Doherty to male dominated at Burncoat. However, the ratio at Burncoat is almost slightly male dominated and is approximately three times lower than the ratio at Doherty.

At Doherty, the school with the cluster program for students interested in engineering/physical science, there are 8 interested males for every interested female.

Computers/Information Technology

Based on the BLS data, computers/information technology was defined as a male dominated field; over all in the Worcester Public Schools, it is also considered a male dominated occupational interest area (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in computers/information technology, within each school.

Table 78: Gender Ratio (M:F) for Computers/Information Technology, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Computers/IT	3.18:1	2.75:1	1.42:1	3.40:1	3.15:1	4.70:1	5:1	3.67:1

For the occupational interest area of computers/information technology, the null hypothesis is disproved. The male to female ratios for students interested in computers/information technology vary from male dominated (close to strongly male

dominated) at Doherty to slightly male dominated at Burncoat. However, the ratio at Burncoat is almost considered equal between the genders.

At each of the schools with clusters for the students interested in computers/IT (Doherty North, South and Worcester Vocational), the ratios are considered male dominated and range from approximately 5:1 at South to approximately 3:1 at North.

Civil Services

Based on the BLS data, civil service was defined as a male dominated field; over all in the Worcester Public Schools, it is also considered a male dominated occupational interest area (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in computers/information technology, within each school.

Table 79: Gender Ratio (M:F) for Civil Service, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Civil Service	2.66:1	3.00:1	2.00:1	3.56:1	1.50:1	1:1.42	2.00:1	8.25:1

For the occupational interest area of civil service, the null hypothesis is disproved. The male to female ratios for students interested in careers in the civil services vary from strongly male dominated at Worcester Vocational to slightly male dominated at Burncoat to slightly female dominated at South.

City Administration

Although there is no BLS data to define the male to female ratio, city administration is concerned a male dominated field; over all in the Worcester Public Schools, it is considered a slightly male dominated occupational interest area (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in city administration, within each school.

Table 80: Gender Ratio (M:F) for City Administration, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
City Admin.	1.61:1	1:0	1:2.00	2.50:1	1:1.25	1:1	0:1	5.50:1

For the occupational interest area of city administration, the null hypothesis is disproved. The male to female ratios for students interested in careers in the city

administration vary from strongly male dominated at Worcester Vocational to male dominated on Doherty to equal at North to slightly female dominated at Burncoat.

At South, the school that has the cluster for students interested in careers in city administration, the male to female ratio is equal (1:1).

Political Office

There is also no BLS data to define the male to female ratio for political office, but it is considered a male dominated field; over all in the Worcester Public Schools, it is considered a slightly male dominated occupational interest area (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in holding a political office, within each school.

Table 81: Gender Ratio (M:F) for City Administration, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Political Office	1.48:1	1:1	1:1	2.40:1	1.40:1	1:1.20	2.00:1	1:0

For the occupational interest area of political office, the null hypothesis is disproved. The male to female ratios for students interested in careers in the city administration vary from strongly male dominated at Worcester Vocational to male dominated on Doherty to equal at Burncoat.

At South, the school that has the cluster for students interested in careers in political office, the male to female ratio is considered equal (1:20).

Business

Based on the BLS data, business was defined as a gender equal field; overall in the Worcester Public Schools, it is also considered an equal occupational interest area (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in business, within each school.

Table 82: Gender Ratio (M:F) for Business, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Business	1.03:1	1:1.29	1.07:1	1:1.07	1:1.02	1.42:1	1:2.67	1.19:1

For the occupational interest area of business, the null hypothesis is supported. Although the male to female ratio of interested students at South is in the slightly male

dominated range, it is close enough to the low end of the range that the research team considered it equal.

The ratios for the schools with clusters for business-interested students (Burncoat, North and Worcester Vocational) are all considered equal.

Art

Based on the BLS data, art was defined as a gender equal field; over all in the Worcester Public Schools, it is also considered an equal occupational interest area (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in art, within each school.

Table 83: Gender Ratio (M:F) for Art, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Art	1:1.10	1.40:1	1:2.11	1:1.11	1:1.67	1.60:1	1:3.00	1.30:1

For the occupational interest area of art, the null hypothesis is disproved. The male to female ratios for students interested in careers in art vary from slight male dominated at South to slightly female dominated at Burncoat. The other schools fall roughly in the equal range.

The art clusters are located at South and Burncoat, which fall into the extreme ratios for this analysis, with South the male dominated end and Burncoat at the female dominated end.

Law

Based on the BLS data, law was defined as a gender equal field; over all in the Worcester Public Schools, it is also considered an equal occupational interest area; although it falls on the line of being slightly female dominated (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in law, within each school.

Table 84: Gender Ratio (M:F) for Law, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Law	1:1.33	1:1.25	1:2.14	1.19:1	1:2.11	1:1.21	1.50:1	1.07:1

For the occupational interest area of law, the null hypothesis is disproved. The male to female ratios for students interested in law careers range from slightly female dominated at Burncoat to equal at Worcester Vocational. However, within the equal range there is some variance. The ratio at Doherty is closer to being slightly male dominated (~1.2:1) while the ratio at South is closer to being slightly female dominated (~1:1.2).

The law clusters is located at South, where the male to female ratio falls into the equal range; although, is closer to the female dominated range, as previously stated.

Teaching

Based on the BLS data, teaching was defined as a female dominated field; over all in the Worcester Public Schools, it is also considered a slightly female dominated field (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in teaching, within each school.

Table 85: Gender Ratio (M:F) for Teaching, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Teaching	1:1.75	0:1	1:2.00	1:1.50	1:1.70	1:2.88	1:1	1.60:1

For the occupational interest area of teaching, the null hypothesis is disproved. The male to female ratios for students interested in teaching careers ranges from equal at Doherty to slightly female dominated at Burncoat and North to female dominated at South.

The teaching clusters are located at South and Worcester Vocational, which fall into the extreme ratios for this analysis, with South at the female dominated end and Worcester Vocational at the male dominated end. Although the ratio at Worcester Vocational is considered equal, it falls on the slightly male dominated line.

Medical Practice

Based on the BLS data, medical practice was defined as an equal field; over all in the Worcester Public Schools, it is considered a female dominated field (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in medical practice, within each school.

Table 86: Gender Ratio (M:F) for Medical Practice, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Med. Practice	1:2.33	1:1	1:3.44	1:2.40	1:2.26	1:2.67	1:2.50	1:1.69

For the occupational interest area of medical practice, the null hypothesis is disproved. The male to female ratios for students interested in medical practice careers ranges from slight female dominated at Worcester Vocational to female dominated at Burncoat. The other schools are generally considered female dominated.

The cluster for medical practice is located at North, where the male to female ratio of medical practice-interested students is on the line between slightly female and female dominated.

Service Industry

Based on the BLS data, the service industry was defined as an equal field; over all in the Worcester Public Schools, it is considered a female dominated field (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in the service industry, within each school.

Table 87: Gender Ratio (M:F) for the Service Industry, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Service Ind.	1:3.06	1:2.00	1:3.22	1:3.00	1:2.30	1:2.82	0:1	1:5.20

For the occupational interest area of the service industry, the null hypothesis is supported. The male to female ratios for students interested in medical support careers all basically fall into the female dominated range; although there is variance within that range. The male to female ratio Worcester Vocational falls almost in the strongly female dominated range, and the ratio at North falls on the line of the slight female dominated range.

The schools with clusters for students interested in careers in the service industry are South and Worcester Vocational, where the male to female ratios fall almost at the extremes of the female dominated range.

Medical Support

Based on the BLS data, medical support was defined as a female dominated field; over all in the Worcester Public Schools, it is also considered a female dominated

field (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in medical support, within each school.

Table 88: Gender Ratio (M:F) for Medical Support, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Med. Support	1:3.23	1:1.25	1:3.00	1:3.27	1:3.31	1:4.33	0:1	1:3.57

For the occupational interest area of medical support, the null hypothesis is supported. The male to female ratios for students interested in medical support careers all fall into the female dominated range.

At the schools with clusters for students interested in careers in medical support (Burncoat, North and Worcester Vocational), the male to female ratios have little variance from the overall ratio.

Social Services

Based on the BLS data, the social services were defined as a female dominated field; over all in the Worcester Public Schools, it is also considered a female dominated field (See Section 3.1). The table below was taken from table B and shows the male to female ratio of students interested in the social services, within each school.

Table 89: Gender Ratio (M:F) for Social Services, by School

	Overall WPS	A.L.L.	Burncoat	Doherty	North	South	U.P.C.S.	Voke
Social Service	1:3.70	1:2.00	1:6.50	1:3.82	1:3.30	1:3.67	0:1	1:2.14

For the occupational interest area of social services, the null hypothesis is disproved. The male to female ratios for students interested in social services careers range from strongly female dominated at Burncoat to slight female dominated at Worcester Vocational. The rest of the schools generally fall in the female dominated range.

3.4 Analysis of Career-Related Concerns

One of the latter sections of the survey (see Appendix A) included a list of career and college related concerns. Students indicated whether or not they felt pressure from perceived gender barriers, concerns about being accepted to and in being able to attend college, and concerns about feeling unprepared to pursue the career of their choice for other reasons than those previously asked. Students indicated these concerns by agreeing with a series of 'I' statements, as listed below.

3.4.1 Analysis of Concerns by Gender

The following table shows the percentage of males and females who indicated a career barrier, as well as an overall percentage of students who selected it. For example, 25 percent of male students agreed with Accept1: "I doubt I'll be accepted to college because my grades are too low." 18 percent of females agreed with this statement for an average of 21 percent of students agreeing.

Table 90: Frequency of Concern, by Gender

Concern	% Males	% Females	% Students
Gender1	8%	9%	9%
Gender2	8%	9%	8%
Gender3	7%	8%	7%
Accept1	25%	18%	21%
Accept2	17%	22%	19%
Attend1	25%	28%	26%
Attend2	7%	5%	6%
Attend3	8%	4%	6%
Unprep1	8%	9%	8%
Unprep2	16%	16%	16%
Unprep3	19%	24%	21%

Gender1, Gender2, etc. correspond to the following concerns.

- Gender1: "People of my gender don't usually go into that field"
- Gender2: "People of my gender don't usually get family support"
- Gender3: "People of my gender don't usually succeed in that field"
- Accept1: "I doubt I'll be accepted to college because my grades are too low"
- Accept2: "I doubt I'll be accepted to college because my test scores are too low"
- Attend1: "I doubt I'll be attending college because it's too expensive"
- Attend2: "I doubt I'll be attending college because its too demanding/difficult"
- Attend3: "I doubt I'll be attending college because I dislike school"
- Unprep1: "I feel unprepared for my career interest because I don't know anyone in that profession"

- Unprep2: "I feel unprepared for my career interest because I don't know what education is required"
- Unprep3: "I feel unprepared for my career interest because I don't know if I will succeed in that profession"

The frequency with which students indicated agreement with these concerns was also analyzed by the ethnicity of the student. Table 99 gives the percentage of students from each of the four major ethnic/racial groups who indicated agreement with each of the concerns.

Table 91: Frequency of Concern, by Ethnicity

Concern	All Students	African Amer.	Asian	Caucasian	Hispanic
Gender1	9%	12%	14%	6%	9%
Gender2	8%	9%	22%	4%	13%
Gender3	7%	8%	13%	4%	10%
Accept1	21%	25%	22%	17%	27%
Accept2	19%	22%	30%	14%	23%
Attend1	26%	26%	40%	18%	37%
Attend2	6%	8%	13%	3%	8%
Attend3	6%	3%	4%	7%	7%
Unprep1	8%	13%	16%	5%	10%
Unprep2	16%	16%	23%	13%	20%
Unprep3	21%	22%	35%	19%	19%

The tables in Appendix D break the concerns by ethnicity down more closely, including by gender among the ethnicities.

These concerns are analyzed by each school, and reported to the schools in their individual school report. Each school is given the percentage of students who have a particular concern among their student body, as well as these concerns by gender. Comparable statistics for the entire population of the survey are included so the schools can see how their students compare to students in Worcester as a whole.

Concerns Related to Perceived Gender Barriers

The research team disregarded the responses to the perceived gender barriers questions because of validity concerns. The research team expected females interested in male dominated careers (engineering or trade) or males interested in female dominated careers (medical support or teaching). Similar percentages of males and females indicated concerns regarding their gender (8% male, 9% female in Gender1 and Gender2, 7% male and 8% female in Gender3), and there was no relationship found

between the agreement of gender concerns and interest in occupational interest areas. This indicates that the validity of the gender concerns section is questionable and is not considered in the analysis of this section. For further information on this decision, please see the survey analysis section of this paper. The other questions are still valid for analysis.

Concerns Related to College Acceptance

One of the more frequent concerns among the students is their concern regarding being accepted to a specific college. 21 percent are worried that their grades are too low, and 19 percent are concerned that their standardized scores are or will be too low.

There is a difference between what concerns male students as compared to female students, however. Males are 39 percent more likely than females to worry about their grades denying them entry to college (25% of male students have this concern, 18% of female students). This data is illustrated in Table X.

Female students, on the other hand, are more concerned with their test scores, either the ones they have now, or what they anticipate scoring. Female students are 29 percent more concerned than male students about their test scores (22% of female students indicated this concern, 17% of male students).

Among the ethnic/racial groups, African American and Hispanic students are more likely than average to be concerned about their grades, with Caucasian students less concerned than average and Asian students about as concerned as average.

When concerns regarding test scores are analyzed, it is found that Asian students are the most concerned, with Caucasian students less likely than average to be concerned. African American and Hispanic students are slightly more concerned than average.

Concerns Related to College Attendance

The cost of attending college is the foremost concern among Worcester Public School students. 26 percent of students doubt that they will be attending college because it is too expensive. Therefore, approximately one in four students are disqualifying theirself from considering careers due to the cost of college. Students should be aware of the need –based financial aid that is available to avoid prematurely eliminating career options.

Other barriers to attending college are much less discouraging to Worcester Public School students. Only 6 percent of students think that college will be too difficult

or demanding and only 6 percent do not wish to further their education due to a dislike for school in general.

Of the three related concerns, a dislike for school (Attend3) is the only concern which shows a difference between the genders, as males (8%) are twice as likely as females to agree with this statement.

African American students are nearly as concerned as average except for in a dislike for school, where they are only half as likely to agree with the statement.

Asian students are more likely to be concerned with the cost and difficulty of college, however, they dislike school at a lesser rate than the average Worcester Public School student.

Caucasian students are less likely than average to worry about the costs and difficulties of college, yet slightly more likely to not want to attend college because they dislike school.

Hispanic students are more likely than average to agree with all three statements relating to college attendance.

Concerns Related to Career Preparedness

Students also expressed concern regarding their degree of preparedness to pursue certain careers. 8 percent of surveyed students would feel more prepared if they knew someone in their desired profession. 16 percent of juniors report that they don't know what education is required for their interest, and 21 percent are concerned that they would not be able to succeed in their profession, even if they were to obtain the necessary education or training.

Of the concerns regarding career preparedness, the gender-splits are equal for except for concern about succeeding in the student's desired profession, where females are 26 percent more likely to be concerned than males. Both males and females are equally concerned about not knowing anyone in their desired field and with not knowing what education is required.

African American students display nearly average concern with each of the career preparedness concerns, with slightly more concerning stemming from not knowing any one in their desired field.

Asian students display more concern than average for each of the three concerns. Indeed, Asian students are most likely to be in agreement with each of the three unprepared statements as students of any other ethnicity.

Caucasian students display slightly less concern than the average for each of the three concerns.

Hispanic students are slightly more concerned than average with not knowing anyone in their desired field and with not knowing what education is required, but less concern than average with doubting they will succeed in the field they would prefer to enter.

3.4.2 Analysis of Concerns by Ethnicity

African American Students

The African American students show varying rates of concern above and below the average concerns shown by all Worcester Public School students. As can be seen in the chart, overall they tend to be more concerned than average with being accepted to college, and also are more concerned than average in wanting/being able to attend. The magnitudes of these changes are not very great however.

Asian Students

Asian students, in general, show more concern in nearly every category.

There are only two barriers where these students display less concern than average. These two barriers are: having good enough grades to attend college (22.1% of Asian students are worried, compared to a comparable 21.2% of all students) and disliking school (only 2.8% of Asian students do not wish to attend college due to disliking school, compared to 6.3% of students in the entire population).

In every other aspect, Asian students in Worcester Public Schools are much more concerned about college and pursuing their careers than the student body as a whole. The Asian students are:

- 67% more likely to be worried about being accepted to college due to their test scores.
- 61% more likely to be worried about paying for college.
- 141% more likely to worry about the demands and difficulties of a college education.
- 100% more likely to feel unprepared due to not knowing anyone in an interesting field.
- 54% more likely to feel unsure about what education is required of them to achieve their career goals.

- 76% more likely to worry about succeeding.

Asian students are more likely than any other ethnic group to be interested in difficult technical careers such as engineering, science and computers which require demanding and expensive educations. This factor may account for some of these statistics. However, there are almost certainly cultural reasons for this as well. Many Asian cultures value high motivation and success in work very highly. "Conclusions such as 'folk theory of success' and the concept of 'need to achieve' are said to be much more predominant in Asia" (Joynt and Warner, 1996). This may stem from Asian cultures placing a greater value on collectivism, whereas western cultures typically value individualism (Nelson and Chowdhury, 1994). Thus, a person's value to his/her community is directly related to his/her ability to work successfully. This places great pressure on Asian students to be successful in school and work, and any worries they have are likely to be amplified due to this pressure.

Caucasian Students

In contrast, the Caucasian students are much less likely to be worried about fulfilling their aspirations. The Caucasian students show nearly equal or lesser percentage of students concerned about perceived barriers in every aspect.

These students are not overwhelmingly less concerned, but the percentage of Caucasian students concerned is generally only about 60-80 percent of the percentage of students as a whole.

Hispanic Students

Hispanic students are, like Asian students, more likely to be concerned than all Worcester Public School students. Excluding disliking school (7.2% of Hispanic students; 6.0% of all other students) and worrying about success (19.1%; 21.8%), percentage of Hispanic students concerned are above the levels for all other students, regardless of ethnicity.

The magnitude of increased concern is not as great as that of the very large increases among the Asian students, however. Hispanic students range from 23 percent more likely to be concerned (unprepared due to not knowing anyone in the field) to a maximum of 65 percent more likely to be concerned (worried about paying for college) among the various barriers surveyed.

3.4.3 Analysis of Concerns by Student Interest

In order to study whether students who aspire to any certain careers are more or less concerned about their chances of fulfilling their goals, the responses to this section were also compared by interest. This analysis has unfortunately revealed very few trends. Since most students indicated interest in many careers, and often unrelated ones, it becomes unclear which career they are referring to when they show a concern. Some of the few trends which were found are as follows:

- Females interested in engineering/physical science careers are 50% more likely to be concerned about their test scores denying them entry to college.
- All students interested in engineering/physical science or computers/IT are slightly more concerned with paying for college.
- Students interested in entering trade occupations are twice as likely to not want to continue school due to a dislike for it.
- Students interested in medical fields are more concerned than average in having the money to attend college, more concerned than average about their test scores but are much less likely to dislike school.
- Of respondents interested in civil service, their concerns with most aspects of being accepted to and attending college are higher than average.

3.5 Analysis of Concurrent Interests

Analysis was suggested regarding concurrent interests of students. Initially, the other interests of law-interested students were analyzed, in order to speculate what area of law they might eventually enter. However, after this preliminary analysis, it became clear to the research team that the other occupational interest areas should be analyzed in a similar fashion.

The research team expected to find little difference between the interests of the overall sample and the interests of a group of students interested in a specific occupation-interest area; they expected a 100 percent change between the interest levels of the two groups. This is referred to as the null hypothesis. This null hypothesis will be supported when the percent change is between 75 percent and 150 percent. Occupation interest areas will be analyzed in groups where students tend to have concurrent interests; although, significant differences may be found between groups.

Law and Political Careers

Due to the original interest in the concurrent interests of law-interested students, those students were analyzed first. Table 1 shows the percentage of law-interested students (second column, % Law Students) and overall students (third column, % Overall Students) interested in each career interest area and the percent change between the two degrees of interest (fourth column, % Change), respectively.

For law-interested students, the null hypothesis is supported in the occupational interest areas of teaching, engineering or physical science, computers or information technology, business, trade, art and the service industry.

However, law-interested students show significantly more interest in the medical careers, social service, civil service and the political careers. If the research assumes that students will pursue careers in law related to their other interests, it can be hypothesized that law-interested students in this sample will enter areas related to medicine (i.e. medical malpractice law), the social services (i.e. childcare law), the civil services (i.e. public sector law), or politics (i.e. political ethics law).

A logical concurrent interest for law students is their high interest in political careers. Law-interested students are approximately twice as likely to be interested in a career in city administration and politics. This is a logical concurrent interest, according to "Gender in Urban Research," because many politicians started out with a career in law (Garber & Turner, 1994).

Table 92: Concurrent Interests of Law-Interested Students

	% Law Students	% Overall Students	% Change
TCH	15%	13%	118%
EPS	18%	21%	86%
CIT	21%	27%	77%
BUS	53%	37%	142%
TRA	18%	19%	93%
MdP	37%	20%	184%
MdS	34%	17%	195%
LAW	N/A	N/A	N/A
ART	34%	30%	114%
SRV	24%	18%	134%
SCL	33%	16%	213%
CVL	29%	16%	181%
CTY	15%	7%	205%
POL	11%	6%	188%

For students interested in careers in city administration, the null hypothesis is supported in the occupational interest areas of art and the service industry. Those students show significantly more interest in every other occupational interest area (See Table 93).

The most striking concurrently interests for city administration-interested students are their interest in careers in the civil services and politics. These students are 430 percent more interested in a career in the civil services and ~1200 percent more interested in holding a political office.

For politically-interested students, the null hypothesis is supported for the occupational interest area of teaching, computers or information technology, business, trade, the medical careers, art, the service industry, and social services (See Table 94). The change in interest for teaching, computers or information technology, and the social services is close enough to 150 percent to be considered insignificant. Although politically-interested students are significantly more interested in careers in engineering or physical science, law and the civil services, the most striking concurrent interest occurs between city administration and politics.

Table 93: Concurrent Interests of City Administration-Interested Students

	% Law Students	% Overall Students	% Change
TCH	22%	13%	165%
EPS	32%	19%	172%
CIT	46%	24%	194%
BUS	66%	40%	166%
TRA	35%	17%	205%
MdP	38%	24%	158%
MdS	32%	21%	155%
LAW	57%	25%	224%
ART	35%	31%	113%
SRV	27%	19%	141%
SCL	35%	19%	182%
CVL	55%	13%	430%
CTY	N/A	N/A	N/A
POL	38%	3%	1202%

Table 94: Concurrent Interests of Politically-Interested Students

	% Law Students	% Overall Students	% Change
TCH	21%	13%	156%
EPS	36%	19%	192%
CIT	38%	25%	155%
BUS	60%	41%	148%
TRA	21%	18%	113%
MdP	34%	24%	142%
MdS	22%	22%	103%
LAW	52%	26%	197%
ART	34%	31%	111%
SRV	16%	20%	77%
SCL	31%	20%	156%
CVL	31%	15%	206%
CTY	48%	5%	1007%
POL	N/A	N/A	N/A

Nurturing Careers

Students who were interested in one of the nurturing careers (the medical careers, teaching and social services) tended to be interested in the other nurturing careers.

For teaching-interested students, the null hypothesis is supported in the occupational interest areas of engineering or physical science, computers or information technology, business, law, art, the service industry and civil services. These students tend to be more interested in the medical careers, the socials services and political

careers. Teaching-interested students are significantly less interested in careers in trade.

The most striking difference is within the interest of the social services, where teaching-interested are ~300 percent more interested. It is also interested to note that teaching-interested students are also more likely to be interested in city administration and politics than the overall student body. This agrees with research from "Gender in Urban Research" that states that many females tend to start careers in local politics through a career in education (Garber & Turner, 1994).

However, students interested in careers in teaching are less like to be interested in technical careers or trade. This might be explained by the controlled and exact nature of the technical careers compared to the liberal and varying nature of education and other nurturing careers.

Table 95: Concurrent Interests of Teaching-Interested Students

	% Law Students	% Overall Students	% Change
TCH	N/A	N/A	N/A
EPS	16%	21%	77%
CIT	19%	26%	71%
BUS	42%	42%	101%
TRA	11%	20%	53%
MdP	34%	24%	144%
MdS	32%	20%	160%
LAW	32%	27%	120%
ART	37%	30%	121%
SRV	29%	18%	160%
SCL	48%	16%	295%
CVL	16%	16%	98%
CTY	12%	7%	183%
POL	9%	5%	174%

For medical practice-interested students, the null hypothesis is support in the occupation interest areas of engineering or physical science, computers or information technology, business, trade, art, the service industry and civil services. These students are significantly more likely to be interested in law, the socials services, political careers, and most strikingly (and logically) medical support.

Table 96: Concurrent Interests of Medical Practice-Interested Students

	% Law Students	% Overall Students	% Change
TCH	18%	12%	146%
EPS	22%	19%	117%
CIT	22%	26%	85%
BUS	45%	41%	109%
TRA	18%	19%	93%
MdP	N/A	N/A	N/A
MdS	69%	6%	1094%
LAW	41%	23%	179%
ART	32%	31%	104%
SRV	24%	18%	130%
SCL	41%	14%	294%
CVL	19%	15%	128%
CTY	11%	6%	185%
POL	8%	5%	161%

For medical support-interested students, the null hypothesis is support in the occupation interest areas of engineering or physical science, computers or information technology, business, trade, art, civil services and political office. These students are significantly more likely to be interested in law, the service industry, the socials services, city administration, and medical practice (as stated above).

Table 97: Concurrent Interests of Medical Support-Interested Students

	% Law Students	% Overall Students	% Change
TCH	19%	12%	152%
EPS	19%	20%	95%
CIT	22%	26%	82%
BUS	48%	40%	119%
TRA	16%	19%	86%
MdP	74%	10%	735%
MdS	N/A	N/A	N/A
LAW	41%	24%	171%
ART	30%	32%	96%
SRV	28%	17%	159%
SCL	41%	14%	287%
CVL	19%	15%	130%
CTY	10%	6%	163%
POL	6%	6%	98%

For social service –interested students, the null hypothesis is support in the occupation interest areas of business, art and civil services. These students are significantly less interested in careers in engineering or physical science, computers or

information technology and trade. However, they are significantly more interested in teaching, medical careers, law, the service industry and political careers.

Table 98: Concurrent Interests of Social Service -Interested Students

	% Law Students	% Overall Students	% Change
TCH	31%	9%	339%
EPS	13%	22%	61%
CIT	16%	28%	56%
BUS	49%	40%	122%
TRA	13%	20%	63%
MdP	45%	20%	227%
MdS	41%	17%	247%
LAW	45%	23%	196%
ART	35%	30%	114%
SRV	37%	16%	236%
SCL	N/A	N/A	N/A
CVL	21%	15%	142%
CTY	13%	6%	214%
POL	9%	5%	179%

Technical Careers

Students who were interested in one of the technical careers were interested in the other technical careers.

For engineer or physical science-interested students, the null hypothesis is supported in the occupational interest areas of teaching, business, medical practice, medical support, law and art. These students are significantly less interested in careers in the service industry and the social services, but tend to be interested in trade, political careers, the civil services and most strikingly (and obviously) computers or information technology.

Table 99: Concurrent Interests of Engineering or Physical Science -Interested Students

	% Law Students	% Overall Students	% Change
TCH	11%	14%	72%
EPS	N/A	N/A	N/A
CIT	62%	16%	383%
BUS	49%	40%	122%
TRA	31%	15%	201%
MdP	28%	24%	116%
MdS	22%	22%	101%
LAW	25%	28%	88%
ART	32%	31%	103%
SRV	14%	21%	66%
SCL	14%	22%	61%
CVL	25%	14%	176%
CTY	12%	6%	196%
POL	11%	5%	233%

For computers or information technology-interested students, the null hypothesis is supported in the occupational interest areas of business, medical practice, medical support, law and art. These students are significantly less interested in careers in teaching and the social services. They instead tend to be interested in trade, political careers, the civil services and most strikingly (and obviously) engineering or physical science.

Table 100: Concurrent Interests of Computers or Information Technology -Interested Students

	% Law Students	% Overall Students	% Change
TCH	11%	15%	72%
EPS	49%	10%	479%
CIT	N/A	N/A	N/A
BUS	54%	38%	144%
TRA	27%	16%	174%
MdP	22%	26%	85%
MdS	20%	23%	87%
LAW	23%	29%	77%
ART	37%	29%	125%
SRV	19%	20%	96%
SCL	13%	23%	54%
CVL	23%	14%	170%
CTY	13%	5%	254%
POL	9%	5%	183%

Non-Grouped Occupational Interest Areas

Many students indicated an interested in business; therefore, the null hypothesis is supported in most occupational interest areas. However, business-interested students are significantly more interested in political careers, law, computers or information technology as well as in the service industry.

Table 101: Concurrent Interests of Business-Interested Students

	% Law Students	% Overall Students	% Change
TCH	13%	14%	95%
EPS	23%	17%	133%
CIT	33%	20%	164%
BUS	N/A	N/A	N/A
TRA	22%	16%	138%
MdP	27%	24%	112%
MdS	26%	19%	139%
LAW	35%	22%	159%
ART	33%	30%	109%
SRV	31%	12%	266%
SCL	24%	18%	130%
CVL	18%	14%	127%
CTY	12%	4%	277%
POL	8%	4%	217%

For service industry-interested students, the null hypothesis is supported in the occupational interest areas of computers or information technology, trade, medical practice, law, art, civil services and city administration. These students are significantly less interested in a career in engineering or physical and holding a political office. These students are significantly more interested in teaching, business and social services.

Table 102: Concurrent Interests of Service Industry-Interested Students

	% Law Students	% Overall Students	% Change
TCH	20%	12%	160%
EPS	14%	21%	66%
CIT	25%	25%	97%
BUS	66%	36%	183%
TRA	17%	19%	87%
MdP	30%	24%	128%
MdS	32%	19%	167%
LAW	34%	26%	131%
ART	42%	29%	145%
SRV	N/A	N/A	N/A
SCL	38%	16%	232%
CVL	18%	16%	113%
CTY	10%	7%	152%
POL	5%	6%	75%

For trade-interested students, the null hypothesis is supported in the occupational interest areas of business, medical practice, medical support, law, art, the service industry and political office. Students interested in trade are significantly less likely to be interested in teaching and the socials services, but more likely to be interested in engineering or physical science, computers or information technology, the civil services and city administration.

Table 103: Concurrent Interests of Trade-Interested Students

	% Law Students	% Overall Students	% Change
TCH	8%	15%	50%
EPS	33%	17%	198%
CIT	37%	23%	164%
BUS	50%	40%	125%
TRA	N/A	N/A	N/A
MdP	24%	25%	94%
MdS	20%	22%	92%
LAW	26%	28%	94%
ART	27%	32%	85%
SRV	23%	19%	121%
SCL	14%	22%	64%
CVL	37%	11%	322%
CTY	14%	6%	242%
POL	6%	6%	117%

For civil service -interested students, the null hypothesis is supported in the occupational interest teaching, business, medical practice, medical support, art, the

service industry, and the social services. These students are significantly more interested in careers in engineering or physical science, computers or information technology, trade, law and political careers.

Table 104: Concurrent Interests of Civil Service-Interested Students

	% Law Students	% Overall Students	% Change
TCH	13%	14%	94%
EPS	30%	18%	170%
CIT	37%	23%	158%
BUS	48%	41%	118%
TRA	42%	14%	302%
MdP	30%	24%	124%
MdS	28%	21%	135%
LAW	50%	23%	215%
ART	30%	32%	94%
SRV	22%	19%	112%
SCL	27%	19%	138%
CVL	N/A	N/A	N/A
CTY	25%	4%	663%
POL	11%	5%	240%

Art

For art-interested students, the null hypothesis is supported in all occupational interest areas.

Table 105: Concurrent Interests of Art-Interested Students

	% Law Students	% Overall Students	% Change
TCH	16%	13%	121%
EPS	20%	20%	103%
CIT	30%	23%	128%
BUS	44%	41%	108%
TRA	16%	20%	83%
MdP	26%	25%	105%
MdS	22%	22%	103%
LAW	30%	26%	115%
ART	N/A	N/A	N/A
SRV	26%	17%	157%
SCL	23%	20%	115%
CVL	15%	16%	93%
CTY	8%	7%	120%
POL	6%	5%	117%

3.6 Analysis of Career Aspirations by Parental Occupation

It was conjectured that the occupations of the parents of a student would have an effect on that student's interests. Being exposed to someone who works in a field and having the ability to meet people in a field and receive guidance from someone close to you was thought to have the effect of increasing a student's interest in that field.

3.6.1 Parental Occupation: Teaching

The first group of students analyzed was those students who had a parent, either their father or mother in a teaching profession. This group included 39 males and 41 females, for a total of 80 students. The following chart shows their interests:

Table 106: Interests of Students with a Parent in the Teaching Profession

Occupational Interest Area	% Interest	Avg. % Interest
Teaching	18.8%	13.7%
Engineering/Physical Science	17.6%	19.9%
Computers/IT	20.0%	25.3%
Business	47.5%	41.8%
Trade	15.0%	18.5%
Medical Practice	21.3%	24.9%
Medical Support	25.1%	21.8%
Law	23.8%	27.7%
Art	30.1%	31.3%
Service Industry	21.3%	19.8%
Social Services	21.3%	20.5%
Civil Services	18.8%	16.0%
City Administration	8.8%	7.3%
Political Office	3.6%	5.7%

As expected, students with either parent in teaching are more likely to be interested in pursuing a teaching career. This can be seen by comparing the percentage of students with parents in teaching which show a high interest in teaching (2nd column; 1st column shows career) to the percentage of the entire student body who have an interest in teaching (3rd column). These students also show a high interest in other government related jobs such as city administration and civil services.

Careers which these students show less of an interest in include many of the technical and high prestige careers. They are less likely to have a high interest in engineering/physical science, computers/IT, trade, medical practice and law. Also interestingly, they are much less likely to have a high interest in running for political office. This is interesting due to the fact that they are more likely to be interested in other government related jobs like city administration and civil services. This is likely

because teachers have a different relation to how a city is run than someone in politics. Their children likely know that they can make a difference in their community in other ways, and are more likely to want to go into a career like city administration or civil services to make that difference.

3.6.2 Parental Occupation: Technical Careers

This next table shows the interests of students with a parent in a technical career (engineering, physical science or computers). This group includes 57 students, 31 males and 26 females.

Table 107: Interests of Students with a Parent in a Technical Career

Occupational Interest Area	% Interest	Avg. % Interest
Teaching	7.1%	13.7%
Engineering/Physical Science	22.8%	19.9%
Computers/IT	42.1%	25.3%
Business	43.9%	41.8%
Trade	10.6%	18.5%
Medical Practice	29.8%	24.9%
Medical Support	26.3%	21.8%
Law	26.2%	27.7%
Art	31.6%	31.3%
Service Industry	22.8%	19.8%
Social Services	21.1%	20.5%
Civil Services	15.8%	16.0%
City Administration	7.0%	7.3%
Political Office	8.8%	5.7%

Again, to clarify, for each of the careers listed in the rows, the first percentage listed is the percentage of students with a parent in a business occupation who is also interested in that career. The last row shows the percentage of all of the students, regardless of the occupation of their parents, who are interested in that career.
As expected, these students are more likely to be interested in technological careers like engineering/physical science and computers. They are more likely to be interested in computers than physical science, however. These students also show interest in medical careers, perhaps because their families have the resources to put them through many years of medical school. Also, interestingly, these students show a very high likelihood of being interested in politics.

On the other hand, these students show very little interest in pursuing two career paths, teaching and trade. Students whose parents work in technological career are approximately half as likely to be interested in either of these two areas. The lack of

interest in trade can be attributed to class status most likely. A student with a parent in technology probably has the resources to pursue a more prestigious career than an electrician or plumber. The disinterest in teaching is more perplexing, and at this time the group has no hypothesis to explain this phenomenon.

3.6.3 Parental Occupation: Business Related Careers

The interests of students whose parents are in business related occupations (ownership, management, etc.) were also considered. The following chart shows these interests.

Table 108: Interests of Students with a Parent in a Business-Related Occupation

Occupational Interest Area	% Interest	Avg. % Interest
Teaching	13.6%	13.7%
Engineering/Physical Science	20.4%	19.9%
Computers/IT	19.0%	25.3%
Business	45.6%	41.8%
Trade	19.7%	18.5%
Medical Practice	26.5%	24.9%
Medical Support	21.1%	21.8%
Law	32.6%	27.7%
Art	38.7%	31.3%
Service Industry	19.1%	19.8%
Social Services	24.5%	20.5%
Civil Services	18.3%	16.0%
City Administration	10.9%	7.3%
Political Office	8.2%	5.7%

For the most part, these students (which include 69 males and 78 females) have a range of interests very typical to the entire population. This is probably due to the fact that the category business is quite broad, so the parent's of these students could be doing many things, from owning a used car dealership to managing a manufacturing plant. In addition, the sample size of students who have parent's in business is very large, leading to some homogenization of their interests. Several exceptions to this rule are evident. For one, they are more likely to be interested in both city administration and in running for political office. This is probably due to the fact that business and management are very similar to those two aforementioned jobs in many ways. All involve leadership skills and are very interpersonal.

On the other hand, these students are much less interested in computers/IT than usual. This is really the only interest which these students seem significantly less interested than the Worcester Public School students as a whole.

3.6.4 Parental Occupation: Medical Career

The next set of students analyzed is those with a parent in a medical career, either a practicing physician or in support, such as a nurse. 111 students fit this description, 59 males and 52 females. The following chart shows their interests.

Table 109: Interests of Students with a Parent in a Medical Career

Occupational Interest Area	% Interest	Avg. % Interest
Teaching	19.8%	13.7%
Engineering/Physical Science	22.5%	19.9%
Computers/IT	24.3%	25.3%
Business	50.4%	41.8%
Trade	16.2%	18.5%
Medical Practice	29.7%	24.9%
Medical Support	27.0%	21.8%
Law	36.0%	27.7%
Art	32.4%	31.3%
Service Industry	21.6%	19.8%
Social Services	18.9%	20.5%
Civil Services	15.3%	16.0%
City Administration	9.0%	7.3%
Political Office	8.1%	5.7%

These students show above average interest in the medical field, both practice and support. This is expected, for the same reasons discussed for other careers. Beyond this, the students also show above average interest in teaching, law and political office. This may once again be a function of class status; with children of parents who work in medical fields probably have the resources to pursue many career options. These students have a slightly lesser chance of being interested in trade occupations (class status again?), but these are really the only careers which show that trend.

3.6.5 Parental Occupation: Trade Occupation

The final set of students analyzed is those 108 students (68 male, 40 female) which have a parent/guardian who works in a trade occupation. This chart shows their interests.

Table 110: Interests of Students with a Parent in a Trade Occupation

Occupational Interest Area	% Interest	Avg. % Interest
Teaching	15.7%	13.7%
Engineering/Physical Science	26.9%	19.9%
Computers/IT	33.3%	25.3%
Business	39.8%	41.8%
Trade	25.0%	18.5%
Medical Practice	22.2%	24.9%
Medical Support	21.3%	21.8%
Law	33.3%	27.7%
Art	37.0%	31.3%
Service Industry	16.6%	19.8%
Social Services	15.8%	20.5%
Civil Services	24.1%	16.0%
City Administration	8.4%	7.3%
Political Office	9.2%	5.7%

These students are more interested in going into trade occupations, engineering/physical science, civil service, art and political office. This shows a wide variety of interests, but once again the important point to see is that interest in trade went up. Also notable is that interest in civil services increased with a parent in a trade occupation. This same trend is noted in other areas, as students who are interested in trade are also often interested in civil services. Interest in political office may be explained by their parent's involvement in worker's unions, which are often active politically.

The careers which these students show less than average interest in are the medical fields, business and especially service industry and social services.

3.6.6 Gender Specific Parental Occupation Analysis

The previous analysis applied to students and parents as a whole. This can give an idea of the trends which are occurring. Another analysis which was looked at was the father-son relationship. This was analyzed by looking at the interests of only men whose fathers are in select occupations. The occupations analyzed for this purpose were engineering/physical science, trade and manufacturing/labor.

Males With Fathers in a Technical Career

Males whose fathers work in a technical career show an overwhelming likelihood to be interested in those careers, as can be seen in the following chart. In this chart and the next several following, the percentage columns refer to the percentages of only males with the selected father's occupation. This increase was expected, but was not found above in females with a parent in a technical career. These females show above

average interest in engineering/physical science, but unlike boys they are less interested than average in pursuing a computer/IT job.

Table 111: Interests of Male Students with a Father in a Technical Career

Occupational Interest Area	% Interest	Avg. % Interest
Teaching	15.7%	13.7%
Engineering/Physical Science	26.9%	19.9%
Computers/IT	33.3%	25.3%
Business	39.8%	41.8%
Trade	25.0%	18.5%
Medical Practice	22.2%	24.9%
Medical Support	21.3%	21.8%
Law	33.3%	27.7%
Art	37.0%	31.3%
Service Industry	16.6%	19.8%
Social Services	15.8%	20.5%
Civil Services	24.1%	16.0%
City Administration	8.4%	7.3%
Political Office	9.2%	5.7%

In addition to being interested in technical careers, these students also are interested in Medical Support and especially in Political Office. These males are more than twice as likely to have high interest in Political Office as the male population of the survey as a whole. A small increase in interest in City Administration corresponds with this increased interest in Political Office.

These males have very below average interest in two careers: teaching and trade. These men are probably looking to follow their father's footsteps into a more prestigious and lucrative career, which trade occupations and teaching are not.

The sample size of this population is only 24 males, but the trends which are prevalent (more interest in technical careers) should extend to larger populations, since they correspond with trends found in students as a whole who have a parent in a technical career (see above in this section).

Males With Fathers in Trade Occupations

Males with fathers in a trade occupation were also analyzed. This applies to 55 males in the Worcester Public School sample at this time. The next chart shows their interests.

Table 112: Interests of Male Students with a Father in a Trade Occupation

Occupational Interest Area	% Interest	Avg. % Interest
Teaching	10.9%	13.7%
Engineering/Physical Science	38.2%	19.9%
Computers/IT	43.6%	25.3%
Business	32.7%	41.8%
Trade	36.3%	18.5%
Medical Practice	12.8%	24.9%
Medical Support	9.1%	21.8%
Law	27.2%	27.7%
Art	38.1%	31.3%
Service Industry	9.1%	19.8%
Social Services	9.1%	20.5%
Civil Services	34.5%	16.0%
City Administration	9.1%	7.3%
Political Office	9.1%	5.7%

These students are somewhat more likely to also be interested in pursuing a career in a trade occupation. Their interest in trade does not show as much of an increase over the average as the increases in some of the other occupations. These students also show much more interest than average in art, civil service and interestingly, political office.

Males With Father in Manufacturing or Labor

Males with a father who works in manufacturing/labor are also interested in pursuing trade occupations and political office, similar to those men whose father works in a trade occupation. The line between many manufacturing jobs and a trade occupation is a difficult one to draw, and may account for many of the similarities in the interests of these two groups of males. The interests if these students are included in the following chart:

Table 113: Interests of Male Students with a Father in a Manufacturing/Labor Job

Occupational Interest Area	% Interest	Avg. % Interest
Teaching	9.6%	13.7%
Engineering/Physical Science	21.1%	19.9%
Computers/IT	40.4%	25.3%
Business	48.1%	41.8%
Trade	40.4%	18.5%
Medical Practice	9.6%	24.9%
Medical Support	11.5%	21.8%
Law	28.8%	27.7%
Art	30.8%	31.3%
Service Industry	7.7%	19.8%
Social Services	9.6%	20.5%
Civil Services	27.0%	16.0%
City Administration	9.6%	7.3%
Political Office	9.6%	5.7%

An interesting phenomenon to note is that despite the aforementioned similarities, when compared to males whose father works in a trade occupation, this group shows a much lesser likelihood of being interested in engineering/physical science and in medical practice. This is likely motivated largely by economics, as a technical or medical education are among the most expensive one can pursue, and the resources to pay for this are probably not there for these males.

Many other analyses are possible relating to parental occupations to the interests of their children. Unfortunately, due to time and manpower constraints, not all of the possible relationships were able to be analyzed. Hopefully, the analyses that were performed can give an indication of overall trends that may apply to the population as a whole. Further analysis in this area would be interesting, but is not practical at this point.

4. Applications of Survey

To demonstrate the use of the survey beyond analysis, two groups of students with counter stereotypical aspirations were selected from the data set: females interested in politics and community outreach and students interested in engineering and science. The research team utilized existing programs as well as developed programs to encourage the students' aspirations. The research team also proposed future programs and projects to continue the study.

4.1 Young Women of Consequence Award

The ACSW's Annual Young Women of Consequence Award is given to a young, female Worcester resident who demonstrates exceptional leadership and has made a tangible contribution to society. One of the primary reasons for the survey initiative was the award's low number of applicants. Therefore, each aspect of the award was analyzed and further developed.

Award Changes

In previous years, the award was given based on the action of a recommending sponsor, usually a guidance counselor or teacher. The sponsor was responsible for sending in a letter of recommendation for appropriate candidates. (See Appendix E) These letters were the only criteria used to judge these candidates. After consideration, the group decided that recommendation letters on their own did not give enough information to select a recipient who demonstrates outstanding leadership skills and community outreach. At the request of the committee, the group developed a new award format. (See Appendix E)

The new award format was modeled after a college application. The award candidate would have to include a personal statement, list of extracurricular activities, transcripts and a letter of recommendation in their application. Not only does this format allow the student to become more involved in the award, but it demonstrates student initiative. As an award that recognizes the student's leadership, students should be able to organize their own application to seek the award, and the application should reflect their initiative rather than that of others. The new application does this by requiring the student to initiate the process themselves.

The resulting application materials gave the committee more insight into the strengths and interests of the candidates, better enabling them to make an appropriate

choice. With these new materials, the candidates were able to evaluate the students by analyzing their own words, in addition to the words of those recommending them.

It was also suggested that in the future the committee increase the publicity of the award, both prior to and after selecting the award recipient. Before the award deadline, announcements should be made during homeroom periods, student council meetings and meetings for community-outreach clubs (i.e. Amnesty International). Applications should be readily available to students, through both their guidance counselors and related-club advisors. If more students are made aware of the award, it is likely that more will apply.

To publicize the award recipient, an announcement should be made in the Worcester newspapers and in the public schools. There should also be a luncheon or small award ceremony that all the candidates are invited to. This will allow the candidates to network with females with similar interests and goals. The post-award publicity will attract more applicants in the future because they will see the benefit to applying for, and possibly receiving, the award.

Selecting Candidates

Because the above suggestions were made so close to the application distribution date, the committee could not publicize the award prior to the deadline. Therefore, appropriate candidates were selected from the survey data set to ensure an increased number of applicants.

Female students who were 'very interested' (interest level of 5/5) in politics or city administration were chosen along with female students who were involved in extracurricular activities such as student government, Amnesty International, Model Congress and mentoring programs. From the survey identification number, we were able to identify the students' local identification number. Applications were designated to specific students and delivered to the schools, ensuring that qualified students had knowledge of the award and a chance to apply. The process was fairly effective; although, not all promising potential applicants followed through.

4.2 GEMS/STRIVE

Worcester Polytechnic Institute (WPI) offers outreach programs for high school students interested in engineering, math and science. Two of these programs, Girls in Engineering, Math and Science (GEMS) and Strive, are specifically for groups underrepresented in engineering, females and African American, Latino and American Indian students respectively.

The week-long programs give high schools students the opportunity to "explore engineering, math and science, learn about the importance of these fields and learn why these fields are important, and discover how professionals use their knowledge to help people and change the world (WPI, 2005)."

Female students who were 'very interested' (interest level of 5/5) in engineering/physical science or computers/IT were chosen as potential applicants for GEMS, and all students who were 'very interested' (interest level of 5/5) in engineering/physical science or computers/IT and underrepresented (ethnicity response of African American, Hispanic or Other), were chosen as potential applicants for STRIVE. Applications were designated to specific students and delivered to the schools, ensuring that qualified students had knowledge of the programs and a chance to apply.

4.3 FACES@*WPI*

The research team took a particular interest in the high school students, specifically females, who indicated interest in careers in engineering and science. To encourage them to pursue this interest, the group, with the help of the WPI Admissions, developed FACES@*WP* (Females Aspiring to Careers in Engineering and Science),an outreach program to be held at WPI.

Originally, the group had intended to work with the high school guidance counselors to gather all the interested students at each school for a WPI admissions presentation. After meeting with Jennifer Cluett, the Associate Director of the Admissions Department, it was established that WPI Admissions already sends representatives to each school to meet with interested seniors. The data set, however, was able to identify juniors, and therefore could be used in novel forms as a means of attracting future applicants. Ms. Cluett suggested that the research team arrange for the students to come to WPI for tours, lunch and an information session. The research team considered Ms. Cluett's suggestion and then expanded upon it.

Initial Impediments

The research team came up with the concept of an outreach for females interested in careers in engineering and science. Instead of organizing a WPI admissions event, the research team developed a proposal for a program that would include several admissions departments, guest speakers and student interaction (See Appendix E).

The research team encountered several problems in the initial organization of FACES. The primary problem was how to provide transportation for the Worcester Public School students. Other problems included inconsistencies with the sponsor and communication issues with the WPS.

It was unclear whether or not the Worcester Public School System or students' parents could transport them to and from WPI. After a discussion with Judy Thompson and Burt Vasquez, the research team assumed responsibility for transporting the students to WPI. Although there were several more impediments along the way, transportation was provided for the Worcester Public School students because of the initiatives made by Liz Tomaszewski and a donation from Phillip Clay, Dean of Student.

Prior to the discussion with Judy Thompson and Burt Vasquez, the Worcester Public School administration had not been entirely informed of the logistics of FACES. Although the administration was initially resistant to the idea based on the lack of the

communication, they quickly agreed to support the program as a field trip, allowing the students to miss school and ensuring the presence of chaperones. At the same time, the ACSW withdrew their endorsement of the event based on the issues with the Worcester Public Schools as well as the fast pace organization required to coordinate the event. Despite these complications, the research team continued to develop FACES, and as the potential success of the program became apparent, the ACSW re-offered sponsorship of the program.

Agenda of FACES@*WPI*

In order to emphasize that FACES was more than a program established for WPI recruitment, the research team carefully organized the events of the day (See Appendix E). Students and chaperones received information related to females in engineering.

Admissions Presentations

The research team contacted the admissions departments of local universities offering science curriculums to present at FACES. Representatives came from Clark University, College of the Holy Cross and Worcester Polytechnic Institute and spoke about the academics, science and engineering programs and campus life of their respective schools. Admissions materials from each school were also distributed to the students

Professional Speakers

The research team also contacted the Society of Women Engineers about having a professional female engineer speak about her experiences as a female engineer. The Society of Engineers, Hartford Branch, recommended Qing Huo, a female engineer and business woman who owns several robotic-related engineering firms with her husband. Professionals were also contacted through the Women in Industry Network at Worcester Polytechnic Institute. Sara Campbell, a civil engineering consultant responded to the research team and also spoke to the Worcester Public High School juniors who attended FACES.

Facilities Tours

The research team also wanted to the give the participants of FACES a first-hand experience of what engineers can do. They developed a series of laboratory tours and demonstrations to show practical applications of engineering. The facilities tour included a robotics demonstration, by Professor Ken Stafford, and tour of the Fire Protection Engineering Laboratory, by Randall Harris, and tour and demonstration of the Rehabilitation Laboratory, by Professor Allen Hoffman.

Lunch with Current WPI Students

The last event of the day was lunch with current WPI students. This provided a casual setting where the Worcester Public School females could ask the Worcester Polytechnic Institute students about college applications and academics and campus life at Worcester Polytechnic Institute.

FACES@*WPI* Mentoring Program

Each Worcester Public School student who attended FACES was assigned a Worcester Polytechnic Institute student to serve as their mentor for the upcoming school year ('05-'06). The mentors were available to the students via telephone and e-mail to answer questions about college applications and academics, specifically regarding applications to schools with engineering and science programs. In addition, the Worcester Public School students would be notified about any relevant admissions programs, related to engineering and science.

The FACES Mentoring Program required the recruitment of approximately 40 Worcester Polytechnic Institute students as well the permission to distribute the Worcester Public School students' contact information.

Student and Chaperone Feedback

The success of FACES was determined by the feedback from the students and the chaperones (in most cases the chaperones were guidance counselors). Feedback forms were distributed to the students and chaperones during the program (See Appendix E). Overall, the feedback from both the students and the chaperones was positive and constructive.

4.4 Future Programs and Projects

The research team and project advisors had many ideas for applications of the aspirations survey. However, given the time constraints of the study, all of the programs could not be completed. The following are descriptions of proposed projects and programs for the upcoming school year ('05-'06). These projects and programs will continue and expand upon the work of the current research team. The research team anticipates that the ACSW will organize two programs for students interested in gender-non-stereotypic careers. They also anticipate several more Worcester Polytechnic Institute projects originating from the study as well as the continuation of the original aspirations study.

ACSW Sponsored Programs

Young Women in Politics and Public Policy Day

In the past, the ACSW had tried to develop a program for high school-aged young women in Worcester who were interested in politics and public policy, but the program did not move past the conceptual phase. Therefore, the group was recruited to assist in the execution of the program. A preliminary proposal had been drafted by the committee in the fall of 2004, but required further development. (See Appendix E)

The original program called for as many as twenty female Worcester high school students to spend a day with various members of the city administration, including the Mayor, City Manager and female administration members. Parents, guidance counselors or teachers could nominate any student to take part in this program, and the ACSW would select participants based on their leadership, academic standing and character. The day's events would include breakfast with the Mayor and City Manager, a tour of City Hall, lunch with various female political leaders or activists, a simulation of a City Council meeting and a one-on-one shadow.

Program for Young Men Interested in a Non-Stereotypic Career

The research team also anticipates that the ACSW will organize a program for males who are interested in a female-dominated career, such as nursing, teaching or the social services. This program has not been developed further than the initial concept; however, the research team believes it is a valuable idea that will be realized sometime during the next school year (05'-06').

Other Programs and Worcester Polytechnic Institute Projects

Initiative at Accelerated Learning Laboratory

The research team was intrigued in the survey responses to the students at the Accelerated Learning Laboratory; the students at A.L.L. indicated a high interest in a large number of occupational interest areas as well as concern in many of the career and college-related areas. Based on their responses, the research team thinks that the students at A.L.L. could benefit from a program that could help them focus and combine their interests as well as alleviate their concerns. The research team proposes a year-long initiative for a program for the Class of 2007 at A.L.L. (See Appendix E)

Engineering Initiative

Margarita DelGado, Head of Guidance of North High School, has requested that several WPI students spend some time to coach certain North High School students on how to successfully apply to selective technical schools, like WPI. The research team proposes that a future research team survey the sophomore class in the early fall to identify students interested in careers in engineering and physical science. Once those students are identified the future research team could design a year-long program that would assist them in preparing their applications.

Private School Gender Comparison

As an extension of the aspirations study, St. John's High School and Notre Dame Academy would be surveyed. This would allow a future research team to examine the impact of single-sex schools on the aspirations of men and women.

5. Conclusions

The research team successfully fulfilled all of the objectives of the project. They drafted a succinct, yet effective survey to obtain information on the aspirations of the students in the Worcester Public High Schools Class of 2006. They also developed connections with guidance counselors at each of the seven public high schools, which benefited both the distribution of the survey and its applications.

The research team created a database which has the ability to identify any of the students in the survey sample, based on their aspirations. With the creation of the database, the research team was able to analyze different aspects of the Worcester Public High Schools. They found that gender stereotypes still exist in the Worcester Public Schools, with only a few exceptions. These exceptions occurred in the occupational interest areas of politics, business, medical practice and law, where females are beginning to become more interested. The research team found that ethnic stereotypes also prevail in the Worcester Public Schools, with regard to career aspirations as well as career-related concerns.

The research team was able to critically evaluate the effectiveness of the cluster system within the seven Worcester Public High Schools and found that the clusters were unsuccessful in gathering students with similar interests, with the exception of Worcester Vocational's program for students interested in trade-related careers. They also found that gender stereotypes exist to different degrees at each of the schools. It appears that some schools encourage males and females equally in most occupational interest areas, where some do not.

The research team also demonstrated that the database has practical applications through the Young Woman of Consequence Award and FACES@*WPI*. They were also able to use the database to inform students about the G.E.M.S. and Strives programs at Worcester Polytechnic Institute.

Finally, the research team presented the results of the analyses to the ACSW and the Worcester Public High School Guidance Department (See Appendix F). The research team hopes that both of these organizations will take the results of the survey seriously and will make recommendations and develop policy to correct some of the unbalances within career aspirations.

The research team considers every aspect of the project a success, based on the interest in further generations of the survey as well as the development of related programs and projects.

References

"Arts and Humanities" (2005). South High Community School. <http://www.wpsweb WPI "Allied Health & Human Services" (2005). Worcester Vocational High School. <http://voke.us/index_files/page0002.htm > Accessed on February 21, 2005.

"Alden Design & Engineering" (2005). Worcester Vocational High School. <http://voke.us/index_files/page0001.htm > Accessed on February 21, 2005.

"Coughlin Construction Technology" (2005). Worcester Vocational High School. <http://voke.us/index_files/page0003.htm > Accessed on February 21, 2005.

"Current Population Survey" (2003). Bureau of Labor Statistics.

Darling-Hammond, L. (1997). *The Right to Learn: A Blueprint for Creating Schools That Work*. San Francisco: Jossey-Bass.

"Directory Profiles" (2005). Massachusetts Department of Education. <http://profiles.doe.mass.edu/home.asp?mode=o&so=-&ot=5&o=1906&view=enr> Accessed on April 1, 2005.

"Education, Service and Government" (2005). South High Community School. <http://www.wpsweb.com/southhigh/education_service_and_government.htm> Accessed on February 21, 2005.

"Engineering & Technology Academy" (2005). Doherty Memorial High School. <http://www.wpsweb.com/doherty/home.htm> Accessed on February 21, 2005.

Information Technology" (2005). South High Community School. <http://www.wpsweb.com/southhigh/information_technology.htm> Accessed on February 21, 2005.

"Information Technology & Business Services" (2005). Worcester Vocational High School. <http://voke.us/index_files/page0004.htm > Accessed on February 21, 2005.

K-12 Outreach.(2005) Accessed on February 16, 2005.

"Law & Government Program Accelerated Learning Laboratory Pre-Master Cluster" (2005). Accelerated Learning Laboratory. <http://www.wpsweb.com/all/WWW/Projects/law.html> Accessed on February 21, 2005.

Small Learning Communities" (2005). North High School. <http://www.wpsweb.com/north/pathways.htm> Accessed on February 21, 2005.

"School and Community Profile" (2005). Burncoat Senior High School. <http://www.wpsweb.com/burncoatsr/profile.htm> Accessed on February 21, 2005.

Appendix A: Aspirations Survey

Distributed Survey

Survey With Revisions

Appendix A1: Distributed Survey

Guidance Counselor: ID Number: / /
School:
Gender: ☐ Male ☐ Female
Ethnicity: ☐ African American ☐ Asian ☐ Caucasian ☐ Hispanic
☐ Other (specify) _____

Parents'/Guardians' Occupations

Father: _____ Mother: _____ Other(s): _____

Indicate (by circling) your interest level in pursuing the following careers *(1 – no interest ... 5 – very interested)*

Don't let concerns about money/education/parental approval/etc. limit your response.

Teaching	1	2	3	4	5
Engineering/Physical Science	1	2	3	4	5
Computers/Information Tech	1	2	3	4	5
Business (Management, Ownership, etc.)	1	2	3	4	5
Trade (Plumber, Electrician, etc)	1	2	3	4	5
Medical Practice (M.D, Dentist, Vet., Psych)	1	2	3	4	5
Medical Support (Nurse, Med. Technician, etc.)	1	2	3	4	5
Law	1	2	3	4	5
Art (Music, Drama, Fine Arts, etc.)	1	2	3	4	5
Service Industry (Retail, Beauty, Hotel, Restaurant)	1	2	3	4	5
Social Services (Social Worker, Therapist, etc.)	1	2	3	4	5
Civil Service (Police, Postal Worker, etc.)	1	2	3	4	5
City Administration (Mayor, City Manager, etc.)	1	2	3	4	5

Please list specific careers that you are interested in (list ALL that apply & use back for space if necessary):

How interested are you in running for political office? 1 2 3 4 5

If interested, would you consider a position in: ☐ city, ☐ state or ☐ national politics? (Check all that apply)

What are your plans directly after high school?

☐ 4-year college ☐ 2-year college (community college) ☐ Vocational/trade school
☐ Work ☐ Military ☐ Marriage & Family
☐ Other (specify) _____

Is there anything that would prevent you from pursuing a career interest? (Check only those that apply)

- People of my gender don't usually…
  ☐ go into that field ☐ get family support ☐ succeed in that field
- I doubt I'll be accepted to college because…
  ☐ my grades are too low ☐ my test scores are too low ☐ other _____
- I doubt I'll be attending college because …
  ☐ it's too expensive ☐ it's too demanding/difficult ☐ I dislike school
- I feel unprepared for my career interest because I don't know…
  ☐ anyone in that profession ☐ what education is required ☐ if I will succeed in that profession
- List any additional concerns _____

Turn Over

Check all extracurricular activities that you are currently involved in and list any leadership positions within them. (Check all that apply)

Activity	*Leadership Position*
☐ Academic Team	_____
☐ Amnesty International	_____
☐ AP Classes	_____
☐ Art Service Club	_____
☐ Athletics	_____
☐ Audio Technical Squad	_____
☐ Band	_____
☐ Black Student Union	_____
☐ Chess Club	_____
☐ Chorus	_____
☐ Computer Club	_____
☐ Cultural-Related Club	_____
☐ Debate Team	_____
☐ Drama	_____
☐ Engineering Club	_____
☐ Fine Arts Club	_____
☐ Future Business Leaders of America	_____
☐ Future Teachers Club	_____
☐ Gay-Straight Alliance	_____
☐ International Club	_____
☐ Language Clubs	_____
☐ Math Club	_____
☐ Model Congress	_____
☐ Mock Trial Team	_____
☐ National Honor Society	_____
☐ Peer Mediation	_____
☐ Peer Mentors	_____
☐ Peer Tutors	_____
☐ ROTC	_____
☐ School Newspaper	_____
☐ School Website Team	_____
☐ Science Club	_____
☐ Students Against Drunk Driving	_____
☐ Student Council	_____
☐ Yearbook Committee	_____

Appendix A2: Survey With Revisions

Guidance Counselor: School ID #:

School:

Gender: ☐ Male ☐ Female

Ethnicity: ☐ African American ☐ Asian ☐ Caucasian ☐ Hispanic

☐ Other (specify) _____

Parents'/Guardians' Occupations

Father: _____ Mother: _____ Other(s): _____

Indicate (by circling) your interest level in pursuing the following careers *(1– no interest … 5 – very interested)*

Don't let concerns about money/education/parental approval/etc. limit your response.

Teaching	1	2	3	4	5
Engineering/Physical Science	1	2	3	4	5
Computers/Information Tech	1	2	3	4	5
Business (Management, Ownership, etc.)	1	2	3	4	5
Trade (Plumber, Electrician, etc)	1	2	3	4	5
Medical Practice (M.D, Dentist, Vet., Psych)	1	2	3	4	5
Medical Support (Nurse, Med. Technician, etc.)	1	2	3	4	5
Law	1	2	3	4	5
Art (Music, Drama, Fine Arts, etc.)	1	2	3	4	5
Service Industry (Retail, Beauty, Hotel, Restaurant)	1	2	3	4	5
Social Services (Social Worker, Therapist, etc.)	1	2	3	4	5
Civil Service (Police, Postal Worker, etc.)	1	2	3	4	5
City Administration (Mayor, City Manager, etc.)	1	2	3	4	5

Please list specific careers that you are interested in (list ALL that apply & use back for space if necessary):

How interested are you in running for political office? 1 2 3 4 5

If interested, would you consider a position in: ☐ city, ☐ state or ☐ national politics? (Check all that apply)

What are your plans directly after high school?

☐ 4-year college ☐ 2-year college (community college) ☐ Vocational/trade school

☐ Work ☐ Military ☐ Marriage & Family

☐ Other (specify) _____

Is there anything that would prevent you from pursuing a career interest? (Check only those that apply)

- People of my gender don't usually…
  - ☐ go into that field ☐ get family support ☐ succeed in that field
- I doubt I'll be accepted to college because…
  - ☐ my grades are too low ☐ my test scores are too low ☐ other _____
- I doubt I'll be attending college because …
  - ☐ it's too expensive ☐ it's too demanding/difficult ☐ I dislike school
- I feel unprepared for my career interest because I don't know…
  - ☐ anyone in that profession ☐ what education is required ☐ if I will succeed in that profession
- List any additional concerns_____

Comment [I1]: Find some way to convey the idea of occupation instead of name (perhaps bold the word occupation)?

Comment [I2]: Perhaps look over the BLS data and see what careers we might be missing.

Comment [I3]: All of the numbers need to be appropriately defined, according to the scale that we set. I can get that information for you.

Comment [I4]: Delete

Comment [I5]: Make a category for communications or something like that
Split art between visual arts and aural arts as well as distinguish between writer and journalist

Comment [I6]: Split into 2 categories

Comment [I7]: Delete "Computers" or refine and create several categories out of one

Comment [I8]: Split up based on years of school

Comment [I9]: Split up based on music/theatre/fine arts

Consider a category/prompt for writers

Comment [I10]: Add category for national politics as well as political office

Comment [I11]: Add category for communications, journalists

Comment [I12]: Delete; unnecessary for our "new" purposes

Comment [I13]: Break up into 4 year public & private

Comment [I14]: Break up into 2 year public & private

Comment [I15]: This section needs to be entirely reworded. Students didn't understand at all that we were looking for the influence of gender stereotypes. Males & females checked it off in equal proportion and there was no correlation between the students who checked it off and the gender stereotypes associated with careers.

Check all extracurricular activities that you are currently involved in and list any leadership positions within them. (Check all that apply)

Activity	*Leadership Position*
☐ Academic Team	
☐ Amnesty International	
☐ AP Classes	
☐ Art Service Club	
☐ Athletics	
☐ Audio Technical Squad	
☐ Band	
☐ Black Student Union	
☐ Chess Club	
☐ Chorus	
☐ Computer Club	
☐ Cultural-Related Club	
☐ Debate Team	
☐ Drama	
☐ Engineering Club	
☐ Fine Arts Club	
☐ Future Business Leaders of America	
☐ Future Teachers Club	
☐ Gay-Straight Alliance	
☐ International Club	
☐ Language Clubs	
☐ Math Club	
☐ Model Congress	
☐ Mock Trial Team	
☐ National Honor Society	
☐ Peer Mediation	
☐ Peer Mentors	
☐ Peer Tutors	
☐ ROTC	
☐ School Newspaper	
☐ School Website Team	
☐ Science Club	
☐ Students Against Drunk Driving	
☐ Student Council	
☐ Yearbook Committee	

Appendix B: Board of Education Data

Enrollment by Gender (2004-05)

Enrollment by Race/Ethnicity (2004-05)

Appendix B1: Enrollment by Gender (2004-2005)

Table B.1: Gender of Survey Respondents: ALL

	Sample #	Sample %	DOE %
Male	12	48%	50%
Female	13	52%	50%
Total	25		

Table B.2: Gender of Survey Respondents: Burncoat

	Sample #	Sample %	DOE %
Male	66	43%	48%
Female	86	56%	52%
Total	154		

Table B.3: Gender of Survey Respondents: Doherty

	Sample #	Sample %	DOE %
Male	109	51%	50%
Female	91	43%	50%
Total	214		

Table B.4: Gender of Survey Respondents: North

	Sample #	Sample %	DOE %
Male	85	42%	52%
Female	101	50%	48%
Total	201		

Table B.5: Gender of Survey Respondents: South

	Sample #	Sample %	DOE %
Male	109	49%	53%
Female	91	41%	47%
Total	223		

Table B.6: Gender of Survey Respondents: University Park

	Sample #	Sample %	DOE %
Male	10	40%	46%
Female	15	60%	54%
Total	25		

Table B.7: Gender of Survey Respondents: Worcester Vocational

	Sample #	Sample %	DOE %
Male	100	61%	55%
Female	59	36%	45%
Total	164		

Appendix B2: Enrollment by Ethnicity/Race (2004-2005)

Table B.8: Ethnicity/Race of Survey Respondents: ALL

	Sample #	Sample %	DOE %
African American	4	16%	11%
Asian	7	28%	11%
Caucasian	4	16%	31%
Hispanic	10	40%	46%
Other	0	0%	0%
Total	25		

Table B.9: Ethnicity/Race of Survey Respondents: Burncoat

	Sample #	Sample %	DOE %
African American	23	15%	16%
Asian	5	3%	4%
Caucasian	85	55%	51%
Hispanic	29	19%	28%
Other	18	12%	1%
Total	154		

Table B.10: Ethnicity/Race of Survey Respondents: Doherty

	Sample #	Sample %	DOE %
African American	38	18%	14%
Asian	17	8%	8%
Caucasian	117	55%	55%
Hispanic	34	16%	23%
Other	8	4%	1%
Total	214		

Table B.11: Ethnicity/Race of Survey Respondents: North

	Sample #	Sample %	DOE %
African American	35	17%	18%
Asian	19	9%	8%
Caucasian	70	35%	44%
Hispanic	58	29%	30%
Other	19	9%	0%
Total	201		

Table B.12: Ethnicity/Race of Survey Respondents: South

	Sample #	Sample %	DOE %
African American	34	15%	14%
Asian	25	11%	12%
Caucasian	88	39%	39%
Hispanic	53	24%	36%
Other	23	10%	0%
Total	223		

Table B.13: Ethnicity/Race of Survey Respondents: University Park

	Sample #	Sample %	DOE %
African American	4	16%	9%
Asian	4	16%	18%
Caucasian	8	32%	39%
Hispanic	9	36%	35%
Other	0	0%	0%
Total	25		

Table B.14: Ethnicity/Race of Survey Respondents: Worcester Vocational

	Sample #	Sample %	DOE %
African American	17	10%	7%
Asian	2	1%	1%
Caucasian	79	48%	55%
Hispanic	58	35%	36%
Other	8	5%	1%
Total	164		

Appendix C: Bureau of Labor Statistics Information

Bureau of Labor Statistics Current Population Survey (2003)

Occupational Interest Area Correlations

Statistical Correlations

HOUSEHOLD DATA
ANNUAL AVERAGES

39. Median weekly earnings of full-time wage and salary workers by detailed occupation and sex

(Numbers in thousands)

Occupation	2003					
	Both sexes		Men		Women	
	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings
Total, 16 years and over	100,302	$620	56,227	$695	44,076	$552
Management, professional, and related occupations	35,680	887	17,718	1,059	17,962	758
Management, business, and financial operations occupations	14,493	961	8,047	1,143	6,446	799
Management occupations	10,115	1,023	6,143	1,172	3,973	849
Chief executives	1,040	1,558	796	1,736	244	1,243
General and operations managers	662	1,136	490	1,170	173	966
Advertising and promotions managers	57	800	22	(1)	34	(1)
Marketing and sales managers	800	1,127	498	1,271	302	904
Administrative services managers	75	910	51	997	24	(1)
Computer and information systems managers	331	1,401	233	1,437	99	1,280
Financial managers	952	1,004	461	1,314	491	823
Human resources managers	246	971	85	1,242	161	872
Industrial production managers	269	1,046	224	1,135	45	(1)
Purchasing managers	168	1,108	102	1,297	65	844
Transportation, storage, and distribution managers	215	776	187	797	29	(1)
Farm, ranch, and other agricultural managers	92	631	81	655	11	(1)
Construction managers	352	1,014	329	1,016	23	(1)
Education administrators	646	981	235	1,172	411	878
Engineering managers	77	1,484	68	1,476	8	(1)
Food service managers	506	648	289	706	217	584
Lodging managers	97	687	43	(1)	54	609
Medical and health services managers	416	986	132	1,149	285	954
Property, real estate, and community association managers	316	722	140	849	176	638
Social and community service managers	258	788	94	848	163	770
Business and financial operations occupations	4,378	842	1,904	1,014	2,474	744
Wholesale and retail buyers, except farm products	163	737	90	812	73	670
Purchasing agents, except wholesale, retail, and farm products	207	784	99	873	108	718
Claims adjusters, appraisers, examiners, and investigators	258	735	97	868	161	648
Compliance officers, except agriculture, construction, health, safety, and transportation	126	887	63	1,062	63	783
Cost estimators	89	875	74	882	15	(1)
Human resources, training, and labor relations specialists	602	819	181	961	421	774
Management analysts	302	1,115	166	1,267	135	977
Accountants and auditors	1,344	862	561	1,041	784	756
Appraisers and assessors of real estate	54	765	36	(1)	19	(1)
Personal financial advisors	212	1,094	148	1,242	64	800
Insurance underwriters	102	752	29	(1)	72	683
Loan counselors and officers	385	786	158	1,115	227	668
Tax examiners, collectors, and revenue agents	73	711	25	(1)	48	(1)
Professional and related occupations	21,186	845	9,671	1,005	11,516	739
Computer and mathematical occupations	2,790	1,049	2,013	1,130	777	906
Computer scientists and systems analysts	614	1,001	428	1,073	186	869
Computer programmers	492	1,065	362	1,115	131	973
Computer software engineers	701	1,242	545	1,336	156	1,005
Computer support specialists	307	748	198	769	109	727
Database administrators	71	1,073	41	(1)	30	(1)
Network and computer systems administrators	166	979	126	1,007	41	(1)
Network systems and data communications analysts	291	1,045	229	1,113	62	817
Operations research analysts	104	1,022	54	1,145	50	955
Architecture and engineering occupations	2,487	1,053	2,142	1,094	345	827
Architects, except naval	118	1,013	87	1,131	30	(1)
Aerospace engineers	74	1,362	66	1,353	7	(1)
Chemical engineers	76	1,250	62	1,289	15	(1)
Civil engineers	264	1,150	238	1,164	27	(1)
Computer hardware engineers	97	1,083	86	1,137	11	(1)
Electrical and electronics engineers	337	1,332	312	1,348	25	(1)
Industrial engineers, including health and safety	180	1,080	140	1,144	39	(1)
Mechanical engineers	268	1,168	256	1,174	12	(1)
Drafters	197	757	158	776	38	(1)
Engineering technicians, except drafters	382	792	301	821	81	569
Surveying and mapping technicians	62	651	51	632	11	(1)
Life, physical, and social science occupations	1,085	891	638	970	447	773
Biological scientists	91	874	50	876	41	(1)
Medical scientists	90	864	43	(1)	47	(1)
Chemists and materials scientists	126	948	82	997	44	(1)
Environmental scientists and geoscientists	71	1,018	49	(1)	22	(1)

See footnotes at end of table.

HOUSEHOLD DATA
ANNUAL AVERAGES

39. Median weekly earnings of full-time wage and salary workers by detailed occupation and sex — Continued

(Numbers in thousands)

Occupation	2003					
	Both sexes		Men		Women	
	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings
Market and survey researchers	105	838	40	(1)	65	739
Psychologists	86	996	27	(1)	58	938
Chemical technicians	73	818	55	859	19	(1)
Community and social services occupations	1,814	686	751	746	1,063	655
Counselors	514	666	175	690	339	657
Social workers	576	692	132	735	444	685
Miscellaneous community and social service specialists	265	647	90	761	174	611
Clergy	350	761	303	767	46	(1)
Directors, religious activities and education	53	662	21	(1)	33	(1)
Religious workers, all other	56	603	29	(1)	27	(1)
Legal occupations	1,024	1,051	491	1,480	533	796
Lawyers	584	1,560	400	1,619	184	1,413
Judges, magistrates, and other judicial workers	50	1,110	23	(1)	27	(1)
Paralegals and legal assistants	238	696	32	(1)	206	685
Miscellaneous legal support workers	152	657	36	(1)	116	653
Education, training, and library occupations	5,884	754	1,625	904	4,258	708
Postsecondary teachers	748	982	443	1,111	305	878
Preschool and kindergarten teachers	484	494	8	(1)	476	493
Elementary and middle school teachers	2,208	767	428	843	1,780	757
Secondary school teachers	1,009	856	469	903	540	824
Special education teachers	332	799	63	870	269	785
Other teachers and instructors	292	681	111	831	181	627
Librarians	142	797	21	(1)	122	789
Teacher assistants	580	351	53	422	527	344
Arts, design, entertainment, sports, and media occupations	1,473	745	836	837	637	648
Artists and related workers	80	860	56	929	24	(1)
Designers	479	727	252	818	227	619
Producers and directors	94	929	60	1,139	34	(1)
Athletes, coaches, umpires, and related workers	90	661	66	733	25	(1)
News analysts, reporters and correspondents	70	733	43	(1)	27	(1)
Public relations specialists	105	897	35	(1)	70	805
Editors	122	762	61	864	62	690
Writers and authors	72	815	30	(1)	42	(1)
Broadcast and sound engineering technicians and radio operators	72	845	70	853	2	(1)
Photographers	61	622	38	(1)	23	(1)
Healthcare practitioner and technical occupations	4,630	816	1,176	1,002	3,454	770
Dietitians and nutritionists	54	631	6	(1)	49	(1)
Pharmacists	156	1,477	82	1,533	74	1,364
Physicians and surgeons	531	1,405	364	1,677	167	989
Physician assistants	55	1,003	18	(1)	37	(1)
Registered nurses	1,829	899	179	1,006	1,650	887
Physical therapists	120	892	42	(1)	78	837
Respiratory therapists	72	737	35	(1)	37	(1)
Speech-language pathologists	67	867	3	(1)	64	868
Clinical laboratory technologists and technicians	233	751	65	810	168	738
Diagnostic related technologists and technicians	204	759	67	869	137	718
Emergency medical technicians and paramedics	109	662	78	683	31	(1)
Health diagnosing and treating practitioner support technicians	288	497	59	495	229	497
Licensed practical and licensed vocational nurses	401	587	22	(1)	380	584
Medical records and health information technicians	85	505	3	(1)	83	502
Service occupations	13,333	403	6,708	463	6,625	366
Healthcare support occupations	2,023	400	221	469	1,802	396
Nursing, psychiatric, and home health aides	1,285	377	141	438	1,144	372
Dental assistants	169	492	12	(1)	157	490
Protective service occupations	2,405	630	1,964	666	441	505
First-line supervisors/managers of police and detectives	123	904	98	920	25	(1)
Fire fighters	235	816	229	819	7	(1)
Bailiffs, correctional officers, and jailers	373	629	278	671	95	521
Detectives and criminal investigators	116	941	91	1,017	25	(1)
Police and sheriff's patrol officers	596	764	527	770	69	731
Private detectives and investigators	50	637	29	(1)	21	(1)
Security guards and gaming surveillance officers	652	445	500	468	151	387

See footnotes at end of table.

HOUSEHOLD DATA
ANNUAL AVERAGES

39. Median weekly earnings of full-time wage and salary workers by detailed occupation and sex — Continued

(Numbers in thousands)

Occupation	2003					
	Both sexes		Men		Women	
	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings
Food preparation and serving related occupations	3,819	349	1,933	373	1,886	326
Chefs and head cooks	241	463	199	490	42	(1)
First-line supervisors/managers of food preparation and serving workers	509	413	226	485	283	391
Cooks	1,149	334	697	348	452	317
Food preparation workers	305	320	152	334	152	310
Bartenders	183	408	93	466	89	361
Combined food preparation and serving workers, including fast food	125	316	29	(1)	96	319
Counter attendants, cafeteria, food concession, and coffee shop	80	276	28	(1)	51	271
Waiters and waitresses	775	335	247	385	528	318
Food servers, nonrestaurant	90	382	37	(1)	53	368
Dining room and cafeteria attendants and bartender helpers	152	331	87	353	66	306
Dishwashers	154	288	126	290	28	(1)
Hosts and hostesses, restaurant, lounge, and coffee shop	55	321	12	(1)	43	(1)
Building and grounds cleaning and maintenance occupations	3,280	390	2,123	421	1,157	329
First-line supervisors/managers of housekeeping and janitorial work	151	469	86	516	65	411
First-line supervisors/managers of landscaping, lawn service, and groundskeeping workers	111	626	108	628	3	(1)
Janitors and building cleaners	1,405	402	1,041	420	364	349
Maids and housekeeping cleaners	806	323	124	371	682	317
Pest control workers	58	528	53	542	4	(1)
Grounds maintenance workers	749	395	711	397	38	(1)
Personal care and service occupations	1,806	391	467	476	1,339	370
First-line supervisors/managers of gaming workers	87	590	51	685	36	(1)
First-line supervisors/managers of personal service workers	58	472	13	(1)	45	(1)
Gaming services workers	75	446	37	(1)	38	(1)
Hairdressers, hairstylists, and cosmetologists	307	390	21	(1)	286	381
Baggage porters, bellhops, and concierges	57	432	49	(1)	7	(1)
Transportation attendants	75	587	18	(1)	57	510
Child care workers	377	330	18	(1)	359	326
Personal and home care aides	270	351	33	(1)	237	342
Recreation and fitness workers	150	453	46	(1)	104	408
Sales and office occupations	25,108	545	9,456	658	15,652	502
Sales and related occupations	9,924	598	5,557	731	4,367	452
First-line supervisors/managers of retail sales workers	2,259	611	1,321	705	938	496
First-line supervisors/managers of non-retail sales workers	880	828	618	887	263	732
Cashiers	1,378	319	338	339	1,040	315
Counter and rental clerks	110	450	54	527	56	411
Parts salespersons	131	488	118	527	13	(1)
Retail salespersons	1,840	488	1,075	599	765	382
Advertising sales agents	162	670	63	880	99	594
Insurance sales agents	380	743	197	981	183	609
Securities, commodities, and financial services sales agents	315	1,010	211	1,255	103	699
Travel agents	60	589	10	(1)	50	588
Sales representatives, services, all other	418	826	277	861	141	760
Sales representatives, wholesale and manufacturing	1,163	885	884	947	279	675
Real estate brokers and sales agents	410	695	159	953	251	608
Telemarketers	114	375	46	(1)	68	346
Door-to-door sales workers, news and street vendors, and related workers	68	409	45	(1)	23	(1)
Office and administrative support occupations	15,184	523	3,899	584	11,286	513
First-line supervisors/managers of office and administrative support	1,450	650	467	766	984	609
Bill and account collectors	195	498	58	518	137	491
Billing and posting clerks and machine operators	379	508	40	(1)	339	505
Bookkeeping, accounting, and auditing clerks	978	515	84	595	894	512
Payroll and timekeeping clerks	143	549	14	(1)	129	540
Tellers	275	395	25	(1)	250	393
Court, municipal, and license clerks	77	563	16	(1)	62	551
Customer service representatives	1,503	514	465	560	1,038	503
Eligibility interviewers, government programs	78	581	19	(1)	59	571
File clerks	254	482	40	(1)	215	478
Hotel, motel, and resort desk clerks	75	397	22	(1)	53	392
Interviewers, except eligibility and loan	89	504	21	(1)	68	505
Library assistants, clerical	50	449	5	(1)	46	(1)
Loan interviewers and clerks	179	572	26	(1)	153	554
Order clerks	88	517	26	(1)	61	485
Human resources assistants, except payroll and timekeeping	57	580	6	(1)	51	585

See footnotes at end of table.

HOUSEHOLD DATA
ANNUAL AVERAGES

39. Median weekly earnings of full-time wage and salary workers by detailed occupation and sex — Continued

(Numbers in thousands)

Occupation	2003					
	Both sexes		Men		Women	
	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings
Receptionists and information clerks	892	449	61	500	831	446
Reservation and transportation ticket agents and travel clerks	142	542	45	(1)	97	502
Couriers and messengers	166	594	138	599	28	(1)
Dispatchers	224	551	103	588	121	527
Postal service clerks	175	753	104	784	71	721
Postal service mail carriers	296	777	201	782	95	765
Postal service mail sorters, processors, and processing machine operators	109	776	61	822	48	(1)
Production, planning, and expediting clerks	236	634	111	722	125	601
Shipping, receiving, and traffic clerks	494	476	361	485	134	452
Stock clerks and order fillers	967	414	592	425	375	403
Weighers, measurers, checkers, and samplers, recordkeeping	66	513	35	(1)	31	(1)
Secretaries and administrative assistants	2,794	532	101	573	2,692	531
Computer operators	168	604	85	685	83	515
Data entry keyers	464	494	88	529	377	488
Word processors and typists	270	518	24	(1)	246	515
Insurance claims and policy processing clerks	238	549	35	(1)	203	546
Mail clerks and mail machine operators except postal service	124	451	59	475	65	425
Office clerks, general	610	502	100	502	511	502
Natural resources, construction, and maintenance occupations	11,082	608	10,612	613	469	449
Farming, fishing, and forestry occupations	778	369	626	384	152	318
Graders and sorters, agricultural products	62	387	24	(1)	38	(1)
Construction and extraction occupations	5,973	599	5,831	602	141	497
First-line supervisors/managers of construction trades and extraction workers	569	810	555	815	13	(1)
Brickmasons, blockmasons, and stonemasons	148	597	147	598	1	(1)
Carpenters	1,048	551	1,036	552	13	(1)
Carpet, floor, and tile installers and finishers	160	472	158	478	2	(1)
Cement masons, concrete finishers, and terrazzo workers	102	591	100	596	2	(1)
Construction laborers	871	494	843	496	28	(1)
Operating engineers and other construction equipment operators	354	646	347	649	7	(1)
Drywall installers, ceiling tile installers, and tapers	138	477	136	475	2	(1)
Electricians	671	748	657	748	14	(1)
Painters, construction and maintenance	420	480	398	485	22	(1)
Pipelayers, plumbers, pipefitters, and steamfitters	470	678	466	678	4	(1)
Roofers	157	487	155	486	2	(1)
Sheet metal workers	130	703	125	717	5	(1)
Structural iron and steel workers	57	782	57	782	-	-
Helpers, construction trades	101	420	98	418	4	(1)
Construction and building inspectors	82	778	75	795	7	(1)
Highway maintenance workers	64	546	60	557	4	(1)
Installation, maintenance, and repair occupations	4,331	673	4,155	675	176	629
First-line supervisors/managers of mechanics, installers, and repairers	316	832	290	832	26	(1)
Computer, automated teller, and office machine repairers	233	672	199	707	33	(1)
Radio and telecommunications equipment installers and repairers	235	786	199	815	36	(1)
Security and fire alarm systems installers	53	669	51	676	2	(1)
Aircraft mechanics and service technicians	122	821	119	834	3	(1)
Automotive body and related repairers	148	531	146	541	2	(1)
Automotive service technicians and mechanics	663	606	658	605	5	(1)
Bus and truck mechanics and diesel engine specialists	317	681	317	680	-	-
Heavy vehicle and mobile equipment service technicians and mechanics	186	692	184	688	2	(1)
Heating, air conditioning, and refrigeration mechanics and installers	302	621	299	621	3	(1)
Industrial and refractory machinery mechanics	461	686	452	690	9	(1)
Maintenance and repair workers, general	264	607	256	608	8	(1)
Millwrights	69	809	67	821	2	(1)
Electrical power-line installers and repairers	111	800	110	801	1	(1)
Telecommunications line installers and repairers	152	713	141	699	11	(1)
Production, transportation, and material moving occupations	15,100	519	11,733	570	3,367	407
Production occupations	8,599	519	6,069	583	2,530	406
First-line supervisors/managers of production and operating workers	867	693	701	737	166	516
Electrical, electronics, and electromechanical assemblers	244	440	97	510	147	404
Bakers	125	418	78	483	48	(1)
Butchers and other meat, poultry, and fish processing workers	275	421	202	472	73	335
Food batchmakers	86	472	61	450	25	(1)
Computer control programmers and operators	51	616	47	(1)	4	(1)
Cutting, punching, and press machine setters, operators, and tenders	147	507	108	535	40	(1)
Grinding, lapping, polishing, and buffing machine tool setters, operators	77	504	64	512	13	(1)

See footnotes at end of table.

HOUSEHOLD DATA
ANNUAL AVERAGES

39. Median weekly earnings of full-time wage and salary workers by detailed occupation and sex — Continued

(Numbers in thousands)

Occupation	2003					
	Both sexes		Men		Women	
	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings	Number of workers	Median weekly earnings
Machinists	438	616	414	626	23	(1)
Molders and molding machine setters, operators, and tenders, metal	66	443	48	(1)	18	(1)
Tool and die makers	77	776	74	772	3	(1)
Welding, soldering, and brazing workers	484	577	448	597	36	(1)
Job printers	72	597	64	608	8	(1)
Printing machine operators	167	594	144	606	23	(1)
Laundry and dry-cleaning workers	116	348	44	(1)	73	328
Pressers, textile, garment, and related materials	56	323	14	(1)	42	(1)
Sewing machine operators	277	344	68	389	210	326
Tailors, dressmakers, and sewers	62	472	23	(1)	39	(1)
Sawing machine setters, operators, and tenders, wood	62	452	51	481	11	(1)
Stationary engineers and boiler operators	106	711	104	711	2	(1)
Water and liquid waste treatment plant and system operators	58	688	55	695	3	(1)
Chemical processing machine setters, operators, and tenders	67	848	58	881	9	(1)
Crushing, grinding, polishing, mixing, and blending workers	105	582	96	586	8	(1)
Cutting workers	84	460	69	504	15	(1)
Inspectors, testers, sorters, samplers, and weighers	645	571	386	657	259	448
Medical, dental, and ophthalmic laboratory technicians	82	527	39	(1)	43	(1)
Packaging and filling machine operators and tenders	272	390	123	430	148	362
Painting workers	142	509	121	530	21	(1)
Paper goods machine setters, operators, and tenders	63	435	40	(1)	22	(1)
Helpers--production workers	61	412	41	(1)	20	(1)
Transportation and material moving occupations	6,501	520	5,664	547	837	410
Supervisors, transportation and material moving workers	185	705	158	705	27	(1)
Aircraft pilots and flight engineers	90	1,350	86	1,360	4	(1)
Bus drivers	334	501	197	536	137	470
Driver/sales workers and truck drivers	2,611	603	2,510	606	101	474
Taxi drivers and chauffeurs	188	481	166	497	21	(1)
Railroad conductors and yardmasters	54	884	52	892	2	(1)
Service station attendants	68	369	60	371	8	(1)
Crane and tower operators	60	589	58	598	2	(1)
Dredge, excavating, and loading machine operators	62	653	61	656	1	(1)
Industrial truck and tractor operators	502	488	463	488	39	(1)
Cleaners of vehicles and equipment	217	373	186	375	32	(1)
Laborers and freight, stock, and material movers, hand	1,261	464	1,069	475	191	415
Machine feeders and offbearers	53	437	30	(1)	23	(1)
Packers and packagers, hand	350	348	133	345	217	350

[1] Data not shown where base is less than 50,000.

NOTE: Occupations reflect the introduction of the 2002 Census occupational classification system derived from the 2000 Standard Occupational Classification system into the Current Population Survey. Beginning in January 2003, data reflect revised population controls used in the household survey.

Appendix C2: Occupational Interest Area Correlations

- Teaching
  - Education, training and library occupations
- Engineering/Physical Science
  - Architecture and engineering occupations
  - **Selected** Life, physical, and social science occupations
    - Biological Scientists
    - Chemists and materials scientists
    - Environmental scientists and geoscientists
    - Chemical technicians
- Computers/Information Tech
  - Computer and mathematical occupations
- Business
  - Management, business, and financial operations occupations
- Trade
  - Construction and extraction occupations
  - Installation, maintenance and repair occupations
- Medical Practice
  - **Selected** Healthcare practitioner and technical occupations
    - Dieticians and nutritionists
    - Pharmacists
    - Physicians and Surgeons
    - Emergency medical technicians and paramedics
    - Physical therapists
    - Respiratory therapists
  - **Selected** Life, physical and social scientists
    - Medical Scientists
    - Psychologists
- Medical Support
  - **Selected** Healthcare practitioner and technical occupations
    - Physician assistants
    - Registered nurses
    - Clinical Laboratory technologists and technicians
    - Diagnostic related technologists and technicians
    - Health diagnosing and treating practitioner support technicians
    - Licensed practical and licensed vocational nurses
    - Medical records and health information technicians
  - Healthcare support occupations
- Law
  - **Selected** Legal Occupations
    - Lawyers
    - Judges, magistrates, and other judicial workers
    - Paralegals and legal assistants
- Art
  - **Selected** Arts, design, entertainment sports and media occupations
    - Artists and related workers
    - Designers
    - Writers and authors
    - Photographers

- Service Industry
  - **Selected** Management occupations
    - Food service managers
    - Property, real estate, and community association managers
    - Lodging managers
  - Food preparation and serving related occupations
  - **Selected** Personal care and service occupations
    - Hairdressers, hairstylists, and cosmetologists
  - **Selected** Sales and related occupations
    - Counter and retail clerks
    - Retail salespersons
    - Travel agents
    - Real estate brokers and sales agents
- Social Services
  - **Selected** Community and social services occupations
    - Counselors
    - Social Workers
    - Miscellaneous community and social service specialists
- Civil Services
  - **Selected** Protective service occupations
    - First line supervisors/managers of police and detectives
    - Fire fighters
    - Bailiffs, correctional officers, and jailers
    - Detectives and criminal investigators
    - Police and sheriff's patrol officers
  - **Selected** Office and administrative support occupations
    - Postal service clerks
    - Postal service mail carriers
    - Postal service mail sorters, processors, and processing machine operators

Appendix C3: Statistical Correlations

* Taken from Appendix C1

Occupational Interest Area	Male Workers	Female Workers	% Male	% Female
Teaching	1625	4258	27.6%	72.4%
Engineering or Physical Science	2378	471	83.5%	16.5%
Computers or IT	2013	777	72.2%	27.8%
Business	8047	6446	55.5%	44.5%
Trade	9986	317	96.9%	3.1%
Medical Practice	677	541	55.6%	44.4%
Medical Support	634	4486	12.4%	87.6%
Law	455	417	52.2%	47.8%
Art	376	316	54.3%	45.7%
Service Industry	3723	3455	51.9%	48.1%
Social Services	397	957	29.3%	70.7%
Civil Services	1589	435	78.5%	21.5%

Appendix D: Data

Data Regarding Gender, High Interest

Data Regarding Ethnicity, High Interest

Data Regarding Ethnicity, Concerns

Data Regarding Individual Schools, High Interest

Data Regarding Individual Schools, Post-Graduation Plans

Data Regarding Individual Schools, Concerns

Data Regarding Occupation Interest Areas, Concerns

Private School Information

Appendix D1: Data Regarding Gender, High Interest

Table D1: Frequency of High Interest, by Gender

	Male	Male %	Female	Female %	Total	Total %
Teaching	50	10%	88	19%	148	15%
Eng/Phys. Science	161	33%	39	9%	213	21%
Computers/IT	194	40%	61	13%	274	27%
Business	214	44%	207	45%	451	45%
Trade	155	32%	31	7%	201	20%
Medical Practice	75	15%	175	38%	268	27%
Medical Support	52	11%	167	37%	238	24%
Law	120	24%	159	35%	295	29%
Art	150	31%	165	36%	329	33%
Service Industry	49	10%	150	33%	215	21%
Social Service	44	9%	162	36%	216	21%
Civil Service	117	24%	44	10%	172	17%
City Admin.	45	9%	28	6%	82	8%
Political Office	34	7%	23	5%	65	6%
Totals	491		456		1006	

Figure D1: Percentage of High Interest, by Gender

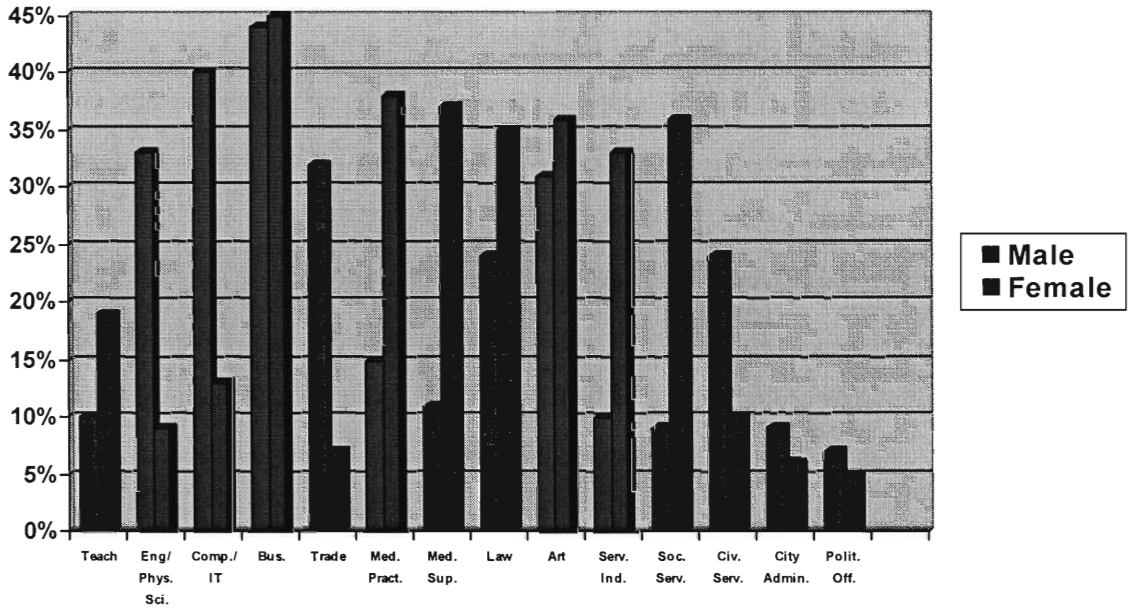


Figure D2: Teaching Interest by Gender

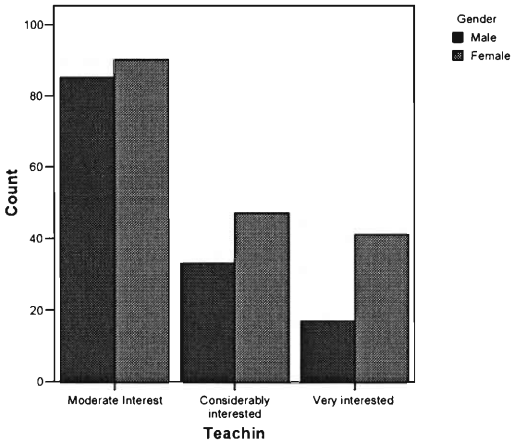


Figure D3: Engineering/Science Interest by Gender

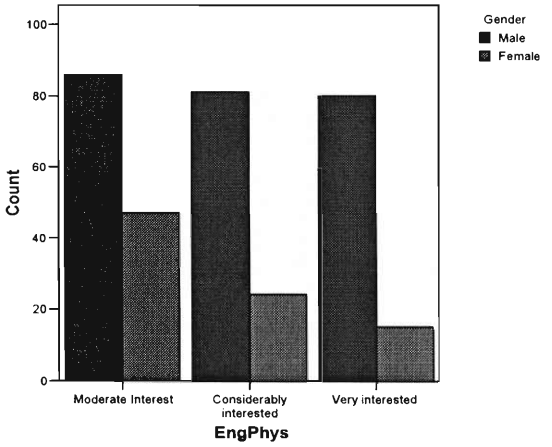


Figure D4: Computer Interest by Gender

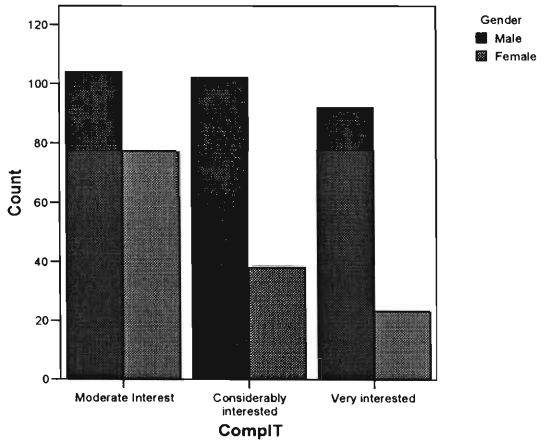


Figure D5: Business Interest by Gender

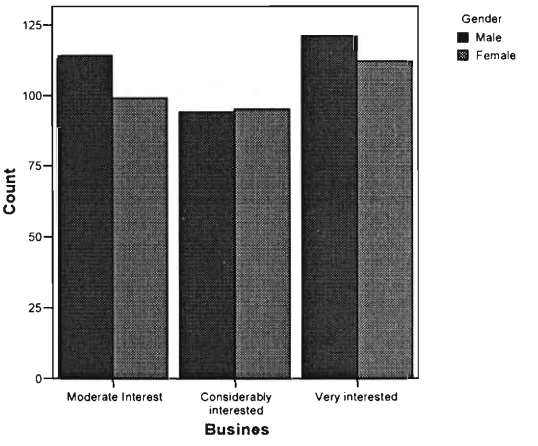


Figure D6: Trade Interest by Gender

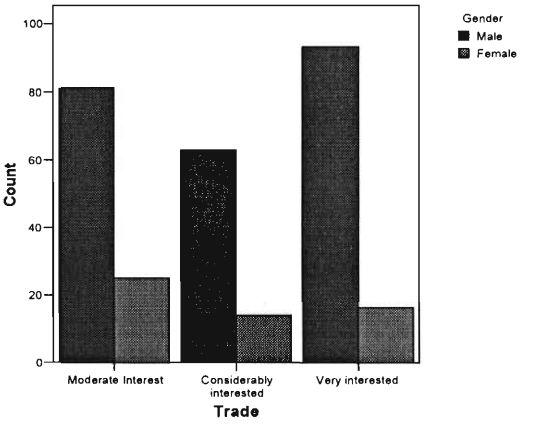


Figure D7: Medical Practice Interest by Gender

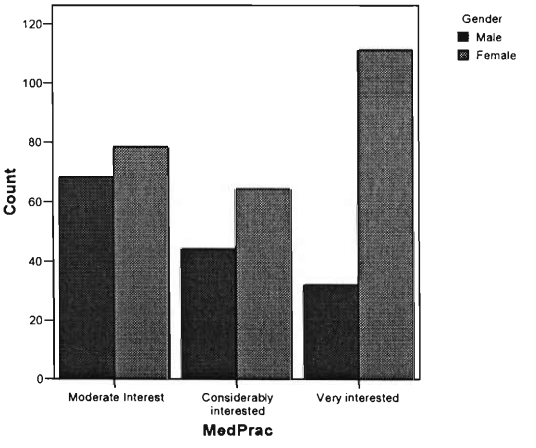


Figure D8: Medical Support Interest by Gender

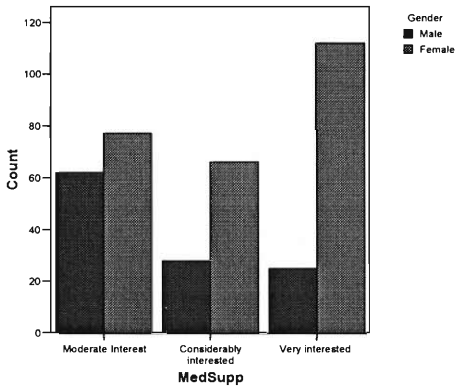


Figure D9: Law Interest by Gender

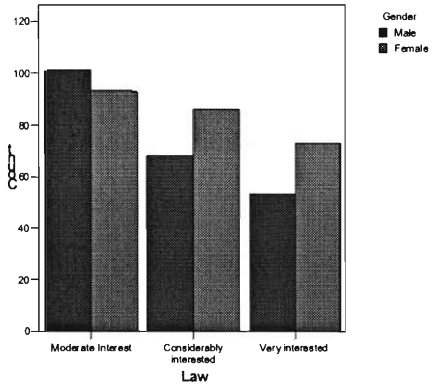


Figure D10: Art Interest by Gender

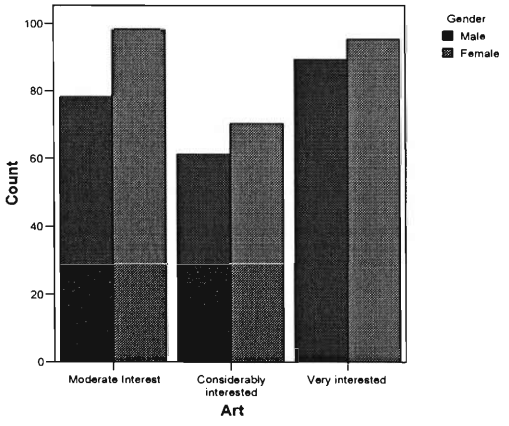


Figure D11: Service Industry Interest by Gender

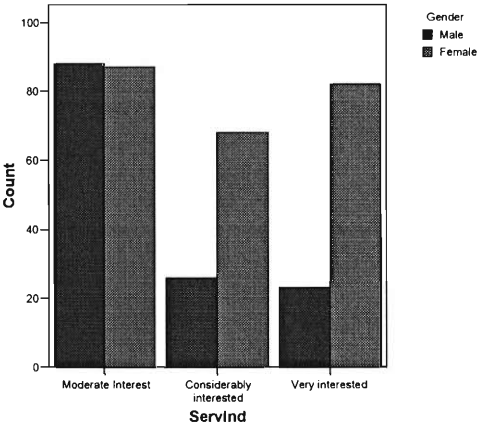


Figure D12: Social Service Interest by Gender

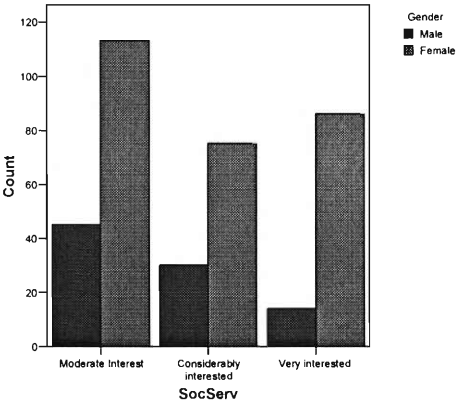


Figure D13: Civil Service Interest by Gender

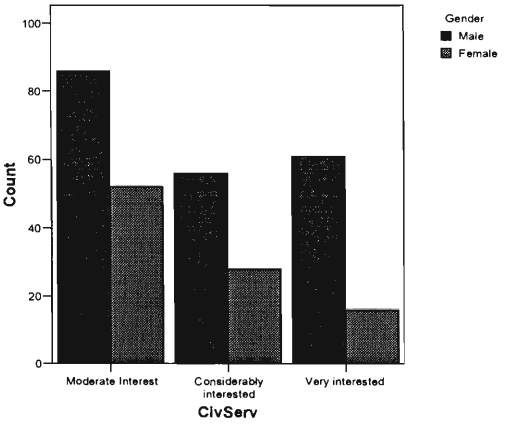


Figure D14: City Administration Interest by Gender

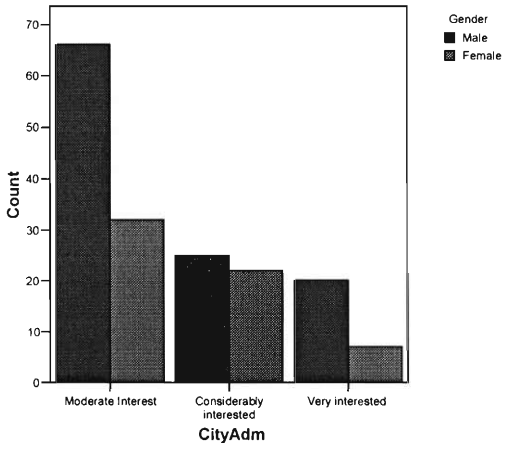
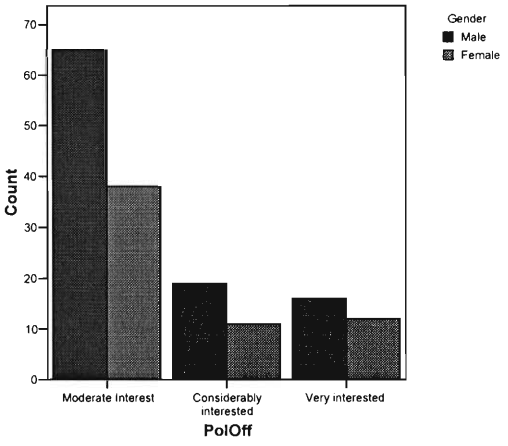


Figure D15: Political Interest by Gender



Appendix D2: Data Regarding Ethnicity, High Interest

Table D2: Frequency of High Interest among African Americans, by Gender

	Male	Male %	Female	Female %	Total	Total %
Teaching	10	14%	11	15%	21	15%
Eng/Phys. Science	26	38%	6	8%	32	22%
Computers/IT	24	35%	13	17%	37	26%
Business	31	45%	40	53%	71	49%
Trade	16	23%	3	4%	19	13%
Medical Practice	12	17%	29	39%	41	28%
Medical Support	12	17%	40	53%	52	36%
Law	21	30%	31	41%	52	36%
Art	20	29%	25	33%	45	31%
Service Industry	5	7%	36	48%	41	28%
Social Service	11	16%	30	40%	41	28%
Civil Service	12	17%	4	5%	16	11%
City Admin.	7	10%	4	5%	11	8%
Political Office	3	4%	6	8%	9	6%
Totals	69		75		144	

Figure D16: Percentage of High Interest, African Americans v. Overall

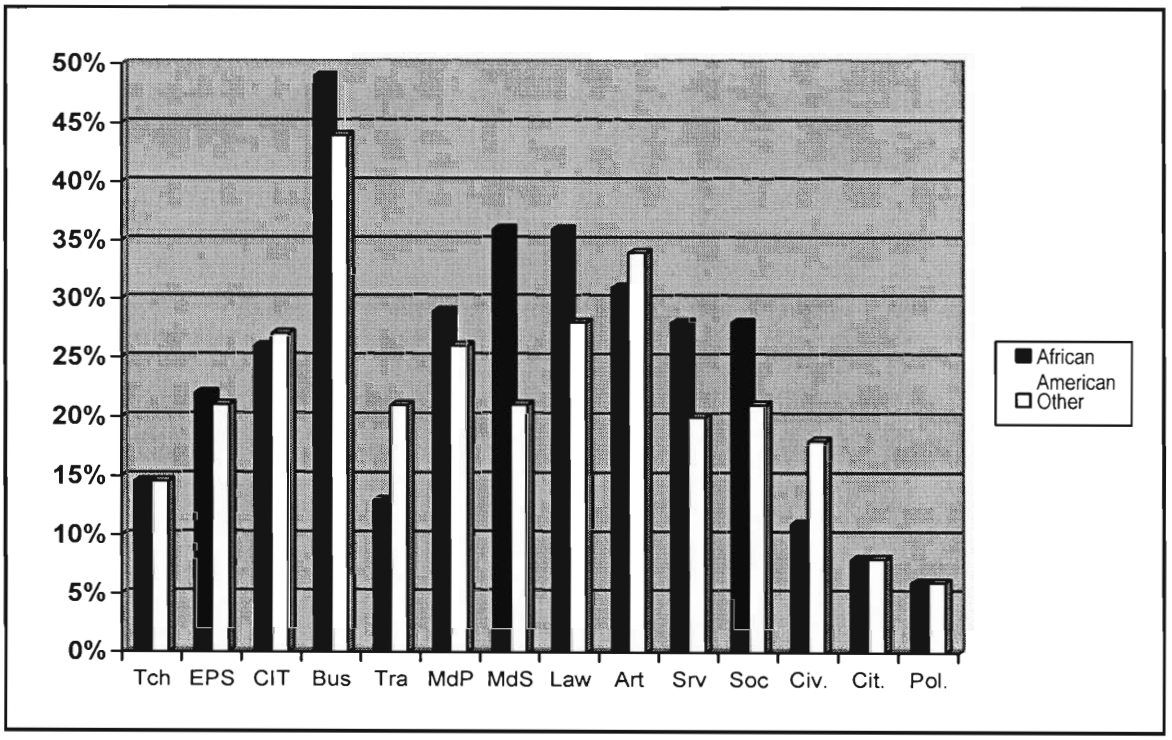


Table D3: Frequency of High Interest among Asians, by Gender

	Male	Male %	Female	Female %	Total	Total %
Teaching	3	8%	8	21%	11	14%
Eng/Phys. Science	19	49%	5	13%	24	31%
Computers/IT	24	62%	11	29%	35	45%
Business	14	36%	23	61%	37	48%
Trade	7	18%	1	3%	8	10%
Medical Practice	9	23%	11	29%	20	26%
Medical Support	3	8%	11	29%	14	18%
Law	2	5%	8	21%	10	13%
Art	16	41%	17	45%	33	43%
Service Industry	8	21%	17	45%	35	45%
Social Service	1	3%	9	24%	10	13%
Civil Service	5	13%	5	13%	10	13%
City Admin.	6	15%	3	8%	9	12%
Political Office	1	3%	2	5%	3	4%
Totals	39		38		77	

Figure D17: Percentage of High Interest, Asians v. Overall

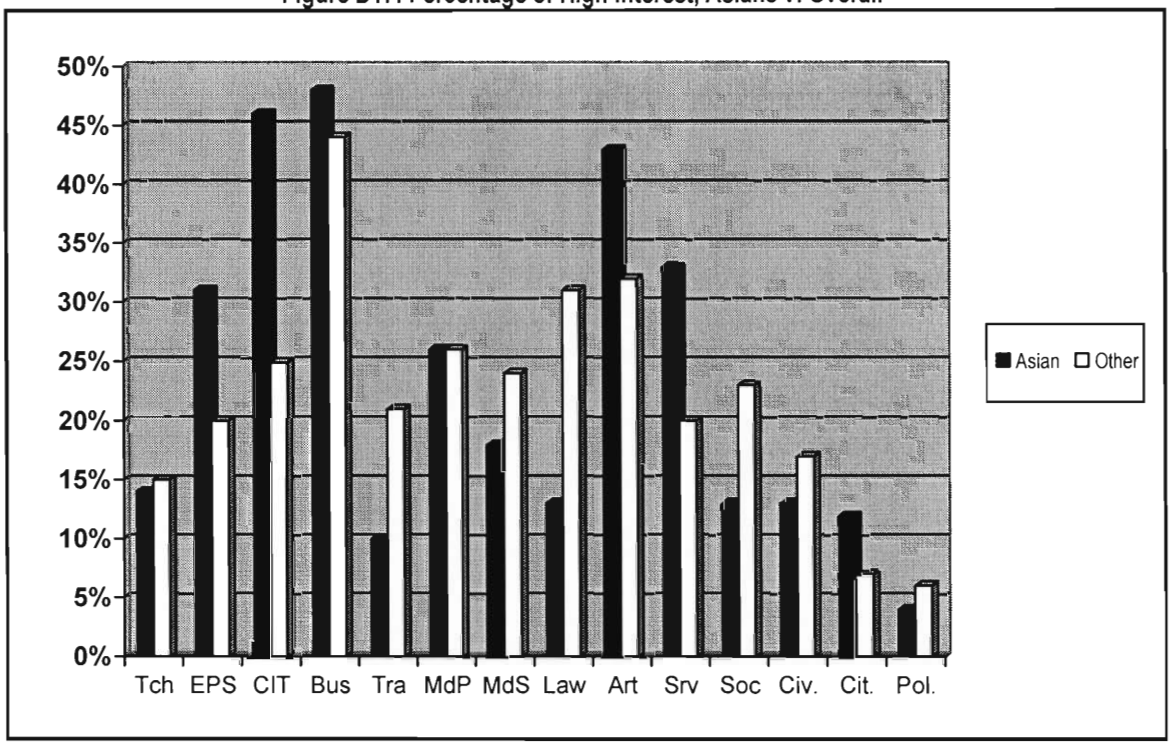


Table D4: Frequency of High Interest among Caucasians, by Gender

	Male	Male %	Female	Female %	Total	Total %
Teaching	25	11%	45	21%	60	14%
Eng/Phys. Science	62	28%	16	7%	78	18%
Computers/IT	74	33%	23	11%	97	22%
Business	94	42%	87	41%	181	41%
Trade	75	33%	18	8%	93	21%
Medical Practice	28	12%	84	39%	109	25%
Medical Support	15	7%	76	36%	91	21%
Law	53	24%	77	36%	130	30%
Art	59	26%	82	38%	141	32%
Service Industry	17	8%	62	29%	79	18%
Social Service	19	8%	73	34%	92	21%
Civil Service	56	25%	20	9%	76	17%
City Admin.	18	8%	9	4%	27	6%
Political Office	21	9%	10	5%	31	7%
Totals	62	28%	16	7%	78	18%

Figure D18: Percentage of High Interest, Caucasians v. Overall

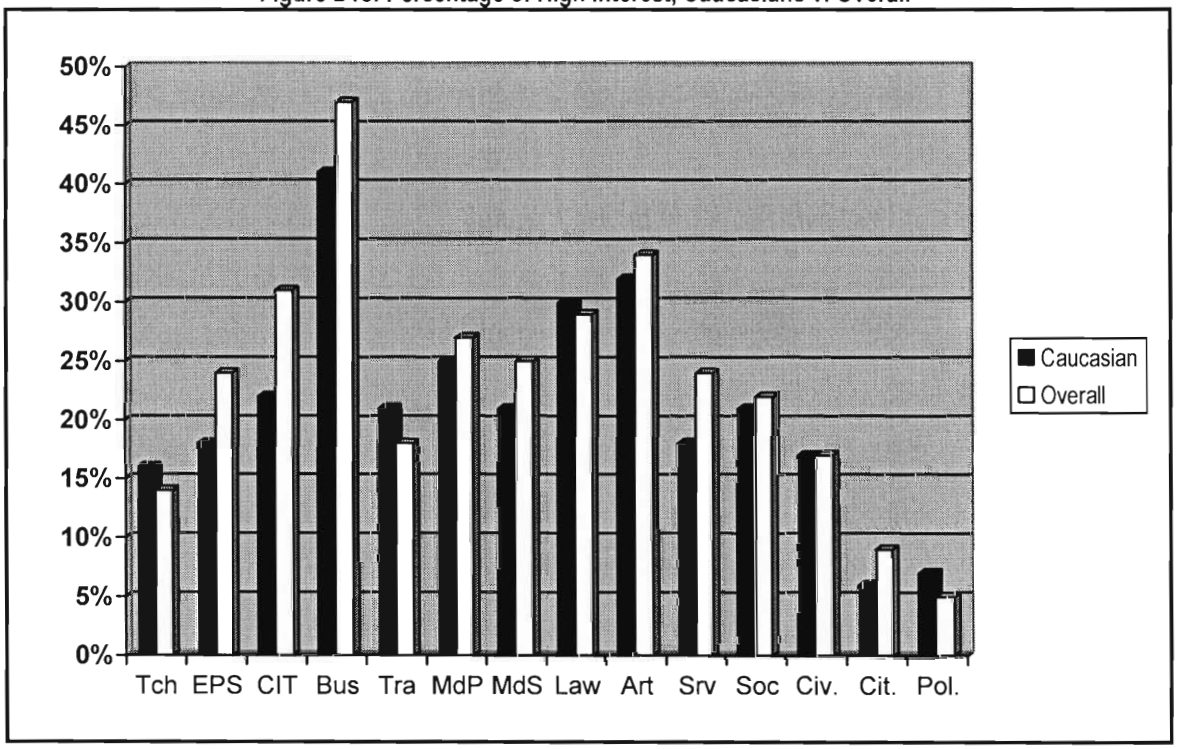
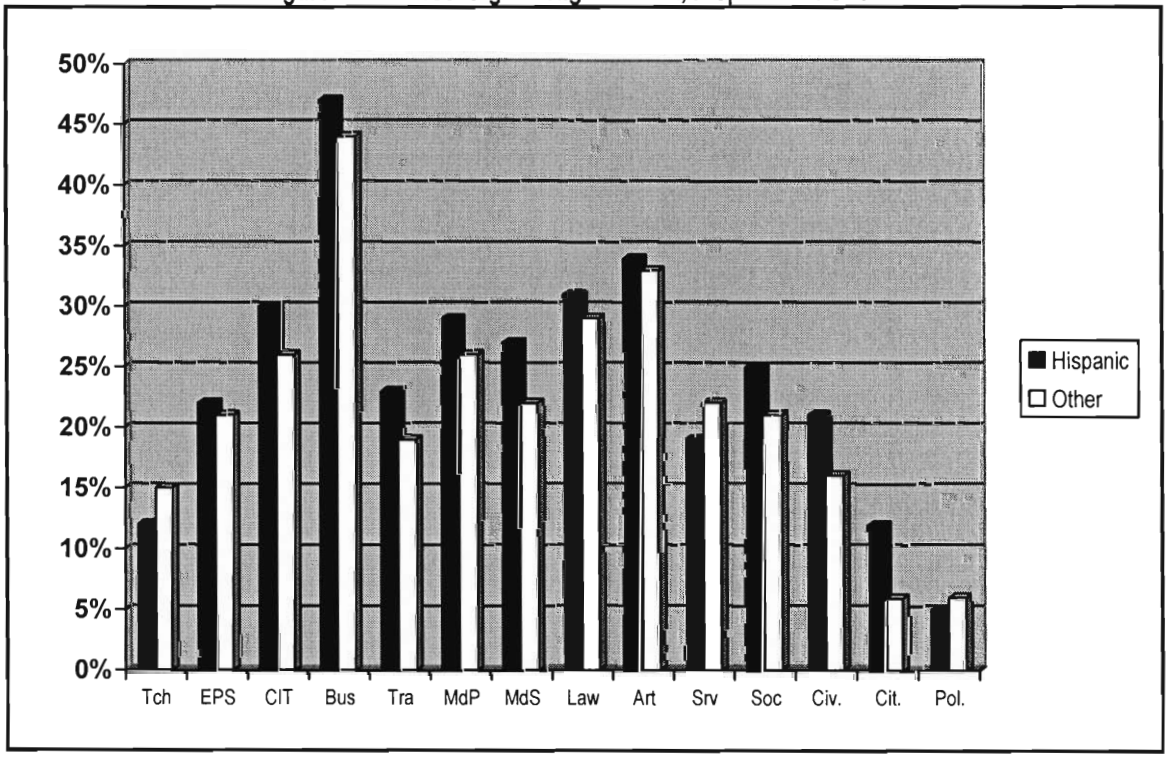


Table D5: Frequency of High Interest among Hispanics, by Gender

	Male	Male %	Female	Female %	Total	Total %
Teaching	9	7%	20	18%	29	12%
Eng/Phys. Science	44	35%	8	7%	52	22%
Computers/IT	59	47%	12	11%	71	30%
Business	57	46%	53	48%	110	47%
Trade	46	37%	8	7%	54	23%
Medical Practice	22	18%	45	41%	67	29%
Medical Support	19	15%	45	41%	64	27%
Law	36	29%	37	34%	73	31%
Art	43	34%	36	33%	79	34%
Service Industry	14	11%	31	28%	45	19%
Social Service	12	10%	46	42%	58	25%
Civil Service	38	30%	11	10%	49	21%
City Admin.	17	14%	11	10%	28	12%
Political Office	8	6%	3	3%	11	5%
Totals	125		110		235	

Figure D19: Percentage of High Interest, Hispanics v. Overall



Appendix D3: Data Regarding Ethnicity, Concerns

Table D6: African American Concerns

Concern	% Males	% Females	% Students	% Other WPS
Gender1	8.7%	13.3%	11.1%	8.7%
Gender2	10.1%	6.7%	8.3%	8.8%
Gender3	4.3%	10.7%	7.6%	7.8%
Accept1	32.8%	20.0%	26.8%	20.5%
Accept2	19.2%	27.3%	23.0%	18.4%
Attend1	36.8%	38.2%	37.4%	26.4%
Attend2	11.2%	4.5%	8.1%	5.7%
Attend3	8.8%	5.5%	7.2%	7.0%
Unprep1	10.4%	9.1%	9.8%	7.6%
Unprep2	20.8%	19.1%	20.0%	15.8%
Unprep3	15.2%	23.6%	19.1%	21.0%

Table D7: Asian Concerns

Concern	% Males	% Females	% Students	% Other WPS
Gender1	20.5%	5.3%	13.0%	8.7%
Gender2	17.9%	26.3%	22.1%	7.6%
Gender3	15.4%	10.5%	13.0%	7.4%
Accept1	33.3%	10.5%	22.1%	21.1%
Accept2	30.8%	28.9%	29.9%	17.9%
Attend1	41.0%	39.5%	40.3%	25.1%
Attend2	12.8%	13.2%	13.0%	5.4%
Attend3	5.1%	2.6%	3.9%	6.6%
Unprep1	15.4%	15.8%	15.6%	7.8%
Unprep2	17.9%	28.9%	23.4%	15.2%
Unprep3	35.9%	34.2%	35.1%	19.9%

Table D8: Caucasian Concerns

Concern	% Males	% Females	% Students	% Other WPS
Gender1	4.4%	8.0%	6.2%	11.6%
Gender2	4.9%	3.3%	4.1%	12.8%
Gender3	3.6%	4.2%	3.9%	11.2%
Accept1	19.1%	15.5%	17.4%	24.6%
Accept2	13.3%	14.6%	13.9%	23.2%
Attend1	16.9%	18.8%	17.8%	33.6%
Attend2	4.0%	2.3%	3.2%	8.4%
Attend3	8.9%	4.2%	6.6%	6.1%
Unprep1	5.8%	4.2%	5.0%	11.4%
Unprep2	13.8%	11.7%	12.8%	18.5%
Unprep3	17.8%	20.7%	19.2%	22.8%

Table D9: Hispanic Concerns

Concern	% Males	% Females	% Students	% Other WPS
Gender1	8.8%	9.1%	8.9%	9.1%
Gender2	11.2%	15.5%	13.2%	7.3%
Gender3	9.6%	10.0%	9.8%	7.2%
Accept1	32.8%	20.0%	26.8%	19.4%
Accept2	19.2%	27.3%	23.0%	17.6%
Attend1	36.8%	38.2%	37.4%	22.6%
Attend2	11.2%	4.5%	8.1%	5.3%
Attend3	8.8%	5.5%	7.2%	6.0%
Unprep1	10.4%	9.1%	9.8%	8.0%
Unprep2	20.8%	19.1%	20.0%	14.5%
Unprep3	15.2%	23.6%	19.1%	21.8%

Appendix D4: Data Regarding Individual Schools, High Interest

	High Interest In Teaching					
	Males	**%**	**Females**	**%**	**Total**	**%**
ALL	0	0%	3	100%	3	2%
Burncoat	9	33%	18	67%	27	20%
Doherty	14	40%	21	60%	35	25%
North	10	37%	17	63%	27	20%
South	8	26%	23	74%	31	22%
WV	8	62%	5	38%	13	9%
UP	1	50%	1	50%	2	1%
Total	50	36%	88	64%	138	

	High Interest In Engineering/Phys Science					
	Males	**%**	**Females**	**%**	**Total**	**%**
ALL	9	75%	3	25%	12	6%
Burncoat	18	72%	7	28%	25	13%
Doherty	49	89%	6	11%	55	28%
North	28	80%	7	20%	35	18%
South	33	75%	11	25%	44	22%
WV	20	83%	4	17%	24	12%
UP	4	80%	1	20%	5	3%
Total	161	81%	39	20%	200	

	High Interest In Computer/IT					
	Males	**%**	**Females**	**%**	**Total**	**%**
ALL	11	73%	4	27%	15	6%
Burncoat	17	59%	12	41%	29	11%
Doherty	51	77%	15	23%	66	26%
North	41	76%	13	24%	54	21%
South	47	82%	10	18%	57	22%
WV	22	79%	6	21%	28	11%
UP	5	83%	1	17%	6	2%
Total	194	76%	61	24%	255	

	High Interest In Business					
	Males	**%**	**Females**	**%**	**Total**	**%**
ALL	7	44%	9	56%	16	4%
Burncoat	30	48%	32	52%	62	15%
Doherty	46	48%	49	52%	95	23%
North	39	49%	40	51%	79	19%
South	47	59%	33	41%	80	19%
WV	43	54%	36	46%	79	19%
UP	3	27%	8	73%	11	3%
Total	215	51%	207	49%	422	

	High Interest In Trade					
	Males	**%**	**Females**	**%**	**Total**	**%**
ALL	8	89%	1	11%	9	5%
Burncoat	10	59%	7	41%	17	9%
Doherty	29	100%	0	0%	29	16%
North	15	94%	1	6%	16	9%
South	26	79%	7	21%	33	18%
WV	66	83%	14	18%	80	43%
UP	2	100%	0	0%	2	1%
Total	156	84%	30	16%	186	

	High Interest In Medical Practice					
	Males	**%**	**Females**	**%**	**Total**	**%**
ALL	6	50%	6	50%	12	5%
Burncoat	9	23%	31	78%	40	16%
Doherty	15	29%	36	71%	51	20%
North	19	31%	43	69%	62	25%
South	12	27%	32	73%	44	18%
WV	13	37%	22	63%	35	14%
UP	2	29%	5	71%	7	3%
Total	76	30%	175	70%	251	

	High Interest In Medical Support					
	Males	%	Females	%	Total	%
ALL	**4**	**44%**	**5**	**56%**	**9**	**4%**
Burncoat	9	25%	27	75%	36	16%
Doherty	11	23%	36	77%	47	20%
North	13	23%	43	77%	56	24%
South	9	19%	39	81%	48	21%
WV	7	22%	25	78%	32	14%
UP	0	0%	3	100%	3	1%
Total	53	23%	178	77%	231	

	High Interest In Law					
	Males	**%**	**Females**	**%**	**Total**	**%**
ALL	1	17%	5	83%	6	2%
Burncoat	14	32%	30	68%	44	16%
Doherty	31	54%	26	46%	57	20%
North	19	32%	40	68%	59	21%
South	24	45%	29	55%	53	19%
WV	29	52%	27	48%	56	20%
UP	3	60%	2	40%	5	2%
Total	121	43%	159	57%	280	

	High Interest In Art					
	Males	**%**	**Females**	**%**	**Total**	**%**
ALL	7	58%	5	42%	12	4%
Burncoat	18	32%	38	68%	56	18%
Doherty	28	47%	31	53%	59	19%
North	21	38%	35	63%	56	18%
South	48	62%	30	38%	78	25%
WV	26	57%	20	43%	46	15%
UP	2	25%	6	75%	8	3%
Total	150	48%	165	52%	315	

	High Interest In Service Industry					
	Males	%	Females	%	Total	%
ALL	3	33%	6	67%	9	5%
Burncoat	9	24%	29	76%	38	19%
Doherty	11	25%	33	75%	44	22%
North	10	30%	23	70%	33	17%
South	11	26%	31	74%	42	21%
WV	5	16%	26	84%	31	16%
UP	0	0%	2	100%	2	1%
Total	49	25%	150	75%	199	

	High Interest In Social Service Industry					
	Males	%	Females	%	Total	%
ALL	3	33%	6	67%	9	4%
Burncoat	4	13%	26	87%	30	15%
Doherty	11	21%	42	79%	53	26%
North	10	23%	33	77%	43	21%
South	9	21%	33	79%	42	20%
WV	7	32%	15	68%	22	11%
UP	0	0%	6	100%	6	3%
Total	44	21%	161	79%	205	

	High Interest In Civil Service Industry					
	Males	%	Females	%	Total	%
ALL	6	75%	2	25%	8	5%
Burncoat	12	67%	6	33%	18	11%
Doherty	32	78%	9	22%	41	25%
North	15	60%	10	40%	25	16%
South	17	59%	12	41%	29	18%
WV	33	89%	4	11%	37	23%
UP	2	67%	1	33%	3	2%
Total	117	73%	44	27%	161	

	High Interest In City Administration					
	Males	%	Females	%	Total	%
ALL	4	100%	0	0%	4	5%
Burncoat	4	33%	8	67%	12	16%
Doherty	15	71%	6	29%	21	28%
North	4	44%	5	56%	9	12%
South	7	50%	7	50%	14	19%
WV	11	85%	2	15%	13	18%
UP	0	0%	1	100%	1	1%
Total	45	61%	29	39%	74	

	High Interest In Political Office					
	Males	%	Females	%	Total	%
ALL	1	50%	1	50%	2	3%
Burncoat	5	50%	5	50%	10	17%
Doherty	12	71%	5	29%	17	29%
North	7	58%	5	42%	12	21%
South	5	45%	6	55%	11	19%
WV	3	100%	0	0%	3	5%
UP	2	67%	1	33%	3	5%
Total	35	60%	23	40%	58	

Appendix D5: Data Regarding Individual Schools, Post Graduation Plans

	ALL					
	Males	%	Females	%	Total	%
4-year College	8	67%	9	69%	17	68%
2-year College	2	17%	1	8%	3	12%
Vocational School	1	8%	0	0%	1	4%
Work	1	8%	0	0%	1	4%
Military	3	25%	0	0%	3	12%
Total	12	48%	13	52%	25	

	Burncoat					
	Males	%	Females	%	Total	%
4-year College	50	76%	71	83%	121	80%
2-year College	9	14%	10	12%	19	13%
Vocational School	2	3%	3	3%	5	3%
Work	8	12%	7	8%	15	10%
Military	5	8%	4	5%	9	6%
Total	66	43%	86	57%	152	

	Doherty					
	Males	%	Females	%	Total	%
4-year College	87	80%	74	81%	161	81%
2-year College	14	13%	11	12%	25	13%
Vocational School	5	5%	3	3%	8	4%
Work	14	13%	11	12%	25	13%
Military	8	7%	2	2%	10	5%
Total	109	55%	91	46%	200	

	North					
	Males	%	Females	%	Total	%
4-year College	65	76%	82	81%	147	79%
2-year College	10	12%	20	20%	30	16%
Vocational School	4	5%	2	2%	6	3%
Work	7	8%	5	5%	12	6%
Military	9	11%	1	1%	10	5%
Total	85	46%	101	54%	186	

	South					
	Males	%	Females	%	Total	%
4-year College	71	65%	75	82%	146	73%
2-year College	15	14%	14	15%	29	15%
Vocational School	9	8%	2	2%	11	6%
Work	17	16%	12	13%	29	15%
Military	7	6%	2	2%	9	5%
Total	109	55%	91	46%	200	

	Worcester Vocational					
	Males	%	Females	%	Total	%
4-year College	39	39%	36	61%	75	47%
2-year College	16	16%	16	27%	32	20%
Vocational School	8	8%	3	5%	11	7%
Work	36	36%	17	29%	53	33%
Military	13	13%	3	5%	16	10%
Total	100	63%	59	37%	159	

	University Park					
	Males	%	Females	%	Total	%
4-year College	10	100%	13	87%	23	92%
2-year College	0	0%	1	7%	1	4%
Vocational School	0	0%	0	0%	0	0%
Work	2	20%	0	0%	2	8%
Military	0	0%	1	7%	1	4%
Total	10	40%	15	60%	25	

Appendix D6: Data Regarding Individual Schools, Concerns

OVERALL						
	Male	%Male	Female	%Female	All	All %
Gender1	40	8.1%	41	9.0%	81	8.6%
Gender2	39	7.9%	39	8.6%	78	8.2%
Gender3	33	6.7%	36	7.9%	69	7.3%
Accept1	121	24.6%	80	17.5%	201	21.2%
Accept2	81	16.5%	98	21.5%	179	18.9%
Attend1	123	25.1%	126	27.6%	249	26.3%
Attend2	33	6.7%	24	5.3%	57	6.0%
Attend3	41	8.4%	19	4.2%	60	6.3%
Unprep1	41	8.4%	39	8.6%	80	8.4%
Unprep2	76	15.5%	74	16.2%	150	15.8%
Unprep3	91	18.5%	109	23.9%	200	21.1%

ALL						
	Male	%Male	Female	%Female	All	All %
Gender1	3	25.0%	2	15.4%	5	20.0%
Gender2	6	50.0%	5	38.5%	11	44.0%
Gender3	2	16.7%	1	7.7%	3	12.0%
Accept1	5	41.7%	2	15.4%	7	28.0%
Accept2	2	16.7%	4	30.8%	6	24.0%
Attend1	8	66.7%	6	46.2%	14	56.0%
Attend2	2	16.7%	1	7.7%	3	12.0%
Attend3	1	8.3%	0	0.0%	1	4.0%
Unprep1	5	41.7%	5	38.5%	10	40.0%
Unprep2	4	33.3%	4	30.8%	8	32.0%
Unprep3	1	8.3%	6	46.2%	7	28.0%

BURNCOAT						
	Male	%Male	Female	%Female	All	All %
Gender1	3	4.5%	4	4.7%	7	4.6%
Gender2	4	6.1%	5	5.8%	9	5.9%
Gender3	3	4.5%	6	7.0%	9	5.9%
Accept1	15	22.7%	13	15.1%	28	18.4%
Accept2	9	13.6%	10	11.6%	19	12.5%
Attend1	10	15.2%	15	17.4%	25	16.4%
Attend2	4	6.1%	5	5.8%	9	5.9%
Attend3	6	9.1%	0	0.0%	6	3.9%
Unprep1	6	9.1%	3	3.5%	9	5.9%
Unprep2	16	24.2%	6	7.0%	22	14.5%
Unprep3	12	18.2%	18	20.9%	30	19.7%

DOHERTY						
	Male	%Male	Female	%Female	All	All %
Gender1	9	8.3%	6	6.6%	15	7.5%
Gender2	5	4.6%	6	6.6%	11	5.5%
Gender3	5	4.6%	4	4.4%	9	4.5%
Accept1	24	22.0%	18	19.8%	42	21.0%
Accept2	16	14.7%	22	24.2%	38	19.0%
Attend1	23	21.1%	15	16.5%	38	19.0%
Attend2	8	7.3%	2	2.2%	10	5.0%
Attend3	5	4.6%	3	3.3%	8	4.0%
Unprep1	11	10.1%	8	8.8%	19	9.5%
Unprep2	13	11.9%	13	14.3%	26	13.0%
Unprep3	21	19.3%	17	18.7%	38	19.0%

NORTH						
	Male	%Male	Female	%Female	All	All %
Gender1	7	8.2%	10	9.9%	17	9.1%
Gender2	9	10.6%	8	7.9%	17	9.1%
Gender3	4	4.7%	9	8.9%	13	7.0%
Accept1	20	23.5%	19	18.8%	39	21.0%
Accept2	15	17.6%	24	23.8%	39	21.0%
Attend1	29	34.1%	37	36.6%	66	35.5%
Attend2	4	4.7%	7	6.9%	11	5.9%
Attend3	4	4.7%	5	5.0%	9	4.8%
Unprep1	3	3.5%	4	4.0%	7	3.8%
Unprep2	12	14.1%	23	22.8%	35	18.8%
Unprep3	16	18.8%	20	19.8%	36	19.4%

SOUTH						
	Male	%Male	Female	%Female	All	All %
Gender1	8	7.3%	8	8.8%	16	8.0%
Gender2	8	7.3%	10	11.0%	18	9.0%
Gender3	5	4.6%	9	9.9%	14	7.0%
Accept1	36	33.0%	11	12.1%	47	23.5%
Accept2	17	15.6%	23	25.3%	40	20.0%
Attend1	31	28.4%	32	35.2%	63	31.5%
Attend2	9	8.3%	6	6.6%	15	7.5%
Attend3	7	6.4%	6	6.6%	13	6.5%
Unprep1	11	10.1%	13	14.3%	24	12.0%
Unprep2	20	18.3%	19	20.9%	39	19.5%
Unprep3	21	19.3%	30	33.0%	51	25.5%

WORCESTER VOCATIONAL						
	Male	%Male	Female	%Female	All	All %
Gender1	9	9.0%	10	16.9%	19	11.9%
Gender2	6	6.0%	3	5.1%	9	5.7%
Gender3	14	14.0%	2	3.4%	16	10.1%
Accept1	20	20.0%	15	25.4%	35	22.0%
Accept2	20	20.0%	11	18.6%	31	19.5%
Attend1	20	20.0%	15	25.4%	35	22.0%
Attend2	5	5.0%	3	5.1%	8	5.0%
Attend3	18	18.0%	3	5.1%	21	13.2%
Unprep1	5	5.0%	2	3.4%	7	4.4%
Unprep2	10	10.0%	8	13.6%	18	11.3%
Unprep3	18	18.0%	15	25.4%	33	20.8%

UNIVERSITY PARK						
	Male	%Male	Female	%Female	All	All %
Gender1	1	10.0%	1	6.7%	2	8.0%
Gender2	1	10.0%	2	13.3%	3	12.0%
Gender3	0	0.0%	5	33.3%	5	20.0%
Accept1	1	10.0%	2	13.3%	3	12.0%
Accept2	2	20.0%	4	26.7%	6	24.0%
Attend1	2	20.0%	6	40.0%	8	32.0%
Attend2	1	10.0%	0	0.0%	1	4.0%
Attend3	0	0.0%	2	13.3%	2	8.0%
Unprep1	0	0.0%	4	26.7%	4	16.0%
Unprep2	1	10.0%	1	6.7%	2	8.0%
Unprep3	2	20.0%	3	20.0%	5	20.0%

Appendix D7: Data Regarding Occupational Interest Areas, Concerns

TEACHING						
	Male	%Male	Female	%Female	All	All %
Gender1	4	8.0%	5	5.7%	9	6.5%
Gender2	5	10.0%	11	12.5%	16	11.6%
Gender3	2	4.0%	7	8.0%	9	6.5%
Accept1	10	20.0%	17	19.3%	27	19.6%
Accept2	9	18.0%	22	25.0%	31	22.5%
Attend1	15	30.0%	24	27.3%	39	28.3%
Attend2	0	0.0%	7	8.0%	7	5.1%
Attend3	2	4.0%	4	4.5%	6	4.3%
Unprep1	2	4.0%	7	8.0%	9	6.5%
Unprep2	12	24.0%	14	15.9%	26	18.8%
Unprep3	6	12.0%	28	31.8%	34	24.6%

ENGINEERING/PHYSICAL SCIENCE						
	Male	%Male	Female	%Female	All	All %
Gender1	17	10.6%	5	12.8%	22	11.0%
Gender2	17	10.6%	2	5.1%	19	9.5%
Gender3	11	6.8%	4	10.3%	15	7.5%
Accept1	39	24.2%	4	10.3%	43	21.5%
Accept2	25	15.5%	12	30.8%	37	18.5%
Attend1	45	28.0%	10	25.6%	55	27.5%
Attend2	9	5.6%	2	5.1%	11	5.5%
Attend3	10	6.2%	1	2.6%	11	5.5%
Unprep1	21	13.0%	4	10.3%	25	12.5%
Unprep2	30	18.6%	9	23.1%	39	19.5%
Unprep3	30	18.6%	9	23.1%	39	19.5%

COMPUTERS/INFORMATION TECH.						
	Male	%Male	Female	%Female	All	All %
Gender1	18	9.3%	6	9.8%	24	9.4%
Gender2	24	12.4%	7	11.5%	31	12.2%
Gender3	11	5.7%	3	4.9%	14	5.5%
Accept1	55	28.4%	11	18.0%	66	25.9%
Accept2	37	19.1%	9	14.8%	46	18.0%
Attend1	63	32.5%	19	31.1%	82	32.2%
Attend2	16	8.2%	6	9.8%	22	8.6%
Attend3	14	7.2%	2	3.3%	16	6.3%
Unprep1	21	10.8%	2	3.3%	23	9.0%
Unprep2	41	21.1%	13	21.3%	54	21.2%
Unprep3	36	18.6%	13	21.3%	49	19.2%

BUSINESS						
	Male	%Male	Female	%Female	All	All %
Gender1	17	7.9%	23	11.1%	40	9.5%
Gender2	18	8.4%	16	7.7%	34	8.1%
Gender3	15	7.0%	21	10.1%	36	8.5%
Accept1	55	25.6%	37	17.9%	92	21.8%
Accept2	32	14.9%	42	20.3%	74	17.5%
Attend1	53	24.7%	61	29.5%	114	27.0%
Attend2	12	5.6%	9	4.3%	21	5.0%
Attend3	18	8.4%	7	3.4%	25	5.9%
Unprep1	21	9.8%	19	9.2%	40	9.5%
Unprep2	31	14.4%	33	15.9%	64	15.2%
Unprep3	37	17.2%	53	25.6%	90	21.3%

TRADE						
	Male	%Male	Female	%Female	All	All %
Gender1	17	10.9%	3	10.0%	20	10.8%
Gender2	20	12.8%	3	10.0%	23	12.4%
Gender3	15	9.6%	3	10.0%	18	9.7%
Accept1	40	25.6%	6	20.0%	46	24.7%
Accept2	28	17.9%	6	20.0%	34	18.3%
Attend1	40	25.6%	14	46.7%	54	29.0%
Attend2	12	7.7%	2	6.7%	14	7.5%
Attend3	20	12.8%	3	10.0%	23	12.4%
Unprep1	13	8.3%	3	10.0%	16	8.6%
Unprep2	22	14.1%	4	13.3%	26	14.0%
Unprep3	28	17.9%	8	26.7%	36	19.4%

MEDICAL PRACTICE						
	Male	%Male	Female	%Female	All	All %
Gender1	4	5.3%	14	8.0%	18	7.2%
Gender2	8	10.5%	17	9.7%	25	10.0%
Gender3	9	11.8%	15	8.6%	24	9.6%
Accept1	14	18.4%	35	20.0%	49	19.5%
Accept2	9	11.8%	45	25.7%	54	21.5%
Attend1	22	28.9%	57	32.6%	79	31.5%
Attend2	5	6.6%	7	4.0%	12	4.8%
Attend3	1	1.3%	6	3.4%	7	2.8%
Unprep1	4	5.3%	16	9.1%	20	8.0%
Unprep2	7	9.2%	28	16.0%	35	13.9%
Unprep3	12	15.8%	47	26.9%	59	23.5%

MEDICAL SUPPORT						
	Male	**%Male**	**Female**	**%Female**	**All**	**All %**
Gender1	4	7.5%	17	9.6%	21	9.1%
Gender2	6	11.3%	20	11.2%	26	11.3%
Gender3	9	17.0%	14	7.9%	23	10.0%
Accept1	17	32.1%	31	17.4%	48	20.8%
Accept2	8	15.1%	49	27.5%	57	24.7%
Attend1	18	34.0%	55	30.9%	73	31.6%
Attend2	7	13.2%	11	6.2%	18	7.8%
Attend3	4	7.5%	5	2.8%	9	3.9%
Unprep1	5	9.4%	19	10.7%	24	10.4%
Unprep2	9	17.0%	31	17.4%	40	17.3%
Unprep3	9	17.0%	45	25.3%	54	23.4%

LAW						
	Male	**%Male**	**Female**	**%Female**	**All**	**All %**
Gender1	8	6.6%	22	13.8%	30	10.7%
Gender2	10	8.3%	13	8.2%	23	8.2%
Gender3	6	5.0%	13	8.2%	19	6.8%
Accept1	28	23.1%	30	18.9%	58	20.7%
Accept2	16	13.2%	35	22.0%	51	18.2%
Attend1	30	24.8%	44	27.7%	74	26.4%
Attend2	6	5.0%	8	5.0%	14	5.0%
Attend3	11	9.1%	7	4.4%	18	6.4%
Unprep1	10	8.3%	13	8.2%	23	8.2%
Unprep2	16	13.2%	25	15.7%	41	14.6%
Unprep3	22	18.2%	41	25.8%	63	22.5%

ART						
	Male	%Male	Female	%Female	All	All %
Gender1	10	6.7%	17	10.3%	27	8.6%
Gender2	18	12.0%	12	7.3%	30	9.5%
Gender3	11	7.3%	18	10.9%	29	9.2%
Accept1	47	31.3%	34	20.6%	81	25.7%
Accept2	34	22.7%	40	24.2%	74	23.5%
Attend1	47	31.3%	56	33.9%	103	32.7%
Attend2	13	8.7%	10	6.1%	23	7.3%
Attend3	14	9.3%	10	6.1%	24	7.6%
Unprep1	15	10.0%	18	10.9%	33	10.5%
Unprep2	30	20.0%	26	15.8%	56	17.8%
Unprep3	36	24.0%	39	23.6%	75	23.8%

SERVICE INDUSTRY						
	Male	%Male	Female	%Female	All	All %
Gender1	2	4.1%	19	12.7%	21	10.6%
Gender2	7	14.3%	18	12.0%	25	12.6%
Gender3	5	10.2%	15	10.0%	20	10.1%
Accept1	13	26.5%	31	20.7%	44	22.1%
Accept2	8	16.3%	36	24.0%	44	22.1%
Attend1	17	34.7%	46	30.7%	63	31.7%
Attend2	7	14.3%	11	7.3%	18	9.0%
Attend3	8	16.3%	8	5.3%	16	8.0%
Unprep1	8	16.3%	15	10.0%	23	11.6%
Unprep2	5	10.2%	22	14.7%	27	13.6%
Unprep3	9	18.4%	42	28.0%	51	25.6%

SOCIAL SERVICE						
	Male	%Male	Female	%Female	All	All %
Gender1	4	9.1%	15	9.3%	19	9.3%
Gender2	7	15.9%	21	13.0%	28	13.7%
Gender3	5	11.4%	14	8.7%	19	9.3%
Accept1	14	31.8%	32	19.9%	46	22.4%
Accept2	9	20.5%	42	26.1%	51	24.9%
Attend1	16	36.4%	55	34.2%	71	34.6%
Attend2	6	13.6%	3	1.9%	9	4.4%
Attend3	4	9.1%	4	2.5%	8	3.9%
Unprep1	5	11.4%	15	9.3%	20	9.8%
Unprep2	6	13.6%	26	16.1%	32	15.6%
Unprep3	7	15.9%	42	26.1%	49	23.9%

CIVIL SERVICE						
	Male	%Male	Female	%Female	All	All %
Gender1	13	11.1%	5	11.4%	18	11.2%
Gender2	14	12.0%	6	13.6%	20	12.4%
Gender3	14	12.0%	7	15.9%	21	13.0%
Accept1	36	30.8%	11	25.0%	47	29.2%
Accept2	24	20.5%	14	31.8%	38	23.6%
Attend1	41	35.0%	12	27.3%	53	32.9%
Attend2	14	12.0%	6	13.6%	20	12.4%
Attend3	12	10.3%	4	9.1%	16	9.9%
Unprep1	13	11.1%	5	11.4%	18	11.2%
Unprep2	30	25.6%	9	20.5%	39	24.2%
Unprep3	17	14.5%	9	20.5%	26	16.1%

CITY ADMINISTRATION						
	Male	%Male	Female	%Female	All	All %
Gender1	4	8.9%	3	10.3%	7	9.5%
Gender2	8	17.8%	2	6.9%	10	13.5%
Gender3	4	8.9%	4	13.8%	8	10.8%
Accept1	11	24.4%	5	17.2%	16	21.6%
Accept2	6	13.3%	8	27.6%	14	18.9%
Attend1	17	37.8%	9	31.0%	26	35.1%
Attend2	1	2.2%	3	10.3%	4	5.4%
Attend3	2	4.4%	0	0.0%	2	2.7%
Unprep1	8	17.8%	4	13.8%	12	16.2%
Unprep2	7	15.6%	5	17.2%	12	16.2%
Unprep3	8	17.8%	5	17.2%	13	17.6%

POLITICAL OFFICE						
	Male	%Male	Female	%Female	All	All %
Gender1	2	5.7%	4	17.4%	6	10.3%
Gender2	3	8.6%	2	8.7%	5	8.6%
Gender3	2	5.7%	3	13.0%	5	8.6%
Accept1	6	17.1%	5	21.7%	11	19.0%
Accept2	3	8.6%	7	30.4%	10	17.2%
Attend1	8	22.9%	6	26.1%	14	24.1%
Attend2	2	5.7%	4	17.4%	6	10.3%
Attend3	2	5.7%	0	0.0%	2	3.4%
Unprep1	3	8.6%	4	17.4%	7	12.1%
Unprep2	4	11.4%	5	21.7%	9	15.5%
Unprep3	6	17.1%	5	21.7%	11	19.0%

Appendix E: Survey Applications

Original Young Woman of Consequence Application

Revised Young Woman of Consequence Application

FACES@*WPI* Proposal

FACES@*WPI* Agenda

FACES@*WPI* Student Feedback Sheet

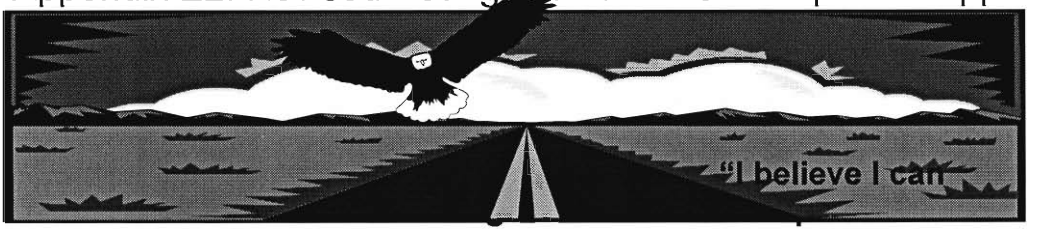
FACES@*WPI* Chaperone Feedback Sheet

Young Women in Politics Event Proposal

A.L.L. Initiative Proposal

Appendix E1: Original Young Woman of Consequence Application

Appendix E2: Revised Young Woman of Consequence Application



The 6th Annual Young Woman of Consequence Award

Event Date: March 2, 2005

This annual award is given by the City Manager's Commission on the Status of Women, on behalf of the City Manager and the people of the City of Worcester. It was created to honor young women who have shown exceptional leadership and/or have made tangible contributions to the community.

Presented annually, this award and the associated scholarship is designed to give young women an incentive to get involved in their community and schools, to build courage and strength, and to develop leadership skills that will benefit them for a lifetime.

All young women between 14 and 18 years of age, who reside in Worcester and are still in school, are eligible to be nominated. The winner will be someone who demonstrates dedication, talent, compassion for positive change and a commitment to service.

A committee, named by the City Manager's Status of Women Commission in conjunction with the City Manager, will review nominations and recommend a recipient. The award is presented each March in conjunction with the celebration of The Worcester Women of Consequence Award.

For more information, please contact Larry Raymond, City Liaison for the Commission on the Status of Women through the Office of Human Resources at City Hall.

E-mail: raymondl@ci.worcester.ma.us
Phone: 508-799-1031
Fax: 508-757-1040

Applications are due January 28, 2005.

Young Woman of Consequence Application

Personal Information

Name:_____
(Last) (First)

Date of Birth:_____
(Month, Day, Year)

Address:_____
(Street) (City)

High School Name:_____

Expected Date of Graduation:_____
(Month, Day, Year)

Extracurricular Activities

Please list and describe of your all extracurricular activities (consider sports, clubs, volunteer work, etc). Include information such as: description of the activity, leadership position, time spent on the activity.

_____

_____

_____

_____

_____

_____

_____

Letter of Recommendation

Please have a teacher, organization leader or other person who knows you well write a short letter of recommendation concerning your candidacy for the award. Submit this letter with the application.

Essay Topics

Please answer one of the following essay questions in no more than 500 words. Essays should be typed, double-spaced in an appropriately sized font.

1. Please describe steps that you have already taken to improve your community. If you were given the necessary resources, describe something you would like to do to improve your community or Worcester as a whole.

2. If you aspire to a political office or other community leadership position, please discuss your motivation for this goal and what you would like to achieve once obtaining that position. Also, describe a recent event, situation, experience, etc. which exemplifies your leadership skills.

Transcripts

Please have a copy of your high school transcripts sent to the award committee, either with your application or sent to:

ATTN: Larry Raymond

Office of Human Resources

Commission on the Status of Women

Worcester City Hall

455 Main Street

Worcester, MA 01608

Reminder

Please send in all application materials to:

- ☐ Completed Application
- ☐ Essay
- ☐ Transcripts
- ☐ Letter of Recommendation

Page missing or incorrectly numbered in original

IQP/MQP SCANNING PROJECT

Appendix E4: FACES@*WPI* Agenda

Itinerary
April 15, 2005

9:00 a.m.	**Welcome**	Hagglund Room
	Admissions Presentation	Hagglund Room
	Jen Cluett, Worcester Polytechnic Institute Rebecca Garcia, Holy Cross Maria Furtado, Clark University with Mark Turnbull, Professor of Chemistry	
10:15 a.m.	**Professional Speakers**	Hagglund Room
	Qing Huo, Vice President of Shanghai Grandar Lighting Co. and Shanghai Grandar Robotics Co., Ltd. Sara Campbell, Consulting Civil Engineer	
10:45 a.m.	**Facilities Tours**	
	Robotics Demonstration Professor Ken Stafford	Odeum C
	Fire Protection Engineering Laboratory Tour Randall Harris	HL 026
	Rehabilitation Laboratory Tour Professor Allen Hoffman	HL 129
12:00 p.m.	**Lunch with Current WPI Students**	Hagglund Room
12:30 p.m.	**Closing**	Hagglund Room

Appendix E5: FACES@*WPI* Student Feedback Sheet

FACES@*WPI*

Females Aspiring to Careers in Engineering and Science

Student Feedback Form

How valuable were each of the following to your experience at FACES@*WPI*?
Please rate each of the following (1-not valuable at all ... 5-extremely valuable).

Admissions Presentations:	ī1	ī2	ī3	ī4	ī5
WPI Admissions	ī1	ī2	ī3	ī4	ī5
Holy Cross Admissions	ī1	ī2	ī3	ī4	ī5
Clark Admissions	ī1	ī2	ī3	ī4	ī5
Professional Speakers:	ī1	ī2	ī3	ī4	ī5
Qing Huo	ī1	ī2	ī3	ī4	ī5
Sara Campbell	ī1	ī2	ī3	ī4	ī5
Facilities Tours:	ī1	ī2	ī3	ī4	ī5
Robotics Demonstration	ī1	ī2	ī3	ī4	ī5
Fire Protection Engineering Lab Tour	ī1	ī2	ī3	ī4	ī5
Rehabilitation Lab Tour	ī1	ī2	ī3	ī4	ī5
Lunch with current students:	ī1	ī2	ī3	ī4	ī5

If you could have increased the amount of time allotted to one of the above activities, which would you choose to extend and why?

_____

_____

If one of the above activities were to be eliminated, which one would you eliminate and why?

_____

_____

Are there any other activities that you would like to see added to the program? For instance,

ī campus tour ī class-shadowing ī student panel

ī discussion involving participants ī hands-on engineering-related activity

ī Other (specify!)_____

_____

Please list additional comments on the back

Additional Comments (Note: As this is the first time FACES@*WPI* has been offered, any and all of your comments will be extremely helpful in improving the program):

Appendix E6: FACES@*WPI* Chaperone Feedback Sheet

Chaperone Feedback Form

Name: _____ School: _____

In your opinion, how valuable were each of the following to your students' experience at FACES@*WPI*?

Please rate each of the following (1-not valuable at all ... 5-extremely valuable).

Admissions Presentations:	ī1	ī2	ī3	ī4	ī5
WPI Admissions	ī1	ī2	ī3	ī4	ī5
Holy Cross Admissions	ī1	ī2	ī3	ī4	ī5
Clark Admissions	ī1	ī2	ī3	ī4	ī5
Professional Speakers:	ī1	ī2	ī3	ī4	ī5
Qing Huo	ī1	ī2	ī3	ī4	ī5
Sara Campbell	ī1	ī2	ī3	ī4	ī5
Facilities Tours:	ī1	ī2	ī3	ī4	ī5
Robotics Demonstration	ī1	ī2	ī3	ī4	ī5
Fire Protection Engineering Lab Tour	ī1	ī2	ī3	ī4	ī5
Rehabilitation Lab Tour	ī1	ī2	ī3	ī4	ī5
Lunch with current students:	ī1	ī2	ī3	ī4	ī5
Mentoring Program:	ī1	ī2	ī3	ī4	ī5

Would you like to see FACES@*WPI* continued in the future?

ĩYes ĩNo

Which event(s) within FACES do you think your students were most interested in?

_____

Least? _____

How could this be improved upon for the future?

_____

_____

If you could have increased the amount of time allotted to one of the above activities, which would you choose to extend and why?

_____

_____

If one of the above activities were to be eliminated, which would you eliminate and why?

_____

_____

Are there any other activities that you would like to see added to the program for the students? For instance,

í campus tour íclass-shadowing ístudent panel

ídiscussion involving participants í hands-on engineering-related activity

í Other (specify!)_____

_____

What about FACES@*WPI* was most beneficial for you as a guidance counselor and why?

_____

Least?_____

Would you like for FACES@*WPI* to include separate events specifically for guidance counselors during some of the student events?

íYes í No

If yes, do you have any specific suggestions as to what type of events would be most beneficial to you as a guidance counselor?

_____

_____

Additional Comments:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Can we follow-up with you to receive more feedback on your experience at FACES@WPI?

íYes í No

Phone Number: _____ E-mail: _____

Appendix E7: Young Women in Politics Event Proposal

PROPOSAL FOR WORCESTER YOUNG WOMEN AND POLITICS DAY 2004
Presented by the City of Worcester Advisory Committee on the Status of Women
Co-chairwomen: Sarah Sadowski and Leslie Frank

Purpose:

To introduce high school-aged young women in Worcester to key structures, figures, functions, and procedures of city government in order to encourage their interest and future participation in political leadership starting at the local level.

Date:

November 2004

Participants:

Students: Up to twenty (20) young women from Worcester currently enrolled in a Worcester public or private high school.

Adults: Members of the ACSW; Mayor Tim Murray; City Manager Thomas Hoover; various City Councilors (TBA); various City employees (TBA); other area women with special interest or experience in local political leadership, including Julie Jacobson, (other key staff persons in city government), Konstantina Lukes, Barbara Haller, Harriet Chandler, Karyn Polito, Rebecca Dono Healy, representatives from the League of Women Voters, major political parties, and other appropriate organizations.

Selection Process:

A flyer would be drafted by the ACSW, approved by appropriate City officials, and distributed to local schools, after school programs, and interested parties (September 2004). Nominations would be made by any adult sponsor (teacher, guidance counselor, coach, program administrator, even neighbor or parent). Up to twenty (20) young women would be selected based on demonstrated dedication to leadership, good academic standing (since they will be missing a day of school, this is imperative), and character (done at least one month in advance). A representative of the ACSW would then contact each student selected and her school to verify willingness and capability of participation. A second round of choices could be made if necessary. Letters would be sent out detailing schedule of program, and arrangements could begin for securing appropriate transportation and chaperones for the day.

Preliminary Event Schedule:

Tuesday evening, 6-7:30pm: Participants attend City Council meeting in order to observe first-hand city government in action.

Wednesday, 8:00-9:30am: Breakfast and conversation with the Mayor and City Manager. Students could begin by giving their responses to the City Council meeting. They would be introduced to the Mayor and City Manager, given brief descriptions of each's role in relationship to Worcester's city government, and allowed to ask questions of the Mayor and City Manager. If either / both could only be available for a short period of time, it would be preferable if they were

available toward the end of this time frame so that the open response and overview could occur beforehand.

9:30-11:30am: Tour of City Hall with further explication of Worcester's city history, government, and major current issues. Students would be introduced to various City Hall employees, and perhaps have a panel discussion with a few selected representatives from various city departments.

11:30am-1:30pm: Lunch (pizza, salad, fruit) and conversation with various local women political leaders or activists. We would attempt to secure at least six women guests, representing various political roles and interests to come meet our students and to join them in an informal, round-table discussion about women in politics, particularly at the local level. In order to accommodate women's schedules, they would be invited to drop in at any time during this session, and to stay for as long as they could (it would NOT be a two-hour obligation). We would try to have some sense of when each guest would be coming so that we could make the best use of the time; for instance, students could use time at the start of the session to generate questions for the guests.

1:30-3:30pm:

Option A: Simulation of a City Council meeting and wrap-up. Students would engage in a simulation of a City Council meeting in order to debate and to find resolution to a critical city issue. The issue would be chosen in advance, and appropriate background information would be distributed in advance of the day to students. Each student would be assigned a particular role (Mayor, City Manager, Councilor from a particular district, etc.) and would be allowed but not required to prepare some ideas / bring in additional research or materials. The simulation would be facilitated by members of the ACSW and other appropriate parties, and these adults would be allowed to assist students and provide procedural advice if appropriate. The simulation would be followed by a wrap-up discussion of the day's experiences.

The simulation could also include committee work that reflects citizen advisory committees and other special committees that work through the City Manager side of government.

Option B: Shadowing city officials and workers to see their work in action. Students would be paired with a city employee at City Hall in order to shadow that person for the afternoon. This would give them a one-on-one opportunity with a city employee, during which they could ask questions and find out on a first-hand basis what city government work entails. We would try to match students with employees based on common interest, background, or other appropriate criteria.

Students would then be invited to the beginning of the next ACSW meeting to share their response to the event. They could also stay for the rest of the meeting in order to observe how a Citizen Advisory committee works, although this would not be expected / required.

Follow-Up:

Students could be asked to fill out a survey or to submit suggestions for future events. Since the committee had spoken about having a non-voting young member, we could invite participants to apply for this position and possibly encourage other Citizen Advisory committees to do the same. We could keep these students informed about our committee's activities, and invite them to help us with events such as Pay Equity Day and to attend future Young/Woman of Consequence awards. If we decide to do this more than once, we could get former participants involved, or at least do a follow-up inquiry about their current leadership roles and community involvement.

Required Resources:

1) Approval from the appropriate involved parties of this plan.

2) Committed participation of the various individuals cited above in each part of the event.

3) Printing costs for materials to be distributed (introduction to Worcester city government; supporting material for simulation).

4) Food, beverages, and accoutrements for breakfast and luncheon.

5) Permission from parents and schools once participants are chosen.

6) A few adult advisors to work with the students throughout the day.

Appendix E8: A.L.L. Initiative Proposal

Proposal for Accelerating Learning Laboratory Program

Background

In January of 2005, a WPI team surveyed the junior class of the Worcester Public Schools (WPS) on their career interests, post-high school plans and career and college-related concerns. This data was collected for several reasons, including assisting the guidance counselors at the high schools and identifying students for programs related to their career interests.

In the analysis of this data, several striking differences were found between the concerns, plans and career interests of the students at each school. The data collected from the students at the Accelerating Learning Laboratory (A.L.L.) demonstrates some of these differences.

In general, students at A.L.L. are more concerned than the students attending the other schools in the Worcester Public School System (See Table 1). They also have a wider range of aspirations when compared to the students attending other schools (See Table 2).

Table 114

	Grades	Test scores	Financial	Too difficult	Dislike school	No contacts	Requirements
WPS	21%	18%	26%	6%	6%	8%	15%
ALL	**28%**	**24%**	**56%**	**12%**	4%	**40%**	**32%**

(Numbers in bold highlight the increased concern of the A.L.L. students)

Table 115

	Law	City Administration	Politics	Medical Practice	Medical Support	Business	Civil Services	Teaching	Engineering / Physical Science	Computers/IT	Art	Service Industry	Social Services
WPS	30%	8%	6%	24%	23%	41%	16%	14%	19%	24%	31%	19%	20%
ALL	24%	**16%**	**8%**	**48%**	**36%**	**64%**	**32%**	12%	**48%**	60%	**48%**	**36%**	**36%**

(Numbers in bold highlight the increased interest in the occupational interest area of the A.L.L students)

Goals

1. To demonstrate the benefit of the aspirations survey to guidance counselors on a small scale
2. To introduce the students at A.L.L. to occupational options which combine their multiple career interests
3. To encourage the students at A.L.L. to pursue the appropriate education for their career interests
4. To alleviate some of the career and college-related concerns of the students at A.L.L.

Program Description

Over the course of the 2005-2006 school years, a member of the WPI team would meet with the junior students at A.L.L. on a weekly or bi-weekly basis. The team member would initially administer the aspirations survey to the students. Then, each topic of the sections of the surveys would be addressed:

1. Career interests
2. Post-high school plans
3. Career and college-related concerns.

The team member would address each of these topics in general and then offer specific help to each individual student based on their survey responses.

The team member would be working closely with a faculty member to ensure that all policies of the Worcester Public School System were followed.

Appendix F: Reports

Overall School Report

ACSW Progress Reports

Appendix F1: Overall School Report

*Note: Similar reports were developed for each individual high school, but are only available to the Worcester Public School administration or faculty of that high school.

Gender Based Comparative Study of Public Schools
Student Aspirations Report

Worcester Public Schools — Class of 2006

The students of the junior class (Class of 2006) at each Worcester Public High School were surveyed in January of 2005 to determine their range of career aspirations, post-graduation plans and higher education-related concerns. The results of the aspiration survey were analyzed based on gender, ethnicity and school.

Response Rate

Figure 1 shows the overall response rate, as well as the highest and lowest response rates.

Table 116: Quality of Data Set

	Expected	Actual	Response %	Male	% Male	Female	% Female
WPS	1571	1006	64%	491	49%	456	45%

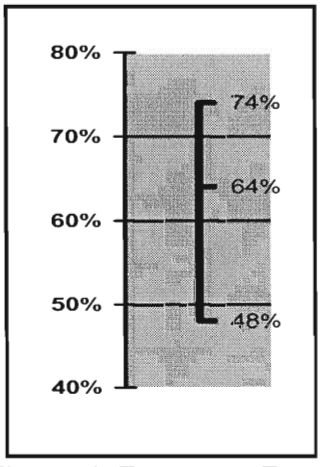


Figure 1: Response Rates

Aspirations Data

In the survey, students were asked to indicate their interest in the following occupational areas, based on a five point Likert scale: teaching; engineering & physical science, computers & IT, business, trade, medical practice, medical support, law, art, service industry, social service, civil service, city administration and political office. A response of a 4 or a 5 was considered to represent a high interest level.

Occupational interest areas were compared based on gender, ethnicity and school within the WPS.

Table 2 gives the number and percentage of students, by gender interested in each occupational interest area.
Table 3 gives the ratio of males to females in each occupational interest area, by ethnicity.
Table 4 gives the percentage of students interested in each occupational interest area who attend each school.
Table 5 gives the ratio of males to females in each occupational interest area, by the school they attend.

Table 117: Occupational Interest Area by Gender

	Male	Male %	Female	Female %	Total	Total %
Teaching	50	10.2%	88	19.3%	138	13.7%
Eng/Phys. Science	161	32.8%	39	8.6%	200	19.9%
Computers/IT	194	39.5%	61	13.4%	255	25.3%
Business	214	43.6%	207	45.4%	421	41.8%
Trade	155	31.6%	31	6.8%	186	18.5%
Medical Practice	75	15.3%	175	38.4%	250	24.9%
Medical Support	52	10.6%	167	36.6%	219	21.8%
Law	120	24.4%	159	34.9%	279	27.7%
Art	150	30.5%	165	36.2%	315	31.3%
Service Industry	49	10.0%	150	32.9%	199	19.8%
Social Service	44	9.0%	162	35.5%	206	20.5%
Civil Service	117	23.8%	44	9.6%	161	16.0%
City Admin.	45	9.2%	28	6.1%	73	7.3%
Political Office	34	6.9%	23	5.0%	57	5.7%
Totals	491		456		1006	

Table 118: Gender Ratio (M:F) by Ethnicity & Occupational Interest Area

	Overall	African Amer.	Asian	Caucasians	Hispanics
Trade	5.00:1	5.33:1	7.00:1	4.17:1	5.75:1
Engineering/PS	4.13:1	4.33:1	3.80:1	3.88:1	5.50:1
Computers/IT	3.18:1	1.85:1	2.18:1	3.22:1	4.92:1
Civil Services	2.66:1	3.00:1	1:1	2.80:1	3.45:1
City Admin	1.61:1	1.75:1	2.00:1	2.00:1	1.55:1
Political Office	1.48:1	1:2.00	1:2.00	2.10:1	2.67:1
Business	1.03:1	1:1.28	1:1.64	1.08:1	1.08:1
Art	1:1.10	1:1.25	1:1.06	1:1.39	1.19:1
Law	1:1.33	1:1.47	1:4.00	1:1.45	1:1.03
Teaching	1:1.75	1:1.10	1:2.63	1:1.79	1:2.22
Medical Practice	1:2.33	1:2.44	1:1.22	1:3.03	1:2.04
Service Industry	1:3.06	1:7.14	1:2.17	1:3.70	1:2.22
Medical Support	1:3.23	1:3.33	1:3.70	1:5.00	1:2.38
Social Services	1:3.70	1:2.70	1:9.09	1:3.85	1:3.85

Table 119: Occupational Interest Area by School

	School A	School B	School C	School D	School E	School F	School G
Teaching	1%	9%	20%	22%	20%	2%	25%
Eng/Phys. Sci.	3%	12%	18%	22%	13%	6%	28%
Computers/IT	2%	11%	21%	22%	11%	6%	26%
Business	3%	19%	19%	19%	15%	4%	23%
Trade	1%	43%	9%	18%	9%	5%	16%
Med. Practice	3%	14%	25%	18%	16%	5%	20%
Med. Support	1%	14%	24%	21%	16%	4%	20%
Law	2%	20%	21%	19%	16%	2%	20%
Art	3%	15%	18%	25%	18%	4%	19%
Service Ind.	1%	16%	17%	21%	19%	5%	22%
Social Service	3%	11%	21%	20%	15%	4%	26%
Civil Service	2%	23%	16%	18%	11%	5%	25%
City Admin.	1%	18%	12%	19%	16%	5%	28%
Political Office	5%	5%	21%	19%	17%	3%	29%

Table 5: Gender Ratio (M:F) by School & Occupational Interest Area

	Overall WPS	School A	School B	School C	School D	School E	School F	School G
Trade	5.00:1	1:0	4.71:1	15.0:1	3.71:1	1.43:1	8.00:1	1:0
Eng/Phys. Sci.	4.13:1	4:1	5.00:1	4.00:1	3.00:1	2.57:1	3.00:1	8.17:1
Computers/IT	3.18:1	5:1	3.67:1	3.15:1	4.70:1	1.42:1	2.75:1	3.40:1
Civil Service	2.66:1	2.00:1	8.25:1	1.50:1	1:1.42	2.00:1	3.00:1	3.56:1
City Admin.	1.61:1	0:1	5.50:1	1:1.25	1:1	1:2.00	1:0	2.50:1
Political Office	1.48:1	2.00:1	1:0	1.40:1	1:1.20	1:1	1:1	2.40:1
Business	1.03:1	1:2.67	1.19:1	1:1.02	1.42:1	1.07:1	1:1.29	1:1.07
Art	1:1.10	1:3.00	1.30:1	1:1.67	1.60:1	1:2.11	1.40:1	1:1.11
Law	1:1.33	1.50:1	1.07:1	1:2.11	1:1.21	1:2.14	1:1.25	1.19:1
Teaching	1:1.75	1:1	1.60:1	1:1.70	1:2.88	1:2.00	0:1	1:1.50
Med. Practice	1:2.33	1:2.50	1:1.69	1:2.26	1:2.67	1:3.44	1:1	1:2.40
Service Ind.	1:3.06	0:1	1:5.20	1:2.30	1:2.82	1:3.22	1:2.00	1:3.00
Med. Support	1:3.23	0:1	1:3.57	1:3.31	1:4.33	1:3.00	1:1.25	1:3.27
Social Service	1:3.70	0:1	1:2.14	1:3.30	1:3.67	1:6.50	1:2.00	1:3.82

Career-Related Concerns

In the survey, students were also given a series of statements regarding career-related concerns. They were asked to indicate if they agreed with the statement. Career-related concerns were compared based on gender and school.

The figures below show the percent of the students that agreed with each statement. Each figure shows the overall percentage of Worcester Public School students that agreed with the statement, as well as the overall percentage of males and females who agreed with the statement. It also shows the highest and lowest percentage of students who agreed, of the seven public high schools.

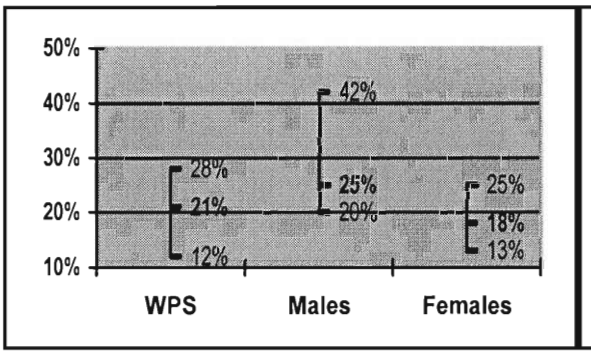


Figure 2: "I doubt I'll be accepted to college because my grades are too low."

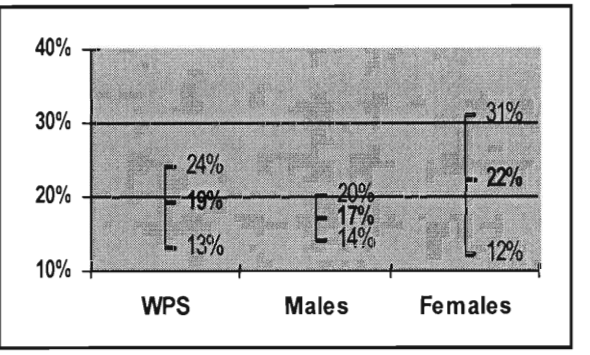


Figure 3: "I doubt I'll be accepted to college because my test scores are too low."

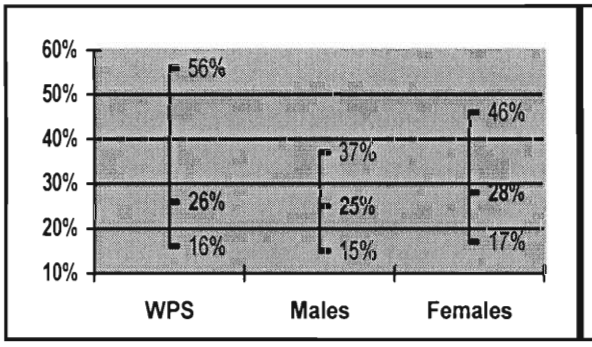


Figure 4: "I doubt I'll be attending college because it's too expensive."

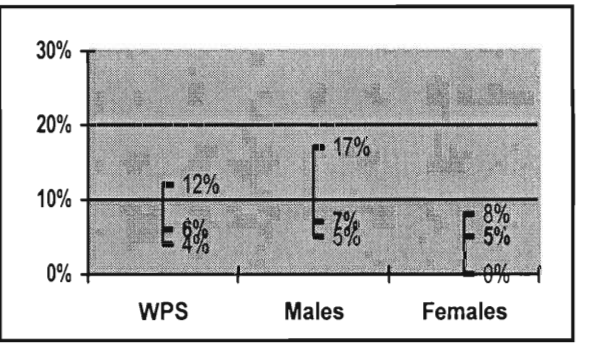


Figure 5: "I doubt I'll be attending college because it's too demanding/difficult."

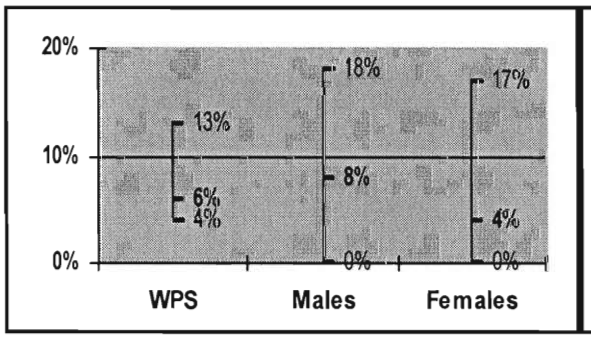


Figure 6: "I doubt I'll be attending college because I dislike school."

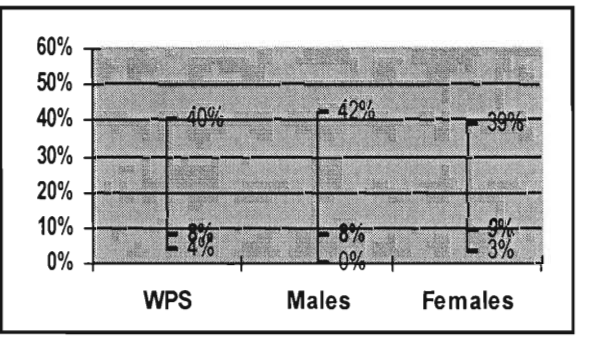


Figure 7: "I feel unprepared because I don't know anyone in that profession."

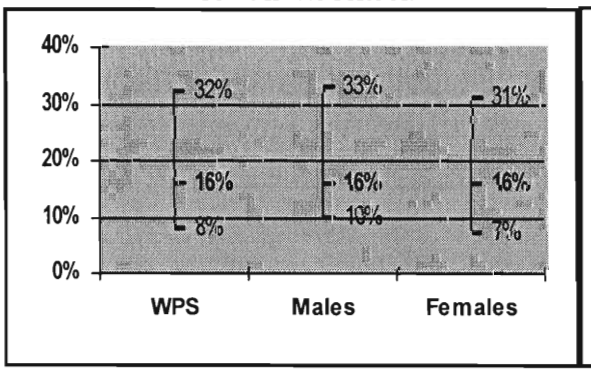


Figure 8: "I feel unprepared because I don't know what education is required."

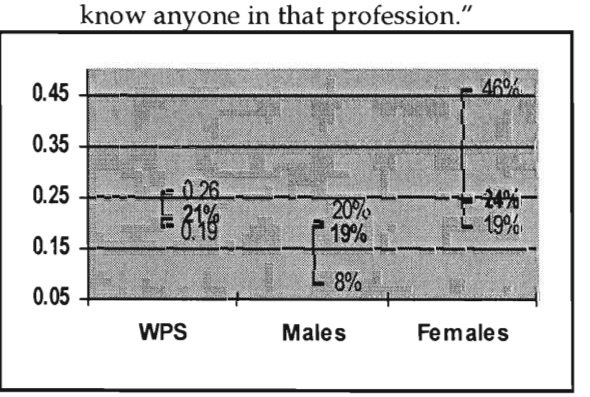


Figure 9: "I feel unprepared because I don't know if I will succeed in that profession."

The rate at which students expressed agreement with the concern statements was found to vary greatly by ethnic group. Table 6 shows the percentage of students in each of WPS largest four ethnic populations who agreed with each of the career-related concerns.

Table 6: Career-Related Concerns by Ethnicity

Concern	Overall	African Amer.	Asian	Caucasian	Hispanic
Grades	21%	25%	22%	17%	27%
Test Scores	19%	22%	30%	14%	23%
Financial Aid	26%	26%	40%	18%	37%
Difficulty of College	6%	8%	13%	3%	8%
Dislike School	6%	3%	4%	7%	7%
Lack of Contacts	8%	13%	16%	5%	10%
Required Education	16%	16%	23%	13%	20%
Success Doubts	21%	22%	35%	19%	19%

Submitted by: Laura Handler and Patrick Hogan
Worcester Polytechnic Institute, Class of 2006
Sponsored by: City Manager's Committee on the Status of Women

April 26, 2005

Appendix F2: ACSW Progress Reports

IQP Progress Report: November 2004

Gender-Based Comparative Survey of Public HS Students

Laura Handler
Pat Hogan

Since the start of our project in B Term of 2004, we have accomplished the following tasks:

* *Contact Worcester Public Schools*

To implement a survey in the Worcester Public High Schools, we had to contact several people in the administrative branch to approve the project and the survey.

First we contacted Sherrill McKeon, Supervisor of Student and Staff Support Services, to find out the state of affairs of aspirations data within the public schools. (See Appendix 1) Ms. McKeon delegated our team to Albert Vasquez, Manager for Secondary Initiatives and Worcester Vocational High School. He indicated immediate interest because the public schools do not have updated aspirations data.

On November 18, we e-mailed Mr. Vasquez the letter that we sent Ms. McKeon to set up an appointment to discuss the survey with him. Concurrently, we contacted Dr. Patty Mostue, Director of Test and Assessment, to approve the contents of the survey.

We met with Dr. Mostue and Mr. Vasquez on December 8 to discuss the content of the survey and the implementation of the survey. They made suggestions to the survey (which will be discussed below) and agreed to discuss the survey with Dr. James Caradonio, the superintendent.

* *Develop Survey Instrument*

Development of the survey instrument for distribution to the schools is a crucial part of our project and thus has taken up a significant amount of our time. Through the development stages, we have attempted to balance the interests of the ACSW with the interests of the public school guidance departments. In addition, in order to save costs in the printing stage and to save time in the data entry and analysis phases along with the time the schools must take to take the survey, the length has been kept to one page, or just slightly over one page.

The first section of the survey collects personal information from the respondent. They are prompted to fill out their name, school, and the occupations of their parents/guardians and to check the appropriate box to indicate their ethnicity and gender.

Name is currently being negotiated with the public schools, which are reluctant to have it included due to confidentiality issues. Having the name is important to the guidance counselors at each school to be able to talk directly to students about their responses as well as to the ACSW in identifying students which should be contacted about the Young Woman of Consequence Award. Some possible solutions to this problem include a negative permission slip or some coding system, both of which are being discussed and negotiated at this time.

Gender will allow Laura and me to develop gender-specific statistics. Of explicit interest are numbers regarding how many students of each gender are interested in counter-stereotypical careers. For example, a girl who aspires to be a plumber

and a boy who aspires to be a nurse are following career paths which are very unusual, and they may need special attention from their guidance counselors. The ACSW also has interests in female students who wish to pursue political office, and this question will allow us to give the committee statistics (and perhaps names) regarding this.

School and ethnicity will be used to allow Laura and I to keep statistics based on these criteria. We will be able to let each school know how their students rate in comparison to students in other schools, and allow them to perhaps make some curriculum or program changes to address these strengths/weaknesses. School will be pre-printed on each survey before distribution to each school to avoid any confusion later on. The Worcester Public Schools have a magnet system in place which attempts to attract students with particular interests to specific schools. They are interested in how well this system is working, and seeing if most students with particular aspirations are attending the appropriate school will be a strong indicator of this.

Parent and guardian occupation information will be used in two ways. It will allow us to see whether the student has a parental role model in striving for a particular career as well as giving us an idea of the social class of the respondent. Determining which careers belong in what social class may be difficult but can be addressed at a later time.

The next section is used to gauge each student's interests in a variety of careers. The current section in its final form is a far cry from how it originally looked. At first, several career types were listed with the student asked to indicate their interest along a scale of 1 to 10. However, this first draft would have been difficult for the students to understand what was meant by several of the career areas. To solve this, several examples are given after some of the career categories which may be difficult to understand or mean different things to different students. Also of concern was the fact that some areas like Medicine cover a wide variety of areas, from nurse to surgeon, which cover significant differences in the height of aspirations, education level, gender stereotypes, etc. To allow us to distinguish, some of the careers are now split up into several groups, for example instead of Medicine it is now Medical Practice and Medical Support. Several smaller changes include a heading which instructs the respondent to answer the questions with their dreams, not reality, in mind and the interest scale reduced to 5 numbers to ease the cognitive stress of the respondent.

After the career interests comes a question about the political interests of the student. This was originally included in the list of careers but was moved to its own section so that it makes sense with the following question about politics and to give it more emphasis, since the ACSW is quite interested in political aspirations. The question following will give an idea of just how motivated the students are at pursuing a political office. Due to the political environment of today, those who aspire to political careers are most likely to want to obtain a national level office at the height of their career.

To see how prepared a student is to pursue the career of his/her choice should be of significant interest to the guidance counselors of each school. From this they can determine if they need to include more programming on teaching students how to prepare for their career or whether certain students need specific aid in networking or career planning.

Questioning the students on why they feel they cannot pursue their interests should be one of the most interesting parts of the survey. The committee is

significantly interested in gender problems, so the first question which respondents will answer if they feel held back from a career because of their gender should be significant for them. The schools should be interested as well, and can look into the problem if a significant number of their students will not be pursuing careers of their choice due to the feeling that they should not or cannot, due to their gender.

The following 3 questions in the section deal with 3 cases, the first is the case of the student who wishes to go to college but feels they will not be accepted due to low grades, test scores or any other problem. The second case is students who could probably get into college but will not be attending because either they think college is too expensive, difficult, or if they just plain do not wish to attend because of a dislike of school. Lastly are students who could get into college and want to go but do not think they are prepared to do so. Perhaps they don't know what degree is required, what to look for in a college or some other reason. Lastly, each student is asked to indicate which extracurricular activities they are involved in and their leadership positions within each. This was originally intended to allow students to be chosen for the Young Woman of Consequence Award by gauging their leadership and community involvement through their extracurricular activities. Hopefully we will be allowed to use names and it will still be useful in this regard. If not, however, it will still be interesting to see if any correlation can be found between a students' activities and his/her aspirations.

Several sections and/or questions have been deleted from the original survey. Originally, more questions relating to politics were included in earlier copies which now have been either deleted or changed. Originally, students were simply asked if they would like to run for a political office, and were to respond with yes or no. This was later changed to a 1-5 scale like that of the career interest section. This question yields significantly more data than a simple yes or no question and will force the respondent to think more about his/her response to the question. Students were also asked if they would explain the reason for their interest or disinterest with politics. This question is not in the final survey because it is thought that open questions will yield minimal responses and because leaving space for the question took up valuable space. For the amount of space required to include that question we just weren't likely to receive enough useful information to justify its inclusion.

The section on career obstacles has also been changed significantly. At the time of presenting the survey to Dr. Patty Mostue and Albert Vasquez, the questions were quite different. The first and fourth question has not changed, but the second question leading the student to check what they feel is not desirable about education has been split into two questions, as described above. The third question, which tried to determine if any racial or religious problems were the cause of a student not pursuing a career, was scratched when Dr. Mostue and Mr. Vasquez expressed concern with it, feeling that it may be probing into a sensitive area and was unlikely to gather a free response from the respondent.

A list of extracurricular activities was added recently to the survey. Dr. Mostue feels that students are unlikely to list things accurately or at all, and so the move to the back of the page, which makes the survey slightly longer and increases printing costs, was considered justified in order to have confidence in the responses and to ensure that some data is collected. If they wish, the student can list any activities which are not included in the list.

* *Make Format Changes to Women of Consequence Award*

One of the driving forces behind the project was the desire of the ACSW to be able to identify promising young women to be candidates for their Young Woman of Consequence Award. In the past, it was left up to the guidance counselors or someone else who managed to obtain a copy of the nomination form to submit it in order for a young woman to become a candidate. Due to lack of time, etc., this method resulted in a shortage of candidates. It was hoped that through a survey, names of potential winners could be discovered by reviewing the surveys and picking women with interests in political careers or other leadership positions and were highly involved in their community. Guidance counselors would then be able to make sure these girls were nominated.

Because of the nature of the award, we felt it made more sense for the girls to take their own initiative to get the application in. Thus, we took it upon ourselves to change the application format from one dominated by guidance to a form which each applicant must fill out, and also added more to it, so a winner could be better chosen. Now, each applicant must get a letter of recommendation, a school transcript and write an essay, along with filling out information on extracurricular activities, etc. It is now an application which will be distributed to the student or picked up by them from the guidance office, but is entirely in their hands from that point on. The winner of a leadership award should be able to do this.

Due to this change, the survey loses one part of its usefulness to the committee. However, the data collected, especially the gender comparison and women in politics data will still be of much use to them. The new format should still be more effective than relying on guidance counselors regardless, so this was not a fallback plan. Instead, we feel this is the most effective way to handle award applications and are proud to have been a part of changing it.

IQP Progress Report: March 2005

Gender-Based Comparative Survey of Public HS Students

Laura Handler
Pat Hogan

Data Analysis

- Interests by Gender

  The attached charts show examples of comparisons of career interest via gender. This data will be compared to labor statistics and analyzed to determine how strongly gender stereotypes predict the interests of today's students in Worcester. Specifically, we are interested in looking at the Engineering/Physical Science and Political Office categories.

- Interests by Ethnicity

  Similar data comparing career interests to gender have been generated, with some examples attached. In regards to ethnicity, we are interested in seeing if minorities are striving to increase their involvement in underrepresented careers. Similarly, we will be looking at the difference in gender among each ethnicity to examine if any cultural barriers are holding women back.

- Interests by School

  Each school's guidance department should be curious as to how their students compare to students in the public school system as a whole. This information will allow them to better prepare their students to achieve their goals by informing them of their students' aspirations and concerns.

- Interests by Parental Occupation

  Analysis of interests vs. parental occupation will give an idea of how many students are looking to pursue similar career paths as their parents. In addition, knowing parental occupations gives an idea of the relative socio-economic status of the respondent, and can be used that way in comparison.

- Post High School Plans

  Besides career interests, the students' plans after graduating can be analyzed based on the four criteria above.

- Career Barriers

  Perceived career barriers can be analyzed in comparison with the above four criteria.

Survey Applications

- Young Women of Consequence Award

  We were able to identify female students with a high interest (4/5 or 5/5) in politics or city administration. We were then able to deliver award applications with a specific student designation.

- GEMS/Strive

  Similar to the Young Women of Consequence Award, we identified students who would be eligible for each program based on the results of the survey. GEMS applicants are female, with an interest in engineering and science; Strive applicants are underrepresented (ethnicity: African American, Hispanic or Native American). Applications were distributed in a similar fashion to the award.

- Engineering & Science Program

  We are looking to organize an event at W.P.I for students interested in engineering and physical science. The agenda will include general W.P.I admissions events as well as speakers from various engineering societies, such as the Society of Women Engineers (SWE) and the Society of Black Engineers (NSBE). Students will be invited to this program based on their survey responses (high interest in engineering/science).

- Females in Politics Program

  We would like to arrange an event for females interested in politics. We are currently in contact with the Massachusetts Commission on the Status of Women to speak at this event and would like to find more speakers for the event to further encourage females to pursue careers in politics and city administration. Students will be invited to this program based on their survey responses (high interest in politics or city administration as well as participation in student government activities and community-outreach programs).

PROPOSAL FOR: FACES@*WPI*
Females Aspiring to Careers in Engineering and Sciences

Sponsored by:
Worcester City Manager's Advisory Committee on the Status of Women
Submitted by:
Laura Handler and Pat Hogan

Purpose:

To encourage female high school juniors in Worcester who are interested in careers in engineering and science to pursue those careers.

Date: April 15, 2005

Participants:

Students: Up to 40 female students with interest in engineering, science and computers attending Worcester Public and Private Schools

Organization & Individuals: Speakers from Society of Women Engineers; WPI students; WPI Admissions; WPI Crimson Key

Selection Process:

Invitations will be sent to students identified by the committee's career aspirations survey. Guidance counselors, teachers and related-club advisors will also be notified about the event. All interested students will have to RSPV prior to the event, by April 8.

Tentative Schedule of Events:

(Subject to Change as Transportation is Arranged & As WPS Input is Received)

9:00 *Arrival*
Students will arrive to WPI campus starting at 9:00. They will receive their schedule of events, tour groups, mentor contact information, lunch host, admissions information & any other information that SWE or ACSW want to hand out (Table in Campus Center). They will be directed to the Hagglund Room in the Campus Center.

9:15 *Introduction & Admission Information Session*
Organizers will welcome students. Admission representatives from WPI, Clark and Holy Cross will use the remainder of the time to explain the benefits of attending the schools as well as requirements, etc.

10:15 *Society of Women Engineers*
Speakers from the Society of Women Engineers will speak to students.

11:00 *Facilities Tour*
Students will tour 3-4 different labs for approximately 15 minutes each. Possibly labs are the Fire Protection Engineering Lab, new Chemistry Lab, Robotics Lab and Rehab Lab.

12:00 *Lunch*
Pizza & soda will be provided by Admissions. 10 WPI females will join discussion in a casual setting.

12:30 Closing

Students will hand in evaluation forms, etc. Students will be escorted to the bus & shuttle stop.

Follow-Up:

Students will receive admissions/application information for WPI, Holy Cross & Clark. They will also fill out a written evaluation form for the program.
Students will also receive contact information for their WPI mentor to establish a line of communication with WPI.

Required Resources:

1. Transportation for students
2. Funds for printing invitations and advertisement
3. Permission and input from Worcester Public High Schools
4. Undergraduate students for mentor program & lunch
5. Publicity
6. At least 1 chaperone from each of the Worcester Public High Schools that have students attending