Report R-1

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THE NEW YORK STATE PAY EQUITY STUDY: A RESEARCH REPORT

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New York State Pay Equity Study

Executive Summary

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The Civil Service Employees Association (CSEA) and the State, through its Governor's Office of Employee Relations (GOER), negotiated funds in 1982 to carry out a study to assess pay equity in three bargaining units covering approximately 100,000 State employees. In 1983, the Center for Women in Government was asked by CSEA and GOER to examine the effects of sex and race/ethnicity of the typical job incumbent on the setting of salaries.

Pay equity studies, also commonly called comparable worth studies, are designed to determine whether the salaries associated with job titles accurately reflect a consistently applied standard of job worth regardless of the sex or race/ethnicity of a typical job incumbent. These studies require a methodology through which:

- the relative worth of different jobs can be assessed;
- undervalued job titles can be identified; and
- estimates regarding the extent of undervaluation can be calculated.

To accomplish these objectives, most pay equity studies have relied on job evaluation techniques, which historically have formed the basis of most formal classification systems and salary-setting practices in the public and private sectors.

The use of conventional job evaluation can be problematic in research on pay equity, however. Given historical assumptions about the value of "women's work" or work done by minorities, there is reason to suspect that sex and race/ethnicity of typical job incumbents play a subtle role in assigning salaries through these evaluation systems. To avoid potential bias, it is necessary to modify conventional job evaluation. The Center for Women in Government's approach was designed to maximize consistency and minimize sex and race/ethnicity bias in the way jobs are described and evaluated and in the procedures for establishing wages. The study uses a policy-capturing approach, which relies heavily on statistical procedures for designing the data collection, for analyzing the data to establish factor weights, and for estimating the appropriate salary for female-dominated and for disproportionately minority jobs.

Since New York State is the third largest public employer in the United States, with well over 175,000 employees in over 7,350 classified job titles, the job evaluation study required the collection of massive amounts of accurate

information about job content from a large sample of job incumbents filling a representative range of job titles. Given the volume of information that had to be collected in New York State, we utilized incumbent self-reports as a major source of information about job content. Our two primary criteria for this decision were:

- this approach was the way to get the most information at the lowest cost; and
- a number of authorities regard incumbent self-reports as the best source of information about jobs.

In addition, we averaged incumbent responses within each job title to obtain a title profile. This has the effect of minimizing the impact of any unique incumbent differences in filling out questionnaires, including any tendencies to overstate or understate the duties, skills, and responsibilities involved in their jobs.

By virtue of our contractual agreement, estimates of undervaluation were targetted to female-dominated and disproportionately minority titles with ten or more incumbents in the three bargaining units represented by CSEA. Female-dominated titles were defined as those in which at least 67.2 percent of incumbents are females. Disproportionately minority jobs were defined as those in which at least 30.8 percent of incumbents are minorities. These definitions are based on a formula,

$$(.4X) + X,$$

where X is the overall proportion of women or minorities in the New York State labor force. In addition to providing equitable pay estimates for female-dominated and disproportionately minority titles, we provided similar estimates for a set of titles in the direct line of promotion from disproportionately minority and female-dominated entry level titles found to be undervalued. The pool of titles for which equitable pay estimates were made include 168 female-dominated and disproportionately minority titles and 20 direct-line-of-promotion titles.

Data were collected from a sample of incumbents in a broad range of job titles. Sampling of incumbents within titles was done differently for the subset of female dominated and disproportionately minority titles for which we provide pay equity estimates than for the remaining titles. For estimated titles, we included all employees in titles with 150 or fewer incumbents. In titles with more than 150 incumbents, we sampled 150. For the remaining job titles, we sampled all employees in titles with 20 or fewer incumbents. In

titles with more than 20 incumbents, we sampled 20 incumbents using systematic sampling procedures with a random starting point. Note that direct-line-of-promotion titles were sampled in this way, primarily because the final policy decision to examine them for potential undervaluation was made after the sample had been selected.

To collect information on job content from sampled incumbents, we designed a closed-ended questionnaire customized to the range of content associated with work in New York State government. The design of the Job Content Questionnaire was shaped by three basic objectives:

- to capture variations in job content as they relate to variations in civil service grade level;
- to maximize consistency and minimize sex and race/ethnic bias in the range and wording of job content questions; and
- to allow incumbents in all titles to read and accurately respond to the questions being asked.

To our knowledge, it represents the first attempt to carefully and systematically meet these objectives in a large-scale public sector pay equity study. Its development and modification was carried out over eleven months, involving a process of comprehensive review of previous job analysis and job evaluation approaches combined with a sensitivity to detail in the range of tasks, functions, and behaviors of work associated with New York State job titles. It involved as well continual revision of content, wording, and lay-out in light of the reactions and criticisms of several hundred state employees acting either as respondents in two waves of preliminary field testing or as experts or both.

Between February and June, 1984, a pilot survey was carried out to improve the technical quality of the main survey by providing information on distribution methods, survey mechanics, and questionnaire construction. The pilot Job Content Questionnaire was distributed to 1,862 incumbents in 68 job titles sampled primarily from six agencies and two facilities. Response rates were, for the most part, adequate for all types of jobs and for all distribution methods. This finding was stable across sex, race/ethnicity, and literacy level of job incumbents, negotiating unit, agency, and salary grade, and for small incumbency titles. A few titles had relatively low response rates, but these titles did not fit any pattern that could be used as the basis for targeting titles in the main data collection survey. As a result of these findings, we decided to rely exclusively on mailed distribution and to track response rates by title in the main survey.

As explained in the body of the report, the pilot survey also established the reliability and validity of the Job Content Questionnaire. In general, we found that the questionnaire appeared valid to employees. Items predicted pay as one would expect. It is important to note that the questionnaire has a seventh grade reading level and, therefore, does not measure ability to read instead of job content. Moreover, questionnaire items group conceptually into factors similar to those found in other job evaluation systems.

A substudy comparing supervisor and incumbent responses on a subset of questions was included to assess the validity of using incumbents as informants about their jobs. The logic underlying this analysis was that supervisor ratings, which are frequently used for job analysis, are regarded as a standard of accuracy. We found substantial agreement between supervisors and incumbents, supporting our selection of using incumbents as sources of job content data.

A final objective of the pilot survey was to simplify and improve the Job Content Questionnaire so that it would be easier for employees to fill out. A factor analysis of the questionnaire items was performed. As a result, several items were deleted and a few were added. In addition, many questions were re-written to remove ambiguities, to improve format and layout, and to make all questions closed-ended. The Job Content Questionnaire used in the main survey represents a more efficient and simplified document.

The main data collection occurred between November 30, 1984, and March 4, 1985. It involved sampling, printing, distributing, following-up, and preparing the data for analysis. The New York State Civil Service Department drew a systematic sample with a random start for each job title. A subcontractor printed and mailed 36,812 questionnaires to agency liaisons, who forwarded them to employees. Questionnaires were returned directly to the Center for Women in Government, where they were logged in and checked. The data were entered onto computer tape and verified by a private company, and the Center checked the data further for accuracy.

A major concern was to obtain high response rates. Efforts to increase the quantity of responses included extensive advance publicity of the study, sending a stamped return envelope to those who had less access to free interagency mails, mailing two follow-up letters, and mailing replacement copies when the originals were lost. We also made available a toll-free telephone number to respondents and agency liaisons in order to answer questions and solve any distribution problems. As a result of these efforts, a total of 27,394 completed questionnaires were returned providing an overall response rate of over 73 percent. The response rate for individual titles was adequate in all but 43 titles, which were deleted from the analysis. After verification of the accuracy of the data entry processing and of the fact that the responses fell within established parameters, 25,852 individual cases remained for use in the final analysis, providing information on 2,582 job titles.

Several procedures were used to prepare the data for the remaining analysis. Some questionnaire items were recoded and the population of each title was adjusted to reflect changes in title populations between the time of sample selection and the survey distribution intake. The individual incumbent level data were averaged and title scores were calculated. Indices were created for the complexity of writing, reading, and mental demands. A factor analysis of 80 items and three indices yielded a 14-factor solution. The 14 factors obtained were:

- Management/supervision;

- Unfavorable working conditions;
- Contact with difficult clients;
- Communication with public;
- Education required;
- Data entry;
- Group facilitation;
- Computer programming;
- Fiscal responsibility;
- Stress;
- Autonomy;
- Consequence of error;
- Time effort; and
- Mental demands.

Factor-based scores were calculated. These scores were used in a set of regression analyses that produced the pay policy equations for the New York State work force. Finally, for the regression analyses we delimited the sample of jobs to all jobs with four or more incumbents, because sex and race/ethnic composition of jobs is more stable across time with larger incumbency titles. Excluding the small incumbency titles made little difference in the final regression equations.

Regression analysis is the statistical procedure used in policy-capturing job evaluation to select the set of job content factors and the weights associated with the factors that are most related to the current implicit pay policy of New York State. The resulting regression equation is essentially a compensation model describing the job content factors of different jobs and the relationship of these factors to salaries. Three regression models were specified:

- a pay policy line based on all jobs;
- a pay policy line based on all jobs and adjusted to statistically remove the effect of female or minority composition of jobs; and
- a pay policy line based on white male jobs (defined to be those jobs filled 90 percent by males and 90 percent by nonminorities).

The first equation is included as a baseline against which the other two models can be assessed. It is inappropriate for use as a basis for equity adjust-

ments because the overall pay policy line incorporates any undervaluation in pay that affects female-dominated and disproportionately minority jobs. The second and third lines represent two different approaches toward adjusting for the impact of sex and race/ethnic bias.

Twenty-seven variables were entered into regression equations predicting salary grade. Of the 27 variables, 15 were found to be significant in the overall and adjusted pay policy equations. These 15 variables that were retained account for nearly 90 percent of the variance in salary grade across jobs. Ten variables were found to be significant in the white male policy equations.

Our results demonstrate that, for all pay policy lines, education, experience, management, supervision, and writing are highly compensated factors in New York State government employment. Moreover, several factors are not valued or are negatively valued. These include unfavorable working conditions, stress, group facilitation, communication with the public, data entry, and autonomy. While the pay equity estimates are based on the obtained regression equations, New York State could explicitly choose to change any of the regression weights in order to value these job factors differently. For some factors, like working conditions, changing the current regression weight from a negative to a positive value would affect disproportionately minority as well as predominantly white jobs. Other changes in regression weights (e.g. data entry) would have an impact only on disproportionately female jobs.

Using the adjusted pay policy line, with all other job factors held constant, jobs done entirely by women are on average two salary grades lower than jobs of equal value to the state done entirely by men. Jobs done by less than 100 percent women on average were undervalued less than two salary grades. In New York State an increase of one salary grade is an increase of approximately five percent in salary.

In order to calculate accurate predicted salary grades and accurate confidence intervals for female-dominated, disproportionately minority, and direct-line-of-promotion titles, we used a statistical procedure known as jackknifing. The estimated pay equity adjustments average 1.6 salary grades for the adjusted pay policy line and approximately 2.9 salary grades for the white male pay policy line. There is a strong tendency for job titles in the lower salary grades to be more undervalued than job titles in higher salary grades. This is the case no matter which of the pay policy lines is used. The salary grades of the job titles we examined ranged from grade 1 to grade 15. Particularly among the clerical and health care system job titles it was common to find titles in grade levels 6 and below to be undervalued by four or five salary grades.

We found no significant overall effect for the percent minority in a title. However, job titles which are both disproportionately female and disproportionately minority, on average are undervalued by approximately one-half of a salary grade more than the average. For instance, as indicated above, the average undervaluation using the adjusted pay policy line is 1.6 salary grades.

Among titles that are both disproportionately female and disproportionately minority this figure is 2.1 salary grades. Using the white male pay policy line the average undervaluation is 2.9 salary grades. However, for titles which are both disproportionately female and disproportionately minority, the figure is 3.3 salary grades.

Out of a total of 185 job titles in the CSEA bargaining unit that are more than 67.2 percent female and 30.8 percent minority or are jobs in the direct line of promotion for those female dominated and disproportionately minority jobs, we found 142 to be undervalued by more than a half a salary grade using the adjusted pay policy line and 163 were undervalued using the white male pay policy line. The number of employees in job titles undervalued by more than one half a salary grade is over 55,000 using the adjusted line and over 65,000 using the white male line.

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CHAPTER I

INTRODUCTION

New York State long has been at the forefront of efforts to enact and implement innovative policies to make the labor market more just and equitable by improving the terms and conditions of employment. This longstanding commitment was demonstrated in 1982 by the Civil Service Employees Association (CSEA) and the State, through its Governor's Office of Employee Relations (GOER), negotiating funds to carry out a pay equity study of three bargaining units covering approximately 100,000 State employees. In 1983, the Center for Women in Government was asked by CSEA and GOER to examine the effects of sex and race/ethnicity of typical job incumbents on the setting of salaries.

In this report, we present the results of the New York State Comparable Pay Study.[1] The goal of the study is to assess whether the wages paid for jobs traditionally held by women and minorities accurately reflect their productive value to New York State or are depressed because the work has been and continues to be performed by women and minorities.

This introductory chapter sets the stage for the study results. Specifically, we describe the distribution of women and minorities in the New York State government labor force. We then discuss job evaluation methodologies, and present a set of criteria for designing a job evaluation study consistent with principles of pay equity. The decision to use policy-capturing job evaluation is presented, as is an overview of the study design. The chapter concludes with an overview of the contents of the report.

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[1]This report is a revised version of a full technical report submitted to the state and the CSEA on October 1, 1985.

THE NEW YORK STATE LABOR FORCE

The New York State Civil Service Department, because of its sensitivity to the state's equal employment opportunity obligations, has addressed the issue of equal pay for equal work and has revised examinations to make them more job related. However, its classification and compensation system, established in 1937 and last revised in the mid-1950s, has never been assessed to determine whether assumptions about the value of jobs and the assignment of job titles to salary grades have been distorted by the sex or race/ethnicity of the typical job incumbent.

Prior to this study, the Center for Women in Government compiled statistics that demonstrate significant concentration of women and minorities in job titles at the lower grade levels of the State's wage structure. In 1981, women constituted over 74 percent of all employees in salary grades 12 and below, in a 38 grade system. Examining only women employees, fully 75 percent of all women were employed below grade 12. Similarly, although minorities constituted only 22 percent of the state work force, they made up 39 percent of those in grade levels 12 and below. Reviewing only minority employees, over three-quarters are employed below grade 12.

Reviewing income statistics, we found that women and minority men earned less than non-minority men. While 57 percent of non-minority male employees earned over $16,000 per year, only 30 percent of non-minority females, 21 percent of minority females, and 35 percent of minority males earned over $16,000 per year (McLaughlin, 1984).

Moreover, examining the sex composition of all competitive job titles with four or more incumbents, the Center found that, in 1979, over three-quarters of all state titles were either dominated by males or females. Of these, 65.3 percent were male-dominated and only 13.3 percent were

female-dominated.[2] Moreover, looking at the distribution of these titles across the wage structure, we found that 68 percent of the job titles below grade 7 were female-dominated, while only 3.1 percent of the job titles in grades 24 to 30 were female-dominated, and not even one job title in grades 31 to 38 was female-dominated. By contrast, slightly over 10 percent of job titles in grades 3 to 7 were male-dominated, while fully 80 percent of titles in grades 24 to 30 and over 90 percent of titles in grades 31 to 38 were male-dominated. Mixed job titles were distributed more evenly throughout grade levels (Center for Women in Government, 1982: 84-91).

An examination of the race/ethnicity composition of job titles with four or more incumbents revealed a similar pattern. Disproportionately Black and Hispanic positions constituted approximately 14 percent of job titles below grade 7, slightly over 11.5 percent of titles in grades 8 to 12, less than one percent of titles in grades 13 to 30, and no titles in grades 31 to 38. Regardless of grade level, the overwhelming majority of titles are filled by white incumbents: over 80 percent of titles in grades 3 to 12, and well over 90 percent of titles in grades 13 to 38 (Ibid.).

A career ladder study, completed by the Center in 1979, strongly suggested that the wage gap in state government employment was partly a function of the fact that almost all job titles and career ladders were dominated either by males or females (Peterson-Hardt and Perlman, 1979). Furthermore,

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[2]For the purpose of this early analysis, a male-dominated title is one in which 70 percent or more of incumbents are men and a female-dominated title is one in which 70 percent or more of incumbents are female. We defined disproportionately Black and Hispanic titles as ones in which 40 percent or more of incumbents are Black and Hispanic. These definitions differ from those used in the study, primarily because the analysis was completed prior to the decision by CSEA and GOER about what constitutes a female-dominated and disproportionately minority title.

it found that female-dominated ladders consistently began at lower pay grades and peaked at lower pay grades.

PAY EQUITY AND JOB EVALUATION: BACKGROUND

Occupational segregation by sex and race/ethnicity can contribute to the wage gap in one of two ways. First, for a variety of reasons, women and minorities may be systematically channeled into low worth jobs; that is, jobs that require less skill, effort, and responsibility than jobs filled by white males. We think of this source of wage differentials as a function of productivity-related job content differences. Insofar as occupational segregation results from discriminatory practices, past or present, this is an affirmative action issue, but is not a pay equity issue. Affirmative action policies work to eliminate this source of the wage gap through incentives and sanctions that increase the mobility of women and minorities into higher paying, more productive jobs.

Second, women and minorities may be segregated in jobs that require equivalent amounts of skill, effort, and responsibility as jobs held mainly by white males but that are paid less. Insofar as these jobs are systematically undervalued because the work is performed predominately by women and minorities, this type of wage discrimination is the focus of pay equity efforts. Pay equity, then, is concerned only with eliminating wage differences associated with the sex or race composition of jobs that cannot be accounted for by productivity-related job content characteristics.

The policy goal of equal pay for work of comparable worth broadens the earlier policy of equal pay for equal work which prohibited wage discrimination when women and men were doing essentially the same or similar work. A comparable worth or pay equity policy requires, instead, that

dissimilar work of functionally equivalent worth to the employer should be paid the same wages. Conceptually, pay equity involves assuring that work done primarily by women and minorities is not systematically undervalued because the work has been and continues to be done primarily by women and minorities. Simply stated, establishing pay equity involves correcting the practice of paying women and minorities less than white men for work that requires equivalent skills, effort, and responsibility under similar working conditions.

Pay equity studies are designed to determine whether salaries accurately reflect an explicit and consistently applied standard of job worth regardless of the sex or race/ethnicity of a typical job incumbent. These studies require a methodology through which:

- the relative worth of different jobs can be assessed,
- undervalued job titles can be identified, and
- estimates regarding the extent of undervaluation can be calculated.

To accomplish these objectives, most pay equity studies have relied on job evaluation techniques, which historically have formed the basis of most formal classification systems and salary-setting practices in the public and private sectors. Typically, job evaluation involves three major components: description of job characteristics, evaluation of job characteristics, and salary-setting.

Job description involves gathering accurate information about the skills, responsibilities, tasks, and conditions of work entailed in each job. This information makes it possible to organize many individual positions into job classes or titles. As a final step, job specifications are prepared which summarize job content in terms of key characteristics. They provide the link between description and evaluation.

Evaluation of characteristics involves assigning relative worth to job content in order to rank jobs in relation to one another. Most systems include some systematic procedure for developing and assigning weights or relative value to the job content characteristics. The highest weights would be assigned to those characteristics that are regarded as most important to the employer. In the most precise systems, job value is defined in terms of points. Once an employer has selected an evaluation system, the system is used to analyze each title to obtain a score for the title. The scores become the basis for directly translating a set of job characteristics into an appropriate ranking.

Salary-setting involves the conversion of job worth points into pay rates for specific jobs. Commonly, this is accomplished through a pay policy line. A pay policy line establishes graphically the statistical relationship between job worth points and a measure of existing pay rates for a sample of job titles. The line of best fit between the points on this graph is then typically determined using multiple regression. The pay for each remaining job is determined by what pay rate is appropriate on the pay policy line, given the job's particular number of job worth points.

The process of job evaluation need not lead to sex-based and race/ethnicity-based wage discrimination. Job evaluation is nothing more than a set of techniques for making explicit the job content values of the enterprise in relation to what features of jobs should be compensated. It provides a procedure for systematically ordering jobs into a hierarchy based on the job content values articulated. However, given historical assumptions about the value of "women's work," there is reason to suspect that sex is an implicit compensable factor in the job evaluation systems of many organizations. By this we mean that jobs filled by higher proportions of females tend

to pay less than jobs requiring equal levels of skill and responsibility with lower proportions of female incumbents. This makes the use of conventional job evaluation problematic in pay equity research.

To avoid potential sex and race/ethnicity bias, it is necessary to modify conventional job evaluation. Specifically, comparable worth job evaluation requires that we apply to all jobs consistently a single bias-free point factor system (Remick, 1984). The following design criteria need to be met at each step of job evaluation.[3]

(1) Description of characteristics. All jobs should be described fully and consistently and not differentially by the sex or race/ethnicity of the typical incumbent. This means that all jobs must be viewed in terms of the same possible range of job content characteristics, including those associated with female-dominated or disproportionately minority work. The information must be collected in a way that ensures that variations are not a function of incumbent differences in providing information.

(2) Evaluation of characteristics. All jobs should be evaluated and assigned points according to a uniform set of factors and weights. Factors should include characteristics associated with all types of jobs, including those often associated with jobs which are disproportionately minority, although it may be that some of these characteristics are not valued by the employer, regardless of the sex or race/ethnicity of the typical incumbent.

(3) Salary-setting. Wages should be assigned according to one pay policy line established on the basis of a graph including an agreed upon set of jobs in the organization. This line must be adjusted using an adjustment formula, as those recommended in Treiman and Hartmann (1981) and Treiman, Hartmann and Roos (1984).

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[3] See Steinberg (1984) and Steinberg and Haignere (1985) for a discussion.

POLICY-CAPTURING JOB EVALUATION

One of the most important design decisions in job evaluation methodology involves the development of factors and weights. Two basic approaches to developing and applying factors and weights exist: an a priori approach and a policy-capturing approach.

A priori approaches begin with a predetermined system of factors and weights to evaluate jobs within a specific organization. These weights may come from a predefined consultant's package or they may be derived from a policy-making committee's decisions about what should be valued for the purpose of compensation.

Typically, a priori systems define work content in terms of broad categories such as skill, effort, responsibility, and working conditions, even before specific jobs in an organization are examined. Each category or factor is further subdivided and, within each subcomponent, levels are created with points assigned to each level. The application of a priori systems usually involves evaluation committees, which review a job description or job specification and arrive at a consensus decision about what overall score a job title should receive. Descriptions are sometimes produced from information collected through desk audits or group interviews. Or, they are sometimes derived from responses to an employee questionnaire asking such broad questions as: "Describe the most significant tasks associated with your job."

The second approach to job evaluation is policy-capturing. This involves developing a compensation model in which specific job content features such as the number of persons supervised, the amount of prior experience in a related job, the level of analytic reasoning required, and the level of education needed to perform the job are divided into factors and then these factors are weighted in such a way that they statistically "predict" the current wage

structure. In other words, the weights for each compensable job content characteristic are derived from a statistical model which makes explicit what is currently implicitly valued for compensation purposes within an organization.

Policy-capturing or a priori job evaluation systems can vary from employer to employer. For example, a public jurisdiction may value, among other things, supervision, responsibility for budgetary decisions, and writing skills. By contrast, a maunfacturing firm may value supervision, cost-related managerial decisions, production monitoring, and manual dexterity, ignoring writing skills altogether. Compensation models for these two organizations would differ because the range of job titles and job content varies, what is considered valuable in job content varies, and their current wage structures vary.

The Center for Women in Government designed the New York State Study in terms of a policy-capturing approach for two reasons. First, in the early stages of developing the proposal we worked with GOER, CSEA, the Civil Service Department, the Center's Board of Directors, and the Center's Research Advisory Committee to select the job evaluation methodology best suited to New York. We reviewed several a priori systems, offering New York a set of predetermined factors and weights. These alternatives were rejected by policy-makers and constituent group leaders. Instead, there was a strong preference for the policy-capturing approach. It was believed that this approach was best suited to a pay equity study because it is based on what New York State implicitly does value and not on what New York State should value. Once we determined what New York State actually values in job content, we would base the estimates of undervaluation on the existing, and now explicit, New York State compensation policy.

Consistent with the state policy-makers' views, the Center regards policy-capturing as an appropriate job evaluation approach for assessing pay equity. A comparable worth pay policy does not tell an employer what job content should be valued. It requires only that whatever an employer values is valued consistently and systematically across all job titles and not arbitrarily and implicitly as a function of the sex or race/ethnicity of the typical incumbent of a job title. As the National Academy of Sciences Committee on Occupational Classification concluded:

> Paying jobs according to their worth requires only that whatever characteristics of jobs are regarded as worthy of compensation by an employer should be equally so regarded irrespective of the sex, race, or ethnicity of job incumbents (Treiman and Hartmann, 1981: 70).

COMPARABLE WORTH JOB EVALUATION: OVERVIEW OF DESIGN

The New York State study uses a policy-capturing approach, which relies heavily on statistical procedures for designing the data collection, for analyzing the data to establish factor weights, and for estimating the appropriate salary for female-dominated and disproportionately minority jobs. To meet the three methodological criteria specified above, we maximized consistency and minimized sex and race/ethnic bias in the way jobs are described and evaluated and in the procedures for establishing wages. We further adjusted the final set of factors and weights to remove the possible impact of wage discrimination in the jurisdiction's current pay policy.

To meet the first criterion of describing all jobs fully and consistently and not differentially by the sex or race/ethnicity of the typical incumbent, we developed a questionnaire customized to the range of job content characteristics found in New York State jobs. To design the questionnaire, we

examined over 18 job analysis or job evaluation approaches. We reviewed these plans so as to include in our survey instrument every category of job content characteristic that previously had been found to be compensable. We also included additional potentially compensable characteristics which were not a part of other systems but which might be relevant to New York State pay policy. We wrote the questionnaire at a seventh grade readability level. For each question, employees had to choose one from a number of possible closed-ended responses, to minimize the impact of differential abilities to express ideas in writing and to eliminate any sex and race/ethnic differences in word usage or comprehension of job content factors. The development of the Job Content Questionnaire is described at greater length in Chapter III.

The second criterion is that all jobs be evaluated and assigned points according to a consistently applied and uniform set of factors and weights. In order to meet this criterion, we statistically derived one set of factors and weights by analyzing the data collected from our employee questionnaires in relation to current New York State salaries. To do this, we first averaged incumbent responses for each job title in order to obtain a single composite job description for each job. Next, we statistically sorted the data from the questionnaire using factor analytic statistical techniques to group together items of similar job content, like questions on supervision, data entry, group facilitation, and so on. Weights for job content factors were assigned in relation to the current wage structure using multiple regression analysis. The resulting compensation model was applied to each female-dominated and disproportionately minority job title to obtain a predicted salary grade, indicating what the wages for these jobs would be in the absence of discrimination.

These policy-capturing procedures rely heavily on statistical analysis performed on computers. The use of standard statistical procedures and computer analysis ensures that the set of factors and weights are applied consistently, eliminating the possibility that consultants or committees impose subjective stereotypes in their selection and application of factors and weights in relation to particular female-dominated and disproportionately minority jobs.

The Center for Women in Government is assisting the state in meeting the salary-setting criterion that appropriate wages should be assigned on the basis of one adjusted pay policy line. We computed three separate pay policy lines. The first pay policy line is based on the compensation model for all New York State job titles. This cannot be used as a basis for pay equity adjustments, however, because it includes the salaries of female-dominated and disproportionately minority jobs which may be undervalued due to discrimination.

The remaining two estimation procedures, in effect, remove from the pay policy line the potential distortion of discrimination. The second estimation procedure involves adjusting the overall compensation model by statistically removing the effects of percentages of female and minority incumbents in job titles from the job content characteristics predicting pay. This approach removes from the compensation model that part of the variation in New York State's pay policy that can only be explained by the proportion of women and minority incumbents in job titles.

The third procedure involves using the white male pay policy line as the standard for determining the job content value of all titles. The validity of this procedure is based on the assumption that the salaries assigned to jobs held primarily by white males are not affected by sex or race/ethnic discrimination.

These last two estimates provide measures of potential undervaluation in female-dominated and disproportionately minority titles. Thus, the Center is using an adjusted policy-capturing approach as the basis for pay equity estimates.

OVERVIEW OF THE REPORT

This report is organized into seven remaining chapters. A chapter providing a general overview of the methodology follows this introductory chapter. It builds on the preceding overview of the study design by describing the study population and sample, providing definitions for female-dominated and disproportionately minority titles, and delineating the general approach to data collection through the use of a customized questionnaire administered through incumbent self-reports.

Chapters III and IV discuss the development of the Job Content Questionnaire and the pilot survey designed to test the validity and reliability of the questionnaire as well as the feasibility of using different distribution methods in the main data collection survey.

Chapter V reports on the process of collecting the job content information in the main data collection stage. Chapter VI reports on the results of the preliminary data analysis and the examination of the job content factor and items of the study. In addition, it treats the methodology and the results of creating indices and factors out of the items contained in the Job Content Questionnaire.

Chapter VII reports on the unadjusted average pay policy line and the two pay policy models that are used to generate estimates of undervaluation for female-dominated and disproportionately minority titles. Chapter VIII reports the estimates of undervaluation for female-dominated, disproportionately

minority, and those related direct line of promotion titles where the entry level title is found to be undervalued.

CHAPTER II

GENERAL METHODOLOGY

New York State is the third largest public sector employer in the United States with well over 175,000 employees in over 7,000 job titles. To undertake a pay equity job evaluation study requires the collection of massive amounts of accurate information about job content from a large sample of job incumbents filling a representative range of job titles.

This chapter reports on the basic methodological decisions shaping key features of the study design. It begins with a discussion of the use of an incumbent self-administered questionnaire customized to New York State job content as the data collection instrument. It continues with basic definitions of the survey population and concludes with a description of the general sampling frame.

THE COLLECTION OF JOB CONTENT INFORMATION

In traditional job evaluation, job content information is typically collected using desk audits, group interviews of incumbents, questionnaires to incumbents, questionnaires to supervisors, or some combination of the above methodologies.

Given the volume of information that had to be collected in New York State, desk audits and group interviews were ruled out. To do desk audits of just ten job titles, observing only five positions within each title, would take approximately 150 days of staff time. To collect information on over 2500 job titles would take 37,500 staff days! Desk audits are most frequently used to review single jobs for reclassification. However, these are not practical for system-wide analysis such as the one being undertaken here. Group interviews in each job title would be less labor intensive but still prohibitive if substantial numbers of titles were included. In addition, group interviews raise sensitive issues as to which employees are selected to

participate, which geographic areas employees are drawn from, and biases that the interviewer brings to the interview. We thus eliminated all of these options.

Based on our review of the research literature, we selected multiple incumbent self-reports as the optimal mode of data collection for our purposes. Our two primary criteria for this decision were:

- this approach was the way to get the most information at the lowest cost; and
- a number of authorities regard incumbents as the best source of information about jobs.

Incumbents operate as "multiple raters", representing a more diverse set of agency and geographic settings than could be reached using any other source of information or sampling procedure. In addition, we decided to average incumbent responses within each job title to obtain a title profile. This has the effect of minimizing the effect of any unique incumbent differences in filling out questionnaires, including under-aggrandizement and over-aggrandizement.[1] It also averages actual variations in job content of positions within titles. Thus, what we are left with is a description of the average or typical content of each job title.

Early on in the design of the study methodology, concern was expressed that incumbents would aggrandize their jobs by exaggerating the duties associated with them. As one way of minimizing that propensity, it was proposed that supervisors be asked to review employee questionnaires. After serious consideration, we rejected supervisor review for several reasons.

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[1] Under-aggrandizement involves a respondent reporting fewer skills and less responsibility then is actually involved in her or his job title. Accordingly, over-aggrandizement involves a respondent reporting more skills and larger responsibility then is actually in her or his job.

First, direct supervisor review of incumbent questionnaires would violate the confidentiality of responses. This would not only violate the State University human subjects review requirement, but would jeopardize crucial union support of the study.[2]

Second, we were doubtful about the validity of information received from supervisors as a standard for judging the accuracy of incumbent responses. Supervisors may well be motivated to aggrandize the jobs they supervise, as much or more than incumbents are. Additionally, their distance from the duties of the jobs they supervise may give them an inaccurate picture of the jobs.

Fortunately, there have been studies specifically designed to investigate the accuracy of incumbent responses to job questionnaires using supervisor responses as a standard. These studies find that incumbents describe their jobs as accurately as supervisors do. For instance, the findings of a study done in the Air Force indicates that, "when compared to supervisors' estimates there is no tendency for incumbents to exaggerate the number or difficulty of the tasks they perform (Madden et al, 1964:10). These researchers go on to indicate that "supervisors may not know precisely what any subordinate does task by task" (Ibid). They conclude that,

> since there is no tendency for workers to exaggerate the number or difficulty of tasks performed, the current Air Force procedure of collecting job information directly from incumbents seems preferable to collection of job information from supervisors (Ibid).

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[2] As a matter of routine, all research projects conducted at the State University of New York at Albany (SUNYA) must meet certain ethical standards in research. Proposals are reviewed by the SUNYA Institutional Review Board. One concern of the review process involves the protection of subjects from participating in research that involves providing sensitive personal information.

Another study comparing supervisor and incumbent responses completed by researchers from the Universities of Pittsburgh and Minnesota concluded that: "Overall, the findings gave strong support for the ability of workers to rate their jobs accurately, that is, consistently and with evidence of validity" (Dawson and Weiss, 1973:188). Finally, the Interim Report of the National Academy of Sciences Committee on Occupational Classification and Analysis questioned the assumption that supervisor responses were even as accurate as incumbent responses (Treiman, 1979:45).

As a matter of logic, there is no reason to suppose that supervisors exaggerate about job duties of subordinates less than those who hold the jobs. Indeed, those involved in other state comparable pay studies report informally that supervisor reviews consistently result in upgrading the described job responsibilities. In the Iowa comparable worth study, supervisors tended to review and modify incumbent responses in such a way as to generally increase the difficulty of jobs. Similar findings were reported in Illinois and Oregon. Moreover, there is some reason to suspect the possibility of sex stereotyping through supervisor bias. A study of supervisor ratings of job content noted that:

> differences were found in the amount of variance of ratings within jobs. Jobs such as mechanical engineer, computer programmer, adding machine serviceman, welder, and sheet metal worker were rated with less variability than were dietician, librarian, secretary-stenographer, and sewing machine operator. The jobs which were rated more consistently seemed to require working more closely with objects and hand tools and may have been easier to assess because specific tasks may have been more easily identified. The jobs which were less consistently rated were more service-oriented, or people-oriented, with tasks not as readily defined; they were also jobs in which women predominated (Dawson and Weiss, 1973, Ibid.).

This research raises serious questions about the validity of supervisor information about women's jobs in particular.

In summary, since there is no evidence that supervisors are either more accurate or less likely to exaggerate in describing the duties of jobs they supervise, we questioned whether supervisor review would lead to a better set of job descriptions. In addition, given the possibility that greater sex bias may be present in supervisor responses, we concluded that supervisors should not be relied upon as a source of job content information in a comparable pay study. As will be reported later, we conducted a pilot substudy in which we compared responses between supervisors and incumbents on a subset of items in the job content survey. We found no consistent differences between supervisor and incumbent ratings on the same job.

Two additional problems with using supervisor reports on job content relate to pragmatic and practical considerations. In the course of carrying out the pilot study, we were informed by several personnel directors in our pilot agencies that if incumbents knew that supervisors were being asked to review their job questionnaires, some of them may either provide inaccurate information perceived to be acceptable to their supervisors, or not even respond to the questionnaire. This was because some incumbents, and the unions representing them, may mistrust both the promised confidentiality of their responses and the eventual uses to which the data were being put.

Moreover, it was impractical to collect separate supervisor information given time and cost constraints. Indeed, the Center went through considerable difficulties in locating a mere 200 supervisors during the pilot study.[3] To

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[3]We first submitted a list of jobs for which we wanted the names of supervisors to the personnel director at each of eight sites. In each case, the personnel directors had no systematic information about supervisory relationships, and they spent considerable time tracking down who supervised whom. Most frequently, they located the supervisors by referring to time

(Footnote Continued)

have incorporated supervisor information on jobs consistently would have meant locating supervisors in almost 2,800 job titles. Based on our pilot experience, we saw no feasible way to sample supervisors in the main survey.

The next decision concerned the format for asking incumbents about job content. As a starting point, we reviewed job description questionnaires used by other researchers and consultants. These fall into two general categories: open-ended and closed-ended questionnaires. Open-ended questionnaires can lead to biased results for two reasons. First, the incumbents of many job titles such as Launderer, Mental Hygiene Therapy Aide, and Laborer tend to have less verbal skill than the incumbents of some other titles such as Personnel Administrator, Fiscal Analyst, and Program Evaluator. Second, linguistic research has noted the many ways in which words, particularly verbs, used by women are weaker and less action oriented (Remick, 1979). In addition, closed-ended questionnaires are less time-consuming to fill out and considerably less expensive to process. For these reasons, we preferred a closed-ended questionnaire.

Few job evaluation packages use closed-ended job content questionnaires. The major exception is the Position Analysis Questionnaire (PAQ) (McCormick, et al, 1969). The PAQ was originally developed for administration by job evaluators of blue-collar jobs. It was used as one of two information collection instruments in the Michigan Comparable Worth study. However, not surprisingly, data obtained from the survey proved unuseable as it was too difficult a survey instrument for incumbents to comprehend. Research has shown that the

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(Footnote Continued)
sheets to see who signed them. Despite this effort, eight blank questionnaires (or four percent) were returned to us because the employees receiving them did not supervise anyone in the specified job title.

readability level of the PAQ is college graduate (Ash and Edgell, 1975). It was thus inappropriate for use in a study relying on an incumbent self-administered survey in the public sector.

A variant of the PAQ was developed for a pilot comparable pay study for public employees in Pennsylvania, but it retained many of the limitations of the PAQ (Pierson and Koziara, 1984). Thus, there were no closed-ended questionnaires available that we thought appropriate for use in obtaining job content information. As a result, we developed a customized job content questionnaire for New York State government employment. The development of this questionnaire is the topic of the next chapter.

POPULATION DEFINITIONS

Job Title as the Unit of Analysis

Comparable worth job evaluation requires that the unit of analysis is the job title. Although we collected information from individual incumbents filling positions within titles, we averaged responses by job title. The focus of the research is on the job content chracteristics of the title. For instance, we are interested in the level of education or experience required to fill the job title and not in the level of education or experience of individuals in the title. To be sure, these should be highly correlated, but our sole interest is in the job title requirements.[4] Similarly, comparable worth research is less concerned with the unique job content features of

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[4] If wage level were a function of incumbent characteristics, and not job title characteristics, then we would indeed be interested in collecting information on compensable incumbent characteristics. However, New York State compensation policy is built on job characteristics, although seniority differences are incorporated into salaries within grade levels.

positions within a job title than with the job content common to all positions grouped together into a job title. This created some methodological complexities, most notably with respect to the sampling frame within the job title, which is discussed below.

Job Title Population: A Definition

The New York State Civil Service system currently has over 7,350 job titles, falling for the most part within six bargaining units and a management confidential group. For the purposes of this research, we specified the study population to include all the classified titles in the New York State Civil Service System. However, we made the following exclusions in the study population:

- titles for which salaries are not set by the Civil Service system (N.S. for non-statutory) or where salaries are set by law (O.S. for other-statute);
- classified titles with fewer than four incumbents, except those designated Management/Confidential;[5] State University faculty and professionals;
- titles located only in the following eight so-called quasi-agencies: Bridge Authority, Commission on Investigation, Energy Research and Development Authority, State Police Law Enforcement titles, Housing Finance Agency, N. E. Queens Nature and Historic Preservation Commission, Teachers' Retirement System, and the Thruway Authority.

In addition to these job title definitional restrictions, the employee population was specified to exclude the following:

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[5]This exclusion criterion was later expanded to include positions designated managerial/confidential (M/C). M/C titles with fewer than four incumbents were also dropped, because the regression analysis indicated that eliminating these small incumbency titles did not change the results. Moreover, doing so avoided giving the same weight to a single incumbency job title as to a larger job title where the responses of incumbents were averaged.

- incumbents of positions earmarked to be reviewed when these incumbents leave their positions;
- incumbents working part-time;
- incumbents who, subsequent to the sample selection, had moved to a non-sampled job title;
- incumbents with less than one-month tenure in the position; and
- incumbents who were retired, deceased, laid off, or otherwise not in the position at the time of the data collection survey.

These exclusions reduced the number of job titles represented in the study to 2,898.

Female-Dominated and Disproportionately Minority Titles: Definitions

One of the most consequential research design decisions in a pay equity study is what constitutes a female-dominated and disproportionately minority job. The criteria for selecting female-dominated or disproportionately minority titles directly determines the pool of jobs for which estimates of potential undervaluation will be made. Of course, not all job titles in the pool will necessarily be found to be misvalued. But only those titles in the pool will be examined to see if there is any misvaluing of jobs. Thus, the goal of achieving internal equity through pay equity adjustments is best met if we include too many, rather than too few titles in the pool.

The development of the criteria for selecting the sample of female-dominated and disproportionately minority titles was done jointly by labor and management with consultation from Center staff. The criteria encompass three rules indicating bargaining unit restrictions, a proportion female or minority incumbent cutoff point, and a minimum incumbency size.

First, because funds for the study were provided in the contract between the state and CSEA, estimates of undervaluation were contractually limited to titles in CSEA's bargaining units.

Second, the standards that had been used elsewhere in pay equity studies were reviewed. We found that for female-dominated job titles, most studies had used a 70 percent cutoff point. Specifically, this meant that only job titles with 70 percent or more female incumbents were examined to determine whether there was undervaluation in their wages. In most studies done in other jurisdictions the remaining job titles with 69.9 percent female or less were not examined. However, there is reason to expect that salary discrimination may affect job titles with less than 70 percent females as well as those with 70 percent or more females.

Moreover, since New York State was the first jurisdiction to look at disproportionately minority positions, we found no previous standards on how to define a disproportionately minority title. Thus, the definition of female-dominated and disproportionately minority titles by a cutoff point, whatever it would be, would be somewhat arbitrary.[6]

As a third step, we examined the impact of a 70 percent cutoff rule on the job titles in the CSEA bargaining units to see whether it, at a minimum, encompassed titles culturally associated with women and minorities. We dis-

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[6]Since one of our adjustment formulas involves using percentage female and percentage minority to adjust the compensation model, it follows that, if these variables are found to be statistically significant predictors of pay, they will affect the predicted salary grade of all titles with substantial percentages of female and minorities. Accordingly, we recommended early in the study that all titles with greater than the mean percentage of women and minorities in the New York State workforce be assessed for potential undervaluation. This recommendation was not accepted.

covered that the 70 percent rule would exclude some of the largest titles in which historically female work is routinely performed, such as Mental Hygiene Therapy Aide, with over 17,000 incumbents, Mental Hygiene Therapy Assistant I, Housekeepers, and Launderers. Conceptually, these exclusions make little sense since these titles are clearly associated with traditionally female work. Moreover, consistent with the theoretical underpinnings of pay equity, these titles are likely to have been undervalued because they have traditionally been filled by women. In light of our examination of the impact of the specific cutoff points on the final list of estimated titles, we were certain that the 70 percent cutoff point traditionally used to define female-dominated was too high given New York State employment demographic data.[7]

With a great deal of input from both labor and management, an alternative model for defining female-dominated and disproportionately minority job titles was developed. This conceptually-based model uses a standard which is tied to the proportion of women and minorities in the total New York State labor force.

The formula is (.4X) + X, where X is the overall proportion of women or minorities in the New York State labor force.[8] Thus, jobs are considered to

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[7]Despite our concerted attempts, we have been unable to discover exactly where the 70 percent-and-above definition originated. Unconfirmed data indicate that it was adopted for use in the Washington State study based on consultant use of a set of U.S. Department of Labor charts. However, our own library and computer-based searches have not uncovered a U.S. Department of Labor reference using a 70 percent definition for a female-dominated job.

[8]The .4 factor evolved from the development of an approach to defining disproportionately minority based on the traditional definition of female-dominated. New York State was the first jurisdiction faced with defining a disproportionately minority encumbered job. The only existing related precedent was the commonly used 70 percent standard to define female-dominated. Exactly how the 70 percent standard originally came to be

(Footnote Continued)

be female jobs if their percentage female is at least 40 percent larger than it would be if workers were distributed across jobs without regard to sex. Similarly, a disproportionately minority job is one in which there is at least a 40 percent excess of minority workers relative to their proportion in the labor force. In New York State, where women constituted just over 48 percent of the total public sector workforce in 1984, the formula resulted in a 67.2 percent cutoff point ((.4 X 48) + 48 = 67.2). This meant that all CSEA titles with 67.2 percent or more female incumbents were included within the sample of titles for which undervaluation would be assessed.

This same formula was used for minorities. Since minorities constitute 22 percent of the New York State workforce, a disproportionately minority title is one in which 30.8 percent or more of the incumbents are minorities ((.4 X 22) + 22 = 30.8). Along with the female-dominated titles, these would be assessed for potential undervaluation.

The third and final criterion for female-dominated and disproportionately minority titles involves the minimum incumbency size for titles for which undervaluation would be assessed. Once a listing of titles had been developed based on the cutoff rule, labor and management deliberated over what the minimum number of incumbents should be before estimates of undervaluation

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(Footnote Continued)
used is unclear. However, a logic applied post hoc is that, given that women are roughly 50 percent of most work forces, as well as of the population at-large, 70 percent is enough above this base of 50 percent to constitute a disproportionate representation of women. Thus, a similar increment above the base proposition of minorities in a work force could constitute a disproportionately minority encumbered title. Therefore, to establish the definition of disproportionately minority, we used an equation: 70 percent is to 50 percent as X is to 22 percent (minority representation in the New York State workforce). In this equation X = 30.8 equals 0.4. Applied to sex composition in New York State, where women constitute 48 percent of the workforce then, 48 (.4) + 48 = 67.2.

would be made. They decided that estimates of undervaluation would be made only for female-dominated or disproportionately minority titles with ten or more incumbents. The decision on incumbency size was based on the instability of sex and race/ethnic percentages in job titles with less than ten incumbents. Below that number the shift of only one or two positions from male to female or white to minority would change the categorization of the title. This decision resulted in the deletion of 56 titles.

Table 2.1 lists the 168 female-dominated and disproportionately minority titles for which undervaluation was to be assessed. Two titles were later eliminated due to extremely low response rates. (See Appendix G.) They are grouped by title code. In addition to titles included as a result of the above criteria, we included the following four titles:

Title Code	Job Title
7150000	Maintenance Helper
7617200	Bus Driver
3016000	Janitor
7202022	Maintenance Assistant (Refrigeration)

These titles exceeded the 30.8 percent cutoff point for disproportionately minority when positions in the State University system were excluded. However, they fell below the cutoff when State University positions were added. This finding is an indication that the university incumbents of these titles are primarily white, while the incumbents of positions in other agencies include a substantially greater proportion of minorities. Given our concern with being more inclusive, labor and management decided to include these titles within the list of those to be estimated for undervaluation.

Finally, it was decided that those titles in the direct line of promotion of any of the titles which were examined for potential undervaluation would be

examined for potential undervaluation if their related entry level title was found to be undervalued, regardless of the proportion of women and minorities in them. Perhaps due to the common cultural assumptions and expectations about the work behavior and the appropriate roles of men and women, white males tend to be at the top of female-dominated or disproportionately minority career ladders. As a result, many of the higher grade level job titles in disproportionately female or minority promotional tracks have lower percentages of women and minority incumbents and do not meet the cutoff proportion of women or minorities necessary to be included. However, where the entry-level position has been found to be undervalued, the likelihood increases that undervaluation has affected the grade level assignment of the promotional titles as well. Moreover, if such job titles were not examined for undervaluation when job titles at the bottom of the same job family were examined, the State could face serious problems with internal inconsistencies in the classification system. Table 2.2 lists the direct-line-of-promotion job titles which were assessed for undervaluation. This constitutes 20 job titles, making a grand total of 188 titles in the original list of estimated titles.[9]

JOB TITLE SAMPLING FRAME

Given the large number of employees and job titles in New York State government employment, it was not feasible to collect information from each

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[9]This number includes the deletion of one direct-line-of-promotion title because its entry title was not found to be undervalued.

TABLE 2.1

FEMALE-DOMINATED AND DISPROPORTIONATELY
MINORITY JOB TITLES FOR WHICH UNDERVALUATION WILL BE ASSESSED

Title Code	Title	Title Code	Title
100200	Account Clerk	911200	Laboratory Animal Crt
100300	Senr Acct Clerk	911300	Senr Lab Animal Crtkr
100500	Prin Acct Clerk	1836100	Inst Rtl Str Clerk
102100	Payroll Audit Clk 1	1935000	Park Regn Bus Assnt
102200	Audit Clerk	2134101	Trans Plng Aide 1
102230	Payroll Audit Clk 3	2337110	Consumer Srvs Spec 1
102300	Senr Audit Clerk	2501200	Clerk
105200	Cashier	2501300	Senr Clerk
112000	Toll Collector	2501317	Senr Clerk Surrogate
130110	Emps Ret Bnfts Exmr 1	2501320	Senr Clerk Corp Srch
130310	Emps Ret Bnfts Exmr 3	2501500	Prin Clerk
133100	Emps Ret Mbrsp Exmr 1	2501517	Prin Clerk Est Tx App
133200	Emps Ret Mbrsp Exmr 2	2501590	Prin Clerk Personnel
702200	Statistics Clerk	2502200	Comp Claims Clerk
702300	Senr Statistics Clerk	2502300	Senr Comp Clms Clerk
702500	Prin Statistics Clerk	2503200	File Clerk
750300	Senr Actuarial Clerk	2503300	Senr File Clerk
750500	Prin Actuarial Clerk	2503500	Prin File Clerk
822010	Data Proc Clk 1	2504200	Admitting Clerk
822020	Data Proc Clk 2	2504300	Senr Admitting Clerk
849200	Data Entry Mach Oper	2506100	Nursing Station Clk 1
849300	Senr Data Enty Mach O	2508400	Driver Impv Adjdtn C
849500	Prin Data Enty Mach O	2508600	Adjudctn Corrpdnc Clk
2510100	Purchasing Assnt 1	2559200	Library Clerk 2
2510200	Purchasing Assnt 2	2559300	Library Clerk 3
2512200	Ident Clk	2560100	Student Loan Clk 1
2512300	Senr Ident Clerk	2560200	Student Loan Clk 2
2513300	Senr Med Records Clrk	2568100	Emp Ins Revwng Clk 1
2513400	Treatmnt Unit Clk	2569100	Disablty Detrm Rv C 1
2514300	Senr Underwrtng Clerk	2601200	Typist
2514400	Senr Payroll Audt Clk	2601300	Senr Typist
2515200	Credentials Assistant	2601310	Senr Typist Law
2521100	Motor Veh Title Clk 1	2601500	Prin Typist
2521200	Motor Veh Title Clk 2	2605200	Dict Mach Trans
2522210	Legal Assnt 1	2606100	Info Procssg Spec 1
2540100	Motor Veh Rep 1	2606200	Info Procssg Spec 2
2540200	Motor Veh Rep 2	2606300	Info Procssg Spec 3
2540300	Motor Veh Rep 3	2609000	Secretarial Steno
2540510	Supvg Motor Veh Rep 1	2610200	Stenographer
2553310	Trans Offc Assnt 1	2610300	Senr Stenographer
2553320	Trans Offc Assnt 2	2610320	Senr Steno Law
2557100	Apps Cntrl Clk 1	2610500	Prin Stenographer
2558100	Payroll Clerk 1	2610520	Prin Stenographer Law
2558200	Payroll Clerk 2	2612200	Hearing Reptr
2558300	Payroll Clerk 3	2703100	Telephone Oper Typ
2559100	Library Clerk I	2703200	Telephone Oper

TABLE 2.1
(continued)

2703300	Senr Telephone Oper	5303100	Beautician
2706100	Dirctry Info Sys Op 1	5350200	Dental Assnt
2712200	Calculating Mach Op	5359000	Dental Hygienist
2715200	Bookkeeping Mch Op	5500200	Licensed Prac Nrs
2715220	Bookkeeping Mch Op Ds	5503200	Operating Room Technician[a]
2810100	Admnv Aide		
2859010	State Univ Prgm Aide	5503300	Senior Operating Room Technician[a]
3004000	Housekeeper		
3004500	Supvg Housekeeper	5501100	Hosp Attendant 1
3014000	Cleaner	5502200	Hosp Clinical Techn
3016000	Janitor	5518500	Comty Resdnc Aide
3021000	Elevator Operator	5532101	Hosp Clinical Assnt 1
3102300	Cook	5532202	Hosp Clinical Assnt 2
3102600	Head Cook	5540300	Psych Therapy Aide
3106100	Dietitian Techn	5544100	Mental Hyg Hfwy H A 1
3124200	Food Service Wkr 1	5570300	Mental Hyg Ther Aidel
3124300	Food Service Wkr 2	5570400	Mental Hyg Ther Ast 1
3124400	Food Service Wkr 3	6201000	Laboratory Helper
3137200	Food & Suppls Processor	6202200	Laboratory Worker
3302200	Launderer	6204000	Laboratory Aide
3302300	Senr Launderer	6210000	XRay Aide
3307000	Clothing Clerk	6211510	Teaching Hosp Stl Stl
5302100	Barber	6211520	Teaching Hosp Stl St2
6223200	Electrocardogrph Tech	6214200	Electroencphgrph Tech
6225100	Medical Lab Tech 1	6219200	Central Med Sup Tech
6301000	Pharmacy Aide	6220200	Histology Technician
6818000	Assnt Wkrs Comp Exmr	6220300	Senr Histology Tech
6824100	Workers Comp Revw An	6893100	Medicaid Clms Exmnr 1
6893200	Medicaid Clms Exmnr 2	7150000	Maintce Helper
7202022	Maintce Assnt Refrign	7611000	Chauffeur
7611300	Senr Chauffeur	7614000	Tractor Trailer Oper
7616100	Motor Veh Oper	7617200	Bus Driver
7711000	Bindery Helper	8261202	Youth Div Aide 2
8261303	Youth Div Aide 3	8261400	Youth Div Aide 4
8340100	Alclsm Rehab Assnt 1	8342200	Rehab Interviewer S S
8410100	Training Aide	8431200	Empl Sec Clk
8431300	Senr Emp Sec Clerk	8431500	Prin Emp Sec Clerk
8621100	Parole Prog Aide	8701600	Watchman
8937100	Motor Veh Ins Sv RP 1	8970100	Driver Imprv Adjudctr

[a]These titles were deleted due to inadequate incumbent responses.

TABLE 2.2

DIRECT-LINE-OF-PROMOTION JOB TITLES
FOR WHICH UNDERVALUATION WERE ASSESSED

Title Code	Title
102220	Payroll Audit Clerk 2
102500	Principal Audit Clerk
130210	Emps. Return Benefits Examiner 2
133300	Emps. Return Membership Examiner 3
822030	Data Processing Clerk 2
911500	Principal Laboratory Animal Caretaker
2134202	Transportation Planning Aide 2
2522220	Legal Assistant 2
3004600	Head Housekeeper
3016500	Supervising Janitor
3016600	Head Janitor
3302600	Head Laundry Supervisor
5518800	Community Residence Assistant Director
5518900	Community Residence Director
5570500	Mental Hygiene Therapy Assistant 2
6218400	Medical Technologist
6225200	Medical Laboratory Technician 2
6818200	Workers Comp. Examiner
7132200	Refrigeration Mechanic

incumbent of each position. Therefore, it was necessary to design a frame for selecting both a sample of job titles and a sample of incumbents within each title.

Of course, our objective was to design the sampling frame so as to obtain the most accurate and comprehensive information on job title content. To meet this objective, we needed to maximize the information gathered on the range of work performed across all grade levels and minimize the "standard error" which results when a sample is drawn from a larger population. Let us consider each of these in turn.

It is important to gather information on the entire range of work performed in New York State because the policy-capturing approach to job evaluation involves the development of a statistical model specifying the relationship between job content and wages for the system as a whole. It requires that the sample of job titles go beyond the CSEA titles and instead be representative of the entire range of work performed throughout New York State at all grade levels. If we limited a compensation model to CSEA-represented jobs only, which fall at the lower end of the pay scale, it would seriously distort the model of the pay practices of New York State. This would raise fundamental questions about any estimates we might generate from such a partial model. For example, how could we judge what a Licensed Practical Nurse, a Senior Stenographer, or a Mental Hygiene Therapy Aide should be paid if we do not know the basis by which Registered Nurse, Office Manager, or Treatment Team Leader is paid?

Moreover, if we limited the compensation model to those jobs for which estimates of potential undervaluation would be made, we would understate the effects of sex and race/ethnicity. We would, in essence, be studying the effect of sex and race/ethnicity composition <u>within</u> the set of female-domi-

nated and disproportionately minority jobs and ignoring the effects of sex and race/ethnicity on the difference in pay between these jobs and all other jobs, where the percentages of women and minorities are small.

In addition to this concern with comprehensiveness, we aimed at designing an approach to sampling that would minimize the errors of estimate. The standard error is an estimate of how accurate the results based on a sample are as an estimate of what the results would be if the whole population were studied. In general, the larger the sample, the smaller the standard error. Our sampling frame is based on maximizing the sample size both for job titles and, within titles, for incumbents.

Since job title, and not individual incumbent, is the unit of analysis, it is most important to maximize the number of job titles sampled. Based on this simple fact, we decided to sample as many job titles as possible throughout New York State employment. Accordingly, in general we defined our population to encompass job titles with four or more incumbents and sampled incumbents from all of these job titles. We modified this procedure for Management/Confidential (M/C) titles to sample all titles without a minimum incumbency restriction. This is because the exclusion of small incumbency managerial titles appeared to make the sample less representative of the population of titles.

Yet, we remained somewhat reluctant to collect data from titles with only one or two incumbents, because of the need to protect confidentiality and because of the potential impact of unique responses from an individual incumbent in such titles. Also, it is difficult to specify the sex and race/ethnic composition of a title reliably when there are so few incumbents. Consequently, we explored the possibility of grouping these titles into larger generic categories. Based on our work with the Division of Classification

and Compensation of the Civil Service Department, however, we concluded that this would not be feasible. Thus, the best course of action at the time of sampling was to treat each title separately.

To summarize, we sampled all job titles in the New York State system with more than three incumbents and all M/C titles, regardless of the number of incumbents. The consequence of this decision was to significantly reduce the standard errors of the estimates of potential undervaluation.

As a second step, we determined how many incumbents from each job title to sample. This decision was based on several considerations. First, we wanted to obtain the highest number of responses at the lowest cost. Second, based on a projected minimum 50 percent response rate, we estimated how many incumbents to sample in order to obtain a sufficient number of responses within each job title, which would minimize the overall standard error.

Moreover, we decided to sample female-dominated and disproportionately minority titles differently from titles that would be used to estimate the policy-capturing model. The level of accuracy required to provide separate estimates of the potential undervaluation of individual job titles is greater than that required for job titles used only to determine the model. Moreover, different strategies minimize the standard error of the policy-capturing models and the standard errors of each of the estimates of undervaluation. Specifically, the standard errors of estimate for the entire policy-capturing model is minimized by maximizing the number of job titles sampled. As indicated, since we are examining nearly the entire population of titles, this is not an issue. The only significant source of error then derives from sampling within job titles. The standard errors of estimate of undervaluation of individual job titles are minimized when the sample of incumbents is large or is close to the number of incumbents within that title.

Based on these considerations, we developed two sampling frames--one for estimated titles and another for non-estimated titles as follows.

- Non-estimated titles. In job titles used to derive the New York State statistical pay policy model, we sampled up to 20 incumbents in each job title. This means that, in job titles with fewer than 21 incumbents, all incumbents were sampled. In titles with more than 20 incumbents, 20 employees were systematically selected with a random starting point. The figure of 20 incumbents was chosen because, assuming a 50 percent response rate, we would have 10 responses to use in obtaining a job content profile for each title. This was considered the appropriate number of responses to minimize the standard error of estimate, given time and money constraints. Note as well that most job titles have 20 or fewer incumbents. Thus, using this sampling frame, the ratio of sample to population would be high for the overwhelming majority of titles.

- Female-dominated and disproportionately minority estimated titles. In job titles for which estimates of undervaluation were to be made, we sampled up to 150 incumbents in each job title. This means that in job titles with fewer than 151 incumbents, each incumbent of the job title was sampled. This represents the population of incumbents in these titles. In titles with more than 150 incumbents, with one exception, 150 employees were randomly sampled.[10]

- Direct-line-of-promotion estimated titles. The policy decision to include the direct-line-of-promotion titles among the estimated titles was made after the main data collection survey had already been distributed. As a result, it was too late to increase the sample size of these titles up to the level of the other estimated titles. Thus, they were sampled at the same level as the non-estimated job titles used to derive the pay policy model. That is, in job titles with fewer than 21 incumbents, all employees are sampled and in titles with more than 20 incumbents, 20 were selected.

SUMMARY

In this chapter we reviewed the basic methodological decisions guiding the New York State Comparable Pay Study.

[10]The exception was for Mental Hygiene Therapy Aide. Since there are more than 17,000 incumbents in this job title, we sampled 175 employees.

A major methodological decision was to use multiple incumbent self-reports, averaged over incumbents of each job title, as the sole source of information on job content. This decision was made not only because we share the judgment of many researchers that incumbents are the best source of information about jobs, but also because we were able to obtain a larger total number of responses with this information at a substantially lower cost per response than was possible through any other method. To collect this information, we developed a closed-ended questionnaire customized to the range of job content associated with work in New York State government.

The unit of analysis is the job title. The population of titles used for deriving a compensation model is all classified titles with four or more incumbents and all M/C titles. By virtue of our contractual agreement, however, estimates of undervaluation were restricted to female-dominated and disproportionately minority titles with ten or more incumbents in the three bargaining units represented by CSEA and those titles in the direct line of promotion from disproportionately minority or female-dominated entry level titles found to be undervalued. Female-dominated titles were defined as those in which at least 67.2 percent of incumbents are female. Disproportionately minority jobs were defined as those in which at least 30.8 percent of incumbents are minorities.

Data were to be collected from a sample of incumbents in each of the job titles included in the compensation model. Sampling of incumbents within titles would be done differently for the subset of estimated titles for which we were obligated to provide pay equity estimates and the remaining titles. For non-estimated job titles, we sampled all employees in titles with 20 or fewer incumbents. In titles with more than 20 incumbents, we sampled 20 incumbents, using systematic sampling procedures with a random starting point.

For estimated titles, we sampled all employees in titles with 150 or fewer incumbents. In titles with more than 150 incumbents, we sampled 150. Finally, direct-line-of-promotion titles were sampled in the same way as non-estimated titles, primarily because the final decision to examine them for potential undervaluation was made after the sample had been selected.

CHAPTER III

THE JOB CONTENT QUESTIONNAIRE: DEVELOPMENT AND PRELIMINARY FIELD-TESTING

The design of the Job Content Questionnaire for the New York State Comparable Pay Study was shaped by three basic objectives:

- to capture variations in job content as they relate to variations in civil service grade level;
- to maximize consistency and minimize sex and race/ethnic bias in the range and wording of job content questions; and
- to allow incumbents in all titles to read and accurately respond to the questions being asked.

The first objective reflects the fact that we are conducting a policy-capturing job evaluation study. This approach relies on the Job Content Questionnaire as the basic information source for describing and evaluating job titles. The questionnaire thus must be comprehensive enough to encompass those features of work that differentiate jobs with respect to salary grade.

The second objective reflects the fact that this study involves comparable worth job evaluation, although freedom from bias is a desirable property of job evaluation studies regardless of purpose. Maximizing consistency in job description requires that we ask the same set of questions to incumbents of all jobs. Minimizing sex and race/ethnic bias requires that questions include frequently ignored job content characteristics found in female-dominated or disproportionately minority jobs. (Steinberg and Haignere, 1985).

Third, we stressed readability considerations because of a reported low literacy level of many incumbents of the lowest grade level jobs. Ensuring readability increases our confidence that the information gathered from incumbents captures what is actually a part of a job and that it does not reflect incumbent differences in ability to fill out the survey instrument.

To our knowledge, the Job Content Questionnaire designed for New York State by the Center for Women in Government represents the first attempt to carefully and systematically meet these objectives in a large-scale public

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To our knowledge, the Job Content Questionnaire designed for New York State by the Center for Women in Government represents the first attempt to carefully and systematically meet these objectives in a large-scale public

sector pay equity study. The development and modification of the customized survey instrument was carried out over eleven months. It involved several initial drafts, two preliminary field tests, and a large-scale pilot study.

This chapter reviews the questionnaire development up to the point of the pilot study. It includes discussion of the initial questionnaire construction and the two waves of preliminary field testing, as well as the comprehensive expert review of several draft survey instruments. Following this, Chapter IV provides an overview chapter on the pilot survey and explains the further testing and modification of the questionnaire as part of the pilot survey.

PRELIMINARY ACTIVITIES AND QUESTIONNAIRE DEVELOPMENT

Before starting to design the questionnaire, we collected 20 job analysis and job evaluation frameworks (Table 3.1). Each approach involves a range of job content characteristics which are used as the basis for describing or analyzing jobs. For example, the Hay Guide Chart Profile Method categorizes job content in terms of four factors and several subfactors (Bellak, 1982). Its Know-how factor is made up of Managerial Know-how, Vocational/Technical Know-how, and Human Relations Know-how. Each of these subfactors is further divided into levels from simple to complicated tasks or functions. In this type of system, employers may specify different levels within subfactors to reflect their preferences as to how work in their organization should be described for the purpose of paying wages.

The Hay system represents one predominate approach to job evaluation. A second popular approach is represented by the Position Analysis Questionnaire (PAQ) which contains 194 specific questions organized in terms of six broad categories. Although it is not feasible for use in an incumbent self-administered survey on public sector jobs, the general approach to job analysis and job evaluation of the PAQ is the one followed in our study.

TABLE 3.1

JOB ANALYSIS SYSTEMS USED IN
THE DEVELOPMENT OF THE JOB CONTENT QUESTIONNAIRE

1. Communications Workers of America
2. Factor Evaluation System (FES)
3. Executive Evaluation System - U. S. Civil Service
4. Hay Plan
5. Stellman's Health and Well-being Survey
6. Iowa Plan
7. Job Characteristics Inventory
8. Job Evaluation Guide (California School Employees Association)
9. Job Activity Preference Questionnaire
10. Job Descriptive Index
11. Job Diagnostic Survey
12. MIMA-Office Jobs
13. Minnesota Job Description Questionnaire
14. Job Demands and Office Work Evaluation (MIOSH)
15. Position Analysis Questionnaire
16. Phoenix Plan
17. Quality of Employment Study-Working Conditions Survey
18. Occupation Analysis Inventory
19. Willis Plan
20. Rohmert and Rutenfranz: Arbeitswissenschaftliche Beurteilung der Belastung und Beanspruchung an unschiedlichen industriellen Arbeitsplatzen

We examined these twenty different frameworks to determine the range of typical categories used in describing job content, by disaggregating these systems into job content categories and listing every way an item had been formulated in these twenty systems. (Table 3.2 lists the general subfactor category list.) Then, for each job content category, we compiled the way different job analysis or evaluation systems had labeled the categories to determine the degree of precision other systems used in differentiating levels of complexity or difficulty within a category of work content. We were also interested in discerning where other systems placed the significant cutting points in measuring degrees of difficulty in a task or in a responsibility.

Second, to assess the comprehensiveness of the job content category list derived from the 20 sources, we selected 45 representative New York State job titles, varying by job family and salary grade level. We reviewed their job specifications to identify any job content characteristics of these titles that may not have been captured in the category list, and by so doing, uncovered some important additional characteristics. For instance, the job element list did not include characteristics associated with institutional human services work, such as dealing with emotionally troubled clients or the degree of severity of clients, patients, or inmates which an employee serves.

Moreover, we found that the levels of categories used in previous analysis and evaluation schemes were insufficiently differentiated, especially at the lower end of the task range, and were poorly worded. For instance, in distinguishing among levels of reading skills, the evaluation frameworks overlooked the need to read inquiries or forms. Similarly, record-keeping was described without a category for maintaining records or files. We included those job characteristics on our list and later included them as items in the New York State Job Content Questionnaire.

TABLE 3.2

CONTENTS OF JOB CONTENT CATEGORY LIST DEVELOPED FROM REVIEW OF JOB EVALUATION SYSTEMS

1. Knowledge and Experience
   - Education/experience combined
   - Academic and vocational combined
   - Academic only
   - Vocational
   - In-Service
   - Experience
   - Type of experience
   - Knowledge levels and education combined

2. Special Skills
   - Math
   - Reading
   - Writing
   - Speaking
   - Other communications
   - Symbolic/graphics
   - Comprehension of communication
   - Creative skill
   - Mechanics, including keyboard, computer
   - Transportation
   - Technology
   - Electrical/electronic knowledge

3. Cognitive Skills
   - Information input, including estimation
   - Fact finding/record keeping
   - Memory
   - Information processing
   - Evaluation
   - Problem solving
   - Decision making
   - Task complexity
   - Task variety

4. Scope and Effect
   - Scope
   - Effect
   - Task identity
   - Effect of error

5. Responsibility for People and Things
   - Management responsibility - general
   - Supervision of others - how many
   - Amount of time supervising
   - Level of supervision
   - Supervision tasks
   - Manage/plan/schedule
   - Planning-how much
   - Coordinating
   - Responsibility for material assets
   - Impact on budget

6. Supervision of Incumbent
   - Frequency of supervision
   - Closeness of supervision
   - Autonomy
   - Prescription of task
   - Judgment
   - Review and feedback

7. Personal Contacts
   - Importance or skill
   - Amount
   - Types of people
   - Purpose of contacts

8. Working Conditions
   - Body activities
   - General working conditions
   - Lifting weight
   - Repetition of motion
   - Body position
   - Environmental conditions
   - Hazards
   - Stress factors - general
   - Stress-time
   - Stress from concentration
   - Stress from distractions
   - Stress-adaptability to change
   - Stress-work schedule
   - Stress-travel
   - Stress from other people

Moreover, in these other systems, even where levels of job characteristics ranged from simple to complex, they often lacked precision. This was in part a problem of anchoring, in that there is no explicit frame of reference that all incumbents share.[1] To the extent possible, we wanted to avoid questions with ambiguous wording or uncertain frames of reference.

Third, while completing the job content listing and assessment, we conducted a comprehensive literature search on job evaluation. We were especially interested in obtaining general information on the range of available systems, as well as on specific types of job content characteristics included in them. We located well over 100 relevant articles and books.

Based on these preliminary steps, we wrote a 32-page draft questionnaire. This first draft questionnaire contained 104 questions representing 194 job content items. As much as possible, the questionnaire was written to capture factual aspects of work through closed-ended questions about specific features of job content. We wanted, for example, to know how many clients, patients, or inmates an incumbent worked with. We avoided asking employees to evaluate their jobs in terms of ambiguous concepts such as "responsibility," "problem-solving," and "freedom."

PRE-TESTING THE QUESTIONNAIRE

Prior to conducting the first preliminary field-test, the draft questionnaire was administered to twelve Center for Women in Government staff in three

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[1] By "anchoring," we mean either the ability to compare one's job accurately within the range of job titles in New York State government employment, or the ability to judge the degree to which job content characteristics like "cold" or "hot" working environment relates to the working conditions that an employee experiences.

units: Administration, Research, and Training. Representatives of each unit met at a separate interview. After individually completing the questionnaires, each group was interviewed. All project staff were present in order to establish standardized procedures for subsequent field-testing at job sites outside the Center. These interviews both gave us a sense that the questionnaire would, in fact, differentiate among jobs and indicated some of the most obvious areas of ambiguity. We revised the questionnaire before field-testing it with state employees.

The first stage of preliminary field-testing was carried out by interviewing 37 job incumbents in 19 state job titles in the greater Albany area in January 1984. We selected titles for field-testing that

- were in the same job family, but covered a range of grade levels;
- maximized diversity by sex and race/ethnicity, including titles that are integrated;
- spanned the grade level hierarchy;
- had a large number of incumbents; and
- are used as benchmarks in New York State.

The specific job titles on which the field-testing was conducted are listed in Table 3.3.

Interviews were conducted with one to three incumbents of a particular title during two to four hour sessions. While filling out the questionnaire, incumbents pointed out problem items and indicated any job content that was not covered. The information obtained from the preliminary field-testing was integrated and used as a guide to revising the Job Content Questionnaire.

From the preliminary field-test we identified several areas for improvement of the survey instrument. We shortened the questionnaire considerably, improved the wording of many of the questions, and improved the instructions. We deleted most items that were redundant, although some were kept to enable a

TABLE 3.3

JOB TITLES AND AGENCY LOCATIONS SAMPLED
FOR PRELIMINARY FIELD-TESTING: FIRST WAVE

Agency	Title
Office of General Services	Cleaner Laborer
Office of Mental Health: Capital District Psychiatric Center	Licensed Practical Nurse Treatment Team Leader Food Service Worker I Food Service Worker II
Civil Service Department	Senior Clerk
Labor Department	Employment Interviewer
Department of Corrections: Coxsackie Correctional Institute	Corrections Officer
Office of Mental Retardation: OD Heck Facility	Nurse I Nurse II Treatment Team Leader
Department of Transportation	Highway Equipment Operator
Department of Motor Vehicles	Clerk Stenographer Data Entry Machine Operator Senior Personnel Administrator
Office of Mental Hygiene: Marcy Facility	Mental Hygiene Therapy Aide Launderer

crude item-reliability check in the pilot survey. We included specific examples within many of the questions, so as to clarify the types of tasks, behaviors, working conditions, or equipment about which we were asking.

In addition, we found that people were confused as to whether we were asking generally about the job title or about how they performed in their individual position. As a result, we modified the questionnaire to make consistent references to respondents as informants about typical incumbents in their job title. Respondents were very clear about what a typical incumbent did and thus had no trouble answering the questions framed in this way.

A second stage of intensive interviews was conducted to further refine the questionnaire prior to the pilot test. We decided to restrict the number of titles to a smaller number than the first field-test, but to draw these titles from a wider range of grade levels. We also included some of the job titles sampled in the first field-test to assess whether the changes we made with respect to readability, comprehension, and "anchoring" made it easier to fill out the survey instrument. Finally, we included several job title incumbents from New York City in the field-test because of anecdotal reports that the responses of Albany-based state employees would not be typical of state employees based in New York City. Interviews were conducted with respondents in the job titles listed in Table 3.4.

As was true in the first wave of interviews, employees were asked to fill out the questionnaires and to identify questions that were unclear or inappropriately stated. We revised the questionnaire after each three or four interviews, so that changes could be tested and revised again immediately if necessary.

This second stage of field-testing was extremely useful. Items were further simplified in wording and anchored through examples. Repetitious

TABLE 3.4

JOB TITLES SAMPLED FOR
PRELIMINARY FIELD-TESTING: SECOND WAVE

Job Title	Salary Grade	Number Incumbents Surveyed
Cleaner	4	2
Janitor	6	2
Construction Equipment Operator	7	2
Senior Clerk	7	2
Licensed Practical Nurse	9	1
Principal Account Clerk	14	1
Senior Computer Programmer	18	1
Sanitary Engineer 1	20	1
Associate Classification and Compensation Analyst	23	2
Associate in Education	26	1
Director of Personnel	31	1
Director of Public Information	31	1
Assistant Director of Classification and Compensation	33	1
Associate Commissioner of Mental Health	38	1

items were, for the most part, deleted and a number of items were consolidated. A number of items were revised considerably to better describe state jobs, personnel policies, and procedures.

As a result of these two waves of preliminary field-testing, the Job Content Questionnaire was ready for a trial with a larger number of incumbents in a more varied set of titles. The pilot survey, described in the next chapter, not only provided an opportunity for testing reliability and validity but also provided further qualitative feedback on item wording and questionnaire layout.

EXPERT REVIEW AND MODIFICATION

Throughout the development and preliminary field-testing of the Job Content Questionnaire, we conferred regularly with four categories of experts, knowledgeable on: questionnaire wording and design, job content, job evaluation, and social science methodology. Those who assisted us are recognized in our Acknowledgements in Appendix A.

SUMMARY

The process of preliminary field-testing and the development of the Job Content Questionnaire for the New York State Comparable Worth Study spanned the six-month period between September 1983 and February 1984. It involved a process of comprehensive review of previous job analysis and job evaluation approaches combined with a sensitivity to detail in capturing precisely the range of tasks, functions, and behaviors of work associated with New York State job titles. It involved as well continual revision of content, wording, and layout in light of the reactions and criticisms of several hundred state

employees acting as respondents or experts or both. By February 1984, we were secure that the survey instrument was refined enough to test on a large sample of employees representing a wide range of New York State job titles.

CHAPTER IV

THE PILOT SURVEY

A pilot survey of the New York State Comparable Pay Study was conducted between February and June, 1984. It was designed to improve the technical quality of the main survey, in order to increase the precision of the final estimates of undervaluation. The objectives of the pilot survey were:

- to test sampling procedures that were to be performed by the Civil Service Department;
- to evaluate several methods for distributing the questionnaire;
- to assess the effects of race/ethnicity, sex, salary grade, and estimated reading level on response rates;
- to assess the rate of response in low incumbency titles;
- to improve the survey instrument; and
- to test for the validity of incumbent responses.

Through the pilot survey we gained a greater understanding of survey mechanics in New York State and found that a mailed distribution method is most effective. We obtained adequate response rates from both sexes and those in all race/ethnic groups, salary grades, and reading levels. We established the reliability and validity of the survey instrument in terms of the stated purpose of the comparable pay study. Further, we observed a high degree of similarity in responses from incumbents and supervisors, thereby validating the use of incumbent self-reports.

This chapter presents the pilot survey results. We begin with a discussion of the general methodology of the pilot survey, including the selection of the sample of job titles, the selection of the sample of incumbents, and the test of four methods of distribution. The chapter continues with an assessment of the adequacy of the procedures followed in distributing the questionnaire and the response rate in relation to four possible distribution

methods. We then present the findings regarding the reliability and validity of the Job Content Questionnaire. Finally, we discuss further revision of the Job Content Questionnaire.

GENERAL METHODOLOGY

Methods of Distribution

One of the primary objectives of the pilot survey was to test four methods of distribution:

- mailed, in which surveys were distributed to employees through interagency mail;
- on-site, in which employees were asked to fill out the questionnaires individually in a group setting; and
- direct distribution by union stewards or personnel directors, in which surveys were distributed directly to employees by a representative of either the state or the union. (We initially treat these as one distribution method, but later in the analysis stage we treat them separately.)

These four distribution methods are described more fully in the next section on survey mechanics.

Sampling of Titles and Incumbents

The pilot Job Content Questionnaire was distributed to 1862 incumbents in 68 job titles sampled primarily from six agencies and two facilities. Job titles were selected for the pilot study based on considerations both of economy and of representativeness of occupations found in the New York State employment system.

The sample of job titles is listed in Table 4.1. They were drawn from all bargaining units, from the range of salary grades, and from a diversity of occupational families. The final sample contained a mixture of female-dominated, disproportionately minority, white male-dominated, and integrated

TABLE 4.1

JOB TITLES INCLUDED IN PILOT SAMPLE

Negotiating Unit	Title Code	Job Title	Salary Grade
1	8731100	Security Service Assistant 1	6
	8755200	Safety and Security Officer 1	12
	8700100	Corrections Officer	14
	8700200	Corrections Sergeant	17
	8700300	Corrections Lieutenant	20
2	2501200	Clerk	3
	0849200	Data Entry Machine Operator	4
	2610200	Stenographer	5
	2606100	Information Processing Specialist 1	6
	2501300	Senior Clerk	7
	0102300	Senior Audit Clerk	9
	2540300	Motor Vehicle Rep 3	9
	0620200	Tax Comp Rep 3	9
	0821200	Computer Operator	10
	8901000	Motor Vehicle License Exam	12
	0610110	Tax Comp Agt 1	13
	0821300	Senior Computer Operator	14
	0100500	Prin Acct Clerk	14
3	7511000	Power Plant Helper	3
	3014000	Cleaner	4
	6961000	Laborer	6
	6921200	Highway Equipment Operator	7
	7616000	Motor Vehicle Operator	7
	7202000	Maintenance Assistant	8
	6921000	Construction Equipment Operator	8
	7312000	Motor Equipment Mechanic	12
	7501200	Stationery Engineer	12
	7331100	Electrician	12
	7352000	General Mechanic	12
	7501300	Senior Stationery Engineer	14
4	3124200	Food Service Worker 1	4
	3124300	Food Service Worker 2	7
	5500200	Licensed Practical Nurse	9
	5518500	Comty Residence Aide	9
	5570300	Mental Hygiene Therapy Aide	9
	5570400	Mental Hygiene Therapy Assistant 1	11
	5570500	Mental Hygiene Therapy Assistant 2	13

TABLE 4.1

JOB TITLES INCLUDED IN PILOT SAMPLE
(continued)

5	5500510	Nurse 1	14
	5500540	Nurse 2 Psy	16
	3965040	Teacher 4	17
	0820300	Senior Computer Programmer	18
	0403300	Senior Accountant	18
	2810300	Senior Admnv Analyst	18
	8107220	Psych Soc Worker 2	19
	4001200	Civil Engineer 1	20
	0820410	Assoc Comptr Programmer An	23
	8154300	Senior Soc Serv Prog Spec	23
	6501300	Senior Attorney	24
	4001200	Civil Engineer 2	24
	0825500	Supvr Data Process	25
	5620202	Psychiatrist 2	38
6	1441300	Senior Personnel Administrator	18
	1441400	Associate Personnel Administrator	23
	5255230	Treatment Team Leader MH	61
	5255210	Treatment Team Leader MR	61
	8969080	Chief Driver Impv Analyst	62
	8973800	Chief of Vehicle Safety Serv	62
	2000700	Chief Budgeting Analyst	62
	7319800	Assistant Director of Mat Eg Mgt	63
	8514800	Assistant Director Labor Statistics	63
	7319900	Director Mat Eg Mgt	65
	2876900	Director Tax Systems Development & Rsch	65
	2870900	Director Trans Admn Srvs	65
	2876700	Director Admn Tax & Finance	66
	4013900	Director Trans Plan Research Bureau	66
	0645900	Director Tax Processing	68
	0607900	Director Tax Audits	68
	2851000	Senior Project Exec	68

titles. We also included several sets of titles reflecting two or three consecutive steps in a job family career ladder to test questionnaire sensitivity to job content differences between essentially similar jobs. In addition, the sample contained several titles where we anticipated that low reading ability might produce low response rates. Furthermore, to ensure that the main survey would have a sufficient number of incumbents in each job title from which to sample, without including any respondent who had been included in the pilot survey sample, we attempted to limit the job title sample for the pilot study to titles with more than one hundred incumbents.

Sample selection of incumbents within these titles was restricted to limited geographic areas and specific agencies in order to minimize the cost and time involved in the distribution of questionnaires for the pilot study. The pilot survey was limited to agencies and facilities in Albany, New York City, Greene County, and Kings County. For Department of Corrections titles, we sampled incumbents statewide[1] due to a specific problem discussed below. The pilot study involved the following eight agencies:

- Office of General Services
- Department of Motor Vehicles
- Department of Social Services
- Department of Taxation and Finance
- Transportation Department
- Capital District Psychiatric Center, Office of Mental Health
- Brooklyn Developmental Center, Office of Mental Retardation and Developmental Disabilities
- Coxsackie Correctional Facility Department of Correctional Services

[1]These titles were: Correction Officer, Correction Officer (Spanish Speaking), Correction Sergeant, and Correction Lieutenant.

The sampling plan was developed in relation to the objectives of the pilot study. First, 200 completed questionnaires under each of the three distribution methods were needed to analyze the effectiveness of each method.[2]

Second, a minimum of 50 job titles was needed to test for reliability and validity of the questionnaire using factor analysis. This number of titles was the minimum necessary to ensure that the results of the statistical analysis meaningfully captured variations in work performed in New York State job titles. Of course, since we could not expect a 100 percent return rate, we calculated an expected return rate based both on the literature on response rates and on the past experience of those conducting surveys in the New York State employment context. The expected return rate varied by distribution method. Table 4.2 indicates the initial sampling plan designed for the pilot survey given these considerations.

Table 4.3 indicates the actual sample. The number of incumbents sampled within each job title deviated from the plan in a number of ways listed as footnotes to Table 4.3. These included:

- the separation of direct delivery into personnel and union steward distribution;
- the addition of a sample of 15 management confidential titles with one to three incumbents;
- the addition of five Spanish-speaking titles; and
- the oversampling of incumbents in five low literacy titles.

Having selected the final sample of titles, we requested a Composite Report from the Civil Service Department, which listed the current number of incumbents in the selected job titles at each of the specified agency

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[2] Because the direct delivery method was subsequently subdivided into union steward and personnel director, we projected 100 completed responses under each method.

TABLE 4.2

SAMPLING PLAN FOR THE PILOT STUDY

Method	Total Number of Analyzable Questionnaires Needed	Expected Return Rate	Number We Need to Distribute	Number of Incumbents Per Job Title Receiving Questionnaire
Mailed	200	25%	800	16[a]
Captured Audience	200	67%	300	6[a]
Union Steward	100 200[b]	50%	200 400	4 8[a]
Personnel Office	100	50%	200	4
	600		1500	30

a - This represents an expected return rate of four questionnaires per job title sampled.

b - We decided to analyze separately personnel and union steward distribution after we had projected sample estimates. This resulted in distributing an insufficient number in each category to ensure 200 responses.

The sampling plan was developed in relation to the objectives of the pilot study. First, 200 completed questionnaires under each of the three distribution methods were needed to analyze the effectiveness of each method.[2]

Second, a minimum of 50 job titles was needed to test for reliability and validity of the questionnaire using factor analysis. This number of titles was the minimum necessary to ensure that the results of the statistical analysis meaningfully captured variations in work performed in New York State job titles. Of course, since we could not expect a 100 percent return rate, we calculated an expected return rate based both on the literature on response rates and on the past experience of those conducting surveys in the New York State employment context. The expected return rate varied by distribution method. Table 4.2 indicates the initial sampling plan designed for the pilot survey given these considerations.

Table 4.3 indicates the actual sample. The number of incumbents sampled within each job title deviated from the plan in a number of ways listed as footnotes to Table 4.3. These included:

- the separation of direct delivery into personnel and union steward distribution;
- the addition of a sample of 15 management confidential titles with one to three incumbents;
- the addition of five Spanish-speaking titles; and
- the oversampling of incumbents in five low literacy titles.

Having selected the final sample of titles, we requested a Composite Report from the Civil Service Department, which listed the current number of incumbents in the selected job titles at each of the specified agency

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[2] Because the direct delivery method was subsequently subdivided into union steward and personnel director, we projected 100 completed responses under each method.

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SAMPLING PLAN FOR THE PILOT STUDY

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Union Steward	100 200[b]	50%	200 400	4 8[a]
Personnel Office	100	50%	200	4
	600		1500	30

a - This represents an expected return rate of four questionnaires per job title sampled.

b - We decided to analyze separately personnel and union steward distribution after we had projected sample estimates. This resulted in distributing an insufficient number in each category to ensure 200 responses.

TABLE 4.3

ACTUAL ALLOCATION OF RESPONDENT SAMPLE
BY DISTRIBUTION METHOD

Method	Minimum Number of Surveys Needed	Actual Number Distributed	Expected Return Rate	Projected Return Rate	Number of Returns Needed in Each Job Title	Number Distributed in Each of 60 Titles[e]
Mailed	200	929[a]	25%	232	4	16
Captured audience or on-site	200	241[b]	67%	168	4	6
Union steward[f]	100	324[c]	50%	162	2	4
Personnel office[f] distribution	100	368[c,d]	50%	189	2	4
	n=600	1862	50%	751	12	30

a - The total of 929 questionnaires to distribute is a function of the fact that not all titles in the sample have a minimum of 30 incumbents. It also reflects a decision to oversample respondents in 5 titles identified as having incumbents with low literacy.

b - We did not do the captured audience on-site method of distribution at Coxsackie Correctional Facility, at Brooklyn Psychiatric Center, and Region 1 of the Department of Transportation. We excluded these sites because it was impractical to request employees working at many different locations to report to one central location to fill out the questionnaire.

c - The numbers distributed in union steward and personnel office distribution are higher than would be expected because they include additional responses from Coxsackie, Brooklyn Developmental and Department of Transportation, where we did not test the captured-audience distribution method. The questionnaires that would have been distributed on-site at these locations were distributed instead by personnel office.

d - The total number of questionnaires distributed through personnel office staff was greater than the number distributed by union stewards because management confidential titles do not have union stewards.

e - The table was generated on the basis of the 60 job titles with greater than 3 incumbents, excluding Spanish speaking titles. Low-incumbency titles and Spanish-speaking titles were distributed in an analogous way to the 60 titles.

f - We decided to analyze separately personnel and union steward distribution after we had projected sample estimates. This resulted in distributing an insufficient number in each category to ensure 200 responses.

locations from which we would sample. This list constituted the pilot study population. We selected a sample of incumbents using a systematic sampling procedure with a random starting point. Incumbents were divided by title and randomly allocated to one of the four distribution methods, with probability proportionate to the target sample size for each distribution method.

SURVEY MECHANICS

The first major objective of the pilot study involved survey mechanics. Specifically, these mechanics encompassed the set of procedures for selecting a sample of respondents, distributing the survey instrument to respondents, coding, keypunching and verifying the returned information, and analyzing the data. It also included tests of the adequacy of follow-through by agency liaisons, the capacity of the State University of New York at Albany computer system to handle the necessary data analysis, the ability of the keypunching service with which we subcontracted to provide a verified tape in a timely fashion, and the reliability of the agency mails.

In this section we report on the mechanics associated with three stages in carrying out the pilot survey:

- the procedure for selecting the sample of incumbents;
- the procedures for distributing the survey using each of the four distribution methods; and
- the procedures for coding and keypunching the survey data.

Random Selection of Sample

The first step in the pilot test was to give detailed instructions to the Civil Service Department specifying how to select the systematic sample. In choosing the sample for the pilot, we instructed the Civil Service Department

staff as to which job titles, agencies, and institutions we wanted included.[3]

Two limitations of the Civil Service data system were found to have important implications for what we were able to do in the main data-collection stage. First, information concerning the specific worksite location of employees and the specific shift each employee works is not available. The lack of these two kinds of information meant that the number of sites and number of shifts which are likely to be selected randomly in the main survey stage could be very large. Thus, the on-site method of distribution, in which we bring a group of randomly selected employees together for administering the questionnaire, was not feasible from the point of view of both agency personnel people and Center staff. Second, state computer files do not contain a specific employee business address. The lack of specific address means that even with mailed distribution, main survey distribution required the cooperation of agency personnel officials to provide specific location information for thousands of sampled employees.

Distribution of the Pilot Survey

As a first step, GOER contacted each agency. In most cases, this was done through the Personnel Department. Agency staff were told the purpose of the study and asked that a liaison be appointed to work with the Center in distributing the questionnaires for the pilot study. After receiving the names of these agency contacts, Center staff met with each agency liaison person to explain the study goals and specific objectives for the pilot study,

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[3]While we found this a feasible way to select a sample, at the same time, we learned a great deal about the strengths and limitations of the computer files maintained at the Civil Service Department. We are indebted to the EDP staff for their patience in explaining the system to us and for the expertise in selecting the sample for the pilot test.

and the three or four specific methods of distribution that would be used in his/her agency. We also requested a separate meeting with union stewards. A list of the personnel and union steward liaisons for the pilot survey is included as Appendix B of this report.

For all methods, questionnaires were distributed in a 9" x 12" envelope labeled with the employee's name and line item number.[4] A return envelope addressed to the Center was included. All questionnaires were to be returned by interagency mail directly to the Center.

A brief review of the salient features of each distribution method follows:

> Mailed: Questionnaires to be mailed were delivered in person in a single large box to the liaison in each agency. Internal location information had to be added to the address label by the agency representative. These questionnaires were then sent through the agency's mail system to the incumbents. Each respondent who received a survey in the mails received a follow-up letter two weeks later, regardless of whether or not she/he responded to the questionnaire. Since we could not know who responded, we had to send follow-up letters to everyone. This procedure was meant to increase our response rate, as well as to reinforce the confidentiality of responses. These follow-up letters were delivered to liaisons at the same time as the surveys and were similarly labeled.
>
> Personnel: Distribution by a personnel manager was similar to mailed distribution in that a box of questionnaires was delivered to an agency for further labeling and distribution. These questionnaires, however, did not go through the mailrooms or mail clerks; they were distributed in person by the personnel manager. It was whether this personal contact by management had an effect on responses and response rates that was being tested in this method. Since the approach to delivering the per-

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[4] A line item number identifies an employee's position in the New York State government. Each employee has a unique line item number within his or her agency.

sonnel distributed questionnaires was left up to the liaison, slight variations in the method of distribution occurred. In general, however, the liaison either personally delivered the survey to the sampled incumbents or had a staff person hand-deliver the questionnaire.

Union: Questionnaires for the union-distribution method were distributed in a manner similar to the personnel method, except that local union stewards delivered them. We began with meetings arranged with local presidents at each of the eight work sites, where the questionnaires were given to agency union leaders. Many indicated a preference for having the questionnaires come back to them rather than being put directly in interagency mail. However, in many cases, this did not prove practical and many union-distributed questionnaires were returned directly to the Center through interagency mails.

On-site: In this method, incumbents were invited to a group meeting by the agency liaison and the questionnaires were distributed by a representative from the Center. A brief description of the study was presented. Incumbents then filled out the questionnaire and handed it to the Center representative.

Survey Distribution: Department of Correctional Services

As a routine part of meeting with agency liaisons, we arranged an orientation meeting at the Department of Correctional Services with the Main Office Personnel Director, the Assistant Director of Personnel-Classification and Exams, and the Assistant Director of Personnel-Facilities. At this meeting we learned that there might be a problem with Correction Officers being given release time to fill out the questionnaire. This is because Correction Officers must be constantly on alert.

A GOER-initiated solution involved a change in the sampling plan for uniformed titles (i.e., Correction Officer, Correction Officer Spanish-speaking, Correction Sergeant, and Correction Lieutenant). The plan for sampling uniformed officers was changed from sampling a large group at one facility to

one of spreading the sample across the Department of Correctional Services' 47 facilities. It is much easier for work-relief to be arranged for a few officers at each facility than for one facility to arrange work-relief. Because the facilities were widely dispersed across the state, we used only the mailed-distribution method for these questionnaires.

Data Entry and Cleaning

Once the questionnaires were returned by survey respondents to the Center, the data entry and cleaning process began. The steps of this phase are briefly described below.

Coding: All questionnaires were coded and examined for legibility and other problems by Center staff. Coders used a detailed codebook and about 25 percent of the coding was double-checked by a second coder. Further, to assess the accuracy of the coding procedure, twenty questionnaires were randomly selected for comparison. Two persons coded each item on these questionnaires independently and the codings were compared. When comparisons between coders were made, we found three disagreements between coders out of 3,560 potential disagreements. Thus, we concluded that for all practical purposes, coding error is of no concern.

Entering and Verifying: The coded data were entered and 100 percent verified. All the data were keyed twice, discrepancies were reconciled, and various types of errors in data entry were detected through a preprogrammed computer checking procedure. Data were checked for mechanical errors by scanning the patterns of columns and rows in a printout, counting to see that there were four data cards for each case, verifying selected cases, and examining the output from a frequency distribution to detect inappropriate codes. The data-cleaning process involved the addition of missing lines, correcting occasional miskeys, and adding a few new values to code those questionnaires that were mailed to persons who were absent from on-site visits but were supposed to attend them. Moreover, once the data were in useable form for analysis, 20 questionnaires were randomly selected for a final accuracy test. No errors were found. One can conclude, therefore, that the keypunching was close to 100 percent accurate.

In general, we were extremely pleased with the way the mechanics of the pilot survey worked. A cumbersome set of distribution procedures was carried out with remarkable ease by agency liaisons and Center staff. The sample-selection procedure also worked well. Data entry and cleaning were carried out in a timely fashion with no major problems. This put us in a good position to move forward with the main survey with confidence that the mechanics of our survey approach worked.

RESPONSE RATES AND DISTRIBUTION METHODS

In this section, we discuss the results of our analysis of response rates, including the overall response rate, the relationship between sex and race/ethnicity of incumbents and response rate, the level of response rates for different distribution methods, and the results of sampling low incumbency titles.

Overall Response Rate

Overall, 1067 questionnaires were returned out of 1923 sent for a response rate of 55 percent.[5] These totals do not include an extra follow-up mailing of the questionnaire to people who were absent when questionnaires were distributed at on-site visits. With this extra follow-up in the on-site distribution method, the returns were 1110 received of 1923 sent, or 58 percent.

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[5]"Response rate" for the pilot study meant number received divided by number sent. No adjustment was made for sampled employees who were no longer on the job or who had changed titles.

Our return rate is considered to be high relative to the common experience of survey researchers, especially those engaged in mail surveys. Frequently, one obtains a return of about 30 percent to survey questionnaires distributed in applied settings. In addition, we understand it to be an unusually high response rate in the New York State government employment context.

The importance of a high response rate cannot be overstated. Without it, we could not be sure that the sample of respondents is representative of the population of interest. In the New York State context, we need to have confidence that those returning questionnaires are representative of all incumbents in the same job title. If our response rates were low, we would be forced to consider the possibility that respondents would be atypical; for example, those with a special problem on their jobs, those unusually satisfied with their jobs, and so on. Thus, the high response rate in the pilot survey gave us considerable confidence that we would be able to obtain data from a representative sample in the main survey.

Sex and Race/Ethnicity of Incumbents and Response Rates

An important question for sampling in the main study was whether response rates are the same regardless of the sex or race/ethnicity of incumbents. If incumbents of a particular sex or race/ethnicity fail to respond, then results could be substantially distorted. Thus, we examined response rates in the pilot survey to determine whether it would be necessary to do stratified sampling of the main study sample by sex and race/ethnicity.

Response rates for females and males and for minorities and whites were compared. The results are summarized in Table 4.4. Given agency and geographic restrictions in sample selection, it is obvious that these results were not obtained from a representative sample of the entire Civil Service

population. The sample distribution was, however, fairly close to the population distribution. Our sample is 41 percent female; whereas 48 percent of the Civil Service population is female. Our sample is 19 percent minority; while 22 percent of the population is minority. We expect the sex and race/ethnicity distribution of the main survey to be still closer to that of the entire population of New York State employees.

Given the somewhat unrepresentative character of the job titles sampled in the pilot survey, we do not regard the difference in response rates between males (55%) and females (61%) as unduly large. There was no indication from the pilot survey that males would not answer a questionnaire that was identified with a study of comparable pay. Therefore, no special sampling or targeted public relations activity seemed to be needed to ensure an adequate response from both sexes.

The difference in response rates between whites and minorities was more problematic. Sixty-one percent of the whites responded, while only 46 percent of the minorities responded. In the next section, we will see that the race/ethnic difference in response rate can be reduced by the selection of a distribution method. Furthermore, since the unit of analysis is the job title, the response rate issue reduced to the question of whether we could get a high enough proportion of respondents of all sexes and race/ethnicities to ensure that the characterization of each job title is unbiased. Since the ratings of job content characteristics tended to be roughly similar regardless of the sex or race/ethnicity of incumbents, minor variations in the proportion of respondents of particular sexes or race/ethnicity would have little consequence. We decided, therefore, to continue to use the systematic sampling procedure for selecting incumbents within job titles developed in the pilot survey.

TABLE 4.4

RESPONSE RATES BY SEX AND RACE/ETHNICITY

	Total Received[a]	Total Sent	Response Rate (Received/Sent)
Females	485	793	61%
Males	621	1130	55%
Total	1106	1923	
Minorities	166	358	46%
Whites	934	1565	60%
Total	1100	1923	

a - Missing data included four cases for sex and ten for race. That is, these items were left blank on the questionnaires returned.

Comparison of Distribution Methods

Response rates by distribution method are presented in Table 4.5.[6] The highest response rate was with the personnel distribution method (59%); mailed distribution was nearly as high (58%). Based on these results, and on its greater ease in implementing, we decided to use mailed distribution in the main survey.

Sex, Race, and Literacy and Response Rates

Another important question for design of the main survey was whether those in jobs with certain characteristics responded better to a particular survey distribution method. If necessary, we could have supplemented the mailed survey by choosing an alternative distribution strategy to targeted titles so as to obtain the overall highest response rates. However, because we found no response bias, this was not necessary.

Job titles in the pilot study were categorized by sex composition, minority composition, and literacy-type in the following manner. Consistent with the definition in Chapter II, female-dominated jobs were defined as those with 67.2 percent or more females. Similarly, disproportionately minority jobs were defined as those with 30.8 percent or more minorities. For the pilot analysis only, male-dominated job titles were defined as those with 72.8 percent or more males, (Y + .4Y, where Y is the proportion of men in New York State employment). Finally, as indicated above, five jobs were selected for the sample because of the low reading level of incumbents based on advice from state personnel experts.

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[6] In calculating the response rate, responses that were received as a result of special mailed follow-up to on-site visits were excluded from the calculations. A total of 117 people were absent from on-site visits. Questionnaires were mailed to these people after the on-site visits. Forty-three were returned. These cases were used in all data analyses other than the response rates analysis.

An examination of Table 4.5 reveals that, with one exception, mailed and personnel distribution methods yielded consistently better results than union or on-site distribution when sex-, race-, and literacy-type of job were controlled. On-site distribution yielded the highest response rate for female-dominated jobs. In general, however, the response rates for female jobs, using all but the union steward-distribution method, is high.

The high response rate for low literacy titles (49%) was especially gratifying, reflecting the low readability level of the questionnaire (seventh-grade level). It appears that when questionnaires were distributed by mail or by personnel officers, people in low literacy titles coped with the task of filling them out much more than when questionnaires were distributed on-site or by union stewards. It is probable that incumbents who received questionnaires by mail or from personnel staff obtained some assistance, as they probably do for other reading tasks in their lives.

Negotiating Unit, Agency, and Response Rate

Mailed and personnel-distribution methods yielded consistently higher response rates across negotiating units and across agencies. (See Table 4.5.) The only exception was the Department of Tax and Finance, where all methods yielded high response rates. The negotiating unit with the lowest response rate was Institutional Services. This corresponds to the lowest agency response rates at Mental Health (42%) and Mental Retardation (38%).

The differences between agency response rates were examined further. There were no systematic differences between high-rate agencies and low-rate agencies due to agency location. The results from low responding agencies were then examined on a title-by-title basis to determine if low responses could be accounted for by some characteristic that could be taken into account in designing the sampling frame for the main survey. However, we were unable

TABLE 4.5

SUMMARY OF RESPONSE RATES
FOR PILOT SURVEY

	OVERALL			MAILED			PERSONNEL			UNION			ON-SITE	
	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent
Total	.55	1067	1923	.58	593	1019	.59	208	354	.47	144	309	.51	122	241
Agency															
Missing Data		16			12			2			2			0	
Office of General Services	.44	148	334	.47	65	137	.51	36	70	.40	20	50	.35	27	77
Corrections	.54	86	158	.54	77	143	.75*	6	8	.43*	3	7	--	--	--
Social Services	.64	149	232	.69	81	117	.77	27	35	.61	20	33	.45	21	47
Tax and Finance	.62	190	305	.62	94	152	.57	27	47	.61	27	44	.68	42	62
Motor Vehicles	.65	90	139	.64	46	72	.82*	18	22	.63*	12	19	.54	14	26
Transportation	.70	209	298	.75	114	152	.76	44	60	.58	33	57	.62	18	29
Office of Mental Health	.42	69	164	.49	44	90	.40	16	40	.26	9	34	--	--	--
OMRDD	.38	110	293	.38	60	156	.44	32	72	.28	18	65	--	--	--
Negotiating Units															
Security	.47	88	187	.49	76	156	.54*	7	13	.31*	4	13	.20*	1	5
Administrative	.63	350	559	.65	184	282	.64	59	92	.56	45	81	.60	62	104
Operations	.49	219	445	.60	121	203	.48	43	89	.37	31	84	.35	24	69
Institutional Services	.41	83	201	.42	44	106	.50	24	48	.32	15	47	--	--	--
PEF	.61	270	441	.64	141	221	.65	56	86	.57	48	84	.50	25	50
Management/Confidential	.63	57	90	.55	28	51	.73	19	26	--	--	--	.77*	10	13
Sex-type															
Female-67.2% or more	.56	347	623	.57	184	321	.55	65	118	.46	49	107	.64	49	77
Mixed	.59	286	484	.59	145	246	.64	66	103	.49	39	79	.64	36	56
Male-27.2% or less	.53	434	816	.58	264	452	.58	77	133	.46	56	123	.34	37	108

*22 or less were sent

	OVERALL			MAILED			PERSONNEL			UNION			ON-SITE	
	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent
Race-type															
Minority-30.8% or more	.42	131	310	.49	72	158	.51	36	71	.25	17	68	.46*	6	13
White	.58	926	1613	.61	521	861	.61	172	283	.53	127	241	.51	116	228
Literacy-type															
Low reading level	.49	103	212	.55	51	93	.56	25	45	.36	16	44	.37	11	30
Other	.56	964	1711	.59	542	926	.59	183	309	.48	128	265	.53	111	211
Salary Grade															
3-6	.53	233	436	.57	119	209	.61	49	80	.39	29	74	.49	36	73
7-11	.52	191	746	.57	211	367	.52	78	150	.42	59	141	.49	43	88
14-22	.58	289	499	.58	183	317	.64	47	74	.55	35	63	.53	24	45
23-38	.64	154	242	.63	80	126	.78	39	50	.68	21	31	.54	19	35

to find any consistent explanation. Therefore, we could not predict precisely which titles would yield low response rates in the main survey.

Salary Grade and Response Rate

Another possible factor influencing response rate was examined--the impact of salary grade. Titles were grouped by salary grade categories: Grades 3-6, 7-13, 14-22, and 23-38. As indicated in Table 4.5, response rates across these grade categories ranged from 53 percent to 64 percent, with response rates increasing with salary grade.

These results are quite consistent with those commonly found for surveys. While returns are generally lower for the low salary jobs, the return rate for the lowest salary grades (53%) was still adequate for data analysis. We concluded that oversampling low salary jobs or using a second method of distribution was unnecessary.

Small Incumbency Titles

A final research question was whether and at what level we could expect responses in small incumbency titles. Fifteen Management/Confidential titles with less than four incumbents each were included in the pilot study sample, involving a total of 19 questionnaires.

Only four questionnaires out of the 19 sent were not returned, for a response rate of 79 percent. Responses were received from 11 out of 15 titles. Thus, response rates for small incumbency titles were in the 70 percent range, a rate that is adequate for the purpose of our analysis.

RELIABILITY

One of the major objectives of the pilot study was to determine whether the job analysis instrument is reliable, that is, whether it measures job

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FOR PILOT SURVEY

	OVERALL			MAILED			PERSONNEL			UNION			ON-SITE	
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Total	.55	1067	1923	.58	593	1019	.59	208	354	.47	144	309	.51	122	241
Agency															
Missing Data		16			12			2			2			0	
Office of General Services	.44	148	334	.47	65	137	.51	36	70	.40	20	50	.35	27	77
Corrections	.54	86	158	.54	77	143	.75*	6	8	.43*	3	7	--	--	--
Social Services	.64	149	232	.69	81	117	.77	27	35	.61	20	33	.45	21	47
Tax and Finance	.62	190	305	.62	94	152	.57	27	47	.61	27	44	.68	42	62
Motor Vehicles	.65	90	139	.64	46	72	.82*	18	22	.63*	12	19	.54	14	26
Transportation	.70	209	298	.75	114	152	.76	44	60	.58	33	57	.62	18	29
Office of Mental Health	.42	69	164	.49	44	90	.40	16	40	.26	9	34	--	--	--
OMRDD	.38	110	293	.38	60	156	.44	32	72	.28	18	65	--	--	--
Negotiating Units															
Security	.47	88	187	.49	76	156	.54*	7	13	.31*	4	13	.20*	1	5
Administrative	.63	350	559	.65	184	282	.64	59	92	.56	45	81	.60	62	104
Operations	.49	219	445	.60	121	203	.48	43	89	.37	31	84	.35	24	69
Institutional Services	.41	83	201	.42	44	106	.50	24	48	.32	15	47	--	--	--
PEF	.61	270	441	.64	141	221	.65	56	86	.57	48	84	.50	25	50
Management/Confidential	.63	57	90	.55	28	51	.73	19	26	--	--	--	.77*	10	13
Sex-type															
Female-67.2% or more	.56	347	623	.57	184	321	.55	65	118	.46	49	107	.64	49	77
Mixed	.59	286	484	.59	145	246	.64	66	103	.49	39	79	.64	36	56
Male-27.2% or less	.53	434	816	.58	264	452	.58	77	133	.46	56	123	.34	37	108

*22 or less were sent

	OVERALL			MAILED			PERSONNEL			UNION			ON-SITE	
	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent	Rate	Number Received	Number Sent
Race-type															
Minority-30.8% or more	.42	131	310	.49	72	158	.51	36	71	.25	17	68	.46*	6	13
White	.58	926	1613	.61	521	861	.61	172	283	.53	127	241	.51	116	228
Literacy-type															
Low reading level	.49	103	212	.55	51	93	.56	25	45	.36	16	44	.37	11	30
Other	.56	964	1711	.59	542	926	.59	183	309	.48	128	265	.53	111	211
Salary Grade															
3-6	.53	233	436	.57	119	209	.61	49	80	.39	29	74	.49	36	73
7-13	.52	491	746	.57	211	367	.52	78	150	.42	59	141	.49	43	88
14-22	.58	289	499	.58	183	317	.64	47	74	.55	35	63	.53	24	45
23-38	.64	154	242	.63	80	126	.78	39	50	.68	21	31	.54	19	35

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Salary Grade and Response Rate

Another possible factor influencing response rate was examined--the impact of salary grade. Titles were grouped by salary grade categories: Grades 3-6, 7-13, 14-22, and 23-38. As indicated in Table 4.5, response rates across these grade categories ranged from 53 percent to 64 percent, with response rates increasing with salary grade.

These results are quite consistent with those commonly found for surveys. While returns are generally lower for the low salary jobs, the return rate for the lowest salary grades (53%) was still adequate for data analysis. We concluded that oversampling low salary jobs or using a second method of distribution was unnecessary.

Small Incumbency Titles

A final research question was whether and at what level we could expect responses in small incumbency titles. Fifteen Management/Confidential titles with less than four incumbents each were included in the pilot study sample, involving a total of 19 questionnaires.

Only four questionnaires out of the 19 sent were not returned, for a response rate of 79 percent. Responses were received from 11 out of 15 titles. Thus, response rates for small incumbency titles were in the 70 percent range, a rate that is adequate for the purpose of our analysis.

RELIABILITY

One of the major objectives of the pilot study was to determine whether the job analysis instrument is reliable, that is, whether it measures job

content characteristics accurately. A reliable measure is one which would yield the same score on repeated attempts to measure the same thing, whether those attempts are made at two points in time or in different parts of the questionnaire.

A common way of testing the reliability of questions in a survey is to repeat a question, perhaps with a slight variation in wording, at two different points in the questionnaire. In principle, the answers to the two questions should be highly correlated: respondents should give similar responses to both questions. Insofar as they do not, we have evidence that the question is not being understood, is being guessed at, or is otherwise not eliciting a very precise response.

Because the Center's pilot questionnaire already contained 178 separate items, it was not feasible to include more items to repeat measures as a way to test reliability. Consequently, employee responses to the same measures are not available. However, employee responses to similar measures were available through the pilot study. This is a reasonable, albeit somewhat weaker, alternative to the repeated measures design.

Of course, we would not expect the correlation between similar items to be as high as it would be if the items were almost identical. Consider three titles--Licensed Practical Nurse (LPN), Mental Hygiene Therapy Aide (MHTA), and Stenographer. Consider as well the following two items on the pilot questionnaire: How much does your job involve: "physically handling sick and injured people," and "working around people who are sick or disabled with no hope of recovery." Both the LPN and the MHTA are likely to score high on both questions. But consider those Stenographers who work in state mental health or mental hygiene facilities. They are likely to score low on the first question and high on the second. This lack of correspondence reflects actual

job content differences. As a result, the level of correspondence will be lower than if the questionnaire included two items concerning physically handling patients. Nonetheless, we would expect a moderately high correlation between these two items and between other pairs of similar items.

To carry out this test, we identified five pairs of items with similar content. These included: working with sick or injured people; using forms; evaluating subordinates; answering questions or complaints from the public; and education. (The exact wording of items is provided in Table 4.6.) The pairs of items were compared by correlating the two sets of scores for these items. This statistical procedure yields a summary index of the relationship between the two sets of scores. This index may range in value from -1.00 to +1.00. A positive correlation means that the scores on measure A increase as the scores on measure B increase, or that A decreases as B decreases. In reliability studies, the closer the correlation is to plus or minus one, the stronger the reliability of the measure. The pairs of items selected and the results of the correlations are listed in Table 4.6. Correlations range from .59 to .72, which indicates a fairly high degree of agreement. Buros (1978) indicates that, for job analysis instruments:

> Reliability studies have been primarily concerned with interanalyst agreement on the various job dimension scores. Interanalyst reliabilities have generally been in the .50's and higher, although some dimensions seem to be rated with considerably less agreement.

By interanalyst agreement, Buros is referring to correlation between ratings by two job analysts scoring each job on a single variable. Our test, by contrast, compares the scores on two variables, each rated by our entire sample of pilot study respondents. Given that the items are similar but not identical, we would expect lower inter-item correlations than those obtained from two expert job analysts using a single characteristic. In this context,

the reliabilities of .59 and above that we obtained appear high relative to the reliability coefficients found in other job analysis studies. Thus, we gained considerable confidence in the reliability of our survey questionnaire based on the pilot study results.

VALIDITY

Another major objective of the pilot survey was to assess the validity of the Job Content Questionnaire. Validity is the extent to which an instrument measures or predicts what is intended. In the context of this study, validity means the extent to which the questionnaire measures all of the range of job content in New York State job titles, and only the job content. A valid instrument for the purposes of this research would differentiate between jobs in terms of job content measures. Clearly, validity of the instrument is limited by reliability. An unreliable instrument cannot be valid. There are three types of validity relevant to this study: face validity, content validity, and criterion-related validity. The discussion below is organized in terms of these three categories.

Face Validity

Face validity is the extent to which an instrument appears relevant to what one intends to measure. It is usually assessed informally by reviewing the instrument to see whether it appears to cover the content intended. This was done by nearly 100 employees in the pretest, by 1,110 employees in the pilot study, and by numerous advisors to the project. Employees frequently took advantage of opportunities to talk to Center staff or write notes on the questionnaire about any item they felt did not validly represent the New York State job system. Employees were also encouraged to suggest any job content

TABLE 4.6

CONSISTENCY OF INCUMBENT RESPONSE:
CORRELATIONS BETWEEN ITEMS WITH SIMILAR CONTENT

	Item		Correlation
36.	Physically handling sick or injured people.	1 2 3 4	.72
38.	Working around people who are sick or disabled with no hope of recovery.	1 2 3 4	
601.	Filling out forms.	1 2 3 4	.59
612.	Reading forms.	1 2 3 4	
631.	Answering questions from the public on the phone or in person.	1 2 3 4	.67
639.	Answering complaints from the public.	1 2 3 4	
96.	Are you responsible for formally evaluating the performance of the workers you supervise? 1 no 2 yes		.62
985.	Writing evaluations of subordinate performance.	1 2 3 4	
523.	If the State requires education for your job, how much of full-time college or training outside the job is required? _____years, _____months		.69
525.	If the State requires a diploma or a degree for your job, what degree is required? 1 A high school diploma 2 A college degree that requires less than four years of study 3 A four-year college degree 4 A master's degree 5 A doctoral, law, medical or other degree beyond a master's _____(specify)		

that should be added to the questionnaire. In addition, the questionnaire specifically asked people if there was anything else about their job that they wanted to tell us. By the time we had reached the pilot study, employees made few suggestions about additions to the questionnaire, indicating that the survey instrument had face validity.

Content Validity

Content validity is the extent to which the instrument encompasses the range of job characteristics in New York State jobs. Characteristics unique to jobs were of less interest to this study, since we are interested in comparing jobs on common characteristics in order to explain variations in pay. As indicated in Chapter III, in order to insure the inclusion of all relevant job characteristics, we began the process of questionnaire development by examining in detail job analysis instruments developed by other consultants and added a set of questions about the job content associated with social and human service-provision titles. As a result, we were reasonably certain that the questionnaire's content was more inclusive than other job evaluation frameworks used in organizations in the public and private sectors.

A second content validity issue is whether the survey instrument measures systematically some variable other than job content characteristics. An obvious problem in this context is reading skill. If an incumbent cannot read and comprehend the questionnaire, then either the incumbent will not respond, or the incumbent will give invalid responses. In the latter case, the results will be related to reading ability, not job content. In order to minimize the

reading level of the questionnaire, it was edited to reduce the reading level to the seventh-grade.[7]

Furthermore, with the advice of Civil Service staff and personnel directors in several agencies, we were able to identify five job titles for which personnel experts estimated low literacy for 25 percent or more of the incumbents in the title.[8] It was important to know whether responses in low literacy titles were given with understanding. Analysis revealed no evidence of any serious misunderstanding of questions, responses omitted, or other evidence of difficulty; responses in these titles appeared plausible.

A third way in which content validity was assessed was through factor analysis of the job content questionnaire. Factor analysis is a statistical procedure that groups data into categories or factors, sometimes called "underlying dimensions." Items group together or "load" on a factor because they are highly correlated with each other. An example of a factor in this study is "working conditions." For example, we found that items about working in hot, wet, and cramped conditions load together on a working conditions factor. The eighteen factors found in the pilot are listed in Table 4.7.[9]

Our ability to get meaningful factors is further evidence for the content validity of the questionnaire for the following reasons. First, items did group in a meaningful way. In order to get consistent, meaningful loadings on

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[7]The assessment of reading level was done with the Fry Index of Readability as updated by Kretschmer (1976).

[8]Employees entering state service are not tested in any formal way for reading skills. Therefore, it was necessary to use expert opinion to estimate reading problems within each title.

[9]For a fuller description of the factor analysis and the factors found in the pilot study, see The New York State Comparable Worth Study Final Report written by the Center for Women in Government dated 1 October 1985.

each factor, it was necessary that persons doing similar tasks answer related questions in a similar way. Second, the factors appear to represent job dimensions relevant to New York State. Third, the factors are similar to those in other systems. For example, the factor solution for this study is comparable to factors included in the Factor Evaluation System (FES) used by the United States Civil Service Commission. Table 4.7 also illustrates the correspondence between the two factor solutions. They cover about the same job content, except that the New York State pilot study has some factors that are not on the FES.

A final way we assessed content validity was to compare item means across title series. It is especially important that the content of the questionnaire discriminate validly between job titles within a job series or family. Specifically, means (the average response of incumbents in a job title) should vary across the titles in a series in a predictable way. Table 4.8 lists incumbent means on selected relevant items for three series: Corrections, Clerks, and Food Service Workers.

In general, scores ascend or descend across series as one would expect. For example, we would expect the higher grade level jobs in a series to score higher, on average, than lower grade level jobs on such items as "planning in advance," "variety on the job," and "freedom to decide how to do the job." In turn, we would expect that incumbents in lower grade level jobs would report higher scores, on average, than higher grade level jobs on the degree to which their job requires them to perform the "same task over and over."

Criterion-related Validity

A third way to assess validity is to compare results with a criterion that is accepted as a standard. The obvious criterion in the present context is salary grade. Since our purpose is to develop a model relating job con-

TABLE 4.7

COMPARISON OF FACTORS IN THE FES AND NYS STUDY SYSTEMS

FES Factors	NYS Study Factors
Knowledge (facts and skills)	Education Analytical reasoning
Supervisory controls Guidelines (judgement)	Management/supervision Fiscal responsibility Autonomy
Complexity	Variety
Scope and effect	Routine
Personal contacts	Scope of personal contacts Stress from communication
Purpose of contacts (influence, motivate, etc.)	Management/supervision Service provider tasks Office tasks Group facilitation skills
Physical demands Work environment (risks, etc.)	Working conditions Time stress Computer Enter data Reading Writing

TABLE 4.8

AVERAGE SCORES FOR INCUMBENTS ON SELECTED ITEMS

Job Title Series	Item 46. Same task* over and over	55. Math	68. Planning in in advance (how far)	79. Variety in the job	84. Freedom to decide how to do job
Correction Officer	2.00	2.00	1.00	2.00	1.00
Correction Lieutenant	2.00	3.00	6.00	4.00	2.50
Clerk	3.33	2.33	2.67	2.67	3.33
Senior Clerk	1.33	3.00	3.00	3.33	3.00
Food Service Worker 1	3.33	1.33	1.67	2.00	1.50
Food Service Worker 2	1.00	2.00	3.00	2.00	2.00

* These scores should go down in each series. For the other items, the scores should go up in each series.

tent to salary grade, an important criterion for choosing a subset of items from among those with face and content validity is to retain those that are correlated with salary grade. Correlations between items and salary grade were computed to assess both the degree of association between each questionnaire item and salary grade and the direction of the correlations. A selection of correlations between selected items and salary grade are listed in Table 4.9.[10]

Positive coefficients indicate that the higher the score on a variable, the higher the salary grade, e.g., the more a college degree is required for a job, the higher the salary grade. Negative coefficients indicate that the lower the score on a variable, the higher the salary grade, e.g., the more one does the same task over and over, the lower the salary grade. The correlations are in the direction and of a magnitude that one would generally expect.

TABLE 4.9

EXAMPLE CORRELATIONS WITH SALARY GRADE

Doing the same task over and over	-.41
Working in crowded conditions	-.03
Teaching	.24
Preventing others from wasting time	.31
Hiring and firing	.41
Writing original computer programs	.45
Working overtime without pay	.49
Leading meetings	.55
College degree required for the job	.73

[10] For a more complete description of the correlation of items with salary grade, see The New York State Comparable Worth Study Final Report written by the Center for Women in Government dated 1 October 1985.

We also examined the validity of incumbent ratings by comparing them to supervisor ratings. If incumbents and supervisors tended to agree on ratings of the incumbents' jobs, this would provide additional evidence of the validity of incumbents' ratings.

We surveyed the literature on comparisons of supervisor/incumbent reports of job content. While small, that literature indicated that there is high agreement among supervisors and incumbents with respect to job content. In job analysis where tasks are being evaluated rather than worker performance, research indicates that workers can accurately rate their jobs.

Moreover, we asked people about the advisability of supervisor review of questionnaires. Labor representatives, managers, and personnel directors alike were of the opinion that supervisor review would result in incumbents providing acceptable, but not necessarily accurate, responses to the questionnaire. As a result of this advice, we conducted our assessment of the extent of agreement between job incumbents and their supervisors by generating a second survey instrument for supervisors to fill out independently of incumbents.

The design of the supervisor/incumbent substudy included the following steps: selection of items for comparison, data gathering, and data analysis through the computation of correlations and the differences in means between incumbent and supervisor average scores for the selected variables. Twelve questionnaire items were selected for inclusion in the supervisor questionnaire. Items were selected for one of two reasons having to do with potential validity problems. The first concerns a problem of accuracy--incumbents might not know the information requested. Other items were selected to represent problems of anchoring, that is, the ability to rate one's job appropriately in relation to other jobs.

We selected incumbents and supervisors as follows: three incumbents from each of 60 job titles from the larger pilot sample were randomly chosen. In addition, three incumbents, one in each of three titles with one to three incumbents, were included. Supervisors for the 183 selected incumbents in the 63 titles were then identified by agency liaison staff. Supervisor questionnaires were distributed by liaison staff, who were instructed to tell supervisors that we were seeking information about jobs they supervise. Liaisons were not to tell supervisors that we were comparing their responses to incumbent responses, so as not to bias responses. Completed questionnaires were received from supervisors of 107 incumbents, for a response rate of 58 percent.

Since we were interested in responses by job title, we averaged incumbent responses and supervisor responses separately for each title. To remove the possible impact of bias where there was only one incumbent or one supervisor responding, we only analyzed items for which at least two incumbents and two supervisors had responded. On this basis, we eliminated two items.

For each item remaining, the raw data were organized into incumbent and supervisor averages by title. Pearson correlations were then calculated between incumbent and supervisor responses for each item. Eight of the ten correlations were above .55, as positive evidence for agreement between supervisors and incumbents (Buros, 1978: 983).

Two items had lower correlations. The first had to do with the experience necessary to do your job. The low correlation probably represents confusion about the state's experience requirements. For many titles, experience can be substituted for education and vice versa. Another possible reason for the low correlation coefficient on experience is test error. The item was rewritten for the main survey in a simpler form. The other item with

a low correlation coefficient was "How much could your mistake slow down the overall work of the unit?". This item was eliminated from the questionnaire for the main study.

To summarize our findings, the purpose of the supervisor-incumbent sub-study was to assess the validity of using incumbents as informants about their jobs. Our findings of substantial agreement between supervisors and incumbents is support for the choice of using incumbents as sources of job data.

In general, we found that the questionnaire appears valid to employees. Items predict pay as one would expect. The questionnaire samples job elements found on 20 other instruments. The questionnaire does not measure reading level instead of job content. Items group together conceptually into factors like other systems. Items that should form hierarchies do so. Finally, items group together conceptually into factors similar to those found in other job evaluation systems. In conclusion, we are confident about the reliability and validity of the survey instrument.

REVISION OF THE JOB CONTENT QUESTIONNAIRE

A final objective of the pilot survey was to improve the Job Content Questionnaire so that it would be easier for employees to fill out and less expensive to process. This involved re-writing many questions to make them closed-ended, revising questionnaire wording where necessary to remove ambiguities, improving questionnaire format and layout, and eliminating questions when it was found that they were of little use in reaching our research goals. It also involved adding several items to improve the reliability of potential job content factors.

First, the questionnaire was revised to eliminate all fill-in questions. For example, the question asking for job title was replaced by an identifica-

tion label including job title.[11] A question like "What is your negotiating unit" was changed from a fill-in answer to a multiple-choice answer with categories to check. Items requiring quantitative responses were rewritten with response categories based on frequency distributions for the pilot study. In addition, several items were reworded to increase clarity.

The greatest number of revisions resulted from the factor analysis of the items in the Job Content Questionnaire described previously. This analysis involved two main steps: (1) elimination of a small subset of items unrelated to pay, to percent female in a job title, to percent minority in a title, or to another item related to pay, and (2) selection of items for factor scales. An explanation of this questionnaire revision process follows.

Initial Item Elimination

This study is concerned with identifying compensable job content factors in the New York State job system and with adjusting pay policy based on these factors to eliminate potential wage discrimination. Therefore, the decision to delete items from the factor analysis that correlate weakly with salary grade is justified on both theoretical and practical grounds. Since the factor analysis solution from the main survey was to be used to develop a compensation model, it was pointless to build a factor structure on items that bear no relationship to compensation. Such items only clutter an analysis

[11] Each questionnaire in the main survey had a label affixed to the front page with the following information: job title name, title code, and salary grade. Respondents were asked to verify the accuracy of the label. This way, such information did not have to be checked or coded except where the label information was incorrect.

that is already large and in need of data reduction for efficiency and precision of interpretation.[12]

In addition to predicting pay, we particularly were concerned with describing work done disproportionately by females and minorities accurately. Therefore, any item that was strongly related to percent female or percent minority in a job title was retained. We developed a very conservative set of rules to govern the elimination of items. They were as follows:

> Items were omitted that correlated between -0.2 and + 0.2 with salary grade, between -0.4 and +0.4 with percent female or percent minority, and between -0.4 and + 0.4 with any other item that correlated less than -.02 or more than + 0.2 with salary grade.

We chose 0.2 as a conservative cutoff correlation coefficient with salary grade. Any individual item correlating between -0.2 and +0.2 with salary grade has almost no relation to salary grade. We chose 0.4 for the correlation with percent female or percent minority because we were interested in a higher level of certainty about what are actually female or minority job characteristics. We also chose 0.4 as a criterion for items that correlate with other useful items because items with smaller inter-item correlations are almost certain to have very weak factor loadings.

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[12] The possibility exists, of course, that items that have very weak zero-order correlations with salary grade have larger net effects. For example, driving heavy equipment might appear to have no relation to salary grade because heavy equipment-driving jobs are in the middle of the pay hierarchy, paid more than other manual jobs, but less than professional and managerial jobs. If account is taken of other features of jobs, say formal educational requirements, it might turn out that driving heavy equipment has a positive relationship to salary grade because such jobs pay well relative to other manual jobs requiring similar levels of education. In reviewing items in the pilot test, we tried to be sensitive to such possibilities and retain items that on theoretical grounds might be suspected of having a substantial relationship to salary grade when other variables were controlled.

Because this questionnaire editing process was carried out on a sample of 68 job titles, we recognized that the statistical criteria could, at times, be too narrow. Recall that in selecting this pilot sample, we selected titles so as to capture the most important sources of diversity in job content, varying titles by grade level, by job family, by setting, and by percent female and percent minority. However, because 68 titles cannot fully represent the diversity of New York State jobs, we deleted only those items that met the statistical criteria and that pertained to characteristics of jobs in the sample of titles. No item was eliminated that might be related to pay, given a different set of titles in the sample. Moreover, we were well aware that the correlations might be spurious. Therefore, any decision based on correlations was made after careful scrutiny of statistical results to answer such questions as "Is this correlation coefficient plausible?" or "Could a third variable explain the correlation found?".

Fifteen items out of 150 were deleted from the questionnaire based on the above criteria and our qualitative assessments.

Factor Analysis for Questionnaire Editing

All retained items, with a few exceptions, were entered into a principal components factor analysis. We used an 18-factor solution, of which three factors were not useful because items did not load on them substantially. Three groupings of items were added to the remaining 15 factors, for a total of 18 factors.

These results were used to edit the questionnaire further. The reliability of a factor improves substantially with each increase in the number of items up to about six items on the factor (Nunnally, 1978). In a few cases where more than six items loaded on a factor, some items were deleted. In general, criteria for retaining items were both statistical and non-statis-

tical. To be retained, an item had to (1) load high on a factor, (2) not load high on more than one factor, and (3) along with the other retained items, describe the factor comprehensibly.

In spite of the above criteria, several items were retained although they crossed factors or loaded lower than other items on a factor. Some items were retained for face validity of the questionnaire. That is, many people expect to see such items on the questionnaire. Other items were retained because of a special research interest in them. Some of these items seemed to cross factors describing groups of job content characteristics associated with male (e.g., working conditions) or female (e.g., office tasks) jobs. We did not want to drop these items prematurely. After this analysis, 26 additional items were deleted.

As a final step, a number of items were added whenever there were not enough items to measure a factor reliably. These items included:

- working overtime on weekends without pay;
- editing data;
- verifying data;
- deciding what task to do first;
- deciding how quickly to work;
- mistake hurt agency name;
- dealing with high level managers; and
- systems design.

The edited Job Content Questionnaire used in the main comparable worth survey is attached as Appendix D.

SUMMARY

The pilot survey was designed to provide information on distribution methods, survey mechanics and questionnaire construction that would inform and improve the quality of the main data-collection survey. Having gone through the steps of conducting a survey, we had a much better understanding of what had to be done to get the main survey into the field.

In terms of response rate, both personnel and mailed distribution methods yielded consistently higher results than union or on-site. This finding was stable across sex, race/ethnicity, and estimated literacy level of job, across negotiating unit, agency, and salary grade, and for small incumbency titles.

Titles with lower response rates did not have common characteristics that consistently predicted the low response rates. Therefore, there was no basis for deciding that any particular title should be oversampled in the main survey.

Response rates were, for the most part, adequate for all job-type categories in the mailed and personnel-distribution methods. The relatively high response rate for the mailed method of distribution was somewhat surprising and most heartening since mailed-distribution is the easiest procedure to use. The high response rate for the mailed-distribution method might reflect several factors: respondents know how the mails work, their perception of confidentiality may be greater when neither labor nor management is involved. An effective public relations campaign, and the impact of large numbers of agency employees receiving questionnaires, might also be involved. Whatever the reasons, the successful use of the mailed-distribution method in the pilot survey gave us considerable confidence regarding the use of this method in the main survey.

The design of the final survey instrument benefitted greatly from the qualitative and quantitative analysis of the 1,110 returns. It is a reliable and valid instrument for obtaining job content information from state employees. The revised questionnaire represents a more efficient and simplified document, both for respondents to fill out and for Center staff to process. In sum, the pilot survey achieved its stated objectives.

CHAPTER V

MAIN DATA COLLECTION SURVEY: DESIGN AND MECHANICS

The main data collection survey occurred between November 30, 1984 and March 6, 1985. A total of 36,812 questionnaires was distributed throughout New York State to incumbents of 2,944 job titles, and 27,394 questionnaires were returned providing responses for 2,582 job titles. This chapter reports on the design and mechanics of this large undertaking. It begins with an overview of the sampling frame and the mechanics for selecting the incumbent sample. It continues with a discussion of various features of the distribution process that were designed to enhance the response rate and intake procedures. It concludes with a discussion of the survey response rate.

SAMPLING FRAME

As indicated earlier, incumbent self-reports were used as the basic source of information about content in New York State jobs. Since the unit of analysis is the job title, we further decided to average incumbent responses within each title to obtain a title profile. These decisions, along with our choice of a policy-capturing job evaluation analysis, required a complicated frame for sampling incumbents within job titles.

All titles in the population were sampled in one of two ways. If the title was one for which we were providing pay equity estimates, we sampled all employees in titles with 150 or fewer incumbents and 150 incumbents in titles with more than 150 incumbents. For the titles for which we would not be providing pay equity estimates, we sampled all employees in titles with 20 or fewer incumbents and 20 incumbents in titles with more than 20 incumbents. This two-tiered design proved to be the most effective approach to minimizing the statistical errors of estimate of both the final compensation model and the predicted salary grades for female-dominated and disproportionately minority titles.

Based on this design, we provided the Civil Service Department with the necessary information for them to select a sample of incumbents within each job title using systematic sampling procedures with a random starting point. Civil Service Department employee files as of August 22, 1984 were used.[1]

SURVEY DISTRIBUTION DESIGN

As the sampling frame was being finalized and the sample of incumbents selected, we began designing a set of procedures that would facilitate a high response rate. We had decided to use mailed distribution as a result of the pilot survey.

As indicated earlier, a high response rate minimizes the likelihood of "non-response bias," which occurs when respondents differ from non-respondents in significant ways. Researchers do not agree precisely on an acceptable response rate at which response bias is no longer an issue. The minimal acceptable rate seems to be at about 50 percent (Erdos, 1970: 144). According to the Office of Home Management and Budget (1978), they do not question 75 percent or above and they do not accept below 50 percent. The Advertising Research Foundation and Magazine Publishers, Inc., both use 70 percent as an acceptable standard.

Most importantly, the literature indicates that a higher response rate is less important when responses are grouped. Leslie (1972) reviewed 28 studies involving grouped responses and found no differences between respondents and

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[1] The time lag between the calculation of intervals and the actual selection of the sample meant that the number of incumbents in some job titles increased, while others decreased, leading to some variation in the actual numbers selected.

non-respondents. Of course, in this study incumbent responses are grouped by title.

Based on the above findings, we aimed for a 70 percent response rate as acceptable. Having established this standard, we designed the distribution in such a way as to meet, if not exceed, this standard.

We incorporated many of the features of the mailed distribution of the pilot survey. Most notably, we used agency liaisons to assist in distribution. In addition, we reviewed the extensive survey research literature about increasing response rates, which offered several techniques that we built into our distribution and intake design. These included the following techniques.

- Preliminary notification: Advance notice by mail or telephone that a survey is about to be administered has usually been found to increase response rates. (Waisanen, 1954; Stafford, 1966; Wiseman, 1972; Jolson, 1977; Frey, 1983, p. 92.) Myers and Haug (1969) found that in order to increase a response rate by 8.1 percent with prenotification, they had to expend 22 percent in additional research costs. Clearly, it was to our advantage to prenotify incumbents of the survey. Yet, with our large sample, the cost of a preliminary letter or phone call was prohibitive. We chose, instead, to publicize the study in a general way prior to the distribution of the questionnaire. We gave numerous speeches to state worker groups, including the board of each region of CSEA. We worked with GOER and CSEA public relations people to publicize the study in the general, union, and state agency presses.

- Stamped return envelope: Stamped return envelopes yield higher response rates (Ferris, 1951). While for most of our respondents, interagency mails were sufficient, many incumbents are located at outlying worksites with no access to interagency mails. In order potentially to increase the response rates among these workers, we affixed postage on return envelopes whenever agency liaisons informed us that use of the U.S. mails would be necessary.

- Follow-up: Follow-up reminders are almost universally successful in increasing response rates (Kanuk and Berenson, 1975). A telephone reminder has been found more effective than a postcard, and a follow-up phone interview is least effective (Sheth and Roscoe, 1975). For a study the size of this one, telephone follow-up was impractical--in phone costs, in staff time, and in the ability to locate state employees. Alternatively, we decided to use follow-up letters to remind incumbents to fill out and return the questionnaires. Research has demonstrated that one

follow-up message increases response rates as much as 20 percent. (Hinrichs, 1975; Erdos, 1970). A second mailed follow-up may increase response rates as much as 12 percent more (Heberlein and Baumgartner, 1978). After a second mailing, the investment in more mailings yields diminishing returns. Based on these findings, we sent two follow-up letters to remind incumbents to respond to the survey.

- Clarification: One disadvantage of mailed surveys is that respondents cannot ask for clarifications while filling out the questionnaire. We solved this problem by providing a toll-free number staffed by a researcher who could answer respondents' questions during working hours.[2]

As indicated below, our sensitivity to detail in using interagency mails, in providing postage when necessary, in adding two follow-up letters, in maintaining a toll-free phone number for queries, and in conducting a public relations plan geared to informing as many New York State employees as possible about the study, resulted in a smooth distribution process and a high response rate.

DISTRIBUTION AND INTAKE PROCEDURES

Printing and Distribution

The questionnaire was typeset and delivered to a printer who printed over 37,000 copies of the questionnaire, over 74,000 copies of a one-page follow-up letter, over 111,000 envelopes to mail the questionnaires and letters. (The questionnaire and follow-up letter are contained in Appendix D.)

While the questionnaire was being typeset and printed, two sets of labels were generated by the Department of Civil Service--one set of labels for envelopes and a companion set for questionnaires. The envelope labels con-

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[2]Over the first five weeks of the distribution process, we typically handled 30 phone inquiries a day through our toll free phone number.

tained the employee's name, line item number, alpha job title, title code, agency name, agency code, and location code. Agency liaisons later added more specific location information. The labels for the front of the questionnaire, contained only title, title code, and salary grade. These were to be checked by sampled incumbents for accuracy.

The questionnaires, follow-up letters, envelopes, and labels were delivered to a private mailhouse which applied labels to the questionnaire envelopes and to the follow-up letters. The mailhouse shipped boxes containing 36,812 questionnaires and 73,624 follow-up letters to liaisons in state agencies.

Contacting Liaisons

Prior to distribution, we worked with a set of agency liaisons who would assist in the distribution process. Because Civil Service Department records did not include the exact worksite address of most survey respondents, one responsibility of the agency liaisons was to add that information to each envelope.

The Office of Employee Relations supplied the Team with a list of agency liaisons in June 1984. (See Appendix E.) Center staff contacted agency representatives during late summer, 1984, to introduce them to the Center for Women in Government and to the comparable worth study. Liaisons also were asked a specific set of practical questions about handling the questionnaires within their agencies. After this initial contact, there were several communications with agencies and their liaisons. In October liaisons were invited to an informational meeting and reception at the Rockefeller Institute. Later, the Governor's Office of Employee Relations contacted agency commissioners about the study, asking them for their support and to allow the use of worktime for survey respondents to fill out the

questionnaires. Finally, just prior to the distribution of the questionnaire, the Center contacted agency liaisons to explain the distribution process in detail. Also, we sent each liaison a list of employees sampled in their agency or facility.

Distribution

New York State Job Content Questionnaires for 36,812 employees were delivered to agency liaisons on November 30 and December 4. (The original sample of 37,282 was depleted by 470 due to the loss of eight "quasi-agencies" immediately prior to distribution.) Upon receiving the questionnaires, the liaisons added specific worksite addresses to all the envelopes and forwarded questionnaires to employees.

Approximately two weeks after the questionnaires left the mailhouse, Center staff telephoned each liaison to make sure that all questionnaires and follow-up letters had arrived and that the questionnaires had been distributed. During that same phone call to liaisons, we reconfirmed dates to send the follow-up letters. They sent one follow-up letter two weeks after the distribution of the questionnaire and a second follow-up letter two weeks after that.

In addition, we sent questionnaires to 219 individuals in response to telephoned or written requests when incumbents reported that they had lost their questionnaires or had received a follow-up letter but no questionnaire. Before sending out a duplicate questionnaire, we verified that they had been sampled for the survey.

Intake

As the questionnaires were returned to the Center, the obviously unuseable questionnaires were separated out. These included those with missing job

title labels, those that had not been filled out, and those that were returned indicating that the person was laid off, terminated, deceased, unknown, or had resigned or retired.

Potentially useable questionnaires were then checked for a number of specific additional problems. First, approximately 820 questionnaires on which an incumbent had indicated a title and/or grade level change were verified.[3] Second, questionnaires were checked to determine if the respondents worked part-time, had worked for less than one month in the titles about which they were being asked, or had changed to a non-sampled title. These were regarded as unuseable based on the population definition elaborated in Chapter II.

Third, we read any written responses on the questionnaire in order to clarify particular answers to closed-ended questions. For example, a few workers clarified their responses to the question on how many staff they supervised, by indicating that their answers included supervision of students or clients. Since the question only encompassed staff supervision, references to other types of supervision in their answers were ignored.

Finally, questionnaires were sent to a private data entry company which entered the data onto computer tape and verified it.

The entire physical process of questionnaire distribution and intake took place between November 30, 1984 and March 6, 1985. Figure 5.1 shows the cumulative percent of questionnaires returned over a thirteen-week period. Note that over the first eight weeks 96.8 percent of the responses were

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[3]The title code number for the incumbent's new job was entered directly onto the questionnaire. In most cases, this was a routine task. For others, however, it was difficult to recognize the title names that were written in by

(Footnote Continued)

received. However, it was necessary to continue the receipt of questionnaires for five more weeks in order to gain adequate returns in low responding titles through our targeted follow-up efforts, described in the next section.

Special Problems

While the survey distribution and intake were, for the most part, smooth and uneventful, a number of contingencies arose that required that additional tasks be completed. These involved deletion from the sample of eight "quasi-agencies," which required replacement sampling, and a special mailing for sampled incumbents of the title Senior Stenographer Law. Additional adjustments were made in the sample of job titles, including deletion of Division of Military and Naval titles and deletions and title changes to reflect changes in the classification and compensation system.

First, we learned from the Governor's Office of Employee Relations, after the questionnaires had been boxed for mailing, that they did not want to include incumbents in eight "quasi-agencies." We pulled these questionnaires from the mailing and assessed the impact of the deletions on our sampled titles. We found that 407 incumbents were lost to the study, and 21 titles were completely lost. Three other titles were depleted so much that we decided that replacements of individual incumbents were needed to minimize potential sampling error. We developed the following criteria for deciding to replace incumbents in depleted titles: for titles in which the initial sample was 20, the depleted sample was enhanced if the depletion involved the loss of more than three respondents; and for titles in which 150 incumbents were sampled initially, the sample was enhanced if the depletion involved the loss

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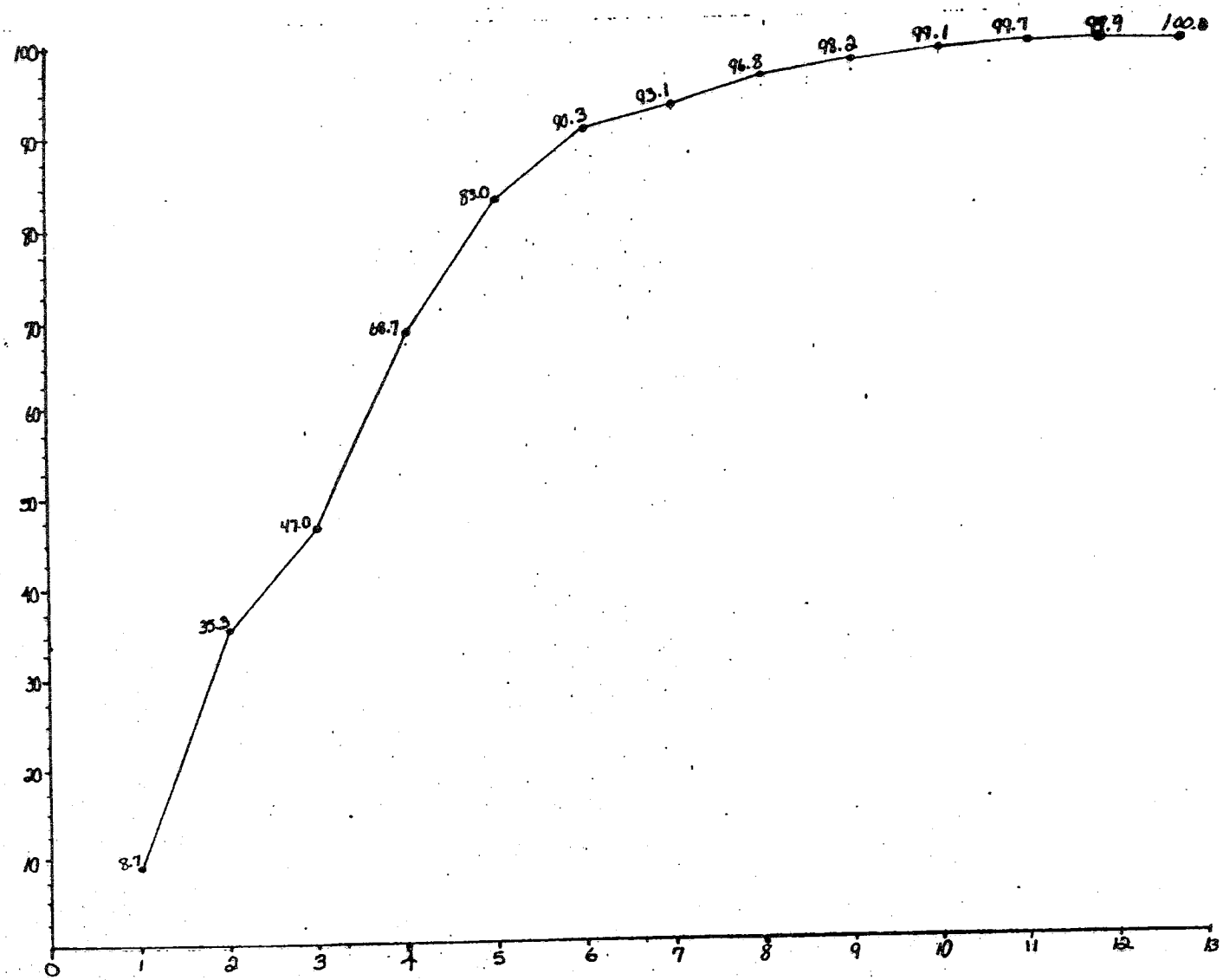
(Footnote Continued)
employees. For these cases, representatives of the Civil Service Department helped us identify titles.

FIGURE 5.1

CUMULATIVE PERCENTAGE OF RESPONSES RECEIVED OVER 13 WEEKS



of 16 respondents. In addition to the three severely depleted titles, we found that ten other titles had also been undersampled according to these criteria. We supplemented all thirteen title samples to achieve these minimums.

Thus, we carried out a total replacement sampling of 139 incumbents. The sampling was done systematically from population lists, using a random starting point.

Second, we mailed 136 additional questionnaires to all of the incumbents in the title Senior Stenographer Law because that title inadvertently was left out of the original sample.

Third, after the questionnaires had been distributed, we learned that salary grades for military and naval titles are determined outside the Civil Service compensation system. Therefore, 26 military and naval titles originally sampled were deleted.

Finally, there were several changes in titles and salary grades made by Civil Service during the course of the study. Our data bank was edited to reflect these changes.

RESPONSE RATES

As indicated above, a major concern in designing the main data collection was to obtain a high response rate, both overall and for those female-dominated, disproportionately minority, and direct-line-of-promotion titles for which estimates of undervaluation would be made. In order to calculate these response rates, we needed to define precisely what is meant by that term. In the simplest sense, a response rate in a survey is the number of questionnaires returned divided by the number sent. This calculation becomes complicated, however, when we begin to consider how to treat questionnaires

that do not clearly fit into either the "sent" or "returned" category. For example, a decision needed to be made as to how to categorize questionnaires that were not filled out because persons are no longer on the job, or have changed job titles, or are on leave. Are these employees part of the sample or should we consider the questionnaires as not having been sent?

Many such problems arose in our survey of the New York State workforce. For example, the Department of Civil Service estimates a five percent monthly turnover in employees, and the incumbent lists from which we drew our samples are not updated until two to six weeks after job changes. As a result, the sample of incumbents that we received was not completely up-to-date. Rules for treating changes of employee status were developed as follows.

(1) Respondents: All completed questionnaires in which incumbents worked full-time in a sampled job that they had held for over one month were treated as responses. As a general rule, incumbents who changed titles, whether acting or permanent, were kept in the sample and treated as incumbents of the new job titles in which they worked. This procedure resulted in no change in the overall response rate, but altered the sample sizes and the number of respondents of individual titles with additions or subtractions.

(2) Non-respondents: We treated 1,033 questionnaires as if they had never been sent and had never been returned. That is, 1,033 was subtracted from the number sampled and from the number returned before computing response rates. These included 710 questionnaires that were returned to us by agency liaisons unopened because the sampled incumbents were deceased, retired, terminated, or the agency had never heard of the person. These also included questionnaires that had been filled out, but the incumbents worked part-time (53), had worked less than one month on the job (158), or had moved to a non-sampled title (112).

(3) Unuseable Questionnaires: A third category of questionnaires included those that were treated as having been sent and returned but were unuseable for several reasons. These included 52 questionnaires returned blank, 25 with missing job title information, and 27 with incomprehensible job title information. Also, questionnaires returned because the incumbents were

on leave were considered as part of the sample and unuseable. Expert opinion differed over how to treat incumbents on leave. As a result, we treated them in a manner least advantageous to the response rate estimate. Sixty-five such questionnaires were sent out a second time to persons in their homes, accompanied by a letter asking the incumbents to respond even though they were on leave. Questionnaires that were returned were treated as respondents. Unreturned questionnaires were treated as having been sent, but as not having been returned.

Job Title Response Rates

In order to determine whether the response rate for each job title was sufficiently high to ensure statistically reliable results, we developed a computer program to calculate the response rate for each title. Our computer program adjusted the number sent for each job title to take into account both those who changed job titles and reductions in the "numbers sent" (those who left service, work part-time, had less than one month of service, or moved to a non-sampled title). The number received by job title was obtained by a computerized count of individual returns. The response rate for each title was computed by dividing the number received by the adjusted number sent, as described above. Appendix F lists the response rate for each job title with more than three incumbents and the response rate for all job titles with one to three incumbents.

The response rate program was run frequently during the questionnaire intake period in order to identify titles with low response rates. We tried to improve the response rates for titles for which the response rates were below 40 percent eight weeks after the beginning of data collection.

Twenty-five agency liaisons were contacted about low responding titles. Liaisons contacted incumbents in low response titles through a variety of means, including meetings, telephone calls, memos, and computer messages to urge them to complete the questionnaire. These follow-up efforts improved the response rates in over half of the targeted titles.

However, even with this effort, it was necessary to delete 43 titles from the study because of too few responses. (Deleted titles are listed in Appendix G.) The majority of deleted titles have low incumbencies. In addition, a number of them are in hospital or institutional services job titles. We used the following criteria as the basis for deleting titles: 0 responses received, only 1 response received out of three or more sampled, or only 2 responses received out of 5 or more sampled. Our criteria reflected concern that the responses of one or two incumbents in larger titles could not form an adequate basis for formulating a composite job description. These deletions adjust the total number of estimated titles from 168 to 166.

SUMMARY OF CHANGES IN THE SAMPLE

Originally, 37,282 incumbents were sampled in 2,944 titles. This chapter has documented events that altered the original sample of incumbents and titles. Table 5.1 summarizes those events and their effect on the sample size.

In addition to the above sources of change in the sample, several other events affected the title sample size. Civil Service changes in the classification system resulted in the deletion of a few titles and the combination of others, as described earlier. Incumbents changing jobs and moving out of small incumbency titles resulted in the elimination of some small titles. Also, a few single incumbency titles that were vacant when the sample was drawn were added because responding incumbents had moved into them. Before computing response rates, incumbents were added to or subtracted from titles according to these reasons.

The original sample size was 37,282, and 27,394 questionnaires were returned, according to a hand count. The adjusted incumbent sample after

TABLE 5.1

SUMMARY OF ADJUSTMENTS IN JOB TITLE AND INCUMBENT SAMPLE, MAIN DATA COLLECTION SURVEY

Event	Change in Number Incumbents	Change in Number Titles
Original number sampled	37,282	2,944
Loss of eight "quasi-agencies"[a]	-407	-21
Replacement of losses due to deletion of eight "quasi-agencies" and due to sampling error[a]	+139	NA
Late sampling of Senior Steno Law[a]	+136	+1
Deletion of military titles[a]	NA	-26
Omissions from sample:[a]		
Deceased, retired, etc.	-710	NA
Worked part-time	-53	NA
Worked less than one month	-158	NA
Moved to a non-sampled title	-112	NA
Adjusted target sample size	36,117	2,898
Unuseable questionnaires:		
Returned blank	-52	NA
Missing job title information	-25	NA
Incomprehensive job title information	-27	NA
Titles dropped because of low response rates	-60	-43
Total returned	35,953	2,855

[a]The sample size was adjusted based on these events before computing response rates.

NA = not available.

additions and deletions noted above was 35,492. The adjusted number received was 25,912 by computer count. The overall response rate, therefore, was 73 percent, a very high response rate. After incumbents in 43 low responding titles were deleted from the returns, 25,852 cases in 2,582 titles remained for use in the analysis.

PREPARATION OF THE DATA FOR ANALYSIS

The data were entered directly from the questionnaires to computer tape by a private company, which verified the accuracy of the data entry by entering it all twice.

Center staff used several procedures to verify the accuracy of the data entry prior to analysis. We examined a printout of the data to check the correctness of columns and questionnaire identification numbers. Identified errors were corrected by referring directly to the questionnaires and by re-entering the data appropriately. We also checked for impossible responses to items by examining frequency distributions. Finally, several of our computer programs, such as the one that produces response rates for each title, also indicated keypunch errors by producing a list of titles which the program did not recognize. Errors indicated by the above procedures were corrected.

SUMMARY

The main data collection involved sampling, printing, distributing, following-up, and preparing the data for analysis. The Civil Service Department drew a systematic sample with a random start for each job title. Private companies printed and mailed 36,812 questionnaires to agency liaisons,

who forwarded them to employees. Questionnaires were returned by respondents directly to the Center for Women in Government, where they were logged in and checked. The data were entered and verified by a private company, and the Center checked the data further for accuracy.

A major concern was to obtain high response rates. Efforts to increase the quantity of responses included extensive advance publicity of the study, sending a stamped return envelope to persons who had less access to free interagency mails, mailing two follow-up reminder letters, and mailing replacement copies of the questionnaire when the originals were lost. We also made available a toll-free telephone number to respondents and agency liaisons in order to answer questions and solve any distribution problems. As a result of these efforts, the overall response rate was 73 percent. The response rate for individual titles was adequate in all but 43 titles, which were deleted from the data. After various corrections and data cleaning, 25,852 individual cases in 2,582 titles remained for use in the analysis.

CHAPTER VI

PRELIMINARY DATA ANALYSIS

This chapter focuses on the preliminary analysis of the questionnaire items that formed the independent variables predicting salary grade in this study. It includes sections on adjusting the population, item recoding, data aggregation by title, defining percent minority, creating indices, and conducting the factor analysis. In this chapter, we often refer to questionnaire items by number. It may benefit the reader to refer to Appendix D for exact wording of questions.

ADJUSTING THE POPULATION

An accurate estimate of the final population in each title was needed in order to analyze subsamples drawn on the basis of population size for titles as of August 1984. As described previously, the sample size for each title was edited to reflect title additions and depletions that we discovered during questionnaire intake. We used this information about our sample to adjust the title population totals in order to derive a more accurate, updated population figure for each title. Since our sample was large and simulated random selection through systematic sampling techniques, we were able to use the changes observed in the sample data to estimate population changes in each title. We did this by calculating the proportion increase or decrease observed in each title sample and then multiplying the Civil Service population data by this proportion to obtain a population adjustment for each title.

ITEM RECODING

Several items of the questionnaire were recoded to facilitate data analysis. First, we recoded salary grade so that all responses were expressed in terms of the same scale. The state uses two comparable salary grade

scales. The most common scale ranges from one to thirty-eight. Job titles on the other scales were adjusted to their equivalent salary grade in the one to thirty-eight grade system.

Recoding was also used to solve a special problem with question 83 about intellectually processing information. This question had a large number of non-responses. Therefore, we defined missing data on question 83 to mean "none of the above," an option that was not overtly stated on the questionnaire but was a logical interpretation of a non-response.

Finally, for items with response choices that involved ranges of values (e.g., two to five years), it was necessary to recode the ranges to their midpoints to obtain a single number representing the category. For example, because we cannot use a range like two to five in our statistical analysis, we use the midpoint, 3.5, to represent that range of response.

Recoding to midpoints becomes problematic, however, for those questionnaire item choices where the range is open-ended (e.g., "more than 15 years"). This range has no upper limit, so it is impossible to calculate the midpoint between the lower and upper limit of the range directly.[1] To estimate the midpoints of open-ended categories we used expert opinion from staff at the Department of Civil Service, the Bureau of Space Planning, the Office of General Services, and the Department of Tax and Finance. These experts advised us concerning the realistic and reasonable upper limits of these categories. The midpoint was then determined to be one-third of the distance from the lower to the upper limit of the categories. The midpoint was

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[1]The questions with open-ended ranges include 4, 5, 7, 8, 11, 14, 38, 40, 41, 82, 91 and 110.

calculated as one-third instead of one-half the distance between the lower and upper limits because upper limits usually represent somewhat unique cases.[2]

AGGREGATING DATA BY TITLE

The recoded incumbent level data were aggregated for each job title. For each item the mean response for each title was calculated. This became the preliminary title level score for each item.

Further examination of the data, however, revealed that responses to many items varied dichotomously, i.e., in a yes/no manner, and not according to the four values provided in the questionnaire (never, once in a while, often, most of the time). Thus, prior to the further analyses, we redefined questions 16 to 23, 25, 31, 61 to 66, 70, 90, 96, 98, 102, 105, and 106 as dichotomous responses. For all but four questions, we did this by entering the percent answering "never" into the analysis as the title level score for each such item.

DEFINING PERCENT MINORITY

Originally, it was assumed that "minority" would mean non-white for the purposes of determining any effect of proportion minority in a title on the state's pay policy. However, we found that the mean salary grade valued on the basis of race/ethnicity for whites was 14.8, for Hispanics 12.3, for

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[2]This method of midpoint approximation was used for all relevant questions except 41 (time to learn a job competently) and 91 (number of patients, etc., served). For question 41, Civil Service experts advised us that three years should be used as the highest midpoint value. For question 91, Civil Service experts indicated that 50 patients served should be used as the highest midpoint value.

Blacks 10.89, and for other race/ethnic groups 17.9. What this suggests is that, in New York State employment, Hispanics and Blacks hold different jobs than those held by "others," a group that includes many Asians in professional and technical jobs. Because our focus is on disadvantaged groups, percent minority was coded as percent Black plus percent Hispanic.

CREATING INDICES

For certain job content areas such as writing, we combined job task questions into indices to create more powerful predictors of salary grade. For example, question 53 (copying written facts) touches on a minor part of some New York State jobs. However, combining the writing items, questions 53 to 58, into a single index describes a very large number of state jobs in a more general way and has the potential of predicting salary grade very powerfully because it describes an important aspect of many jobs--the complexity of writing tasks entailed in the job. Indices of this kind measured complexity of writing (questions 53 to 58), reading (questions 59 to 61), and one's relationship to information (questions 74 to 79).

For each index, salary grade was regressed on potential questions, using the data that had been aggregated by title, in order to determine which questions to include. Regression weights in the equations produced by this procedure indicated the net effect of each question on salary grade. Items with large coefficients (positive or negative) were retained and items with small coefficients were omitted.

To calculate the index scores for each title, standard scores (Z-scores)

for the remaining items were added.[3,4] For items with negative weights, the standard score was subtracted from the index.

THE CREATION OF FACTOR-BASED SCALES

In this section, we discuss the factor analysis procedures we used to reduce the job content items in the questionnaire to a relatively small number of dimensions. We also describe the creation of multiple-item scales reflecting these dimensions of job content.[5]

Factor analysis is a data reduction procedure that groups items together which measure the same general components. For instance, items such as working with toxic material, working in extremely hot or cold conditions, and working in noisy areas might be grouped statistically into a factor that would measure working conditions. Thus, factor analysis reduces a potentially large set of items to a smaller set of explanatory dimensions or factors. These factors can then be used in later analyses as new composite variables in place of the original separate items.

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[3]Standardizing scores puts them into a common metric so that they can be added or compared. A Z-score has a mean of 0 and a standard deviation of 1.

[4]Of course, the maximum correlation between the resulting scale and salary grade would be obtained by using the regression estimates as scale scores (Treiman and Terrell, 1975), but such a procedure entails the danger of overfitting the data. We thus used the regression solely to identify the variables to be included in each scale, and created scales by summing standardized scores. The logic is the same as that underlying our decision to use factor-based scales rather than factor scales; see the discussion in the next section.

[5]"Scale" here means a composite set of items about a single dimension such as education or stress.

There were two reasons for reducing the large number of individual items to a few underlying dimensions: interpretability and reliability. Since the objective of creating measures of job content was to use them in a regression analysis predicting salary grade from job content, we needed a set of measures that would be readily interpretable in the regression context. This led us to focus on general dimensions of job content rather than on idiosyncratic characteristics of specific jobs. Moreover, regression results involving large numbers of questions, particularly questions that are relatively highly correlated with one another, are difficult to interpret. This provided another reason for reducing our questions to a small number of relatively unrelated measures.

The second reason for combining questions into multiple-item scales was to improve the reliability of our measures of job content. It is well known that in general the reliability of scales increases as the number of items increases (Nunnally, 1978). Each additional question is likely to tap a slightly different aspect of the scale.

Factor Analysis

The first step in creating our factor-based scales was to factor analyze 80 job content items in the questionnaire (item numbers 16 to 52, 62 to 73, and 80 to 111) and the three indices, WRITE, READ, and INFO. See Table 6.1 for a list of variables entered into the factor analysis.

The utility of factor analysis as a basis for scale construction is to discover whether a set of questions reflects a single underlying dimension. If it does, the questions will all have high loadings on one factor and low

loadings on all other factors.[6] It can happen, however, that an item thought to reflect a particular dimension turns out to have a low loading on the factor that includes all other items reflecting that dimension, but has a high loading on another factor. This indicates that respondents interpreted the question differently from the way it was intended and, therefore, that it should not be included in the scale.

For example, suppose we hypothesized that six items in our questionnaire tapped a dimension, "contact with clients." These six questions with their factor loadings are (in shortened form):

MI92	Seriousness of client problem	.85
MI24	Dealing with emotionally troubled clients	.77
MI91	Number of patients, inmates served	.71
MI28	Handling sick or injured people	.62
PI63	Advising or supervising clients, inmates	.51
PI65	Interviewing clients	.51

Inspecting the factor loadings and also inspecting the loadings of each of these variables on other factors, we might conclude that a purer scale, tapping "Contact with <u>difficult</u> clients," could be formed by excluding the last two items and constructing a scale from the first four items only. This revised scale is, in fact, one of those we decided upon on the basis of our factor analysis.

There were three bases for such decisions. First, do all the items seem to reflect the same underlying dimension? Second, do all the items have factor loadings of similar size? If not, it will sometimes improve scale relia-

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[6] Factor loadings are the correlations between the factors and the observed variables. They range in value from -1.00 to 1.00. Generally, one looks for items that load high (greater than .4 or less than -.4) when determining which items constitute a factor.

bility to drop items with relatively low factor loadings. Third, do any of the items have high loadings on any other factor? If so, they may be tapping another dimension in addition to the one under consideration. In the preceding example, the last two items appear to be conceptually somewhat different from the first four, tapping not only the activities of the helping professions but also those of tax officers, motor vehicle department clerks, and so on. Additional evidence that this is so is that the last two items have relatively high loadings (.40 and .42) on another factor, "communications with the public." We therefore dropped the last two items and used the first four to form a "contact with difficult clients" scale.

As is evident from this example, the decision about which variables to include and which to exclude is not made entirely on rigid and fixed criteria. Rather, in making decisions, statistical outcomes provided information that was used to arrive at conceptually and substantively sensible solutions.

Even the choice of statistical outcome itself is a judgmental one. The statistical algorithm for factor analysis yields any specified number of factors, from one to one less than the number of variables included in the factor analysis. After exploring five different factor analysis solutions, we settled on a 14 factor solution because it yielded the most readily interpretable set of job content dimensions.[7] However, we made some modifications. We discarded the 14th factor because no items loaded high on it, and we created a new composite variable called "mental demands" by combining the INFO index with question 83 (mentally processing information).

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[7]The factor analysis was carried out using the SPSSX FACTOR procedure to do principal factoring with iteration (PAF), with varimax rotation. In most cases, the same factor structure is found using any method of factor analysis (Nunnally, 1978). A varimax rotation was used to arrive at an orthogonal terminal factor solution rather than an oblique rotation.

TABLE 6.1

VARIABLES ENTERED INTO THE FACTOR ANALYSIS*

PI16	make quick decisions
PI17	feel rushed
PI18	work piles up
PI19	deadline pressure
PI20	need to learn new skills
PI21	feel conflicting demands
PI22	tell people what they don't want to hear
PI23	dealing with upset clients or public
MI24	dealing with emotionally troubled clients
PI25	hot or cold
MI26	fumes
MI27	cleaning up other people's dirt
MI28	handling sick or injured people
MI30	constant noise
PI31	loud noise
MI32	strenuous physical activity
MI33	same task over and over
MI34	work overtime weekdays
MI35	work overtime weekends
MI36	travel overnight
MI37	risk of injury
MI38	years of school required
MI39	degree required
MI40	experience
MI41	gain competence
PI42	work with machines
MI43	math
MI44	body coordination
MI45	editing data
MI46	entering data
MI47	verifying data
MI48	word processing
MI49	using package programs
MI50	writing original computer programs
MI51	systems programming
MI52	systems designing
PI62	answering questions from public
PI63	advising or supervising clients, inmates
PI64	teaching
PI65	interviewing clients
PI66	settling disputes on job
MI67	keeping other workers informed about programs, policies

* P denotes that the item was entered as a percentage into the factor analysis. M denotes that the item was entered on a mean.

TABLE 6.1
(continued)

MI68	negotiating for services
MI69	explaining
PI70	answering complaints from public
MI71	giving speeches
MI72	planning meetings/workshops
MI73	leading meetings/workshops
MI80	setting operating practices
MI81	breadth of planning responsibility
MI82	plan work in advance
MI83	mental information processing
MI84	spend money within budget
MI85	propose budget for unit
MI86	propose budget for agency
MI87	hire and fire
MI88	estimating training needs
MI89	substitute for boss in supervising
PI90	propose policy
MI91	number of patients, inmates served
MI92	seriousness of client problem
MI93	free to decide what task to do first
MI94	new problems
MI95	variety
PI96	prevent waste of materials
MI97	prevent wasted time
PI98	finding replacement for no-shows
MI99	free to decide how to do work
MI100	free to decide how quickly to work
MI101	do same thing
PI102	told what to do
MI103	mistake hurt unit name
MI104	mistake hurt agency name
PI105	mistake harm person
PI106	mistake damage equipment
MI107	deal with non-agency professionals
MI108	deal with government officials
MI109	deal with state managers
MI110	number supervised
MI111	supervisory responsibility
WRITE2	-MI53 (copying)-MI54 (basic writing) + MI55 (original writing) + MI56 (editing) + MI58 (scholarly reports)
READ2	-MI59 (reading letters) + MI61 (reading complicated reports)
INFO2	-MI74 (filing) - MI76 (getting background information) + MI78 (using abstract knowledge) + MI79 (deciding what information is needed)

These questions originally had been on the education factor, but they loaded only moderately high. In addition, these questions seem to be conceptually different from the education items and yet they seemed similar to one another. The correlations between INFO and item 83 was moderately high (.50).

These 14 factors together explain only 60 percent of the variance in the individual items, indicating that a number of individual items do not load highly on any factor. As we will explain later, we included many of these individual items in the regression analysis in addition to the factor-based scales. Table 6.2 gives the content of each of the factors, together with the loading of each included item on the factor.

Constructing Factor-based Scales

To construct scales representing the job content dimensions identified by the factor analysis, we proceeded as follows to obtain factor-based scores for each of the factors listed in Table 6.2. We standardized all questions included in each factor by creating Z-scores, i.e., by subtracting the mean of each item and dividing by the standard deviation, and then added the resulting scores or, in the case of items with negative loadings, subtracted them. The purpose of standardizing the items was to give each of the included items equal weight in the factor-based scale.[8]

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[8]Note that the factor-based scales produced by this procedure differ from factor scores, which are sometimes used. With factor scores, all items entering the factor analysis (in this case 83 items and indices) are included in each scale. However, the items are multiplied by factor weights, derived from the factor analysis procedure prior to adding them to form factor scores. The latter procedure is not as conceptually clear as the procedure we used nor as robust across repeated analyses. The difficulty is that the use of factor scores rather than factor-based scales capitalizes on chance variability in the size of the intercorrelation among items, and hence yields results that are not easily replicable if information on the same items were drawn from

(Footnote Continued)

TABLE 6.2

ITEMS INCLUDED IN EACH SCALE, TOGETHER WITH FACTOR LOADINGS FROM THE 14 FACTOR SOLUTION

Item		Loading
Factor 1: Management/supervision (11 items)		
MI111	Supervisory responsibility	.89
MI97	Prevent wasted time	.87
MI87	Hire and fire	.83
MI81	Breadth of planning responsibility	.82
MI88	Estimating training needs	.78
MI89	Substitute for boss in supervising	.76
MI66	Settling disputes on job (% never)	-.74
MI98	Finding replacement for no-shows (% never)	-.72
MI80	Setting operating practices	.70
MI67	Keeping other workers informed about programs, policies	.70
MI110	Number supervised	.61
Factor 2: Unfavorable working conditions (6 items)		
MI32	Strenuous physical activity	-.81
MI26	Fumes	-.73
MI37	Risk of injury	-.71
PI25	Hot or cold (% never)	.67
PI31	Loud noise (% never)	.63
MI27	Cleaning up other people's dirt or garbage (% never)	-.62
Factor 3: Contact with difficult clients (4 items)		
MI92	Seriousness of client problems	.85
MI24	Dealing with emotionally troubled clients	.77
MI91	Number of patients, inmates served	.71
MI28	Handling sick or injured	.62
Factor 4: Communications with public (4 items)		
PI70	Answering complaints from public (% not part of job)	-.71
PI62	Answering questions from public (% not part of job)	-.67
PI23	Dealing with upset clients or public (% never)	-.62
MI107	Dealing with non-agency professionals	.55
Factor 5: Education required (2 items)		
MI39	Degree required	.83
MI38	Years of schooling	.78

(Footnote Continued)
another sample, say New York State a year from now. For these reasons, we prefer to utilize factor-based scales, which are widely used in the social science literature (Kim and Mueller, 1978).

TABLE 6.2
(continued)

Factor 6: Data entry (3 items)		
MI46	Entering data	.86
MI45	Editing data	.82
MI47	Verifying data	.82
Factor 7: Group facilitation (3 items)		
MI72	Planning meetings/workshops	.73
MI73	Leading meetings/workshops	.69
MI71	Giving speeches	.58
Factor 8: Computer programming (4 items)		
MI50	Writing original programs	.76
MI51	Systems programming	.72
MI49	Using package programs	.67
MI52	Systems designing	.66
Factor 9: Fiscal responsibility (3 items)		
MI86	Propose budget for agency or facility	.61
MI84	Spending money within budget	.60
MI85	Propose budget for unit	.58
Factor 10: Stress (6 items)		
PI17	Feel rushed (% never)	-.54
PI21	Feel conflicting demands (% never)	-.50
PI22	Tell people what they don't want to hear (% never)	-.44
PI19	Feel pressure to meet deadlines (% never)	-.41
PI20	Feel need to learn new skills just to keep up (% never)	-.41
PI16	Have to make quick decisions (% never)	-.37
Factor 11: Autonomy (3 items)		
MI99	Free to decide how to do their work every day	.74
MI100	Free to decide how quickly to do their work	.68
MI93	Free to decide what task to do first	.55
Factor 12: Consequences of error (2 items)		
MI104	Mistake hurt good name of agency	.72
MI103	Mistake hurt good name of unit	.63
Factor 13: Time effort (2 items)		
MI34	Working overtime without compensation	.49
MI35	Working weekends without compensation	.45

TABLE 6.2
(continued)

Factor 14: Mental demands (1 index and 1 item)*

INFO2 Complexity of relationship to information
MI83 Mental information processing

* This composite index was created from factor 14 after the factor analysis, so there are no loadings.

The Reliability of Each Factor

As noted above, in general the reliability of factors increases as the number of items increases. The formula we use for computing reliabilities is puting reliabilities is the Spearman-Brown formula (Nunnally, 1978):

$$r_{kk} = \frac{kr_{ij}}{1 + (k - 1)r_{ij}}$$

where k is the number of items in a scale, and r_{kk} is the correlation between two versions of a k-item scale reflecting the same domain of underlying content, that is, the reliability of the scale and r_{ij} is the average correlation among the items making up the scale. Table 6.3 shows the reliabilities for the 13 factor-based scales we have created and the Mental Demands scale. On a scale of 0 to 1, they are in general quite high, and give us considerable confidence that we are measuring aspects of job content in a reliable way. What this means, from a practical standpoint, is that we would be likely to arrive at essentially the same conclusions if we or others repeated the analysis, measuring the same aspects of job content with multiple-item scales,

even if the specific questions going into each of the scales are somewhat different.

SUMMARY

Several procedures were used to prepare the data for regression analysis. The population of each title was adjusted to reflect changes in title populations between the time of sample selection and questionnaire intake. This was done by changing the title populations by the same proportion change observed in title samples.

Several items were recoded. Salary grade was changed to conform to a single, consistent scale for all titles. Item number 83 about mentally processing information was recoded so that missing data was interpreted as "none of the above." Response ranges were recoded to the midpoints of ranges. The incumbent level data were aggregated by title, and title scores were calculated either as means of each item for each title or as the percent of title incumbents who responded "never" when item responses reflected a yes/no dichotomy.

Percent minority was defined as percent Black plus percent Hispanic rather than percent non-white because it was found that the mean salary grade for other non-whites, especially Asians and Pacific Islanders, was higher than that for whites.

Indices were created for the complexity of writing, reading, and one's relationship to information. This was done by adding the standard scores of items that contributed significantly to the prediction of salary grade in separate regressions of salary grade on each set of potential index items.

A factor analysis of 80 items and three indices yielded a 14 factor solution. Factor-based scores were calculated by summing standardized scores for all questions that loaded highly on a given factor.

TABLE 6.3

RELIABILITY COEFFICIENTS FOR FACTOR-BASED SCALES

Factor	Reliability
Factor 1: Management/supervision (11 items)	.95
Factor 2: Unfavorable working conditions (6 items)	.88
Factor 3: Contact with difficult clients (4 items)	.85
Factor 4: Communications with public (4 items)	.82
Factor 5: Education required (2 items)	.94
Factor 6: Data entry (3 items)	.91
Factor 7: Group facilitation (3 items)	.93
Factor 8: Computer programming (4 items)	.86
Factor 9: Fiscal responsibility (3 items)	.90
Factor 10: Stress (6 items)	.70
Factor 11: Autonomy (3 items)	.84
Factor 12: Consequences of error (2 items)	.91
Factor 13: Time effort (3 items)	.91
Factor 14: Mental demands (2 items)	.67

In Chapter VII we will discuss the use of the factor-based scores in regression analyses that produced the pay policy equations for the New York State workforce.

CHAPTER VII

MODELS FOR ASSESSING WAGE DISCRIMINATION

In the previous chapter, we reported on the analysis of factor-based scales from the Job Content Questionnaire that would form the basis of the regression analysis. Regression analysis is the statistical procedure used in policy-capturing job evaluation to select the set of job content factors and the weights associated with these factors which are most related to the current implicit pay policy of an employer, in our case, New York State government employment. The resulting equation is, essentially, a compensation model describing the job content characteristics of the jurisdiction's jobs and the relationship of these factors to pay. Because it represents the employer's implicit pay policy, the compensation model becomes the standard against which jobs can be assessed for pay equity.

Because the pay policy line obtained through regression analysis is the basis for assigning appropriate grade levels to particular titles, comparable worth job evaluation requires that the models be free of sex and race/ethnic bias. This means that the sex or race/ethnic composition of a job title cannot be an implicit compensable factor, which could lower the salary grade of titles.

The Center was contractually obligated to provide GOER and CSEA with three pay policy lines:

- the pay policy line for all job titles, unadjusted;
- the pay policy line for all job titles, adjusted to statistically control for "proportion female" and "proportion minority," as an implicit compensable factor; and
- the pay policy line for job titles disproportionately filled by white males.

This chapter describes these models and briefly touches on the advantages and disadvantages of each as the basis for making pay equity adjustments.

Before turning to a discussion of these models, however, we provide a brief introduction to the interpretation of regression statistics in the context of pay equity analysis. While readers familiar with regression analysis may want to skip this section, it may prove useful to an understanding of the logic underlying the three pay policy lines for which we obtain regression results.

REGRESSION MODELS FOR PAY EQUITY ANALYSIS

To introduce the reader to regression analysis, we work through a hypothetical example. Let us assume that pay differences among jobs depend on only one factor: how much skill a job requires. In this simple example, each of these factors is measured as follows:

> The pay rate, (Y), is measured by the salary grade for the job title.
>
> Skill, (S), is measured by a multiple item scale of the kind described previously. Let us suppose that scores range from zero to one.[1] A job requiring the least skill gets a score of zero while a job requiring the most skill gets a score of one. A job with moderate skill might get a score of 0.4, and so on.

Consider a very simple model, one in which we wanted to know whether, to what extent, and in what way the salary grade assigned to a job depends on the skill required to do it, ignoring any other determinants of pay differences. We can, in fact, estimate the effect on pay of skill differences between jobs

---

[1] Note that there is, in fact, no "skill" factor per se in the set of New York State factors because this concept is measured in our data set by several factors. So this specific variable should be regarded as an hypothetical example chosen for ease of exposition.

by statistically predicting salary grade from our skill variable using regression analysis.

To see this graphically, imagine that we had a sample of only five job titles. We could then plot each job title on a two-dimensional plot, known as a scatter plot, where the horizontal axis represents our skill variable and the vertical axis represents salary grade. Figure 7.1 illustrates such hypothetical plots where each observed point represents a job title. From even a casual glance at the top plot it is evident that as skill requirements increase, salary grade tends to increase. To statistically describe this relationship, we could provide an equation that would estimate how large a difference in salary grade we would expect, on average, for two job titles that differed by one point on the skill requirements scale. We do this by fitting these points to a line as shown in the bottom of Figure 7.1.

The intercept on the vertical axis is called a. It indicates the value of Y when S = 0. In other words, it tells us what the salary grade would be for a job title with no skill involved in the job content. The slope is called b. It gives the number of units of change in Y for a one-unit change in S. In other words, it tells you how many salary grades a unit change in skill level is worth. Y! tells us what the predicted grade level would be, if title scores fell exactly on the regression line that best fits the job titles in our sample. In the bottom of Figure 7.1 the actual value of S, the actual value of Y, and the predicted value of Y, or Y!, are marked for one of the observed job titles, and these are labeled S_i, Y_i, and $Y!_i$, respectively.

In order to find the predicted grade level, we must first find the so-called "line of best fit" relating skill and salary grade. "Best fit" refers to a statistical criterion, indicating a line that minimizes the sum of the squared differences between the actual salary grade of each job title and

FIGURE 7.1

HYPOTHETICAL JOB TITLE VALUES
FOR SKILL AND SALARY GRADE
AND LINE OF BEST FIT FOR THESE POINTS

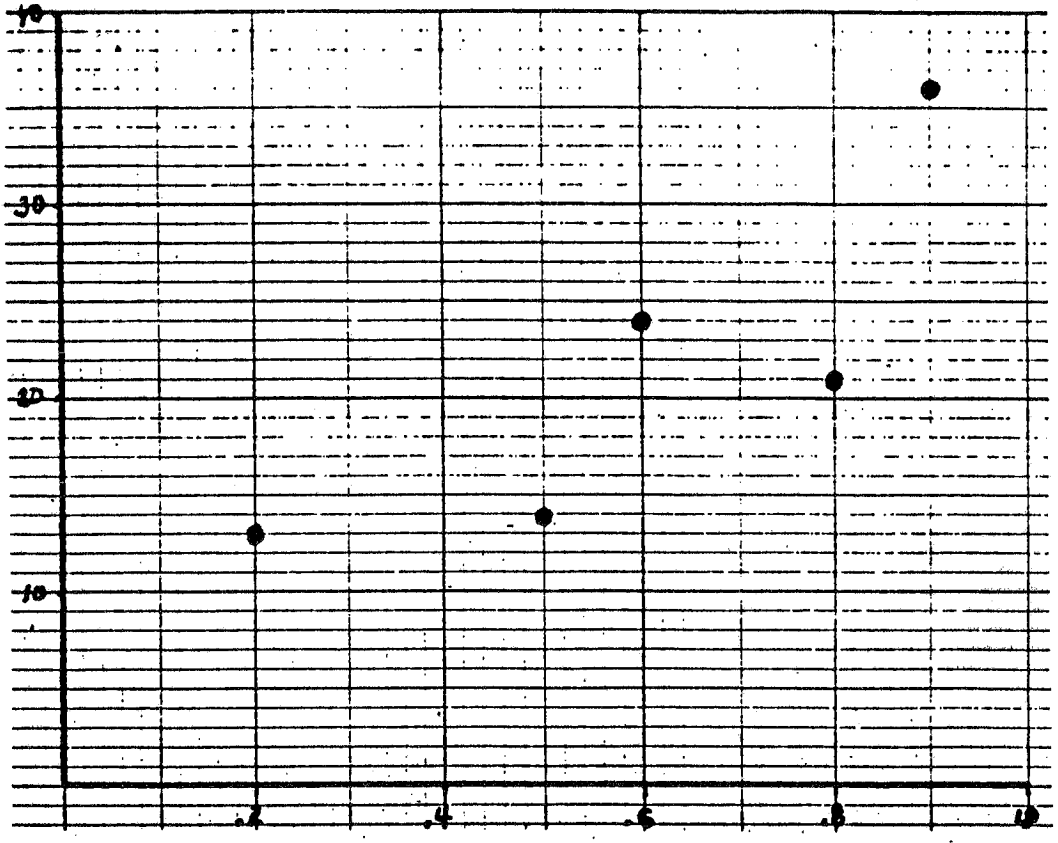

Figure 7.1a

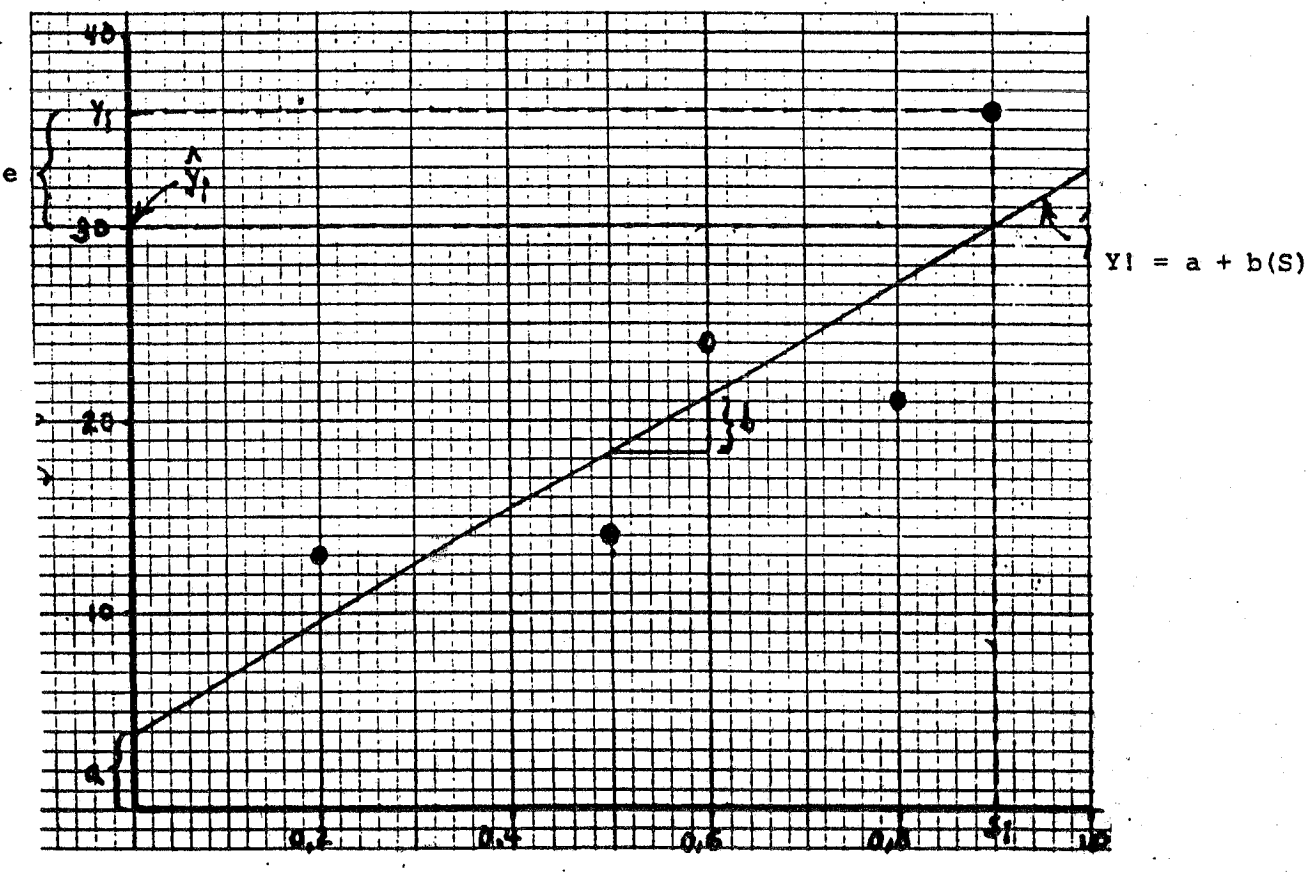

Figure 7.1b

the salary grade predicted from the skill required to do the job. Using this procedure, the line is placed as close to all points as a straight line can be.

Regression is a technique for finding the intercept (a) and the slope (b) of the linear equation that will result in the smallest squared difference between the actual and predicted values, $[(Y - Y!)^2]$. Another way of saying this is that the resulting equation,

$$Y! = a + bS,$$

gives the best prediction of the value of salary grade (Y), given that one knows only the amount of skill required (S).

The smaller the scatter of observed points around the regression line relating skill and salary grade, the better the prediction. The square of the correlation coefficient, called r^2, is a measure of how good the prediction of salary grade is. Formally, r^2 is defined as $r^2 = 1 - (Y - Y!)^2 / (Y - Y)^2$, that is, as one minus the ratio of the variance of observed points around the regression line to the total variance in the observed points. This is why r^2 is a measure of the proportion of the variance in Y explained by another variable, in this case S. From this definition, it is evident that if prediction is perfect, $r^2 = 1$. If there is no association between the two variables, skill and salary grade, $r^2 = 0$.

Now suppose the hypothetical relationship between skill requirements and salary grade for 2500 job titles in New York State is captured by the equation,

$$Y! = 4 + 29(S),$$

with an associated r^2 of .6. These results would tell us, first, that 60 percent of the variation in salary grade can be explained by variation in the skill requirements of jobs. They also tell us that the jobs with the lowest

skill level (a score of 0) would be predicted to be in salary grade 4, and jobs with the highest scale level (a score of 1.0) would have a predicted salary 29 salary grades higher than 4, or salary grade 33.

Simple regression of one variable on another rarely captures the complexity of how things really work. For example, some jobs actually are in even higher salary grades than those predicted in the preceding example, presumably because they not only require a high degree of skill but also great responsibility. For such jobs, relying on skill as the only measure of job content would underestimate their value. Similarly, some jobs not only require low skill but entail little responsibility. For such jobs, relying on skill as the only measure of job content would overestimate their value. For this reason, we need to be able to measure the simultaneous effect of a number of different aspects of job content. To do this, we use a multiple regression procedure to obtain an equation. This is a straightforward extension of the two-variable regression example we have just worked through.

PAY POLICY MODELS FOR ASSESSING WAGE DISCRIMINATION

As indicated above, we were asked to develop three pay policy lines to arrive at estimates of equitable pay, all based on the application of multiple regression procedures: (1) an overall pay policy line, involving conventional job evaluation, with no consideration of the sex or race/ethnic composition of job titles; (2) an adjusted overall pay policy line, involving a modification of the conventional job evaluation approach to include measures of proportion female and proportion minority incumbents within a job title to remove any potential effect of sex or race/ethnicity as implicit compensable factors; and (3) a pay policy line involving the use of only predominately white male job titles as the standard for estimating an equitable pay model.

The overall pay policy line is frequently used in conventional job evaluation studies to determine the relative worth of jobs.[2] This type of line has one major limitation for pay equity research, with several negative consequences. If certain job content characteristics such as skill, responsibility, or physical effort, are related to the sex or race/ethnic composition of jobs, unless the composition is explicitly entered into the regression equation the regression procedure will attribute to skill, responsibility, and physical effort part of the difference in pay which is, in fact, due to sex or race/ethnic composition. For example, if jobs done mainly by women tend to be paid less than comparable jobs done mainly by men because of sex discrimination, and if the jobs done mainly by women require low levels of physical effort relative to the jobs done mainly by men, the regression procedure will incorrectly give physical effort a large regression weight. We could get an inappropriately large regression weight for physical effort even if, in actuality, physical effort has no effect on the pay rates either for jobs performed mainly by men or for jobs performed by women. In this case, what appears to be the weight attributed to the physical effort required on the job may really represent the male sex dominance in the job. This would be an inaccurately specified model. It would incorporate any existing bias in salary-setting which results from sex and/or race/ethnic discrimination. Thus, the consequence of using the overall unadjusted pay policy line is that the line of best fit may incorporate discrimination.

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[2] Sometimes job evaluation has involved multiple pay policy lines, that is, a different pay policy for different subgroups of jobs in one compensation system. However, pay equity requires that a single pay policy be applied consistently to all jobs.

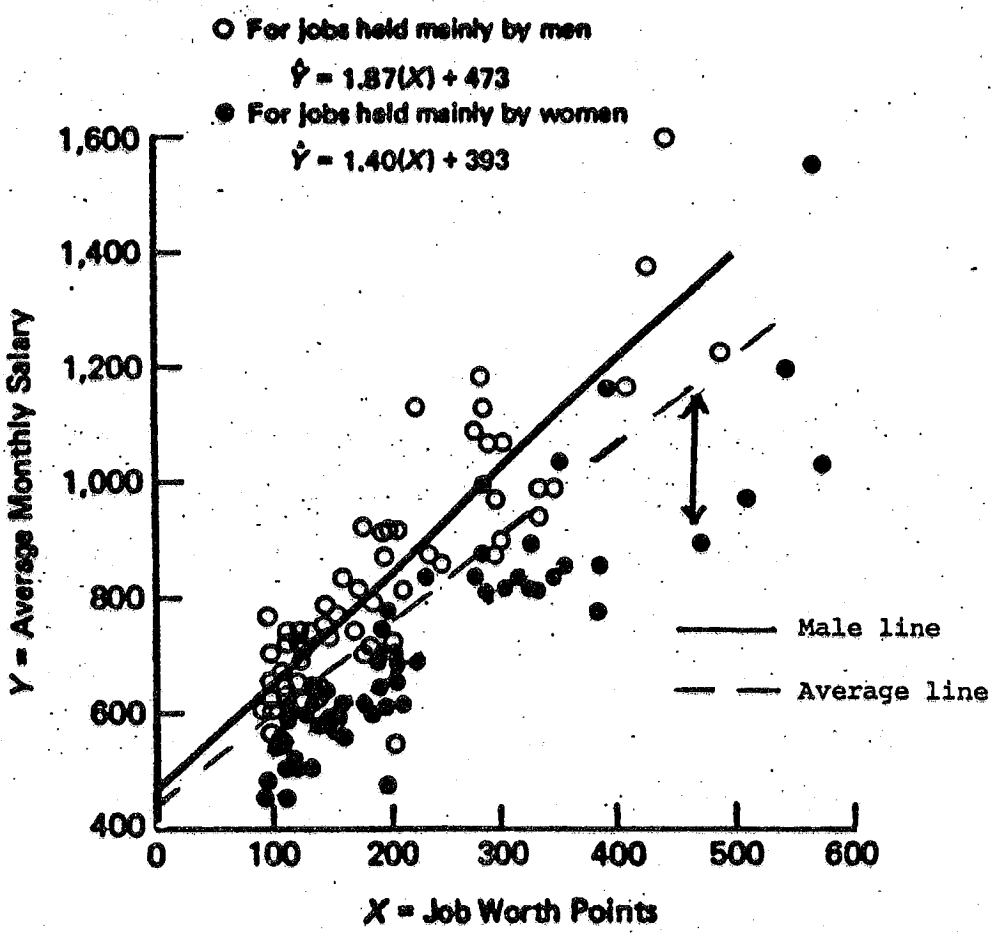
Consider Figure 7.2, which presents data from the 1974 Washington State Comparable Pay Study. Note that virtually all the female-dominated jobs fall under the average pay policy line for male jobs (represented by the solid line). Were we to compute another, overall pay regression line, (represented by the broken line), it would fall below the male line. Therefore, to the extent that the overall line is lower due to discrimination embedded in the salary-setting process, the salaries for male jobs appear inappropriately high. Similarly, if we adjust female salaries only up to this average pay line, it is very likely that the salaries for female jobs would still incorporate sex bias. Thus, while we include a regression equation representing the overall pay policy line, the predicted salary grades cannot be used as the basis for making pay equity adjustments.

To correct for the limitations of the overall pay policy line, two alternative regression models can be estimated. The first alternative strategy is to estimate an equation similar to the overall equation, but with one additional variable, the proportion of incumbents in each job title who are female. The inclusion of the variable "proportion female" does two things: first, it provides a direct estimate of the extent to which the sex composition of jobs affects their pay rates, net of other factors; second, it provides estimates of how skill, responsibility, and other job content characteristics affect pay, net of sex composition.

The coefficient associated with the proportion female indicates the predicted difference in salary grade between job titles that have identical scores on other job content factors but that differ by 1.0 in their proportion female. Specifically, it indicates the predicted difference in the salary grade of two job titles, one of which is 100 percent male and the other of which is 100 percent female, but which have identical scores on the other

FIGURE 7.2

SCATTERPLOT OF MONTHLY SALARIES BY JOB WORTH POINTS, FOR 59 JOBS HELD MAINLY BY MEN AND 62 JOBS HELD MAINLY BY WOMEN IN THE WASHINGTON STATE PUBLIC SERVICE



SOURCE: Remick, 1980. Computed from Willis, 1974.

variables. If the coefficient is negative, for example - 2.0, the equation will indicate that a totally female job title would be two salary grades lower than a totally male job title with identical other job content characteristics.

To see how these weights are used, let us consider the (hypothetical) predicted salary grades for two jobs, Typist and Truck Driver. For simplicity, let us assume that there are only two job content characteristics in the jurisdiction's implicit pay policy: skill and responsibility. Further assume that Typists have a score of 0.4 on the skill factor, a score of 0.3 on the responsibility factor, and are 100 percent female; and that Truck Drivers have a score of 0.4 on the skill factor, a 0.4 on the responsibility factor, and are 0 percent female. The $\underline{a}$ = 3.3, the $\underline{b}$ (skill) = 13, the $\underline{b}$ (responsibility) = 18, and the $\underline{b}$ (proportion female) = -2. With these job characteristics, the predicted pay rate for Typists would be

$$Y! = 3.3 + 13(0.4) + 18(.3) - 2(1.0) = 11.9$$

while the predicted pay rate for Truck Drivers would be

$$Y! = 3.3 + 13(0.4) + 18(.4) - 2(0) = 15.7$$

From these two equations we see that the difference in salary grades between Typist and Truck Driver is 3.8. Only 1.8 (18(0.4) - 18(0.3)) of the difference is due to what we would regard as a legitimate basis of pay differentials, the fact that truck driving involves more responsibility than typing, while 2.0 (-2(0) - -2(1.0)) is due to the fact that truck driving is a male job while typing is a female job.

The logic behind the use of the adjusted line is that these predicted pay rates can be interpreted as "equitable job worth" scores, since they indicate what New York State would pay if responsibility and skill differences between job titles were taken into account, but differences in sex composition were not.

The utility of entering percent female and percent minority into the regression equation is that it provides predicted salary grades that are free of any sex or race/ethnic bias but that otherwise conform as closely as possible to the current pay policy of New York State. Thus, the New York State pay policy is made equitable, while the integrity of the system is maintained. This approach was the basis on which pay equity adjustments were made in Iowa. One drawback of this model is that it is a difficult adjustment procedure to explain to a non-technical audience.

The second alternative model involves estimating an equation where the job titles used in developing the equation are restricted to those in which most incumbents are almost entirely white males. The logic underlying this strategy is that pay differences among jobs done mainly by white males cannot involve sex or race/ethnic discrimination. Thus, by determining what job content characteristics account for pay differences among such jobs, and applying the resulting compensation model equation to the remaining jobs, we discover and apply a compensation policy free of sex or race/ethnic bias.

This strategy has the political advantage of being easy to understand. If we refer to Figure 7.2, it would mean that all the female-dominated titles would be adjusted to the male pay policy line and they would be paid at the average salary level for male jobs at each given job evaluation point level. The disadvantage of this strategy is that it is based on a smaller subset of jobs that may be unrepresentative of all the job titles in New York State. Moreover, if female-dominated and disproportionately minority titles are raised to the male pay policy line, it would leave integrated titles in the position of being the lowest paid titles in New York State. The male pay policy line was used as the basis for making pay equity adjustments in Minnesota.

Of course, theoretically it is possible that all three regression equations would be essentially the same. If this happened, we would conclude that there was no discriminatory pay bias against female-dominated or disproportionately minority jobs. Moreover, we would expect to see as many female-dominated and disproportionately minority jobs above as below the unadjusted pay line. No studies to date have resulted in such a finding.

One final note about compensation models developed using policy-capturing job evaluation: since existing wages are used as the basis for obtaining factors and weights, policy-capturing represents an essentially conservative approach to job evaluation. More than a priori approaches, it tends to preserve existing wage relationships among jobs and rationalize implicit pay policies. It minimizes changes in the existing system. Comparable worth job evaluation using policy-capturing must take care to remove from customary wage relationships the impact of sex and race/ethnic bias. This is first accomplished by introducing the two alternative pay policy lines. However, it also is necessary to examine what job content characteristics New York State does not value or values negatively to determine whether there are subtle biases against characteristics of female and minority jobs. Thus, after presenting the results of the regression analysis for the three pay policy lines, we will briefly discuss what New York State does not value or values negatively.

DEVELOPING THE REGRESSION MODELS: PRELIMINARY DESIGN DECISIONS

In the previous section we discussed the rationale for estimating three models of the relationship between job content and salary grade in the New York State system: (1) an overall pay policy line or conventional job evaluation model, in which salary grade is predicted from measures of job

content; (2) an adjusted pay policy line or modified job evaluation model, in which measures of the sex and race composition of jobs, (i.e., the proportion female and the proportion minority workers), are included in the estimation model in addition to measures of job content; and (3) a white male pay policy line, which is a model based on job content characteristics only, but estimated on the basis of the characteristics of white male jobs rather than of all job titles. This section of the report describes in detail the procedures used to estimate these three compensation models and the decisions made in the course of the estimation.

Minimum Incumbency Size

The development of a model that successfully captures the current pay policy of New York State requires that the model be based on as many and as broad a representation of jobs as possible. Any exclusion of jobs should be done in such a way as not to bias the resulting pay policy model. While this point is fairly obvious, it is important when considering whether and in what way to limit the analysis to job titles with some minimal number of incumbents. The issue in specifying the regression equation involves deciding the minimum number of incumbents necessary to achieve acceptable levels of reliability in the measurement of sex and race/ethnic composition of job titles.[3]

Consider a job title with two incumbents, one male and one female. If the male leaves the job and is replaced by a female, the job will

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[3]Recall that, in Chapter II, one of the criteria for selecting female-dominated, disproportionately minority, or direct-line-of-promotion titles was that there was a minimum of ten incumbents. These criteria were based on a similar concern with the reliability of the sex and race/ethnic variables.

automatically go from a 50 percent female to a 100 percent female job. The inter-rater variance in ratings of job content is in general not large, relative to the variability in sex and race/ethnic composition. Therefore, it is probable that job content measures based on the ratings of a small number of incumbents will be relatively reliable, whereas the measures of sex and race/ethnic composition will not.

This is further problematic since job titles with small numbers of incumbents tend to be concentrated at the upper grade levels. Thus, excluding these job titles leaves us with a somewhat unrepresentative set of all job titles in the system. This is why our original sample included the small incumbency positions designated as managerial but excluded such titles in non-managerial bargaining units.

After exploring a number of different possibilities, and computing our regression models separately for subsets of job titles selected on the basis of the number of incumbents, we decided that the best solution consisted of presenting a single set of results, based on all job titles with four or more incumbents. Under this criterion we reduced the number of job titles available for analysis from 2,582 to 1,601. We were comfortable with this solution because the regression results proved to be basically similar for subsets of job titles with different incumbent counts. In particular, the regression coefficients associated with proportion female and proportion minority were remarkably stable, hardly varying from one sub-group to another.

Defining "White Male" Job Titles

The argument underlying the pay policy line for white male job titles is that jobs done mainly by white males are not subject to sex or race/ethnic discrimination in salary-setting in the way that disproportionately minority and female-dominated jobs may be. Therefore, whatever characteristics of

white male jobs are related to salary grade are regarded as compensable factors free of sex or race/ethnic discrimination. The definition of "mainly white male" had to be very restrictive. For example, using a 67.2 percent cutoff point as the basis for defining white male jobs would, in fact, result in lower estimates of undervaluation. However, such estimates would be lower precisely because undervaluation due to sex and race/ethnic discrimination would be embedded in estimates made on the basis of such low cutoff points. On the other hand, since too narrow a definition would result in the elimination of almost all jobs, we settled upon a minimum of 90 percent white and 90 percent male incumbents as the criteria for defining a job title as "white male."

Scaling Variables

Our independent variables included the set of factor-based scales, plus a set of individual variables not included in the formation of the factor-based scales. For the adjusted pay policy model only, the proportion female and the proportion minority incumbents were also included. The variables are listed in the top panel of Table 7.1. Means, standard deviations, and intercorrelations among all of these variables, plus the dependent variable, mean salary grade, are shown in Appendix C. To ease interpretation of the regression coefficients, we converted each of these variables to a 0 to 1 metric.[4] Thus, the coefficients indicate the predicted difference in salary grade between a

---

[4]The variables were scaled 0 to 1 using the following equation:

$$\text{Scaled score} = \frac{\text{unscaled score} - \text{minimum score}}{\text{maximum score} - \text{minimum score}},$$

where the minimum and maximum refer to the outer limits of unscaled scores for that particular variable.

job title with the highest score on the variable and a job title with the lowest score on the variable, net of the effect of all other variables in the model. For example, in the overall pay policy line, labeled Model A, shown in Table 7.2, the predicted difference between job titles with the highest and lowest scores on the Management/supervision factor is about four and one-half salary grades (4.54), holding constant each of the 14 other variables in the model. But this regression coefficient does not tell us how important Management/supervision is relative to the other 14 variables in the model. To determine the relative importance of the variables in the model, we also present the regression weights expressed as standardized coefficients. These are shown in Table 7.3.[5]

Criteria for Selecting Variables for Retention in the Model

We began the statistical analysis by estimating an initial version of each of our three models that included all 27 of the variables specified in the top panel of Table 7.1: the 13 factor-based scales; the indices we had constructed to measure the complexity of reading, writing, and mental demands;

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[5]Often we wish to have a measure not only of how much of a change in the salary grade can be expected for each one-unit change in each job content variable, but also of the relative effect on salary grade of each of the job content variables. Because job content variables are often measured in a variety of metrics with different dispersions or ranges of values, they cannot be compared directly. Each variable must be expressed in the same metric before comparisons can be made. To enable us to determine the relative importance of the regression coefficients, we make use of what are called standardized coefficients. Technically, these are the equivalent of the metric coefficients we would obtain if, before doing the analysis, we subtracted the mean of each variable from each observation and divided the result by the standard deviation. Doing this would yield a new set of variables, each of which had a mean of zero and a standard deviation of one. For such variables, a one-unit difference is identical to a one-standard deviation difference, since the variables are defined to have a standard deviation of one.

TABLE 7.1

VARIABLES USED IN THE REGRESSION ANALYSES

Variables Used in the Initial Analysis

Y: Mean salary grade
F1: Management/supervision
F2: Unfavorable working conditions
F3: Contact with difficult clients
F4: Communications with public
F5: Education required
F6: Data entry
F7: Group facilitation
F8: Computer programming
F9: Fiscal responsibility
F10: Stress
F11: Autonomy
F12: Consequences of error
F13: Time effort
Mental demands
Complexity of writing
Complexity of reading
MI33: Doing same short task over and over
MI36: Travel overnight on the job
MI40: Amount of experience in related jobs required
MI41: Time to become competent after starting the job
PI42: Work with machines (percent no)
MI43: Highest level of mathematics used
MI44: Special body coordination or expert use of hands or fingers
MI94: How often do new or unexpected problems come up in job
PI105: How much could mistake harm health or safety of another person
PI106: How much damage to equipment could mistake cause
F: Proportion female
M: Proportion minority

Variables Added During Review of Initial Regression Results

PI19: Pressure to hurry to meet deadline (also in Factor 10)
MI32: Very strenuous physical activity (also in Factor 2)
MI37: Risk of being hurt (also in Factor 2)
PI42R4: Work with machines (percent put together or fix complicated machines)
MI95: How much variety in job
PI96: Responsible for preventing damage or waste of equipment or supplies
MI101: Do the same thing every day
PI102: Told what specific tasks to do

and the individual items not included in any of the factors that had plausible interpretations as possible predictors of salary grade; and, for Model B, proportion female and proportion minority as well. From this initial equation, we successively eliminated variables that were statistically non-significant.[6,7] In some instances, however, we retained non-significant variables with metric coefficients of one or greater to allow for the possibility that a variable may pertain to only a few job titles but be an important determinant of salary grade for those few titles. It is possible for such variables to appear non-significant in the overall model because they account for so little of the variance in the dependent variable as a consequence of their rarity. For example, whether or not one is a professional athlete accounts for little of the variance in the income of the

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[6]The use of significance tests in this context may appear surprising since we are studying the entire population of job titles in the New York State civil service system at the time of our study. However, we rely on significance tests because we regard the population of job titles at the time of study as a point-in-time sample of job titles existing in New York State in the mid-1980s, which is the population to which we wish to generalize our results.

[7]We did not make use of stepwise regression procedures because, in our judgment, reliance on strictly mechanical criteria for the retention or elimination of variables too often leads to uninterpretable results, with the retention or elimination of particular variables depending heavily on minor variations in the size of inter-item correlations.

U.S.labor force, since there are so few professional athletes relative to the size of the labor force. However, the metric coefficient associated with a variable distinguishing professional athletes from others would be large because professional athletes earn substantially more on average than do others in the labor force.

Having developed a preliminary model for the overall pay policy line by eliminating variables with no explanatory power (non-significant variables), we then carried out an additional exploratory analysis to ensure that we were adequately reflecting the pay practices of New York State. We reviewed all of the variables available to us, including a number of individual variables that had been included in the factor scales, and considered whether transformations of these variables were possible that would capture aspects of job content better than we had done in the first equation. For instance, item number 42, "Do people in your job work with machines as an important part of their job?" was initially coded to indicate the percentage of incumbents who responded "No, they don't work with machines." In our review process, we defined a new variable, the percentage of incumbents who responded "They have to put together or fix complicated machines," reasoning that perhaps the latter variable would tap the complexity of manual work. For similar reasons, we also picked out some items that were included in factor-based scales and studied their effect as individual items. These variables are shown in the second panel of Table 7.1. None of this exploratory work led to the inclusion of any additional variables.

THE FINAL SALARY GRADE PREDICTION MODEL

Table 7.2 shows the regression coefficients for the final compensation model that would be used as the basis for estimating possible undervaluation

for female-dominated, disproportionately minority, and direct-line-of-promotion titles. The table displays three models. Two models are estimated using all job titles with four or more incumbents. Of these, Model A is the overall pay policy line and includes 15 job content characteristics. Model B is the adjusted pay policy line and includes the same 15 job content characteristics, plus the proportion female and the proportion minority among incumbents of each job title. Model C is estimated using white male job titles only. It contains only the 10 job content characteristics that were statistically significant for this equation. For each model Table 7.2 includes the metric (unstandardized) regression coefficient for each variable. Table 7.3 includes the standardized regression coefficient for each variable.

The first thing to notice about these models is that they successfully account for most of the variation in the salary grades of job titles in the New York State civil service system. Recall that the objective of the regression analysis is to discover the implicit policy underlying the current pay practices of the New York State government. The fact that each of these models accounts for nearly 90 percent of the variance in salary grades among job titles (R^2 is between .88 and .89 in all models) indicates that we have been very successful in this effort.

All three models have strong similarities. However, there is some variation between the models based on all job titles and the model based on white male job titles only. Let us first consider the models based on all job titles.

When all job titles are considered, by far the most important determinants of salary grade are the educational requirements for a job (F5) and the amount of experience required in related jobs (M40), as can be seen from inspection of the standardized coefficients. In fact, these two variables

TABLE 7.2

UNSTANDARDIZED COEFFICIENTS OF THE DETERMINANTS OF SALARY GRADE FOR VARIOUS MODELS FOR JOB TITLES WITH AT LEAST FOUR INCUMBENTS

	All Job Titles		White Male Job Titles
	Model A	Model B	Model C
	Metric Coefficients		
Variables			
F1: Management/ supervision	4.54	4.98	4.47
F2: Unfavorable working conditions	-2.07	-3.14	-4.44
F4: Communication with public	-1.46	-1.53	-3.38
F5: Education required	11.83	11.86	9.72
F7: Group facilitation	-1.22	-.76	2.17
F12: Consequences of error	3.42	2.94	3.16
F13: Overtime without compensation	1.44	1.41	--
F14: Mental demands	8.74	7.63	--
Complexity of writing	5.87	5.57	11.45
M33: Doing same task over and over	-3.60	-3.14	--
M40: Experience required	8.47	7.80	7.63
P42: Not working with machines	1.02	1.22	1.48
M44: Physical coordination	.33	.83	--
P96: Responsible for preventing damage to equipment	1.11	1.40	3.22
P106: Mistake causes damage to equipment	.48	.85	--
F: Proportion female	--	-2.02	--
M: Proportion minority	--	-.16	--
Constant	-2.40	-1.15	2.14
R^2	.885	.889	.884
Standard error of estimate	2.53	2.48	2.34
N	1601	1601	464

TABLE 7.3

STANDARDIZED COEFFICIENTS OF THE DETERMINANTS OF SALARY GRADE FOR VARIOUS MODELS FOR JOB TITLES WITH AT LEAST FOUR INCUMBENTS

	All Job Titles		White Male Job Titles
	Model A	Model B	Model C
	Standardized Coefficients		
Variables			
F1	.14	.15	.15
F2	-.06	-.09	-.15
F4	-.04	-.05	-.11
F5	.35	.35	.28
F7	-.04	-.02*	.07
F12	.08	.07	.07
F13	.03	.03	--
F14	.17	.14	--
Complexity of writing	.13	.12	.29
M33	-.09	-.08	--
M40	.30	.28	.27
P42	.04	.05	.06
M44	.01*	.04	--
P96	.04	.05	.11
P106	.02*	.04	--
Proportion female	--	-.09	--
Proportion minority	--	-.004*	--

*Coefficient not significant at the .05 level.

together account for nearly 81 percent of the variance in salary grade. This is, of course, not surprising because education and experience are important components of most job specifications in New York State. After these, the other most important determinants of salary grade are the extent to which a job title involves management and supervision (F1) and the complexity of writing it requires.

A number of other variables have substantial effects on salary grade as well, although the standardized coefficients are not large, probably because the characteristics pertain to only a small fraction of job titles. This can be seen by inspecting the metric coefficients, which are quite similar in Models A and B. As noted, educational requirements have a very strong effect on salary grade. The predicted difference in salary grade between two job titles, one requiring the greatest amount of education and the other requiring the smallest amount of education, is nearly 12 salary grades, net of all other characteristics. The impact of experience is also strong, the predicted difference between two job titles requiring the most and least related experience being about eight salary grades, net of all other characteristics. Most of the other variables have substantial impact as well. With only two exceptions for Model A and three exceptions for Model B, the predicted difference between jobs at the highest and lowest level of a characteristic is greater than one salary grade, holding constant all other characteristics.

The more women in a job title, the less it pays, net of the 15 other job content variables in the model. The predicted difference between two jobs that are identical on all 15 job content characteristics, but where one job is performed entirely by men and the other is performed entirely by women, is approximately two salary grades (2.02)--with the women's job being the lower paying one.

It is instructive to note that the single variable regression of salary grade (Y!) on proportion female (F) is:

$$Y! = 15.15 - 8.10(F).$$

From this equation, we can observe that, knowing nothing else about a job title other than that it is 100 percent male, we would predict it to be in Salary Grade 15. Alternatively, if it were 100 percent female, we would predict it to be in salary grade 7 (7.05 = 15.15 - 8.10(1)). Model B in Table 7.2 indicates however, that much of the apparent effect of sex composition on pay rates can be attributed to the fact that job content is correlated with sex composition, since the net coefficient of proportion female in Model B is only about one-quarter the size of the simple regression coefficient relating the two variables (-2.01 for Model B and -8.10 for the simple regression). Nonetheless, even the net coefficient is fairly large and indicates substantial undervaluation of jobs done mainly by women.

The presence of a sex effect is in stark contrast to the absence of a race/ethnicity effect. Although the simple one variable regression of salary grade (Y!) on proportion minority (M) yields an equation similar to that for proportion female:

$$Y! = 16.91 - 8.45(M),$$

the net regression coefficient for proportion minority 3 from Model B in Table 7.2 is very small (-.16) and is not significantly different from zero.[8] This tells us that the effect of race/ethnicity in the simple model can be accounted for by differences in the content of jobs held by minority and non-minority workers. Thus, we conclude that, although 100 percent minority jobs are, on average, paid 8.45 salary grades less than jobs with 0 percent minorities, this is due to the fact that minorities tend to be in jobs of low valued job content.

The equation based on white male job titles is, as was indicated above, quite similar to the equation based on all jobs. But there are several important differences. First, for these white male jobs, the complexity of writing requirements (WRITE) is as important and as strong a determinant of salary grade as are education (F5) and experience (MI40); but the complexity of mental demands is not significant. It may be that the complexity of mental demands differentiates clerical jobs from one another more than it differentiates the kinds of jobs mainly performed by men. Writing complexity, by contrast, might distinguish administrative and professional jobs, on the one hand, from manual jobs on the other.

Second, many of the variables that are significant for the equation involving all job titles are not significant when only white male jobs are considered. Five variables, in particular, are significant in both Models A and B but not in Model C for white males: working overtime without compensation (F13); mental demands (F14); doing the same task over and over (M33); physical coordination (M44); and mistake causes damage to equipment (P106). Why these variables do not differentiate the salary grades of white male jobs, but do differentiate among all jobs, is unclear. It is probable, however, that the differences in the determinants of pay between white male job titles and all job titles reflect more than anything else the fact the white male job titles constitute a narrower range of job content than that found in all job titles in the New York State government employment.

A comparison of the samples of job titles on which the overall pay policy line and the white male pay policy line are based reveals that the samples do

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[8]This is true whether or not the proportion female is included in the equation with the proportion minority.

differ in several ways. Table 7.4 shows, not surprisingly, that the sample of white male titles has a higher mean salary grade than the whole sample. Also, there is a greater proportion of titles above salary grade 24 and a smaller proportion below salary grade 8 than in the whole sample.

White male titles tend to have smaller incumbencies. Indeed, the average incumbency is less than half the size of incumbency for the sample of all titles. This raised questions about whether or not female, minority, and integrated titles are sufficiently differentiated with respect to job content.

Earlier we indicated that our definition of white male job title had to be sufficiently restrictive to cancel out possible sex or race/ethnic discrimination. Thus, when we compare the white male job sample to the whole sample, we find it tends to underrepresent titles in negotiating units 2 (Administrative) and 4 (Institutional) with only four titles from each of these units in the sample. These two units contain mostly female-dominated jobs. Accordingly, the white male sample also overrepresents negotiating unit 3 (Operational) with 16.4 percent of titles from this unit, while the whole sample has only 7 percent of titles from this unit.

Finally, we found some differences between the correlations of job factors with salary grade for the two samples. In the whole sample, the correlation between salary grade and working conditions (F2) is -.48, while it is -.74 for the white male sample. As has been suggested elsewhere, working conditions primarily tap job content characteristics found in male jobs (Steinberg and Haignere, 1985). Similarly, the correlation between grade and experience (MI40) is .71 for the whole sample and .64 for the white male sample, indicating that white male jobs across many salary grades require similar experience requirements.

TABLE 7.4

COMPARISON OF DATA FOR ALL
TO DATA FOR WHITE MALE JOBS

	All Jobs		White Male Jobs	
Mean Salary Grade	17.7		19.5	
Mean Title Population	90.0		38.5	
Mean Percent Minority	10.0		1.0	
Percent Titles Above Grade 24	20.1		25.8	
Percent Titles Below Grade 8	8.4		1.7	
Negotiating Unit	Percent	Frequency	Percent	Frequency[9]
1 and 67 Security	1.7	27	2.5	12
2 Administrative	10.1	165	.8	4
3 Operational	7.0	115	16.4	78
4 Institutional	3.6	59	.8	4
5 Professional, Scientific and Technical	52.6	859	53.7	256
6 Management/ Confidential	13.6	222	15.9	76
Missing Data	11.4	187	9.9	47
Total Number of Titles in the Regression	1601	1601	464	464

[9]The negotiating unit frequencies total more titles than the number of titles in the regression because a few titles have missing data for variables that enter the regression and are, therefore, dropped from the regression analysis.

To conclude, the overall sample and white male sample differ in predictable ways. The white male sample has higher pay, few minorities or women, and is drawn from a subset of all negotiating units. Thus, the resulting model of job content relationships with salary grade is somewhat different between the two samples, although the specific job content characteristics found to be valuable are remarkably similar.

JOB CONTENT CHARACTERISTICS NOT CURRENTLY VALUED BY NEW YORK STATE GOVERNMENT

It is instructive to note what New York State does not pay for as well as what it does pay for. By and large, the coefficients have the expected sign. For instance, education (F5), experience (MI40), and mental demands (F14) have positive coefficients, revealing that, for example, the higher the level of education, the higher the pay. Repetition (MI33), by contrast, has a negative coefficient.

In one case the coefficient was not in the predicted direction. That exception is unfavorable working conditions. Those who work in unusual heat, cold, etc., or are involved in unusually strenuous physical effort (F2) are penalized rather than compensated relative to jobs identical in all other measured respects. The coefficient for unfavorable working conditions is negative in all equations. Communication with the public is also negatively valued.

Some additional factors and items had no net impact at all on salary grade. Jobs in New York State requiring contact with difficult clients and jobs involving stress are neither rewarded nor penalized relative to other jobs with similar requirements in other respects. The same is true of data entry and computer programming jobs, a point of considerable interest, given

the oft heard claim that it is necessary to pay such jobs more than their evaluated worth because the demand is so high relative to the supply. Finally, fiscal responsibility and autonomy have no independent effect on salary grade, probably because, despite emerging as separate factors, they have much in common with the much stronger "Management/supervision" factor (F1).

New York State can choose to change any of these regression weights, in order to value these job factors differently. Sometimes, changing the current regression weight of a factor such as stress to a positive value would affect male as well as female jobs. Some changes in regression weights would impact only on female jobs, such as data entry.

One question that must be addressed in the review of this report is whether the job content characteristics found to be negatively valued or of no value are differentially associated with female-dominated or disproportionately minority job titles. If this is the case, there may be bias in the current compensation model for New York State. For example, contact with difficult clients (F3) and data entry (F6) are content characteristics associated with disproportionately female and minority institutional and clerical jobs. They currently are not valuable job content characteristics for pay purposes.

New York State may want to change the evaluation model by adding new factors and weights or changing the weights of factors found to be significant. Changing the pay policy models would result in different predicted salary grades from the ones reported in the following chapter.

SUMMARY

Twenty-seven job factors and items were entered into regression procedures predicting salary grades. Of these, fifteen were found to be significant in two of the equations and ten were significant in the other. The predictors that were retained predict nearly 90 percent of the variance in salary grade across jobs. Three regression models were presented: (A) a pay policy line based on all jobs, (B) a line based on all jobs and adjusted to remove the effect of female or minority composition of the jobs, and (C) a line based on white male jobs only.

Only jobs with four or more incumbents were included in the models, because the sex and race/ethnic composition of jobs is more stable across time with larger titles. Also, we found that excluding the small titles makes little difference in the final regression equations. The net effect of proportion female in a title, all other job factors held constant, is two salary grades; that is, jobs done entirely by women are, on average, two salary grades lower than jobs of equal value to the state done entirely by men. We found no statistically significant independent effect of percent minority in the regression equations.

Our results demonstrate that education, experience, management, mental demands, and writing are the most highly compensated job factors in New York State government. Several factors are not valued or are negatively valued. These include strenuous working conditions, stress, group facilitation, communication with the public, data entry, computer programming, fiscal responsibility, and autonomy.

CHAPTER VIII

PREDICTED SALARY GRADES AND CONFIDENCE INTERVALS

In the last chapter we used multiple regression to arrive at three compensation models that would be used as the basis for predicting salary grades. Since we did not sample the entire population of incumbents of each job title, however, we had to take into account the fact that there would be a certain amount of statistical error in our estimates of predicted salary grades (PSG). If we received responses from all persons in a title, we could be 100 percent confident about the average responses for the title, and, therefore, about the predicted salary grade. However, for titles where we received responses from a subset of incumbents, there may be error in our prediction.

In order to know how much confidence to place in our estimates of predicted salary grade, we needed to determine how widely such estimates might be expected to vary depending on which subset of incumbents was included in the sample. From information available from the sample we actually used, it is possible to make an estimate of how widely the results might vary.

This chapter describes the procedures involved in estimating the salary grades and the possible error in each prediction. Estimates are presented for each female-dominated, disproportionately minority, and direct-line-of-promotion title using each of the three regression models described in Chapter VII.

PROCEDURE FOR OBTAINING PSGs AND CONFIDENCE INTERVALS

The conventional measure of error in prediction from a multiple regression equation is the "standard error of the estimate." It tells us how widely each of the estimated values of the dependent variable might be expected to vary due to the fact that the regression is based on a sample rather than on the entire population. In the context of this study, the

dependent variable is the salary grade and the sample relevant to the error statistic would be the sample of titles from the population of titles. Our major concern, however, is that we sampled within the unit of analysis, i.e., within each title. Thus, the precision of prediction will vary from one job title to another, depending on the number of incumbents sampled and the heterogeneity of responses within each job title. For this reason, we needed to estimate the error in prediction separately for each job title. We do this by utilizing a technique known as "jackknifing" (Mosteller and Tukey, 1968).

Jackknifing simulates a standard approach to estimating error: that is, we calculate a mean and a confidence interval around it.[1] The PSG that we calculated for each title is not a mean; it is the resulting statistic derived from application of a regression equation. We needed to organize our data in such a way that we could calculate the PSG as a mean statistic in order to then compute a confidence interval around it. Jackknifing sets up data in such a way that we can do this.

The basic approach to jackknifing a statistic, such as PSG, involves two sets of procedures: (1) selecting large sub-groups of data from the whole sample and repeating analyses with these groups and (2) calculating the means of these PSGs and confidence interval statistics. Actually, the replicate PSGs are adjusted prior to taking the mean as we will explain below.

The selection of groups of data for repeated analyses is done in such a way so that we can obtain large enough data groups to run the analyses. We

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[1] A confidence interval is a range of values that we are confident includes the true predicted salary grade which could only be calculated if we had sampled all employees. Consider a 95 percent confidence interval. Theoretically, if we were to draw all possible samples of the same size from our population of incumbents, we would obtain predicted salary grades within the confidence interval range of values 95 percent of the time.

systematically selected several small sub-samples from the whole sample according to procedures that will be described in the next section. Each of these sub-samples was sequentially subtracted from the whole sample to create a set of "replicates." A replicate, then, is the larger data set minus one small sub-sample. Ten replicates are an adequate number to use in order to obtain stable results (Mosteller and Tukey, 1968). The entire analysis was repeated on each of the ten replicates to obtain eleven PSGs for each estimated title: one for the whole sample and one for each of the ten replicates.

In the second step of the jackknifing procedure, final statistics are calculated. Following standard jackknifing procedures, as described by Mosteller and Tukey (1968), we created a set of adjusted values for analysis based on the PSG for the whole sample and the PSG for each replicate. These adjusted values, which are referred to in the research literature as "pseudo-values," are created by using the following equation:

$$N(\text{PSG whole sample}) - (N-1)(\text{PSG replicate}) = S,$$

where N is the number of replicates and S is the pseudo-value.[2] For this analysis, we have ten replicates, so,

$$10(\text{PSG whole sample}) - 9(\text{PSG replicate}) = S.$$

We did this calculation for each replicate and obtained ten pseudo-values. We then calculated the final PSG as a mean of these ten pseudo-values and calculated a confidence interval around this mean.[3] Logically, the mean of the

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[2]Note that if the replicate PSG is equal to the whole sample PSG, the pseudo-value S equals the whole sample PSG.

[3]The error cannot be estimated from the replicate PSGs directly because there is approximately a 90 percent overlap between the data in any two

(Footnote Continued)

averaged within job title, and the averaged job title data were used in the subsequent jacknifing analysis.

PREDICTED SALARY GRADES: WHOLE SAMPLE AND REPLICATES

In the last chapter, we reported on the regression equations that best fit the overall pay policy line, the adjusted pay policy line, and the white male pay policy line. We used these equations to calculate the PSGs for the whole sample.

For each replicate we conducted the same analysis that was done with the whole data set, except that we did not select new predictor variables. We used the same variables as those in the equations for the whole sample and computed the regression weights that best fit the replicate data set. Thus, each replicate analysis involved calculating factor-based scores and indices, scaling predictor variables (items and factors) from zero to one, and using regression procedures to form replicate overall, adjusted, and white male lines.

The preceding procedures resulted in eleven regression equations for each of the three pay policy lines. Each pay policy regression equation included the same variables for each replicate and the whole sample. However, the regression weights were different from one replicate to another.

FINAL PREDICTED SALARY GRADES

As indicated in the previous section, for each title, for each pay policy line, we obtained PSGs based on the whole sample and on each of ten replicate data sets, eleven PSGs in total. These PSGs could then be used to calculate the final PSGs in terms of mean salary grades and confidence intervals.

First, ten pseudo-values (S) were obtained by subtracting nine times the predicted salary grades for each replicate from ten times the predicted salary grades for the whole sample, thus:

S_1 = 10 (PSG whole sample) - 9 (PSG replicate 1)

S_2 = 10 (PSG whole sample) - 9 (PSG replicate 2)

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S_{10} = 10 (PSG whole sample) - 9 (PSG replicate 10)

This calculation resulted in ten pseudo-values for each pay policy line for each title. Next, we calculated the mean of each set of ten pseudo-values, producing one mean pseudo-value for each title for each of the three pay policy lines.

These mean pseudo-values are the final PSGs reported in Tables 8.1 to 8.3 for female-dominated and disproportionately minority titles and Tables 8.4 to 8.6 for direct-line-of-promotion titles.

CONFIDENCE INTERVALS

With the data in the form of a mean, it was possible to calculate a confidence interval of the ten pseudo-values around their mean using standard statistical procedures.[4] We followed these steps in calculating the confidence intervals.

(1) For each title, we calculated the standard deviation (SD) of the ten pseudo-values about their mean, using the standard formula:

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[4]The reader is referred to any basic statistical textbook for an explanation of confidence intervals and standard errors. One frequently cited text is Hays, 1973.

$$SD = \frac{(\text{pseudo-mean})^2}{N-1}, \text{ or } \frac{(S_i - PM)^2}{N-1},$$

Where N-1 equals nine.

(2) For each title, we calculated the standard error of the estimate (SEM)[5] of the mean of the pseudo-values:

SEM = SD 10

(3) For each title, we corrected the standard error (SEM) by multiplying the SEM by the finite population correction factor[6]:

$$SEM = (SEM) \frac{\text{Population - \# returned}}{\text{Population - 1}}$$

The population figure used is the adjusted population for each title after title changes, retirements, etc., were taken into account as described previously. The number returned is the number of questionnaires returned for each title.

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[5]The standard error of the estimate of a mean is a range of error around an estimated mean. Theoretically, it is a measure of the range of means that would be found if the study were repeated a very large number of times.

[6]The finite population correction factor is discussed in many basic textbooks on sampling research. See, for example, Cochran, 1963.

The finite population correction factor takes into account the proportion of the population from which responses have been received. If that proportion is very small, then the correction equation is close to one, and no adjustment is made. If everyone in the population responded, then the population would equal the number of responses in the equation, the correction factor would equal zero, and the standard error would equal zero. This is a logical result, since there is no error in our estimate of a mean of a population when we have the data for the whole population.

It should be noted that there is no statistical procedure to correct for any of the error in the entire pay policy line. Therefore, the standard error of the estimate with the finite population correction factor applied is a slight underestimate of the standard error. This problem results in confidence intervals which are slightly underestimated. In most cases, the underestimate is less than 0.1 salary grade, based on an examination of confidence intervals calculated with the adjustment factor and the confidence intervals calculated without it.

(4) For each title, we calculated the confidence interval (CI):

$$CI = 1.96 \text{ (SEM)}$$

Multiplying the SEM by 1.96 and adding and subtracting this value from the pseudo-mean gives a 95 percent confidence interval. That is, if this entire analysis were repeated, a very large number of times, our final predicted salary grades would fall within the calculated confidence limits 95 percent of the time.

Confidence intervals are listed along with predicted salary grades in Tables 8.1 to 8.3 for female-dominated and disproportionately minority titles for each of the three pay policy lines and in Tables 8.4 to 8.6 for direct-line-of-promotion titles. They should be interpreted in the following manner: An Account Clerk's predicted salary grade is 8.12 $\pm$ 0.91, using the adjusted pay policy line. That is, our best estimate of the appropriate salary grade for Account Clerk, given the information we had about the content of the job from the incumbents we sampled, is 8.12, but if we had sampled a different set of incumbents, our estimate might have been anywhere between 7.21 (8.21 - 0.91) and 9.03 (8.12 + 0.91). We are 95 percent certain that this range includes the true salary grade. Most of our confidence intervals are less than one salary grade, indicating a high level of precision in the predicted salary grades. Not surprisingly, due to sampling differences, the confidence intervals for direct-line-of-promotion titles are slightly higher.

ANALYSIS

Our results from Chapter VII demonstrate that, for all pay policy lines, education, experience, management/supervision and writing are highly compensated factors in New York State government employment. While the pay equity estimates are based on the obtained regression equations, New York State could explicitly choose to change any of the regression weights in order to value

these job factors differently. For some factors, like working conditions, changing the current regression weight from a negative to a positive value would affect disproportionately minority as well as predominantly white jobs. Other changes in regression weights (e.g. data entry) would impact only on disproportionately female jobs. The estimates of undervaluation reported here reflect the pay policy of New York State as it currently exists.

The estimated pay equity adjustments for female-dominated, disproportionately minority, and direct-line-of-promotion titles average 1.6 salary grades for the adjusted pay policy line and approximately 2.9 salary grades for the white male pay policy line. There is a strong tendency for job titles in the lower salary grades to be more undervalued than job titles in higher salary grades. This is the case no matter which of the pay policy lines is used. The salary grades of the job titles we examined ranged from grade 1 to grade 15. Particularly among the clerical and health care system job titles it was common to find titles in grade levels 6 and below to be undervalued by four or five salary grades.

We found no significant overall effect for the percent minority in a title. However, job titles which are both disproportionately female, and disproportionately minority, on average are undervalued by approximately one-half of a salary grade more than the average. For instance, as indicated above, the average undervaluation using the adjusted pay policy line is 1.6 salary grades. Among titles that are both disproportionately female and disproportionately minority this figure is 2.1 salary grades. Using the white male pay policy line the average undervaluation is 2.9 salary grades. However, for titles which are both disproportionately female and disproportionately minority, the figure is 3.3 salary grades.

Out of a total of 185 job titles in the CSEA bargaining unit that are more than 67.2 percent female and 30.8 percent minority or are jobs in the direct line of promotion for those female dominated and disproportionately minority jobs, we found 142 to be undervalued by more than a half a salary grade using the adjusted pay policy line and 163 were undervalued using the white male pay policy line. The number of employees in job titles undervalued by more than one half a salary grade is over 55,000 using the adjusted line and over 65,000 using the white male line.

SUMMARY

In order to calculate accurate predicted salary grades (PSG) and accurate confidence intervals for female-dominated, disproportionately minority, and direct-line-of-promotion titles, we used a statistical procedure known as jackknifing. The general approach was to set up the data so that we could apply standard statistical procedures to compute the final PSGs in terms of a mean and a standard error of the mean. This procedure was used for each of the pay policy lines. We systematically drew ten different large replicate data sets from the whole data set. We repeated the analysis on each of the ten replicates. The data from the replicates were then used to calculate adjusted "pseudo-values." The final predicted salary grades were obtained by taking the mean of these pseudo-values for each of the three pay policy lines. The 95 percent confidence intervals around these means are the reported confidence intervals for the predicted salary grades.

The chapter concludes by reporting the estimates of undervaluation for female-dominated, disproportionately minority, and direct-line-of-promotion titles. Many of the titles are undervalued by at least one salary grade. Estimates vary as a function of which pay policy line is used.

PREDICTED SALARY GRADES AND CONFIDENCE INTERVALS
FOR FEMALE-DOMINATED AND DISPROPORTIONATELY MINORITY TITLES -
OVERALL PAY POLICY LINE

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
911200	LABORATORY ANIMAL CRT	5.0	4.17	.45
911300	SENR LAB ANIMAL CRTKR	8.0	7.28	.27
1936100	INST RTL STR CLERK	5.0	4.48	.75
1935000	PARK REGN BUS ASSNT	14.0	16.83	.16
2134101	TRANS PLNG AIDE 1	5.0	8.45	.39
2337110	CONSUMER SRVS SPEC 1	14.0	14.42	.40
2501200	CLERK	3.0	4.52	.72
2501300	SENR CLERK	7.0	6.91	.57
2501317	SENR CLERK SURROGATE	7.0	9.81	0.00
2501320	SENR CLERK CORP SRCH	7.0	1.83	.17
2501500	PRIN CLERK	11.0	11.15	.78
2501517	PRIN CLERK EST TX APP	11.0	9.67	.54
2501590	PRIN CLERK PERSONNEL	11.0	11.87	.23
2502200	COMP CLAIMS CLERK	5.0	7.51	.35
2502300	SENR COMP CLMS CLERK	8.0	9.95	.39
2503200	FILE CLERK	3.0	4.78	1.10
2503300	SENR FILE CLERK	7.0	7.10	.58
2503500	PRIN FILE CLERK	11.0	11.15	.29
2504200	ADMITTING CLERK	4.0	5.07	.26
2504300	SENR ADMITTING CLERK	8.0	10.50	.34
2506100	NURSING STATION CLK 1	7.0	5.01	1.22
2508400	DRIVER IMPV ADJDTN C	4.0	6.23	.15
2508600	ADJUDCTN CORRPDNC CLK	4.0	6.61	.24

TABLE 8.1
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
100200	ACCOUNT CLERK	5.0	7.00	1.13
100300	SENR ACCT CLERK	9.0	9.28	.67
100500	PRIN ACCT CLERK	14.0	13.35	.72
102100	PAYROLL AUDIT CLK 1	5.0	7.41	.21
102200	AUDIT CLERK	5.0	6.84	.21
102230	PAYROLL AUDIT CLK 3	14.0	8.44	.15
102300	SENR AUDIT CLERK	9.0	7.83	.37
105200	CASHIER	9.0	7.37	.14
112000	TOLL COLLECTOR	9.0	6.50	1.19
130110	EMPS RET BNFTS EXMR 1	9.0	8.33	.22
130310	EMPS RET BNFTS EXMR 3	15.0	13.48	.30
133100	EMPS RET MBRSP EXMR 1	5.0	6.39	.19
133200	EMPS RET MBRSP EXMR 2	7.0	8.25	.12
702200	STATISTICS CLERK	5.0	7.08	.23
702300	SENR STATISTICS CLERK	9.0	9.33	.15
702500	PRIN STATISTICS CLERK	12.0	12.22	2.24
750300	SENR ACTUARIAL CLERK	9.0	9.97	.29
750500	PRIN ACTUARIAL CLERK	12.0	13.17	.21
822010	DATA PROC CLK 1	5.0	6.82	.22
822020	DATA PROC CLK 2	9.0	8.92	.20
849200	DATA ENTRY MACH OPER	4.0	7.56	.83
849300	SENR DATA ENTY MACH O	7.0	9.69	.53
849500	PRIN DATA ENTY MACH O	11.0	11.43	.15

TABLE 8.1
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2510100	PURCHASING ASSNT 1	7.0	8.14	.17
2510200	PURCHASING ASSNT 2	11.0	12.23	.28
2512200	IDENT CLK	4.0	5.37	.21
2512300	SENR IDENT CLERK	9.0	8.44	.27
2513300	SENR MED RECORDS CLRK	8.0	7.83	.18
2513400	TREATMNT UNIT CLK	7.0	6.45	.17
2514300	SENR UNDERWRTNG CLERK	8.0	9.31	.23
2514400	SENR PAYROLL AUDT CLK	8.0	8.30	.21
2515200	CREDENTIALS ASSISTANT	4.0	8.19	.17
2521100	MOTOR VEH TITLE CLK 1	4.0	6.31	.41
2521200	MOTOR VEH TITLE CLK 2	7.0	9.98	.24
2522210	LEGAL ASSNT 1	12.0	13.74	.38
2540100	MOTOR VEH REP 1	4.0	7.34	.27
2540200	MOTOR VEH REP 2	7.0	7.09	.23
2540300	MOTOR VEH REP 3	9.0	7.92	.60
2540510	SUPVG MOTOR VEH REP 1	11.0	12.06	.21
2553310	TRANS OFFC ASSNT 1	5.0	5.76	.14
2553320	TRANS OFFC ASSNT 2	9.0	8.83	.12
2557100	APPS CNTRL CLK 1	5.0	3.56	.17
2558100	PAYROLL CLERK 1	5.0	6.64	.17
2558200	PAYROLL CLERK 2	9.0	9.01	.16
2558300	PAYROLL CLERK 3	14.0	13.01	.15
2559100	LIBRARY CLERK 1	5.0	6.09	.43

TABLE 8.1
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2559200	LIBRARY CLERK 2	7.0	9.19	.51
2559300	LIBRARY CLERK 3	11.0	14.39	.22
2560100	STUDENT LOAN CLK 1	4.0	6.37	.16
2560200	STUDENT LOAN CLK 2	8.0	10.92	.29
2568100	EMP INS REVWNG CLK 1	4.0	5.71	.17
2569100	DISABLTY DETRM RV C 1	5.0	8.30	.77
2601200	TYPIST	3.0	5.86	.33
2601300	SENR TYPIST	7.0	9.15	.63
2601310	SENR TYPIST LAW	7.0	9.90	.15
2601500	PRIN TYPIST	11.0	11.95	0.00
2605200	DICT MACH TRANS	4.0	5.91	.60
2606100	INFO PROCSSG SPEC 1	6.0	7.58	.64
2606200	INFO PROCSSG SPEC 2	9.0	9.92	.20
2606300	INFO PROCSSG SPEC 3	12.0	11.14	.20
2609000	SECRETARIAL STENO	12.0	13.08	.73
2610200	STENOGRAPHER	5.0	5.96	.37
2610300	SENR STENOGRAPHER	9.0	7.90	.58
2610500	PRIN STENOGRAPHER	12.0	10.68	1.07
2610520	PRIN STENOGRAPHER LAW	12.0	11.62	.30
2612200	HEARING REPTR	15.0	10.27	.53
2703100	TELEPHONE OPER TYP	4.0	6.46	.21
2703200	TELEPHONE OPER	4.0	6.64	.74
2703300	SENR TELEPHONE OPER	8.0	10.02	.25
2610320	SENR STENOGRAPHER LAW	9.0	8.34	1.09

TABLE 8.1
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2706100	DIRCTRY INFO SYS OP 1	5.0	6.00	.25
2712200	CALCULATING MACH OP	4.0	9.28	.17
2715200	BOOKKEEPING MCH OP	5.0	4.94	.32
2715220	BOOKKEEPING MCH OP DS	5.0	8.32	.16
2810100	ADMNV AIDE	11.0	10.86	.63
2859010	STATE UNIV PRGM AIDE	11.0	13.45	.19
3004000	HOUSEKEEPER	6.0	6.69	1.07
3004500	SUPVG HOUSEKEEPER	9.0	10.18	.33
3014000	CLEANER	4.0	3.90	.88
3016000	JANITOR	6.0	4.91	.85
3021000	ELEVATOR OPERATOR	5.0	4.32	.74
3102300	COOK	9.0	12.30	1.32
3102600	HEAD COOK	12.0	15.84	.24
3106100	DIETITIAN TECHN	9.0	12.09	.54
3124200	FOOD SERVICE WKR 1	4.0	4.36	.73
3124300	FOOD SERVICE WKR 2	7.0	9.19	.97
3124400	FOOD SERVICE WKR 3	9.0	11.45	.33
3137200	FOOD&SUPPLS PROCESSOR	6.0	1.52	.33
3302200	LAUNDERER	4.0	4.16	.98
3302300	SENR LAUNDERER	7.0	6.75	.73
3307000	CLOTHING CLERK	4.0	2.18	.37
5302100	BARBER	7.0	9.51	.27
5303100	BEAUTICIAN	7.0	9.80	.38

TABLE 8.1
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
5350200	DENTAL ASSNT	6.0	5.79	.22
5359000	DENTAL HYGIENIST	10.0	9.75	.15
5500200	LICENSED PRAC NRS	9.0	10.58	1.23
5501100	HOSP ATTENDANT 1	4.0	5.98	1.31
5502200	HOSP CLINICAL TECHN	6.0	8.71	.67
5518500	COMTY RESDNC AIDE	9.0	8.54	1.27
5532101	HOSP CLINICAL ASSNT 1	4.0	5.92	.70
5532202	HOSP CLINICAL ASSNT 2	7.0	7.73	1.25
554C300	PSYCH THERAPY AIDE	9.0	9.64	1.44
5544100	MENTAL HYG HFWY H A 1	9.0	8.86	.40
5570300	MENTAL HYG THER AIDE 1	9.0	8.56	1.77
5570400	MENTAL HYG THER AST 1	11.0	12.25	1.75
6201000	LABORATORY HELPER	1.0	2.52	.31
6202200	LABORATORY WORKER	4.0	4.58	.32
6204000	LABORATORY AIDE	5.0	5.10	.24
6210000	XRAY AIDE	4.0	5.80	.32
6211510	TEACHING HOSP STL ST1	6.0	7.09	.44
6211520	TEACHING HOSP STL ST2	8.0	9.59	.37
6214200	ELECTROENCPHGRPH TECH	8.0	9.80	.16
6219200	CENTRAL MED SUP TECH	6.0	5.74	.44
6220200	HISTOLOGY TECHNICIAN	9.0	8.33	.22
6220300	SENR HISTOLOGY TECH	12.0	14.17	.20
6223200	ELECTROCARDOGRPH TECH	8.0	8.00	.23

TABLE 8.1
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
6225100	MEDICAL LAB TECH 1	9.0	11.24	.27
6301000	PHARMACY AIDE	5.0	4.91	.16
6818000	ASSNT WKRS COMP EXMR	9.0	8.63	.95
6824100	WORKERS COMP REVW AN	14.0	12.23	1.06
6893100	MEDICAID CLMS EXMNR 1	7.0	7.04	.28
6893200	MEDICAID CLMS EXMNR 2	11.0	10.91	.36
7150000	MAINTCE HELPER	6.0	5.95	.60
7202022	MAINTCE ASSNT REFRIGN	8.0	11.33	.40
7611000	CHAUFFEUR	7.0	7.97	.60
7611300	SENR CHAUFFEUR	9.0	8.27	.59
7614000	TRACTOR TRAILER OPER	8.0	4.00	.68
7616100	MOTOR VEH OPER	7.0	7.09	1.70
7617200	BUS DRIVER	8.0	5.27	.59
7711000	BINDERY HELPER	3.0	2.81	.26
8261202	YOUTH DIV AIDE 2	9.0	9.76	1.18
8261303	YOUTH DIV AIDE 3	12.0	12.18	.94
8261400	YOUTH DIV AIDE 4	14.0	11.11	1.72
8340100	ALCLSM REHAB ASSNT 1	11.0	13.78	.49
8342200	REHAB INTERVIEWER S S	9.0	12.13	.20
8410100	TRAINING AIDE	9.0	6.85	.10
8431200	EMPL SEC CLK	5.0	6.60	.14
8431300	SENR EMP SEC CLERK	7.0	6.82	.66
8431500	PRIN EMP SEC CLERK	11.0	11.23	.28

TABLE 8.1
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
8621100	PAROLE PROG AIDE	11.0	12.63	.28
8701600	WATCHMAN	3.0	5.14	1.06
8937100	MOTOR VEH INS SV RP 1	9.0	7.87	.15
8970100	DRIVER IMPRV ADJUDCTR	9.0	9.01	.23

TABLE 8.2

PREDICTED SALARY GRADES AND CONFIDENCE INTERVALS
FOR FEMALE-DOMINATED AND DISPROPORTIONATELY MINORITY
TITLES - ADJUSTED PAY POLICY LINE

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
100200	ACCOUNT CLERK	5.0	8.12	.91
100300	SENR ACCT CLERK	9.0	10.18	.55
100500	PRIN ACCT CLERK	14.0	13.94	.71
102100	PAYROLL AUDIT CLK 1	5.0	8.40	.07
102200	AUDIT CLERK	5.0	7.95	.07
102230	PAYROLL AUDIT CLK 3	14.0	9.62	.08
102300	SENR AUDIT CLERK	9.0	8.74	.40
105200	CASHIER	9.0	8.39	.05
112000	TOLL COLLECTOR	9.0	7.60	.14
130110	EMPS RET BNFTS EXMR 1	9.0	8.95	.12
130310	EMPS RET BNFTS EXMR 3	15.0	13.68	.10
133100	EMPS RET MBRSP EXMR 1	5.0	7.13	.08
133200	EMPS RET MBRSP EXMR 2	7.0	8.97	.04
702200	STATISTICS CLERK	5.0	8.22	.09
702300	SENR STATISTICS CLERK	9.0	10.24	.05
702500	PRIN STATISTICS CLERK	12.0	12.70	2.02
750300	SENR ACTUARIAL CLERK	9.0	10.83	.09
750500	PRIN ACTUARIAL CLERK	12.0	13.71	.07
822010	DATA PROC CLK 1	5.0	7.67	.10
822020	DATA PROC CLK 2	9.0	9.61	.06
849200	DATA ENTRY MACH OPER	4.0	8.67	.67
849300	SENR DATA ENTY MACH O	7.0	10.76	.45
849500	PRIN DATA ENTY MACH O	11.0	12.43	.08

TABLE 8.2
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
911200	LABORATORY ANIMAL CRT	5.0	5.05	.18
911300	SENR LAB ANIMAL CRTKR	8.0	7.72	.09
1836100	INST RTL STR CLERK	5.0	5.39	.07
1935000	PARK REGN BUS ASSNT	14.0	17.27	.05
2134101	TRANS PLNG AIDE 1	5.0	9.55	.11
2337110	CONSUMER SRVS SPEC 1	14.0	14.71	.05
2501200	CLERK	3.0	5.83	.44
2501300	SENR CLERK	7.0	7.94	.38
2501317	SENR CLERK SURROGATE	7.0	10.84	0.00
2501320	SENR CLERK CORP SRCH	7.0	3.22	.06
2501500	PRIN CLERK	11.0	11.98	.48
2501517	PRIN CLERK EST TX APP	11.0	11.14	.06
2501590	PRIN CLERK PERSONNEL	11.0	12.70	.07
2502200	COMP CLAIMS CLERK	5.0	8.50	.08
2502300	SENR COMP CLMS CLERK	8.0	10.82	.07
2503200	FILE CLERK	3.0	6.25	.68
2503300	SENR FILE CLERK	7.0	8.49	.40
2503500	PRIN FILE CLERK	11.0	12.16	.07
2504200	ADMITTING CLERK	4.0	6.13	.13
2504300	SENR ADMITTING CLERK	8.0	11.24	.11
2506100	NURSING STATION CLK 1	7.0	6.08	1.02
2508400	DRIVER IMPV ADJDTN C	4.0	7.65	.11
2508600	ADJUDCTN CORRPDNC CLK	4.0	7.77	.08

TABLE 8.2
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2510100	PURCHASING ASSNT 1	7.0	9.25	.04
2510200	PURCHASING ASSNT 2	11.0	13.11	.07
2512200	IDENT CLK	4.0	6.34	.13
2512300	SENR IDENT CLERK	9.0	9.27	.12
2513300	SENR MED RECORDS CLRK	8.0	8.81	.07
2513400	TREATMNT UNIT CLK	7.0	7.69	.09
2514300	SENR UNDERWRTNG CLERK	8.0	10.16	.07
2514400	SENR PAYROLL AUDT CLK	8.0	9.21	.04
2515200	CREDENTIALS ASSISTANT	4.0	9.09	.07
2521100	MOTOR VEH TITLE CLK 1	4.0	7.69	.37
2521200	MOTOR VEH TITLE CLK 2	7.0	10.81	.07
2522210	LEGAL ASSNT 1	12.0	14.67	.05
2540100	MOTOR VEH REP 1	4.0	8.34	.07
2540200	MOTOR VEH REP 2	7.0	7.98	.08
2540300	MOTOR VEH REP 3	9.0	8.74	.53
2540510	SUPVG MOTOR VEH REP 1	11.0	12.85	.06
2553310	TRANS OFFC ASSNT 1	5.0	6.75	.06
2553320	TRANS OFFC ASSNT 2	9.0	9.67	.04
2557100	APPS CNTRL CLK 1	5.0	4.81	.11
2558100	PAYROLL CLERK 1	5.0	7.78	.07
2558200	PAYROLL CLERK 2	9.0	10.07	.06
2558300	PAYROLL CLERK 3	14.0	13.85	.05
2559100	LIBRARY CLERK I	5.0	7.23	.31

TABLE 8.2
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2559200	LIBRARY CLERK 2	7.0	10.15	.38
2559300	LIBRARY CLERK 3	11.0	15.05	.06
2560100	STUDENT LOAN CLK 1	4.0	7.12	.08
2560200	STUDENT LOAN CLK 2	8.0	11.66	.07
2568100	EMP INS REVWNG CLK 1	4.0	6.84	.05
2569100	DISABLTY DETRM RV C 1	5.0	9.50	.23
2601200	TYPIST	3.0	7.12	.21
2601300	SENR TYPIST	7.0	10.22	.51
2601310	SENR TYPIST LAW	7.0	10.57	.04
2601500	PRIN TYPIST	11.0	12.70	0.00
2605200	DICT MACH TRANS	4.0	7.15	.43
2606100	INFO PROCSSG SPEC 1	6.0	8.65	.55
2606200	INFO PROCSSG SPEC 2	9.0	10.75	.06
2606300	INFO PROCSSG SPEC 3	12.0	11.90	.06
2609000	SECRETARIAL STENO	12.0	14.04	.62
2610200	STENOGRAPHER	5.0	7.19	.21
2610300	SENR STENOGRAPHER	9.0	9.06	.52
2610500	PRIN STENOGRAPHER	12.0	11.67	1.08
2610520	PRIN STENOGRAPHER LAW	12.0	12.61	.12
2612200	HEARING REPTR	15.0	11.32	.49
2703100	TELEPHONE OPER TYP	4.0	7.51	.08
2703200	TELEPHONE OPER	4.0	7.71	.63
2703300	SENR TELEPHONE OPER	8.0	10.91	.08
2610320	SENR STENOGRAPHER LAW	9.0	9.88	1.28

TABLE 8.2
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2706100	DIRCTRY INFO SYS OP 1	5.0	6.96	.07
2712200	CALCULATING MACH OP	4.0	10.20	.09
2715200	BOOKKEEPING MCH OP	5.0	6.26	.14
2715220	BOOKKEEPING MCH OP DS	5.0	9.36	.08
2810100	ADMNV AIDE	11.0	11.65	.50
2859010	STATE UNIV PRGM AIDE	11.0	14.22	.06
3004000	HOUSEKEEPER	6.0	6.90	.83
3004500	SUPVG HOUSEKEEPER	9.0	10.43	.08
3014000	CLEANER	4.0	4.25	.65
3016000	JANITOR	6.0	5.23	.82
3021000	ELEVATOR OPERATOR	5.0	5.75	.11
3102300	COOK	9.0	12.40	1.32
3102600	HEAD COOK	12.0	15.81	.07
3106100	DIETITIAN TECHN	9.0	13.26	.09
3124200	FOOD SERVICE WKR 1	4.0	4.71	.53
3124300	FOOD SERVICE WKR 2	7.0	9.41	.85
3124400	FOOD SERVICE WKR 3	9.0	12.36	.07
3137200	FOOD&SUPPLS PROCESSOR	6.0	2.06	.23
3302200	LAUNDERER	4.0	4.66	.92
3302300	SENR LAUNDERER	7.0	6.95	.50
3307000	CLOTHING CLERK	4.0	3.31	.19
5302100	BARBER	7.0	10.37	.10
5303100	BEAUTICIAN	7.0	10.81	.09

TABLE 8.2
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
5350200	DENTAL ASSNT	6.0	6.58	.06
5359000	DENTAL HYGIENIST	10.0	10.11	.04
5500200	LICENSED PRAC NRS	9.0	11.46	.70
5501100	HOSP ATTENDANT 1	4.0	6.85	.59
5502200	HOSP CLINICAL TECHN	6.0	9.00	.13
5518500	COMTY RESDNC AIDE	9.0	9.50	.56
5532101	HOSP CLINICAL ASSNT 1	4.0	6.77	.11
5532202	HOSP CLINICAL ASSNT 2	7.0	8.38	.83
5540300	PSYCH THERAPY AIDE	9.0	10.74	.18
5544100	MENTAL HYG HFWY H A 1	9.0	9.97	.06
5570300	MENTAL HYG THER AIDE 1	9.0	9.51	.73
5570400	MENTAL HYG THER AST 1	11.0	13.27	.82
6201000	LABORATORY HELPER	1.0	3.39	.20
6202200	LABORATORY WORKER	4.0	5.51	.14
6204000	LABORATORY AIDE	5.0	5.76	.11
6210000	XRAY AIDE	4.0	6.82	.10
6211510	TEACHING HOSP STL ST1	6.0	7.50	.12
6211520	TEACHING HOSP STL ST2	8.0	9.52	.10
6214200	ELECTROENCPHGRPH TECH	8.0	10.37	.05
6219200	CENTRAL MED SUP TECH	6.0	6.56	.07
6220200	HISTOLOGY TECHNICIAN	9.0	8.99	.12
6220300	SENR HISTOLOGY TECH	12.0	14.31	.07
6223200	ELECTROCARDOGRPH TECH	8.0	8.67	.06

TABLE 8.2
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
6225100	MEDICAL LAB TECH 1	9.0	11.43	.07
6301000	PHARMACY AIDE	5.0	5.81	.09
6818000	ASSNT WKRS COMP EXMR	9.0	9.79	.55
6824100	WORKERS COMP REVW AN	14.0	13.38	.11
6893100	MEDICAID CLMS EXMNR 1	7.0	8.15	.08
6893200	MEDICAID CLMS EXMNR 2	11.0	11.63	.12
7150000	MAINTCE HELPER	6.0	6.31	.44
7202022	MAINTCE ASSNT REFRIGN	8.0	10.96	.26
7611000	CHAUFFEUR	7.0	8.61	.14
7611300	SENR CHAUFFEUR	9.0	9.22	.10
7614000	TRACTOR TRAILER OPER	8.0	4.83	.14
7616100	MOTOR VEH OPER	7.0	7.59	1.88
7617200	BUS DRIVER	8.0	5.78	.10
7711000	BINDERY HELPER	3.0	3.20	.15
8261202	YOUTH DIV AIDE 2	9.0	10.59	.77
8261303	YOUTH DIV AIDE 3	12.0	13.02	.74
8261400	YOUTH DIV AIDE 4	14.0	11.90	.99
8340100	ALCLSM REHAB ASSNT 1	11.0	14.76	.10
8342200	REHAB INTERVIEWER S S	9.0	13.00	.04
8410100	TRAINING AIDE	9.0	7.79	.03
8431200	EMPL SEC CLK	5.0	7.71	.04
8431300	SENR EMP SEC CLERK	7.0	7.83	.54
8431500	PRIN EMP SEC CLERK	11.0	12.13	.11

TABLE 8.2
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
8621100	PAROLE PROG AIDE	11.0	13.26	.09
8701600	WATCHMAN	3.0	6.37	.11
8937100	MOTOR VEH INS SV RP 1	9.0	8.74	.04
8970100	DRIVER IMPRV ADJUDCTR	9.0	9.55	.06

TABLE 8.3

PREDICTED SALARY GRADES AND CONFIDENCE INTERVALS FOR FEMALE-DOMINATED AND SIGNIFICANTLY MINORITY TITLES - WHITE MALE LINE (10 VARIABLES)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
100200	ACCOUNT CLERK	5.0	9.23	.75
100300	SENR ACCT CLERK	9.0	10.82	.50
100500	PRIN ACCT CLERK	14.0	13.93	.74
102100	PAYROLL AUDIT CLK 1	5.0	9.61	.16
102200	AUDIT CLERK	5.0	9.47	.16
102230	PAYROLL AUDIT CLK 3	14.0	12.30	.16
102300	SENR AUDIT CLERK	9.0	10.27	.50
105200	CASHIER	9.0	9.52	.09
112000	TOLL COLLECTOR	9.0	10.64	.27
130110	EMPS RET BNFTS EXMR 1	9.0	8.24	.15
130310	EMPS RET BNFTS EXMR 3	15.0	12.77	.25
133100	EMPS RET MBRSP EXMR 1	5.0	8.74	.29
133200	EMPS RET MBRSP EXMR 2	7.0	10.37	.11
702200	STATISTICS CLERK	5.0	10.35	.20
702300	SENR STATISTICS CLERK	9.0	11.28	.08
702500	PRIN STATISTICS CLERK	12.0	13.42	1.91
750300	SENR ACTUARIAL CLERK	9.0	11.22	.20
750500	PRIN ACTUARIAL CLERK	12.0	13.76	.14
822010	DATA PROC CLK 1	5.0	9.76	.26
822020	DATA PROC CLK 2	9.0	10.09	.12
849200	DATA ENTRY MACH OPER	4.0	11.67	.68
849300	SENR DATA ENTY MACH O	7.0	12.27	.43
849500	PRIN DATA ENTY MACH O	11.0	14.03	.16

TABLE 8.3
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
911200	LABORATORY ANIMAL CRT	5.0	8.55	.32
911300	SENR LAB ANIMAL CRTKR	8.0	9.15	.16
1836100	INST RTL STR CLERK	5.0	6.34	.34
1935000	PARK REGN BUS ASSNT	14.0	16.03	.07
2134101	TRANS PLNG AIDE 1	5.0	11.42	.29
2337110	CONSUMER SRVS SPEC 1	14.0	14.54	.12
2501200	CLERK	3.0	8.66	.44
2501300	SENR CLERK	7.0	9.11	.37
2501317	SENR CLERK SURROGATE	7.0	10.68	0.00
2501320	SENR CLERK CORP SRCH	7.0	6.01	.08
2501500	PRIN CLERK	11.0	12.90	.48
2501517	PRIN CLERK EST TX APP	11.0	11.88	.24
2501590	PRIN CLERK PERSONNEL	11.0	13.46	.11
2502200	COMP CLAIMS CLERK	5.0	10.03	.17
2502300	SENR COMP CLMS CLERK	8.0	11.27	.18
2503200	FILE CLERK	3.0	9.84	.62
2503300	SENR FILE CLERK	7.0	11.06	.55
2503500	PRIN FILE CLERK	11.0	13.60	.12
2504200	ADMITTING CLERK	4.0	6.46	.16
2504300	SENR ADMITTING CLERK	8.0	11.23	.18
2506100	NURSING STATION CLK 1	7.0	7.21	.64
2508400	DRIVER IMPV ADJDTN C	4.0	10.16	.26
2508600	ADJUDCTN CORRPDNC CLK	4.0	9.94	.15

TABLE 8.3
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2510100	PURCHASING ASSNT 1	7.0	10.22	.10
2510200	PURCHASING ASSNT 2	11.0	13.15	.13
2512200	IDENT CLK	4.0	10.34	.32
2512300	SENR IDENT CLERK	9.0	11.49	.28
2513300	SENR MED RECORDS CLRK	8.0	10.20	.11
2513400	TREATMNT UNIT CLK	7.0	9.51	.10
2514300	SENR UNDERWRTNG CLERK	8.0	10.69	.16
2514400	SENR PAYROLL AUDT CLK	8.0	10.88	.13
2515200	CREDENTIALS ASSISTANT	4.0	7.99	.11
2521100	MOTOR VEH TITLE CLK 1	4.0	11.02	.33
2521200	MOTOR VEH TITLE CLK 2	7.0	11.24	.17
2522210	LEGAL ASSNT 1	12.0	15.27	.16
2540100	MOTOR VEH REP 1	4.0	9.14	.13
2540200	MOTOR VEH REP 2	7.0	9.10	.14
2540300	MOTOR VEH REP 3	9.0	9.00	.39
2540510	SUPVG MOTOR VEH REP 1	11.0	12.90	.12
2553310	TRANS OFFC ASSNT 1	5.0	7.37	.13
2553320	TRANS OFFC ASSNT 2	9.0	9.30	.07
2557100	APPS CNTRL CLK 1	5.0	8.62	.30
2558100	PAYROLL CLERK 1	5.0	8.78	.14
2558200	PAYROLL CLERK 2	9.0	10.58	.10
2558300	PAYROLL CLERK 3	14.0	14.33	.08
2559100	LIBRARY CLERK I	5.0	8.25	.22

TABLE 8.3
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2559200	LIBRARY CLERK 2	7.0	10.45	.31
2559300	LIBRARY CLERK 3	11.0	14.60	.09
2560100	STUDENT LOAN CLK 1	4.0	7.05	.12
2560200	STUDENT LOAN CLK 2	8.0	12.92	.21
2568100	EMP INS REVWNG CLK 1	4.0	8.99	.13
2569100	DISABLTY DETRM RV C 1	5.0	11.55	.48
2601200	TYPIST	3.0	8.95	.28
2601300	SENR TYPIST	7.0	11.40	.38
2601310	SENR TYPIST LAW	7.0	9.78	.06
2601500	PRIN TYPIST	11.0	13.12	0.00
2605200	DICT MACH TRANS	4.0	9.10	.42
2606100	INFO PROCSSG SPEC 1	6.0	10.42	.41
2606200	INFO PROCSSG SPEC 2	9.0	11.76	.15
2606300	INFO PROCSSG SPEC 3	12.0	13.13	.12
2609000	SECRETARIAL STENO	12.0	15.57	.57
2610200	STENOGRAPHER	5.0	9.48	.36
2610300	SENR STENOGRAPHER	9.0	11.19	.45
2610500	PRIN STENOGRAPHER	12.0	13.28	.92
2610520	PRIN STENOGRAPHER LAW	12.0	13.27	.10
2612200	HEARING REPTR	15.0	12.62	.40
2703100	TELEPHONE OPER TYP	4.0	9.28	.16
2703200	TELEPHONE OPER	4.0	9.43	.71
2703300	SENR TELEPHONE OPER	8.0	11.66	.13
2610320	SENR STENOGRAPHER LAW	9.0	10.87	1.42

TABLE 8.3
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
2706100	DIRCTRY INFO SYS OP 1	5.0	8.38	.24
2712200	CALCULATING MACH OP	4.0	11.61	.21
2715200	BOOKKEEPING MCH OP	5.0	7.65	.21
2715220	BOOKKEEPING MCH OP DS	5.0	10.66	.18
2810100	ADMNV AIDE	11.0	12.66	.47
2859010	STATE UNIV PRGM AIDE	11.0	14.48	.05
3004000	HOUSEKEEPER	6.0	9.14	.89
3004500	SUPVG HOUSEKEEPER	9.0	12.50	.25
3014000	CLEANER	4.0	7.99	.61
3016000	JANITOR	6.0	7.63	.99
3021000	ELEVATOR OPERATOR	5.0	9.91	.38
3102300	COOK	9.0	13.20	1.11
3102600	HEAD COOK	12.0	16.99	.11
3106100	DIETITIAN TECHN	9.0	12.97	.14
3124200	FOOD SERVICE WKR 1	4.0	7.28	.53
3124300	FOOD SERVICE WKR 2	7.0	10.92	.65
3124400	FOOD SERVICE WKR 3	9.0	14.39	.12
3137200	FOOD&SUPPLS PROCESSOR	6.0	7.02	.48
3302200	LAUNDERER	4.0	8.11	.93
3302300	SENR LAUNDERER	7.0	9.13	.55
3307000	CLOTHING CLERK	4.0	5.44	.33
5302100	BARBER	7.0	12.04	.21
5303100	BEAUTICIAN	7.0	11.07	.16

TABLE 8.3
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
5350200	DENTAL ASSNT	6.0	7.54	.08
5359000	DENTAL HYGIENIST	10.0	9.58	.07
5500200	LICENSED PRAC NRS	9.0	10.72	.92
5501100	HOSP ATTENDANT 1	4.0	7.93	.77
5502200	HOSP CLINICAL TECHN	6.0	11.29	.39
5518500	COMTY RESDNC AIDE	9.0	9.89	.57
5532101	HOSP CLINICAL ASSNT 1	4.0	7.72	.26
5532202	HOSP CLINICAL ASSNT 2	7.0	8.87	.96
5540300	PSYCH THERAPY AIDE	9.0	10.92	.30
5544100	MENTAL HYG HFWY H A 1	9.0	10.68	.09
5570300	MENTAL HYG THER AIDE 1	9.0	9.99	.80
5570400	MENTAL HYG THER AST 1	11.0	13.67	.70
6201000	LABORATORY HELPER	1.0	7.95	.38
6202200	LABORATORY WORKER	4.0	7.81	.28
6204000	LABORATORY AIDE	5.0	8.85	.33
6210000	XRAY AIDE	4.0	8.58	.21
6211510	TEACHING HOSP STL ST1	6.0	9.25	.33
6211520	TEACHING HOSP STL ST2	8.0	9.47	.05
6214200	ELECTROENCPHGRPH TECH	8.0	10.09	.10
6219200	CENTRAL MED SUP TECH	6.0	8.21	.25
6220200	HISTOLOGY TECHNICIAN	9.0	10.50	.35
6220300	SENR HISTOLOGY TECH	12.0	15.26	.18
6223200	ELECTROCARDOGRPH TECH	8.0	10.05	.13

TABLE 8.3
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
6225100	MEDICAL LAB TECH 1	9.0	10.83	.21
6301000	PHARMACY AIDE	5.0	7.97	.20
6818000	ASSNT WKRS COMP EXMR	9.0	10.45	.45
6824100	WORKERS COMP REVW AN	14.0	14.09	.29
6893100	MEDICAID CLMS EXMNR 1	7.0	9.72	.15
6893200	MEDICAID CLMS EXMNR 2	11.0	13.61	.14
7150000	MAINTCE HELPER	6.0	7.60	.58
7202022	MAINTCE ASSNT REFRIGN	8.0	9.31	.21
7611000	CHAUFFEUR	7.0	10.82	.34
7611300	SENR CHAUFFEUR	9.0	11.65	.31
7614000	TRACTOR TRAILER OPER	8.0	6.77	.44
7616100	MOTOR VEH OPER	7.0	9.14	1.85
7617200	BUS DRIVER	8.0	7.72	.29
7711000	BINDERY HELPER	3.0	8.09	.34
8261202	YOUTH DIV AIDE 2	9.0	10.64	.53
8261303	YOUTH DIV AIDE 3	12.0	12.96	.82
8261400	YOUTH DIV AIDE 4	14.0	12.36	1.02
8340100	ALCLSM REHAB ASSNT 1	11.0	17.12	.12
8342200	REHAB INTERVIEWER S S	9.0	14.18	.16
8410100	TRAINING AIDE	9.0	8.83	.07
8431200	EMPL SEC CLK	5.0	9.42	.08
8431300	SENR EMP SEC CLERK	7.0	8.90	.58
8431500	PRIN EMP SEC CLERK	11.0	12.96	.09

TABLE 8.3
(continued)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
8621100	PAROLE PROG AIDE	11.0	14.39	.25
8701600	WATCHMAN	3.0	8.96	.52
8937100	MOTOR VEH INS SV RP 1	9.0	9.85	.16
8970100	DRIVER IMPRV ADJUDCTR	9.0	10.39	.22

TABLE 8.4

PREDICTED SALARY GRADES AND CONFIDENCE INTERVALS
FOR DIRECT-LINE-OF-PROMOTION TITLES -
OVERALL PAY POLICY LINE

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
102220	PAYROLL AUDIT CLK 2	9.0	7.36	2.40
102500	PRIN AUDIT CLERK	14.0	11.76	2.33
130210	EMPS RET BNFTS EXMR 2	12.0	8.98	1.20
133300	EMPS RET MBRSP EXMR 3	11.0	9.72	.30
822030	DATA PROC CLK 3	12.0	13.16	.33
911500	PRIN LAB ANIMAL CRTKR	11.0	11.96	.27
2134202	TRANS PLNG AIDE 2	9.0	10.28	.78
2522220	LEGAL ASSNT 2	14.0	16.39	.41
3004600	HEAD HOUSEKEEPER	12.0	14.13	.48
3016500	SUPVG JANITOR	9.0	9.03	2.38
3016600	HEAD JANITOR	12.0	14.03	1.49
3302600	HEAD LAUNDRY SUPVR	12.0	10.91	1.10
5518800	COMTY RESDNC ASNT DIR	11.0	11.48	3.19
5518900	COMTY RESDNC DIR	13.0	15.97	1.95
5570500	MENTAL HYG THER AST 2	13.0	13.31	1.67
6218400	MEDICAL TECHNOLOGIST	14.0	18.89	1.21
6225200	MEDICAL LAB TECH 2	12.0	13.44	2.05
6818200	WORKERS COMP EXMR	14.0	12.00	1.88
7132200	REFRIG MECHANIC	12.0	13.08	2.02
8701000	BULDG GUARD	6.0	7.65	1.85

TABLE 8.5

PREDICTED SALARY GRADES AND CONFIDENCE INTERVALS
FOR DIRECT-LINE-OF-PROMOTION TITLES -
ADJUSTED PAY POLICY LINE

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
102220	PAYROLL AUDIT CLK 2	9.0	8.22	2.22
102500	PRIN AUDIT CLERK	14.0	12.42	2.06
130210	EMPS RET BNFTS EXMR 2	12.0	9.76	1.06
133300	EMPS RET MBRSP EXMR 3	11.0	10.44	.11
822030	DATA PROC CLK 3	12.0	13.70	.10
911500	PRIN LAB ANIMAL CRTKR	11.0	12.35	.11
2134202	TRANS PLNG AIDE 2	9.0	11.32	.75
2522220	LEGAL ASSNT 2	14.0	16.80	.06
3004600	HEAD HOUSEKEEPER	12.0	14.72	.08
3016500	SUPVG JANITOR	9.0	9.62	2.28
3016600	HEAD JANITOR	12.0	14.46	1.34
3302600	HEAD LAUNDRY SUPVR	12.0	11.06	.94
5518800	COMTY RESDNC ASNT DIR	11.0	12.64	2.28
5518900	COMTY RESDNC DIR	13.0	16.97	1.24
5570500	MENTAL HYG THER AST 2	13.0	14.50	.69
6218400	MEDICAL TECHNOLOGIST	14.0	18.84	1.16
6225200	MEDICAL LAB TECH 2	12.0	13.47	1.83
6818200	WORKERS COMP EXMR	14.0	12.89	1.66
7132200	REFRIG MECHANIC	12.0	12.95	1.81
8701000	BULDG GUARD	6.0	8.55	1.75

TABLE 8.6

PREDICTED SALARY GRADES AND CONFIDENCE INTERVALS
FOR DIRECT-LINE-OF-PROMOTION TITLES -
WHITE MALE LINE - (10 VARIABLES)

TITLE CODE	TITLE	CURRENT SALARY GRADE	PREDICTED SALARY GRADE	CONFIDENCE INTERVAL
102220	PAYROLL AUDIT CLK 2	9.0	9.72	1.94
102500	PRIN AUDIT CLERK	14.0	13.32	1.66
130210	EMPS RET BNFTS EXMR 2	12.0	10.39	1.06
133300	EMPS RET MBRSP EXMR 3	11.0	10.57	.22
822030	DATA PROC CLK 3	12.0	14.32	.17
911500	PRIN LAB ANIMAL CRTKR	11.0	13.03	.11
2134202	TRANS PLNG AIDE 2	9.0	13.32	1.26
2522220	LEGAL ASSNT 2	14.0	17.01	.20
3004600	HEAD HOUSEKEEPER	12.0	16.94	.22
3016500	SUPVG JANITOR	9.0	10.10	1.64
3016600	HEAD JANITOR	12.0	16.19	.96
3302600	HEAD LAUNDRY SUPVR	12.0	13.19	.75
5518800	COMTY RESDNC ASNT DIR	11.0	13.53	2.40
5518900	COMTY RESDNC DIR	13.0	17.46	1.02
5570500	MENTAL HYG THER AST 2	13.0	14.82	.60
6218400	MEDICAL TECHNOLOGIST	14.0	18.41	1.35
6225200	MEDICAL LAB TECH 2	12.0	12.08	1.61
6818200	WORKERS COMP EXMR	14.0	13.78	1.50
8132200	REFRIG MECHANIC	12.0	11.82	1.59
8701000	BULDG GUARD	6.0	7.79	1.59

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APPENDIX A:

ACKNOWLEDGMENTS

The New York State Comparable Worth project benefited substantially from the help of dozens of State employees and Center for Women in Government staff. In this Appendix, we want to acknowledge and thank those who assisted us in the completion of the study. While we have tried to list everyone involved in this complicated research effort, we know that there are many individuals who assisted us and whose names are not available to us. We especially want to thank the 27,394 State employees who filled out and returned the Job Content Questionnaires.

Turning to those we can acknowledge by name, Greg Reilly, the liaison to this project from the Governor's Office of Employee Relations, assisted with every step of the project, providing the necessary links with state agencies, and providing us information about the state workforce to facilitate several design decisions. Throughout our two years of working together, he remained supportive, helpful, and collegial.

Similarly, William Blom, Research Director of the Civil Service Employees Association, provided invaluable assistance and support throughout the project. His work on developing the Job Content Questionnaire is especially appreciated.

In addition, a number of other individuals provided general advice about the research design of the study, including: Karen Burstein, Irene Carr, Candice Carter, Cynthia Chovanec, Barry Lorch, William McGowan, and Gail Shaffer.

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This project could never have been completed without the information describing the civil service job titles and their incumbents provided to us by Vic Gilbert and his associates in the Electronic Data Processing Unit of the Civil Service Department. In addition to Vic, we would like to thank Pat McCausland, Carleen McLaughlin, Mary Foster, and Virginia Green.

Over 150 state employees assisted us in questionnaire development through preliminary field testing and well over 1,000 state employees responded to the pilot Job Content Questionnaire. A number of individuals spent considerable time assisting us in item selection, deletion and wording. Candice Carter and Paul Laramie were especially helpful. Each of them spent several days responding to our requests for information and other inquiries. They also helped us anchor general job content categories to the New York State experience. In addition, we appreciate the time and care taken by the following individuals in reviewing and revising the questionnaire: Steven Scaringe, James Shaver, Eileen Guir, Alois Soeller, David Vincelette, Robin Katz, Vincent Perfetto, Alma McCullough, and Richard Visor.

Special thanks is due to Professor James Fleming for applying his expertise in simplifying the reading level of the Job Content Questionnaire. As a result of his efforts, the questionnaire is comprehensible to anyone with at least a seventh grade reading ability. Others who helped us make the questionnaire accessible to incumbents in titles where functional illiteracy is high include: Janet Patterson, David Dunahue, Paul LaJole, Kathy Sims, Carol Ann Modena, George Delamar, and Herbert Steele.

A number of people provided us with information on carrying out survey research in New York State and elsewhere. For their assistance, we wish to thank I-Hisn Wie, Carol Newhart, Rebecca Hatch, Maria Sgroi, Jeff Lutzker, and Bill Coleman, Jr. In addition, George Gaspard, Linda Balinski, and Deloros

Loczak gave us invaluable advice on using the interagency mails for distributing the questionnaire.

The substudy comparing supervisor and incumbent responses to a subset of questionnaire items was mechanically one of the most difficult tasks to complete. Elaine Ellinger, Roger Cudmore, Mabel Murphy, Steven Daly, Esther Swanker, Georgiana Panton, Leslie Collins, David VanHeusen, Candice Carter, Joseph Murphy, Jr., and Cynthia Chovanec made this substudy possible by locating the specific supervisors of incumbents of pilot study titles.

Denice Mitchell, Bill Dorsman, and Joan Conway helped us with the production, layout, and wording of the questionnaire. Mary Nelson and her associates at Professional Insurance Agencies efficiently and effectively completed the data entry.

The public relations efforts surrounding this project were crucial because of the great public interest and importance of the study. In addition, publicity was vital to ensure a high return rate for the questionnaire. We are especially appreciative of the GOER and CSEA public information efforts, lead respectively by Ronald Tarwater and Melinda Carr. We are also grateful for the publicity generated by the Public Employees Federation and a number of state agencies and women's advisors groups. The energies and expertise of the Center's own public information specialists, Audrey Seidman and Fred Padula, were also critical to our success and contributed greatly to the high quality of public relations efforts carried out during the study.

Once the data were ready to analyze, Michael Green assisted in writing the appropriate data analysis computer programs. Others who provided us with technical assistance for the computer analysis are Sue Darbyshire, Ray Coco, Bob Pfeiffer, Janice Jacobson, and Pete Connolly.

This study could not have been completed without the agency liaisons. First, a set of agency and union liaisons provided assistance in the pilot study. This required a lot of work, as we were testing four methods of distribution. The names of these liaisons are listed in Appendix B. A second group encompassed the agency liaisons for the main data collection phase. They are listed in Appendix E. These people worked diligently with us and on our behalf to follow up on the many details involved in distributing hundreds of questionnaires. The 73 percent response rate is a testament to their efforts.

The acknowledgments would not be complete without thanking the many Center for Women in Government members who contributed greatly to the successful completion of this project. Nancy Perlman, our executive director, was among the first to recognize the importance of pay equity research in New York State. Her continued leadership, encouragement, and support was invaluable to those of us who were responsible for the day-to-day management of the project. Robert LaSalle, Sharon Stimson, and Lillie McLaughlin worked as Research Assistants in various phases of the project. Bob contributed in nearly every phase of the project. Sharon organized several facets of the pilot survey. Lillie organized the initial contacts with the main survey agency liaisons. We were fortunate as well to have the assistance of several graduate students, undergraduate students, and research interns: Susan Buckley, Cynthia Dean, Wendi Essex, Elissa Kane, Sue Knoll, Regina Ryan, Cynthia Wise, and Suzanne Felt. In addition, Center interns Nancy Della Rocco and Julie Castleberry chipped in when extra hands were needed, as did Center fellow Judith Saidel.

Our administrative staff, including Nan Carroll, Nancy McDonough, Paulette Moak, Joan Jervis, and Pat Beaudoin all facilitated the process of

project implementation through monitoring our contract, bills, making travel arrangements, and providing backup clerical support.

Finally, our warmest and wholehearted thanks go to Alex Reese and Annette Roberts, clerical staff to the Research and Implementation Unit at the Center. Alex has been with us since the inception of the project. She has managed to survive the oftentimes overwhelming task of retyping many drafts resulting from the frequent editorial changes under tight time schedules. She did a magnificent job completing this final report. Annette joined Alex in completing the clerical tasks associated with this project. Their skill and expertise on this, and in all their work, are invaluable to our unit.

APPENDIX B:

PILOT SURVEY: AGENCY PERSONNEL AND UNION LIAISONS

Agency Liaison Persons for Pilot Distribution

MENTAL HEALTH

Jackie Morris, Project Director
George Delamar, Assistant Director of Personnel
Ann Malmrous, Associate Personel Administrator
David VanHeusen, CDPC Personnel Director

Unions

Henry Wagnoner, CSEA
Joyce Reso, PEF
John Deseve, Council 82

TRANSPORTATION

Esther Swanker, Assistant Commissioner of Manpower and Employee Relations
Steve Daly, Director of Personel Bureau
Steve Jaffy, Associate Personnel Administrator
Carol Cross, Principle Clerk of Personnel
Geraldine Smith, Acting Regional Personnel Officer

Unions

Joan Tobin, CSEA
Milo Barlow, CSEA
Steve Mastensen, PEF

MOTOR VEHICLES

Georgiana Panton, Personnel Director
Alexandra Sussman, Senior Personnel Administrator
Bob Hoffmeister, Labor Relations Director

Unions

Dann Wood, CSEA
Betty Carpenter, CSEA
Mark Hafensterner, PEF
Joan Russel, PEF

MENTAL RETARDATION

Tom Torino, Assistant Director of Personnel

Brooklyn Developmental

Dennis Gallo, Personnel Director
Millie Whitleton, EEO Officer

MENTAL RETARDATION (cont.)

Unions

Ann Worthy, CSEA
Denise Berkley, CSEA
Sue Powell, Council 82
Grace Lott, PEF

TAX & FINANCE

Roger Cudmore, Director of Human Resources
Mable Murphy, Director of Personnel
Debra Ellis, Director of Labor Relations
John Seiler, Agency Labor Relations Representative

Unions

Carmon Bagnoli, CSEA
Mary Jaro, CSEA
Joe Carusone, PEF
Earl Dennyson, PEF
Joyce Lacomb, PEF

OFFICE OF GENERAL SERVICES

Elaine Ehlinger, Associate Personel Administrator
Maria Mazza, Personnel Assistant

Unions

Leroy Holmes, CSEA
Mike Harrigan, PEF
Bob McCarthy, Council 82
Elaine Delanoy, Council 82
Dick O'Connell, Council 82

SOCIAL SERVICES

Ben McFerran, Director of Human Resources Management
Mary Meister, Director of Personnel
Leslie Collins, Assistant Director of Personnel
Rodney Kurst, Associate Personnel Administrator

Unions

Charles Stats, CSEA
Roy Bailey, PEF

CORRECTIONS

Joe Murphy, Director of Human Resources Management
Marsha Herman, Assistant Director of Personnel Facilities
Lee Gould, Assistant Director of Classification and Exams

APPENDIX C

Descriptive Statistics for the Independent Variables Entered Into Regression: Whole Sample and White Male Sample

DESCRIPTIVE STATISTICS: WHOLE SAMPLE

	Mean	Std Dev
MSG	17.715	7.410
PM	.095	.164
PFEM	.317	.312
F1	.427	.230
F2	.201	.203
F3	.220	.216
F4	.725	.223
F5	.519	.216
F6	.383	.302
F7	.314	.243
F8	.119	.188
F9	.194	.194
F10	.940	.088
F11	.701	.156
F12	.638	.165
F13	.147	.157
F14	.544	.146
M133	.227	.177
M136	.308	.245
M140	.441	.262
M141	.441	.179
P142	.331	.290
M143	.526	.178
M144	.331	.324
MI94	.599	.191
PI96	.264	.271
PI105	.428	.354
PI106	.716	.308
WRITE2	.469	.164
READ2	.604	.221

N of cases = 1601

CORRELATION: WHITE MALE SAMPLE

CORRELATION:

	MSG	PM	PFEM	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
MSG	1.000	-.187	-.341	.487	-.480	-.215	.424	.722	.106	.665	.279	.505	.455
PM	-.187	1.000	.219	-.085	.047	.259	-.024	-.112	-.158	-.009	-.196	-.107	-.142
PFEM	-.341	.219	1.000	-.216	-.187	.172	-.089	-.103	.104	-.169	-.129	-.247	-.048
F1	.487	-.085	-.216	1.000	-.070	.112	.279	.119	-.000	.557	.058	.621	.455
F2	-.480	.047	-.187	-.070	1.000	.474	-.351	-.426	-.349	-.300	-.232	-.130	-.259
F3	-.215	.259	.172	.112	.474	1.000	-.061	-.046	-.401	-.019	-.340	.025	.025
F4	.424	-.024	-.089	.279	-.351	-.061	1.000	.377	-.029	.479	-.120	.208	.518
F5	.722	-.112	-.103	.119	-.426	-.046	.377	1.000	.081	.523	.191	.261	.366
F6	.106	-.158	.104	-.000	-.349	-.401	-.029	.081	1.000	-.007	.623	.039	.093
F7	.665	-.009	-.169	.557	-.300	-.019	.479	.523	-.007	1.000	.124	.569	.468
F8	.279	-.196	-.129	.058	-.232	-.340	-.120	.191	.623	.124	1.000	.162	.107
F9	.505	-.107	-.247	.621	-.130	.025	.208	.261	.039	.569	.162	1.000	.340
F10	.455	-.142	-.048	.455	-.259	.025	.518	.366	.093	.468	.107	.340	1.000
F11	.509	-.165	-.168	.523	-.262	-.105	.408	.331	.008	.518	.048	.457	.472
F12	.500	-.070	-.349	.505	-.035	.005	.413	.248	-.070	.467	.044	.388	.409
F13	.629	-.118	-.243	.435	-.248	-.127	.357	.462	.062	.615	.242	.616	.364
F14	.818	-.235	-.316	.402	-.421	-.253	.369	.670	.220	.625	.408	.475	.442
MI33	-.626	.140	.187	-.298	.533	.238	-.388	-.408	-.056	-.459	-.171	-.315	-.342
MI36	.575	-.142	-.374	.110	-.338	-.429	.410	.475	.100	.520	.195	.265	.276
MI40	.712	-.157	-.411	.500	-.222	-.225	.295	.295	.033	.503	.178	.491	.322
MI41	.648	-.221	-.469	.333	-.056	-.223	.244	.201	.050	.317	.134	.306	.291
PI42	.376	.109	-.056	.125	-.216	.146	.345	.350	-.429	.366	-.265	.147	.176
MI43	.490	-.338	-.355	.196	-.205	-.359	.117	.414	.402	.271	.541	.342	.271
MI44	-.469	-.051	.138	-.179	.536	.229	-.421	-.370	-.005	-.397	-.059	-.192	-.249
MI94	.455	-.074	-.150	.454	-.120	.054	.383	.283	.019	.479	.096	.379	.543
PI96	.028	.034	.251	-.471	-.464	-.337	.113	.174	.136	-.120	.016	-.359	-.083
PI105	-.001	-.051	.241	-.246	-.534	-.548	.005	.002	.372	-.125	.225	-.255	-.061
PI106	.263	.037	.289	-.115	-.702	-.287	.314	.351	.177	.154	.048	-.114	.144
WRITE2	.814	-.154	-.249	.450	-.505	-.306	.396	.607	.157	.704	.355	.489	.389
READ2	.710	-.096	-.206	.380	-.478	-.225	.631	.606	.157	.643	.180	.396	.538

CORRELATION: WHITE MALE SAMPLE

	F11	F12	F13	F14	MI33	MI36	MI40	MI41	PI42	MI43	MI44	MI94	PI96
MSG	.509	.500	.629	.816	-.626	.575	.712	.448	.376	.490	-.469	.455	.028
PR	-.165	-.070	-.116	-.235	.140	-.142	-.157	-.221	.109	-.338	-.051	-.074	.034
PFEM	-.168	-.349	-.243	-.316	.187	-.374	-.411	-.469	-.056	-.355	.138	-.150	.251
F1	.523	.505	.435	.402	-.298	.110	.500	.333	.125	.196	-.179	.454	-.471
F2	-.262	-.035	-.248	-.421	.533	-.338	-.222	-.056	-.216	-.205	.536	-.120	-.464
F3	-.105	.005	-.127	-.253	.238	-.429	-.225	-.223	.146	-.359	.229	.054	-.337
F4	.408	.413	.357	.369	-.388	.410	.295	.244	.345	.117	-.421	.383	.113
F5	.331	.248	.462	.670	-.408	.475	.295	.201	.350	.414	-.370	.283	.174
F6	.008	-.070	.062	.220	-.056	.100	.033	.050	-.429	.402	-.005	.019	.136
F7	.518	.467	.615	.625	-.459	.520	.503	.317	.366	.271	-.397	.479	-.120
F8	.068	.044	.242	.408	-.171	.195	.178	.134	-.265	.541	-.059	.096	.016
F9	.457	.388	.616	.475	-.315	.265	.491	.306	.147	.342	-.192	.379	-.359
F10	.472	.409	.364	.442	-.342	.276	.322	.291	.176	.271	-.249	.543	-.083
F11	1.000	.449	.418	.466	-.389	.326	.455	.358	.189	.297	-.248	.517	-.146
F12	.449	1.000	.441	.420	-.272	.354	.487	.404	.230	.223	-.164	.531	-.248
F13	.418	.441	1.000	.591	-.378	.483	.509	.294	.220	.366	-.286	.434	-.116
F14	.466	.420	.591	1.000	-.554	.555	.540	.439	.264	.606	-.432	.467	.019
MI33	-.389	-.272	-.378	-.554	1.000	-.422	-.463	-.307	-.391	-.270	.496	-.335	-.162
MI36	.326	.354	.483	.555	-.422	1.000	.455	.345	.258	.420	-.407	.279	.109
MI40	.455	.487	.509	.540	-.463	.455	1.000	.492	.228	.409	-.295	.398	-.152
MI41	.358	.404	.294	.439	-.307	.345	.492	1.000	.053	.400	-.115	.366	-.148
PI42	.189	.230	.220	.264	-.391	.258	.228	.053	1.000	-.119	-.444	.217	.110
MI43	.297	.223	.366	.606	-.270	.420	.409	.400	-.119	1.000	-.145	.232	-.082
MI44	-.248	-.164	-.286	-.432	.496	-.407	-.295	-.115	-.444	-.145	1.000	-.207	-.320
MI94	.317	.331	.434	.467	-.335	.279	.398	.366	.217	.232	-.207	1.000	-.158
PI96	-.146	-.248	-.116	.019	-.162	.109	-.152	-.148	.110	-.082	-.320	-.158	1.000
PI103	-.062	-.330	-.092	.008	-.115	.104	-.068	-.077	-.164	.004	-.205	-.176	.509
PI106	.082	-.162	.081	.213	-.301	.204	.006	-.092	.234	-.027	-.472	.021	.532
WRITE2	.423	.409	.635	.808	-.577	.583	.585	.358	.318	.460	-.525	.410	.064
READ2	.552	.457	.511	.708	-.501	.564	.509	.403	.316	.458	-.494	.514	.101

CORRELATION: WHITE MALE SAMPLE

	P1105	P1106	WRITE2	READ2
MSE	-.001	.283	.814	.710
PM	-.051	.037	-.154	-.096
PFEM	.241	.289	-.249	-.206
F1	-.246	-.115	.450	.380
F2	-.334	-.702	-.503	-.478
F3	-.548	-.287	-.306	-.225
F4	.003	.314	.396	.431
F5	.002	.351	.607	.606
F6	.372	.177	.157	.157
F7	-.125	.154	.704	.643
F8	.225	.048	.355	.180
F9	-.255	-.114	.489	.396
F10	-.061	.144	.389	.538
F11	-.062	.082	.423	.552
F12	-.330	-.162	.409	.457
F13	-.092	.081	.635	.511
F14	.008	.213	.808	.708
MI33	-.115	-.301	-.577	-.501
MI38	.104	.204	.583	.586
MI40	-.068	.006	.585	.509
MI41	-.077	-.092	.358	.403
PI42	-.164	.234	.318	.316
MI43	.004	-.027	.460	.458
MI44	-.205	-.472	-.525	-.494
MIV4	-.178	.021	.410	.316
PI96	.509	.532	.064	.101
P1105	1.000	.390	.092	.025
P1106	.390	1.000	.305	.292
WRITE2	.092	.305	1.000	.687
READ2	.025	.292	.687	1.000

DESCRIPTIVE STATISTICS: WHITE MALE SAMPLE

	Mean	Std Dev	Label
MSG	19.458	6.781	
PM	.009	.024	
PFEM	.014	.028	
F1	.490	.227	
F2	.269	.243	
F3	.168	.166	
F4	.743	.223	
F5	.503	.198	
F6	.354	.298	
F7	.339	.224	
F8	.138	.192	
F9	.248	.212	
F10	.949	.076	
F11	.745	.142	
F12	.707	.143	
F13	.181	.177	
F14	.579	.136	
MI33	.207	.163	
MI36	.394	.228	
MI40	.572	.244	
MI41	.545	.157	
PI42	.310	.277	
MI43	.614	.182	
MI44	.359	.333	
MI94	.632	.172	
PI96	.163	.231	
PI105	.297	.324	
PI106	.566	.360	
WRITE2	.491	.172	
READ2	.642	.216	

N of cases = 464

CORRELATIONS: WHITE MALE SAMPLE

CORRELATION:

	MSG	PM	PFEM	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
MSG	1.000	-.251	-.032	.434	-.736	-.378	.412	.698	.309	.631	.339	.456	.440
PM	-.251	1.000	.212	-.099	.237	.227	-.104	-.223	-.165	-.142	-.162	-.159	-.124
PFEM	-.032	.212	1.000	-.098	-.103	.035	.004	.082	.109	-.058	-.002	-.111	.019
F1	.434	-.099	-.098	1.000	-.167	.119	.325	.080	-.015	.576	.039	.665	.472
F2	-.736	.237	-.103	-.167	1.000	.495	-.410	-.663	-.405	-.436	-.347	-.281	-.374
F3	-.378	.227	.035	.119	.495	1.000	-.153	-.257	-.319	-.097	-.328	.030	-.063
F4	.412	-.104	.004	.325	-.410	-.153	1.000	.458	.093	.560	.023	.267	.551
F5	.698	-.223	.082	.080	-.663	-.257	.458	1.000	.318	.451	.276	.176	.374
F6	.309	-.165	.109	-.015	-.405	-.319	.093	.318	1.000	.178	.731	.138	.146
F7	.631	-.142	-.058	.576	-.436	-.097	.560	.451	.178	1.000	.184	.565	.505
F8	.339	-.162	-.002	.039	-.347	-.328	.023	.276	.731	.184	1.000	.173	.136
F9	.456	-.159	-.111	.665	-.281	.030	.267	.176	.138	.565	.173	1.000	.392
F10	.440	-.124	.019	.472	-.374	-.063	.551	.374	.146	.505	.136	.392	1.000
F11	.508	-.220	-.076	.531	-.399	-.109	.488	.347	.037	.568	-.005	.471	.473
F12	.361	-.095	-.107	.430	-.101	.021	.445	.175	-.073	.445	-.021	.295	.443
F13	.532	-.208	-.062	.456	-.345	-.094	.459	.404	.108	.611	.158	.602	.418
F14	.790	-.260	-.027	.365	-.663	-.351	.434	.668	.401	.624	.446	.473	.444
MI33	-.663	.197	.026	-.318	.651	.378	-.322	-.415	-.215	-.453	-.212	-.347	-.353
MI36	.472	-.173	-.026	-.016	-.452	-.479	.437	.502	.246	.376	.188	.107	.281
MI40	.639	-.143	-.168	.434	-.350	-.235	.195	.201	.119	.394	.170	.418	.287
MI41	.217	-.042	-.064	.214	-.030	-.069	.150	.097	-.052	.229	.011	.181	.166
PI42	.420	-.043	-.021	.128	-.360	-.164	.352	.343	-.239	.326	-.210	.150	.225
MI43	.300	-.247	-.056	.135	-.415	-.383	.213	.473	.535	.340	.580	.331	.305
MI44	-.637	.145	-.036	-.224	.734	.406	-.400	-.513	-.270	-.424	-.238	-.286	-.310
MI94	.383	-.035	-.064	.390	-.189	.040	.328	.200	.030	.428	.061	.364	.458
PI96	.286	-.108	.061	-.377	-.437	-.317	.127	.385	.235	-.064	.170	-.272	-.028
PI105	.296	-.105	.106	-.133	-.505	-.461	.120	.307	.284	.028	.260	-.117	.053
PI106	.513	-.105	.133	-.043	-.705	-.433	.389	.577	.231	.265	.185	.003	.216
WHITE2	.851	-.202	-.028	.397	-.708	-.396	.414	.637	.358	.643	.416	.447	.382
READ2	.672	-.214	.006	.326	-.634	-.319	.644	.647	.372	.661	.314	.379	.521

CORRELATIONS: WHITE MALE SAMPLE

	FT1	FT2	F13	FT4	MI33	MI36	MI40	MI41	PI42	MI43	MI44	MI94	PI96
MS6	.508	.361	.532	.790	-.663	.472	.639	.217	.420	.500	-.637	.383	.286
PM	-.220	-.095	-.208	-.260	.197	-.173	-.143	-.042	-.043	-.247	.145	-.035	-.108
PFEM	-.076	-.107	-.062	-.027	.026	-.026	-.168	-.064	-.021	-.056	-.036	-.064	.061
F1	.531	.430	.456	.365	-.318	-.016	.434	.214	.128	.135	-.224	.390	-.377
F2	-.399	-.101	-.345	-.663	.651	-.452	-.350	-.030	-.360	-.415	.734	-.189	-.437
F3	-.109	.021	-.094	-.351	.378	-.479	-.235	-.069	-.166	-.383	.406	.040	-.317
F4	.488	.445	.459	.434	-.322	.437	.195	.150	.352	.213	-.400	.328	.127
F5	.347	.175	.404	.668	-.415	.502	.201	.097	.343	.473	-.513	.200	.385
F6	.037	-.073	.108	.401	-.215	.246	.119	-.052	-.239	.533	-.270	.030	.235
F7	.568	.445	.611	.624	-.453	.376	.394	.229	.326	.340	-.424	.428	-.064
F8	-.005	-.021	.158	.446	-.212	.188	.170	.011	-.210	.580	-.238	.061	.170
F9	.471	.295	.602	.473	-.347	.107	.418	.181	.150	.331	-.286	.364	-.272
F10	.473	.443	.418	.444	-.353	.281	.287	.166	.225	.305	-.310	.458	-.028
F11	1.000	.445	.468	.429	-.465	.263	.384	.218	.310	.229	-.387	.480	.030
F12	.445	1.000	.415	.325	-.218	.200	.330	.255	.245	.071	-.167	.514	-.109
F13	.468	.415	1.000	.550	-.348	.369	.346	.166	.215	.311	-.327	.436	-.012
F14	.429	.325	.550	1.000	-.560	.454	.433	.215	.310	.603	-.560	.381	.230
MI33	-.465	-.218	-.348	-.560	1.000	-.336	-.503	-.149	-.392	-.349	.628	-.298	-.234
MI36	.263	.200	.369	.454	-.336	1.000	.251	.072	.246	.363	-.423	.176	.292
MI40	.384	.330	.346	.433	-.503	.251	1.000	.238	.229	.361	-.357	.349	-.015
MI41	.218	.255	.166	.215	-.149	.072	.238	1.000	.052	.135	.011	.291	-.070
PI42	.310	.245	.215	.310	-.392	.246	.229	.052	1.000	.000	-.464	.225	.176
MI43	.229	.071	.311	.603	-.349	.363	.361	.135	.000	1.000	-.343	.170	.106
MI44	-.387	-.167	-.327	-.560	.628	-.423	-.357	.011	-.464	-.343	1.000	-.210	-.387
MI94	.480	.514	.436	.381	-.298	.176	.349	.291	.225	.170	-.210	1.000	-.077
PI96	.030	-.109	-.012	.230	-.234	.292	-.015	-.070	.176	.106	-.387	-.077	1.000
PI105	.046	-.167	.025	.261	-.240	.268	.111	.029	.036	.112	-.387	-.055	.456
PI106	.187	-.065	.189	.466	-.421	.401	.148	.007	.340	.205	-.602	.052	.513
WRITE2	.412	.302	.545	.839	-.619	.440	.502	.181	.335	.540	-.620	.358	.254
READ2	.553	.398	.486	.706	-.518	.526	.391	.172	.356	.536	-.581	.473	.218

CORRELATIONS: WHITE MALE SAMPLE

	PI105	PI106	WRITE2	READ2
MS6	.296	.513	.851	.672
PM	-.105	-.105	-.202	-.214
PFEM	.108	.133	-.026	.006
F1	-.133	-.043	.397	.326
F2	-.505	-.705	-.708	-.634
F3	-.461	-.433	-.396	-.319
F4	.120	.389	.414	.644
F5	.307	.577	.637	.647
F6	.284	.231	.338	.372
F7	.028	.265	.643	.661
F8	.260	.185	.416	.314
F9	-.117	.003	.447	.379
F10	.053	.216	.382	.521
F11	.046	.187	.412	.553
F12	-.147	-.065	.302	.398
F13	.025	.189	.545	.486
F14	.261	.466	.839	.706
MI33	-.240	-.421	-.619	-.518
MI36	.268	.401	.440	.526
MI40	.111	.148	.502	.391
MI41	.029	.007	.181	.172
PI42	.036	.340	.355	.356
MI43	.112	.205	.540	.536
MI44	-.387	-.602	-.620	-.581
MI94	-.055	.052	.358	.473
PI96	.456	.513	.254	.218
PI105	1.000	.649	.296	.197
PI106	.649	1.000	.518	.428
WRITE2	.296	.518	1.000	.687
READ2	.197	.428	.687	1.000

APPENDIX D:

MAIN SURVEY: JOB CONTENT QUESTIONNAIRE,
COVER LETTER, AND FOLLOW-UP LETTER

State University of New York at Albany

Draper Hall, Room 302
135 Western Avenue
Albany, New York 12203
(518) 455-6211
(800) 628-1216

Dear New York State Employee:

Recently you received the New York State Job Questionnaire. If you filled it out and returned it, thank you for your valuable help.

If you have ***not*** returned the questionnaire, we hope you will do so right away. You are one of only a few employees randomly chosen to tell us about your job, so your cooperation is very important. Your response will make it possible to include your job title in the Comparable Worth Study. This is an important study of the New York State salary setting process.

Your responses are anonymous. Remember that you may fill out the questionnaire on work time.

If you have any questions about the study or about the questionnaire, please call (800) 628-1216.

Cordially,

Nancy Perlman

Nancy D. Perlman
New York State Comparable Worth Project

This survey is a key part of a study being conducted by the Center for Women in Government with funding provided through negotiated agreements between the *Governor's OER* and the *Civil Service Employees Association*, AFSCME, AFL-CIO. Bargaining unit titles represented by the *Public Employees Federation*, AFL-CIO and *Council 82*, AFSCME, AFL-CIO are not directly involved in the study; however, both organizations are aware that employees in bargaining units represented by them will be asked to complete questionnaires as part of this study.

APPENDIX E:

MAIN SURVEY: AGENCY LIAISONS

AGENCY LIAISONS

Agency	Liaison
Adirondack Park Agency	Andrea Estus
Advocate for the Disabled	Yvonne Williams
Office for the Aging	Sheldon Jaffee
Department of Agriculture and Markets	Charles Harvey
Division of Alcoholism and Alcohol Abuse	Sharon Williams, Terry Ketterer
Office of Substance Abuse Services	John Debs
Council on the Arts	Trudy Blitz
Department of Audit and Control	Harry Keefe
Banking Department	Gerard Powers, Esther Sasman
Division of the Budget	Nikki M. Smith, Charles Palmer
Office of Business Permits	Joseph Valenti
Commission on Cable Television	William Huff
Council on Children and Families	Frank DiDimenico
Department of Civil Service	John Keefe
Department of Commerce	Charles Pishko
Consumer Protection Board	Stephen Kohn
Department of Correctional Services	Lee Gould, Randy Harris
Commission of Correction	Anne King
Crime Victims Compensation Board	Patricia Poulopoulos
Division of Criminal Justice Services	Gloria Shepard
Education Department	Philip Sperry
State Board of Elections	Richard J. Murray
Office of Employee Relations	Paul Shatsoff
NYS Energy Office	Sandra Camacho
Department of Environmental Conservation	Jerry Burke, Mary McCarthy
Division of Equalization and Assessment	Joseph Kunkel
Executive Chamber	Suzanne Hechemy, Carol Sommers
Office of General Services	Barbara Severance
Higher Education Services Corporation	Seymour Bandremer
Division of Housing and Community Renewal	Jeff Jones
Division of Human Rights	James Cappel
State Insurance Department	Barbara Watson
State Insurance Fund	Albert DiMeglio
Department of Labor	Joseph Kearney
State Labor Relations Board	Thomas Canty
Department of Law	Jack Wolslegel
Division of the Lottery	Terry Bryant
Division on Quality Care for Mentally Disabled	Richard Schaeffer
Office of Mental Health	Jackie Morris
Office of Mental Retardation and Developmental Disabilities	Joseph Costello, Tom Torino
Division of Military and Naval Affairs	Jim Gross
Department of Motor Vehicles	Georgiana Panton
State Liquor Authority	Agnes Miller
Office of Parks, Recreation and Historic Preservation	Stanley Winter

Division of Parole	Henry Bankhead
Division of Probation	Sandra Roberts
Public Employees Relations Board	Virginia Suriano
Public Service Commission	William VanDyke
NYS Racing and Wagering Board	Donald Sommer
Department of Social Services	Leslie Collins
Bureau of Staff Development and Quality of Work Life	Kathy Mucello
Department of State	Joseph Walsh
Department of Taxation and Finance	Roger Cudmore
Department of Transportation	Stephen Daly
State University of New York	Sandy Dennison
Workers' Compensation Board	Rene Miller
Division of Veterans' Affairs	Sandy Ryan
Division for Youth	Rick Martin

APPENDIX F:

MAIN SURVEY: RESPONSE RATE BY TITLE

RESPONSE RATES BY TITLE
TO BE ESTIMATED TITLES

TITLE CODE	TITLE	# SENT	# RECD	% RETURN
100200	ACCOUNT CLERK	160	135	84.4
100300	SENR ACCT CLERK	143	118	82.5
100500	PRIN ACCT CLERK	143	126	88.1
102100	PAYROLL AUDIT CLK 1	29	19	65.5
102200	AUDIT CLERK	116	83	71.6
102230	PAYROLL AUDIT CLK 3	14	12	85.7
102300	SENR AUDIT CLERK	141	121	85.8
105200	CASHIER	88	73	83.0
112000	TOLL COLLECTOR	19	9	47.4
130110	EMPS RET BNFTS EXMR 1	55	44	80.0
130310	EMPS RET BNFTS EXMR 3	14	10	71.4
133100	EMPS RET MBRSP EXMR 1	14	10	71.4
133200	EMPS RET MBRSP EXMR 2	13	12	92.3
702200	STATISTICS CLERK	107	73	68.2
702300	SENR STATISTICS CLERK	48	44	91.7
702500	PRIN STATISTICS CLERK	20	14	70.0
750300	SENR ACTUARIAL CLERK	40	29	72.5
750500	PRIN ACTUARIAL CLERK	17	14	82.4
822010	DATA PROC CLK 1	42	29	69.0
822020	DATA PROC CLK 2	47	39	83.0
849200	DATA ENTRY MACH OPER	144	101	70.1
849300	SENR DATA ENTY MACH O	128	103	80.5
849500	PRIN DATA ENTY MACH O	42	38	90.5
911200	LABORATORY ANIMAL CRT	116	37	31.9
911300	SENR LAB ANIMAL CRTKR	60	38	63.3
1836100	INST RTL STR CLERK	13	5	38.5
1935000	PARK REGN BUS ASSNT	11	10	90.9
2134101	TRANS PLNG AIDE 1	12	7	58.3
2387110	CONSUMER SRVS SPEC 1	30	14	46.7
2501200	CLERK	152	105	69.1
2501300	SENR CLERK	150	121	80.7
2501317	SENR CLERK SURROGATE	10	10	100.0
2501320	SENR CLERK CORP SRCH	16	15	93.8
2501500	PRIN CLERK	129	100	77.5
2501517	PRIN CLERK EST TX APP	14	11	78.6
2501590	PRIN CLERK PERSONNEL	80	62	77.5
2502200	COMP CLAIMS CLERK	55	37	67.3
2502300	SENR COMP CLMS CLERK	98	61	62.2
2503200	FILE CLERK	141	103	73.0
2503300	SENR FILE CLERK	129	109	84.5
2503500	PRIN FILE CLERK	40	34	85.0
2504200	ADMITTING CLERK	56	24	42.9
2504300	SENR ADMITTING CLERK	23	15	65.2
2506100	NURSING STATION CLK 1	136	48	35.3
2508400	DRIVER IMPV ADJDTN C	13	10	76.9
2508600	ADJUDCTN CORRPDNC CLK	12	10	83.3
2510100	PURCHASING ASSNT 1	38	34	89.5
2510200	PURCHASING ASSNT 2	34	27	79.4
2512200	IDENT CLK	66	45	68.2
2512300	SENR IDENT CLERK	86	62	72.1
2513300	SENR MED RECORDS CLRK	120	95	79.2

2513400	TREATMNT UNIT CLK	72	56	77.8
2514300	SENR UNDERWRTNG CLERK	103	70	68.0
2514400	SENR PAYROLL AUDT CLK	15	12	80.0
2515200	CREDENTIALS ASSISTANT	15	13	86.7
2521100	MOTOR VEH TITLE CLK 1	26	24	92.3
2521200	MOTOR VEH TITLE CLK 2	42	34	81.0
2522210	LEGAL ASSNT 1	37	28	75.7
2540100	MOTOR VEH REP 1	63	40	63.5
2540200	MOTOR VEH REP 2	96	58	60.4
2540300	MOTOR VEH REP 3	166	121	72.9
2540510	SUPVG MOTOR VEH REP 1	66	57	86.4
2553310	TRANS OFFC ASSNT 1	42	35	83.3
2553320	TRANS OFFC ASSNT 2	85	78	91.8
2557100	APPS CNTRL CLK 1	10	7	70.0
2558100	PAYROLL CLERK 1	107	80	74.8
2558200	PAYROLL CLERK 2	125	107	85.6
2558300	PAYROLL CLERK 3	99	88	88.9
2559100	LIBRARY CLERK I	149	116	77.9
2559200	LIBRARY CLERK 2	152	123	80.9
2559300	LIBRARY CLERK 3	30	25	83.3
2560100	STUDENT LOAN CLK 1	13	11	84.6
2560200	STUDENT LOAN CLK 2	10	7	70.0
2568100	EMP INS REVWNG CLK 1	15	13	86.7
2569100	DISABLTY DETRM RV C 1	15	8	53.3
2601200	TYPIST	1335	913	68.4
2601300	SENR TYPIST	147	109	74.1
2601310	SENR TYPIST LAW	10	9	90.0
2601500	PRIN TYPIST	12	12	100.0
2605200	DICT MACH TRANS	153	116	75.8
2606100	INFO PROCSSG SPEC 1	185	142	76.8
2606200	INFO PROCSSG SPEC 2	144	113	78.5
2606300	INFO PROCSSG SPEC 3	14	12	85.7
2609000	SECRETARIAL STENO	134	97	72.4
2610200	STENOGRAPHER	1387	1033	74.5
2610300	SENR STENOGRAPHER	177	142	80.2
2610320	SENR STENO LAW	135	81	60.0
2610500	PRIN STENOGRAPHER	144	109	75.7
2610520	PRIN STENOGRAPHER LAW	28	18	64.3
2612200	HEARING REPTR	126	76	60.3
2703100	TELEPHONE OPER TYP	100	72	72.0
2703200	TELEPHONE OPER	141	102	72.3
2703300	SENR TELEPHONE OPER	72	57	79.2
2706100	DIRCTRY INFO SYS OP 1	16	13	81.3
2712200	CALCULATING MACH OP	30	24	80.0
2715200	BOOKKEEPING MCH OP	12	5	41.7
2715220	BOOKKEEPING MCH OP DS	21	17	81.0
2810100	ADMNV AIDE	130	106	81.5
2859010	STATE UNIV PRGM AIDE	21	17	81.0
3004000	HOUSEKEEPER	150	82	54.7
3004500	SUPVG HOUSEKEEPER	148	84	56.8
3014000	CLEANER	149	73	49.0

	3016000	JANITOR	144	92	63.9
	3021000	ELEVATOR OPERATOR	24	14	58.3
	3102300	COOK	139	77	55.4
	3102600	HEAD COOK	112	84	75.0
	3106100	DIETITIAN TECHN	132	109	82.6
	3124200	FOOD SERVICE WKR 1	149	73	49.0
	3124300	FOOD SERVICE WKR 2	149	76	51.0
	3124400	FOOD SERVICE WKR 3	35	30	85.7
	3137200	FOOD&SUPPLS PROCESSOR	24	8	33.3
	3302200	LAUNDERER	142	82	57.7
	3302300	SENR LAUNDERER	151	90	59.6
	3307000	CLOTHING CLERK	114	79	69.3
	5302100	BARBER	69	45	65.2
	5303100	BEAUTICIAN	72	56	77.8
	5350200	DENTAL ASSNT	104	72	69.2
	5359000	DENTAL HYGIENIST	75	67	89.3
	5500200	LICENSED PRAC NRS	144	86	59.7
**	5501100	HOSP ATTENDANT 1	150	42	28.0
**	5502200	HOSP CLINICAL TECHN	24	4	16.7
	5518500	COMTY RESDNC AIDE	146	87	59.6
	5532101	HOSP CLINICAL ASSNT 1	45	24	53.3
	5532202	HOSP CLINICAL ASSNT 2	152	75	49.3
**	5540300	PSYCH THERAPY AIDE	37	11	29.7
	5544100	MENTAL HYG HFWY H A 1	17	15	88.2
	5570300	MENTAL HYG THER AIDE	185	103	55.7
	5570400	MENTAL HYG THER AST 1	142	88	62.0
	6201000	LABORATORY HELPER	27	13	48.1
	6202200	LABORATORY WORKER	83	38	45.8
	6204000	LABORATORY AIDE	37	19	51.4
	6210000	XRAY AIDE	52	21	40.4
	6211510	TEACHING HOSP STL ST1	89	27	30.3
	6211520	TEACHING HOSP STL ST2	29	10	34.5
	6214200	ELECTROENCPHGRPH TECH	14	11	78.6
	6219200	CENTRAL MED SUP TECH	20	12	60.0
	6220200	HISTOLOGY TECHNICIAN	24	13	54.2
	6220300	SENR HISTOLOGY TECH	17	13	76.5
	6223200	ELECTROCARDOGRPH TECH	30	21	70.0
	6225100	MEDICAL LAB TECH 1	120	80	66.7
	6301000	PHARMACY AIDE	124	91	73.4
	6818000	ASSNT WKRS COMP EXMR	159	108	67.9
	6824100	WORKERS COMP REVW AN	26	14	53.8
	6893100	MEDICAID CLMS EXMNR 1	64	45	70.3
	6893200	MEDICAID CLMS EXMNR 2	16	10	62.5
	7202022	MAINTCE ASSNT REFRIGN	16	6	37.5
	7150000	MAINTCE HELPER	131	83	63.4
	7611000	CHAUFFEUR	14	7	50.0
	7611300	SENR CHAUFFEUR	10	7	70.0
	7614000	TRACTOR TRAILER OPER	20	9	45.0
	7616100	MOTOR VEH OPER	21	13	61.9
	7617200	BUS DRIVER	106	43	40.6
	7711000	BINDERY HELPER	10	7	70.0

8261202	YOUTH DIV AIDE 2	107	50	46.7
8261303	YOUTH DIV AIDE 3	147	77	52.4
8261400	YOUTH DIV AIDE 4	147	65	44.2
8340100	ALCLSM REHAB ASSNT 1	22	18	81.8
8342200	REHAB INTERVIEWER	20	16	80.0
8410100	TRAINING AIDE	31	29	93.5
8431200	EMPL SEC CLK	21	19	90.5
8431300	SENR EMP SEC CLERK	142	104	73.2
8431500	PRIN EMP SEC CLERK	64	38	59.4
8621100	PAROLE PROG AIDE	12	9	75.0
8701600	WATCHMAN	67	25	37.3
8937100	MOTOR VEH INS SV RP 1	20	17	85.0
8970100	DRIVER IMPRV ADJUD TR	47	39	83.0

TITLE CODE		# SENT	# RECD	% RETURN
100600	HEAD ACCOUNT CLERK	23	21	91.3
100800	CHF ACCT CLERK	16	13	81.3
102220	PAYROLL AUDIT CLK 2	19	16	84.2
102500	PRIN AUDIT CLERK	20	19	95.0
102600	HEAD AUDIT CLERK	13	9	69.2
112100	TOLL STATN SUPVR	12	9	75.0
130210	EMPS RET BNFTS EXMR 2	21	16	76.2
130410	EMPS RET BNFTS EXMR 4	8	7	87.5
133300	EMPS RET MBRSP EXMR 3	10	7	70.0
204000	UI ACCTS EXMR	21	21	100.0
204100	SENR UI ACCTS EXMR	11	10	90.9
221300	CONTRACT MGT SPEC	17	10	58.8
222500	PRIN SALARY DET ANLST	11	5	45.5
222600	HEAD SALARY DET ANLST	6	5	83.3
224300	SENR SOC SRV MGT SPEC	20	18	90.0
224400	ASSOC SOC SV MGT SPEC	19	13	68.4
224500	PRIN SOC SRV MGT SPEC	19	18	94.7
224700	CHF SOC SRV MGT SPEC	15	14	93.3
230300	SENR HEALTH CARE F AN	22	15	68.2
230400	ASSOC HEALTH CARE F A	19	14	73.7
230500	PRIN HLTH CARE FSCL A	17	11	64.7
230600	CHF HLTH CARE FSCL AN	4	4	100.0
238400	ASSOC UTILITY FIN ANL	4	2	50.0
242300	SENR INTERNAL AUDITOR	7	6	85.7
242400	ASSOC INTERNAL AUDITR	8	7	87.5
256400	ASSOC AUDTR ST EXPNDR	8	8	100.0
256500	PRIN AUDTR STATE EXPD	8	7	87.5
290300	ADMNV FINANCE OFFICER	7	6	85.7
292000	FINANCE OFFICER	8	7	87.5
301200	BANK EXAMINER	19	16	84.2
301300	SENR BANK EXAMINER	20	16	80.0
301500	PRIN BANK EXAMINER	21	19	90.5
301600	SUPVG BANK EXAMINER	19	16	84.2
301900	DEPUTY SUPT BANKS	6	6	100.0
325300	SENR INSUR POLICY EXR	7	6	85.7
375200	INSUR FD FLD SRVS REP	18	12	66.7
375300	SENR INSUR FD FLD S R	18	11	61.1
375400	ASSOC INSUR FD FLD SR	7	5	71.4
375410	INSUR FD DST REP	5	4	80.0
403100	ASSNT ACCTNT	17	12	70.6
403300	SENR ACCTNT	23	17	73.9
403400	ASSOC ACCTNT	20	15	75.0
403500	PRIN ACCTNT	7	4	57.1
407300	SENR ACCTNT ST ACCTS	9	7	77.8
409300	SENR ACCTNT ST SYS	4	4	100.0
409400	ASSOC ACCTNT ST SYS	7	6	85.7
411300	SENR ACCTNT EMP SEC	10	9	90.0
411400	ASSOC ACCTNT EMP SEC	4	3	75.0
413300	SENR ACCTNT SOC SRVS	20	19	95.0
413400	ASSOC ACCTNT SOC SRVS	4	3	75.0
413500	PRIN ACCTNT SOC SRVS	17	14	82.4

421200	ASSNT AUDITOR	10	7	70.0
421300	SENR AUDITOR	20	19	95.0
421310	SENR HGHR EDUC SV A A	6	5	83.3
421400	ASSOC AUDITOR	9	9	100.0
424100	PUBLIC UTIL AUDTR 1	17	11	64.7
424200	PUBLIC UTIL AUDTR 2	17	14	82.4
424300	PUBLIC UTIL AUDTR 3	11	9	81.8
424400	PUBLIC UTIL AUDTR 4	7	6	85.7
426300	SENR STATE ACCTS AUD	20	16	80.0
426400	ASSOC STATE ACCTS AUD	20	18	90.0
426500	PRIN STATE ACCTS AUDR	18	17	94.4
426700	CHF STATE ACCTS AUDTR	13	12	92.3
428300	SENR EXMR MUNCPL AFFR	19	17	89.5
428400	ASSOC EXAMR MUN AFFRS	19	16	84.2
428500	PRIN EXMR MUNCPL AFFR	18	12	66.7
428700	CHF EXAMINER MUN AFFS	8	6	75.0
430110	SUBSTANCE ABS ACCT A1	8	6	75.0
430210	SUBSTANCE ABS ACCT A2	5	5	100.0
431100	MENTAL HLTH AUD SPC 1	10	7	70.0
431200	MENTAL HLTH AUD SPC 2	8	5	62.5
431300	MENTAL HLTH AUD SPC 3	6	5	83.3
433200	MENTAL RETRDTN AD S 2	7	3	42.9
436300	SENR ACCTNT PUB SRV	6	5	83.3
436400	ASSOC ACCTNT PUB SRV	6	5	83.3
438400	ASSOC ABAND PROP AC A	6	6	100.0
440200	MILK ACCOUNTS EXMR	6	5	83.3
440300	SENR MILK ACCTS EXMR	7	5	71.4
442300	SENR MED FCLTS AUD	15	13	86.7
442400	ASSOC MED FCLTY AUDR	21	12	57.1
442500	PRIN MED FCLTY AUDR	18	14	77.8
447200	COMP CLAIMS AUDITOR	18	9	50.0
447300	SENR COMP CLMS AUDTR	9	5	55.6
448110	INSUR PREM AUD 1	20	10	50.0
448220	INSUR PREM AUD 2	16	13	81.3
450200	INSUR EXAMINER	19	13	68.4
450300	SENR INSUR EXMR	18	14	77.8
450400	ASSOC INSUR EXMR	19	15	78.9
450500	PRIN INSUR EXAMINER	17	13	76.5
450600	SUPVG INSUR EXMR	17	14	82.4
450610	ASSNT CHF INSUR EXMR	4	4	100.0
450710	CHF INSUR EXMR 1	5	4	80.0
456400	ASSOC SPEC TAX AUDITR	4	2	50.0
460200	SALES TAX AUDITOR 2	21	19	90.5
460300	SALES TAX AUDITOR 3	19	15	78.9
461200	INCOME TAX AUDTR 2	19	16	84.2
461300	INCOME TAX AUDTR 3	5	5	100.0
462200	CORP TAX AUDTR 2	22	16	72.7
462300	CORP TAX AUDTR 3	10	9	90.0
463200	EXCISE TAX AUDTR 2	15	13	86.7
467100	TAX AUDITOR 1	177	151	85.3
467300	TAX AUDITOR 3	4	3	75.0

470110	UI TAX AUD 1	18	14	77.8
470220	UI TAX AUD 2	19	16	84.2
470330	UI TAX AUD 3	11	11	100.0
470440	UI TAX AUD 4	5	5	100.0
478200	DATA PROC FSCL SY A 2	11	10	90.9
607100	TAX AUDIT ADMR 1	13	11	84.6
607200	TAX AUDIT ADMR 2	16	13	81.3
610110	TAX COMPLNC AGT 1	20	15	75.0
610120	TAX COMPLNC AGT 2	19	18	94.7
610130	TAX COMPLNC AGT 3	20	18	90.0
610140	TAX COMPLNC AGT 4	4	3	75.0
610150	TAX COMPLNC AGT 5	7	5	71.4
620200	TAX COMPLNC REP	21	18	85.7
627200	SALES TAX TECHN 2	19	18	94.7
627300	SALES TAX TECHN 3	19	13	68.4
627400	SALES TAX TECHN 4	5	5	100.0
630200	EXCISE TAX INVESTGTR	5	5	100.0
630300	SENR EXCISE TAX INVST	9	5	55.6
631200	EXCISE TAX TECHN 2	10	-8	80.0
634200	ESTATE TAX TECHN 2	7	6	85.7
640100	TAX TECHN 1	19	16	84.2
640200	CORP TAX TECHN 2	19	17	89.5
640300	CORP TAX TECHN 3	11	7	63.6
641100	TAXPAYER SRV REP 1	21	18	85.7
645200	TAX PROCSSG SPEC	5	4	80.0
647200	INCOME TAX TECHN 2	20	17	85.0
647300	INCOME TAX TECHN 3	19	18	94.7
647400	INCOME TAX TECHN 4	9	7	77.8
649100	TAX REGULATNS SPEC 1	15	12	80.0
649200	TAX REGULATNS SPEC 2	7	5	71.4
673200	PARI MUTUEL EXMNR	7	7	100.0
673300	SENR PARI MUTUEL EXMR	4	3	75.0
702600	HEAD STATISTICS CLERK	5	3	60.0
705200	STATISTICIAN	9	7	77.8
705300	SENR STATISTICIAN	16	9	56.3
705400	ASSOC STATISTICIAN	17	12	70.6
722400	ASSOC BIOSTATISTICIAN	7	6	85.7
750600	HEAD ACTUARIAL CLERK	4	4	100.0
752200	ASSNT ACTUARY	12	6	50.0
752302	SENR ACTUARY CASUALTY	4	2	50.0
752310	SENR ACTUARY LIFE	8	7	87.5
752410	ASSOC ACTUARY LIFE	4	2	50.0
752440	ASSOC ACTUARY CASLTY	6	4	66.7
752501	PRIN ACTUARY LIFE	6	6	100.0
752502	PRIN ACTUARY CASUALTY	4	2	50.0
752601	SUPVG ACTUARY LIFE	11	10	90.9
803110	COMPUTER SYS PROGR 1	17	13	76.5
803220	COMPUTER SYS PROGR 2	10	8	80.0
803500	MANAGER COMPUTER S SW	9	6	66.7
807100	WMS IMPLEMNTN S 1 NYC	12	8	66.7
807300	WMS INSTALLTN TEAM CR	6	5	83.3

820200	COMPUTER PROGR	18	14	77.8
820300	SENR COMPTR PROG	21	16	76.2
820305	SENR COMPTR PROG AN	19	17	89.5
820410	ASSOC COMPTR PRGMR AN	22	17	77.3
820413	ASSOC COMPTR PG A SCI	8	7	87.5
820900	MANAGER COMPUTER OP	15	12	80.0
821101	DATA BASE PGMMR AN 1	18	15	83.3
821102	DATA BASE PGMMR AN 2	8	7	87.5
821200	COMPUTER OPER	18	12	66.7
821300	SENR COMPTR OPER	20	13	65.0
821500	SUPVG COMPTR OPER	18	13	72.2
821700	CHF COMPTR OPER	18	14	77.8
822030	DATA PROC CLK 3	17	12	70.6
825500	SUPVR DATA PROC	19	14	73.7
825800	ASSNT DIR DATA PROC	17	17	100.0
825901	DIR DATA PROC A	4	4	100.0
825903	DIR DATA PROC C	5	5	100.0
829300	SENR COMPTR SYS ANLST	16	13	81.3
839890	ASSNT DIR DATA PRC SA	6	5	83.3
849600	HEAD DATA ENTY MACH O	11	10	90.9
880000	MANAGER DATA CMMUNCTS	5	5	100.0
880100	DATA COMMUNCTNS SPC 1	10	10	100.0
881300	SENR EMP SYS DATA P S	8	7	87.5
882500	DATA BASE SUPVR	4	4	100.0
893400	STUDENT AID DATA TECH	7	5	71.4
901200	FARMER	20	15	75.0
901600	HEAD FARMER	14	9	64.3
901700	FARM MANAGER	10	7	70.0
911500	PRIN LAB ANIMAL CRTKR	11	8	72.7
1001200	GROUNDS WORKER	19	15	78.9
1001300	SENR GROUNDS WORKER	21	17	81.0
1001500	SUPVR GROUNDS	20	14	70.0
1014000	GREENHOUSE WORKER	6	5	83.3
1101200	HORTICULTURAL INSP	20	18	90.0
1101300	SENR HORTICULTRL INSP	5	5	100.0
1102100	HORTICULTURAL ASSNT	13	11	84.6
1108100	PESTICIDE CONTRL INSP	15	10	66.7
1108300	SENR PESTCDE CTRL INS	8	6	75.0
1201305	VET ANML INDUS	10	9	90.0
1204400	ANIMAL HLTH TECH	6	6	100.0
1210300	SENR LIVESTOCK GRD SP	6	4	66.7
1213300	AGRICL PROGM AIDE	4	3	75.0
1304210	FARM PROD GRDG INSP 1	19	12	63.2
1304220	FARM PROD GRDG INSP 2	9	7	77.8
1304230	FARM PROD GRDG INSP 3	12	10	83.3
1304240	FARM PROD GRDG INSP 4	4	4	100.0
1306300	SENR MARKTG REP	17	14	82.4
1306500	CHF MARKTG REP	4	2	50.0
1403300	SENR CLASS&PAY ANALST	8	8	100.0
1403400	ASSOC CLASS&PAY ANLST	10	8	80.0
1403500	PRIN CLASS&PAY ANALST	4	3	75.0

1405300	SENR STAFFING SV REP	21	16	76.2
1405400	ASSOC STAFFING SV REP	17	15	88.2
1405500	PRIN STAFFING SRV REP	10	8	80.0
1405900	STAFFNG SVS PRGM MGR	4	3	75.0
1412300	SENR PERSNL EXMR	20	14	70.0
1412400	ASSOC PERSNL EXMR	13	9	69.2
1412500	PRIN PERSNL EXMR	6	4	66.7
1420300	SENR MUNCPL PERS CSLT	5	5	100.0
1420400	ASSOC MUNCPL PER CSLT	5	5	100.0
1427300	SENR EMPLE INSUR REP	7	5	71.4
1427400	ASSOC EMPL INS REP	6	4	66.7
1441300	SENR PERSNL ADMR	21	16	76.2
1441400	ASSOC PERSNL ADMR	22	19	86.4
1442100	ASSNT DIR PERS B	14	13	92.9
1442200	ASSNT DIR PERS A	8	6	75.0
1443100	DIR PERSONNEL D	6	5	83.3
1443200	DIR PERSONNEL C	4	4	100.0
1443400	DIR PERSONNEL A	7	5	71.4
1445200	DIR HUMN RESRC MGT 2	8	8	100.0
1445300	DIR HUMN RESRC MGT 3	4	3	75.0
1445400	DIR HUMN RESRC MGT 4	4	3	75.0
1445500	DIR HUMN RESRC MGT 5	4	3	75.0
1446100	DIR INST HMN RSRC M 1	19	17	89.5
1446200	DIR INST HMN RSRC M 2	12	9	75.0
1453220	SOC SRV HUMN RESC DS2	12	10	83.3
1453330	SOC SRV HUMN RESC DS3	8	7	87.5
1453440	SOC SRV HUMN RESC DS4	5	5	100.0
1456100	AGENCY LABR REL REP 1	7	7	100.0
1456200	AGENCY LABR REL REP 2	21	17	81.0
1456300	AGENCY LABR REL REP 3	13	10	76.9
1463310	SENR TRNG TECH POLICE	6	5	83.3
1463330	SENR TRNG TECH FR SFT	9	8	88.9
1463360	SENR TRNG TECH YTH SV	4	3	75.0
1463410	ASSOC TRNG TECHN PLC	6	3	50.0
1464100	AGENCY TRNG&DV S 1	19	14	73.7
1464200	AGENCY TRNG&DV S 2	17	14	82.4
1465951	DIR STAFF DEV&TRNG 1	8	6	75.0
1465952	DIR STAFF DEV&TRNG 2	6	6	100.0
1471100	MENTAL HYG STF DS 1	12	12	100.0
1471200	MENTAL HYG STF DS 2	18	13	72.2
1471300	MENTAL HYG STF DS 3	18	14	77.8
1471310	MENTAL HYG STF DS 3 N	21	13	61.9
1471400	MENTAL HYG STF DS 4	21	14	66.7
1480100	CAREER OPP FLD REP	6	5	83.3
1487100	AFFIRM ACTN ADMR 1	8	5	62.5
1487220	AFFIRM ACTN ADMR 2	9	9	100.0
1488200	AFFIRM ACTN OFFR 2	9	7	77.8
1488300	AFFIRM ACTN OFFR 3	4	3	75.0
1492300	SENR MINRTY G PS	12	8	66.7
1492320	SENR MINRTY G PS S	5	4	80.0
1497100	COMPLIANCE SPEC 1	8	6	75.0

1498200	REGNL AFFRM ACTN R 2	4	3	75.0
1498700	REGNL AFFRM ACTN COORD	4	3	75.0
1500100	PARK WORKER 1	15	10	66.7
1500200	PARK WORKER 2	20	14	70.0
1500300	PARK WORKER 3	190	133	70.0
1506100	FOREST RANGER 1	20	19	95.0
1506200	FOREST RANGER 2	6	5	83.3
1506300	FOREST RANGER 3	12	11	91.7
1507100	PARKS&REC FOREST RNGR	4	2	50.0
1516300	SENR FORESTER	19	19	100.0
1516400	ASSOC FORESTER	20	17	85.0
1530000	FORESTRY TECHNICIAN	14	11	78.6
1530300	SENR FORESTRY TECHN	10	8	80.0
1530500	PRIN FORESTRY TECH	9	7	77.8
1533400	PARKS&REC RGNL PGM SP	9	9	100.0
1538200	TREE PRUNER	19	12	63.2
1538500	TREE PRUNER SUPVR	19	15	78.9
1541000	CONSERVN OPERS SPVR 1	19	16	84.2
1541400	CONSERVN OPERS SPVR 2	20	18	90.0
1542501	REGNL PARK MTCE SPV 1	8	8	100.0
1542601	PARK MTCE SUPVR 1	20	18	90.0
1542602	PARK MTCE SUPVR 2	19	18	94.7
1543100	PARK SUPVR	5	5	100.0
1545500	ASSNT SUPVR PARK OPER	5	4	80.0
1545600	SUPVR PARK OPERATIONS	4	3	75.0
1568200	ASSNT REGNL MGR PK&RC	7	7	100.0
1568300	REGNL MANGR PKS&REC	8	8	100.0
1570501	GOLF CRSE MTCE SUPV A	10	7	70.0
1570502	GOLF CRSE MTCE SUPV B	5	4	80.0
1570503	GOLF CRSE MTCE SUPV C	5	4	80.0
1573100	PARK MANGR 1	21	16	76.2
1573200	PARK MANGR 2	22	21	95.5
1573300	PARK MANGR 3	15	12	80.0
1573600	ASSNT PARK MANGR 1	5	4	80.0
1588100	PARKS&REC ASSNT	9	8	88.9
1608200	ENVIRNL IMPACT EXMR	7	7	100.0
1610700	REGNL SUPVR NTRL RSRC	7	7	100.0
1612610	ENVIRNL SCIENTIST 1	5	5	100.0
1616000	ENVIRNL CONS OFFICER	20	19	95.0
1616500	SUPVG ENVIRNL CONS OF	21	21	100.0
1616700	CHF ENVIRNL CONS OFFR	9	8	88.9
1618100	ENVIRNL ANALYST	19	15	78.9
1618300	SENR ENV ANALYST	19	16	84.2
1618400	ASSOC ENVIRNL ANALYST	21	20	95.2
1618500	PRIN ENVIR ANALYST	12	12	100.0
1621100	MINED LAND RCLMTN S 1	7	4	57.1
1629100	FISH CULTRST 1	13	12	92.3
1629300	FISH CULTRST 3	4	3	75.0
1629400	FISH CULTRST 4	5	5	100.0
1630000	FISH&WILDLIFE TECHN	19	13	68.4
1630300	SENR FISH&WILDLF TECH	20	20	100.0

1630500	PRIN FISH&WILDLF TECH	19	16	84.2
1633110	ENVIRNL CONS INVST 1	21	18	85.7
1633220	ENVIRNL CONS INVST 2	6	6	100.0
1634100	SOLID WASTE MGT SPC 1	4	3	75.0
1634200	SOLID WASTE MGT SPC 2	7	7	100.0
1636200	MARINE RESRCS SPEC 2	6	5	83.3
1636300	MARINE RESRCS SPEC 3	4	3	75.0
1637100	MINERAL RESRCS SPC 1	6	4	66.7
1637200	MINERAL RESRCS SPC 2	5	4	80.0
1637300	MINERAL RESRCS SPC 3	4	3	75.0
1637400	MINERAL RESRCS SPC 4	4	4	100.0
1701400	WMS INSTALLTN TEAM S	12	12	100.0
1711400	ASSOC SOC SV MEDCD AN	7	6	85.7
1714335	CRMNL JSTC PRGM AN 3	7	7	100.0
1726100	LOCAL DATA CNTR CRD 1	6	5	83.3
1728400	ASSOC WATER MGT PGM C	7	5	71.4
1750200	ENERGY CONS PS2	10	8	80.0
1750300	ENERGY CONS PS 3	13	10	76.9
1750400	ENERGY CONS PS 4	7	6	85.7
1761300	ENERGY PLNNR 3	5	4	80.0
1762200	HIGHER EDUC SV PG A 2	13	12	92.3
1769300	AGING SRVS PGM ANL 3	4	4	100.0
1775400	ASSOC HEALTH CARE MSA	7	4	57.1
1775500	PRIN HLTH CARE MG S A	4	4	100.0
1803100	ASSNT PURCHSNG AGNT	17	12	70.6
1803200	PURCHASING AGENT	20	14	70.0
1810140	PURCHASING OFCR 1 PRT	4	4	100.0
1810150	PURCHASING OFCR 1	20	17	85.0
1810210	PURCHASING OFCR 2	8	6	75.0
1811000	PURCHASE SPCS ASSNT	4	3	75.0
1811340	SENR PURCH SP WTR MCH	7	7	100.0
1812200	MOTOR EQ STORESKEEPER	10	9	90.0
1813200	MECHNCL EQUIP INSP	5	3	60.0
1831200	STORES CLERK	19	14	73.7
1831300	SENR STORES CLERK	21	17	81.0
1831500	PRIN STORES CLERK	18	12	66.7
1834200	MECHNCL STRS CLK	17	12	70.6
1834300	SENR MECHL STORES CLK	20	18	90.0
1835100	COMMISSARY CLERK 1	20	15	75.0
1835200	COMMISSARY CLERK 2	13	13	100.0
1835310	COMMISSARY CLERK 3	18	15	83.3
1835400	COMMISSARY CLERK 4	10	9	90.0
1836300	INST RTL STR ASST MGR	9	5	55.6
1836401	INST RTL STR MNGR 1	9	7	77.8
1836402	INST RTL STR MNGR 2	9	5	55.6
1901200	BUSINESS MGMT ASSNT	5	3	60.0
1901300	SENR BUS MGT ASSNT	16	14	87.5
1904200	HEALTH FACLT MGT A 2	14	13	92.9
1905100	BUSINESS OFFICER 1	15	11	73.3
1905200	BUSINESS OFFICER 2	18	15	83.3
1908100	ASSNT BUSINESS OFFR	19	16	84.2

1909500	INST STEWARD	19	18	94.7
1910810	DEPUTY DIR INST ADM 1	8	6	75.0
1910820	DEPUTY DIR INST ADM 2	20	18	90.0
1912700	HOSP ADMN CONSLT	8	5	62.5
1921900	DIR FCLTY ADMNV SRVS	12	12	100.0
2000300	SENR BUDGETG ANLYST	15	12	80.0
2000400	ASSOC BUDGETG ANLST	18	13	72.2
2000600	SUPVG BUDGTG ANLST	7	5	71.4
2000700	CHF BUDGETG ANALYST	20	17	85.0
2001200	BUDGT EXAMINER	8	3	37.5
2001220	BUDGT EXMR PUB FIN	4	2	50.0
2001300	SENR BUDGET EXMR	29	16	55.2
2001320	SENR BUDGET EXMR P FN	7	4	57.1
2001400	ASSOC BUDGET EXMR	27	19	70.4
2001500	PRIN BUDGET EXMR	15	10	66.7
2001513	PRIN BUDGET EXMR P F	6	3	50.0
2001700	ASSNT CHF BDGT EXR	8	4	50.0
2001800	DEPUTY CHF BDGT EXMR	10	5	50.0
2126011	PUBLIC TRANS SFTY S1B	5	5	100.0
2130200	RAIL TRANS SPEC	6	5	83.3
2130300	SENR RAIL TRANS SPEC	13	9	69.2
2130400	ASSOC RAIL TRANS SPEC	8	6	75.0
2132200	TRANS ANALYST	18	15	83.3
2132300	SENR TRANS ANALYST	19	14	73.7
2132400	ASSOC TRANS ANALYST	16	14	87.5
2134202	TRANS PLNG AIDE 2	15	10	66.7
2134303	TRANS PLNG AIDE 3	6	5	83.3
2141200	TRANSIT SPEC 2	8	7	87.5
2141300	TRANSIT SPEC 3	4	3	75.0
2200300	PROOFREADER	6	4	66.7
2203300	SENR EDTRL CLERK	4	3	75.0
2206201	ARTIST DESIGNER 1	4	3	75.0
2206202	ARTIST DESIGNER 2	11	11	100.0
2206203	ARTIST DESIGNER 3	12	11	91.7
2206204	ARTIST DESIGNER 4	4	3	75.0
2209200	PHOTOGRAPHER 2	19	15	78.9
2209300	PHOTOGRAPHER 3	12	10	83.3
2225030	UTILITY OTRCH&ED SP 3	8	6	75.0
2233200	PUBLCTNS PROD ASSNT	6	3	50.0
2238802	ASSNT LOTTRY RGNL D 2	7	3	42.9
2243130	ENVIRNL EDUC 3	4	4	100.0
2243520	CITIZEN PARTCPTN SP 2	8	7	87.5
2243700	CONSERVN ED ASSNT	5	5	100.0
2247200	MUSEUM ATTENDANT	11	7	63.6
2255000	LOTTERY MRKTG AIDE	5	3	60.0
2255100	LOTTERY MRKTG REP 1	15	10	66.7
2255600	LOTTERY MRKTG SPEC	5	4	80.0
2258300	SENR PUBLIC INF SP	16	12	75.0
2258400	ASSOC PUBLIC INFO SP	14	12	85.7
2260000	MEDICAL RELTNS OFFCR	7	5	71.4
2269300	REGNL TOURISM COORD	5	4	80.0

2271200	EMPS RET SYS INFO R 2	7	7	100.0
2275000	ENERGY INFO AIDE	4	4	100.0
2320301	SENR SYSTEM PLNR GAS	4	2	50.0
2322100	EQUALZTN RATES AIDE	8	7	87.5
2322110	EQUALZTN RATES AN 1	8	8	100.0
2322150	EQUALZTN PROGM AIDE	6	4	66.7
2322200	EQUALZTN RATES AN 2	5	5	100.0
2337100	CONSUMER SRVS REPR 1	10	4	40.0
2337200	CONSUMER SRVS REPR 2	6	5	83.3
2337220	CONSUMER SRVS SPEC 2	7	3	42.9
2337330	CONSUMER SRVS SPEC 3	9	8	88.9
2337440	CONSUMER SRVS SPEC 4	4	3	75.0
2347100	REAL PRPTY INFO SYS S	7	6	85.7
2347300	SENR REAL PROP I S S	19	15	78.9
2347400	ASSOC REAL PROP I S S	19	15	78.9
2347500	PRIN REAL PROP I S S	8	6	75.0
2349100	JR RIGHT OF WAY AGENT	16	11	68.8
2349200	ASSNT RIGHT OF WAY AG	22	20	90.9
2349300	SENR RIGHT OF WAY AGT	20	17	85.0
2349400	ASSOC RIGHT OF WAY AG	17	12	70.6
2349500	PRIN RIGHT OF WAY AGT	4	2	50.0
2351110	ASSNT REAL EST AP MAS	17	9	52.9
2351200	REAL ESTATE APPRAISER	7	6	85.7
2351210	REAL ESTATE APP MAS	22	16	72.7
2351300	SENR REAL ESTATE APPR	4	4	100.0
2351310	SENR REAL EST APP MAS	20	17	85.0
2351500	PRIN REAL EST APPRSR	4	4	100.0
2351510	PRIN REAL EST APP MAS	7	6	85.7
2352100	HOUSING MGT ASSNT	6	4	66.7
2352200	HOUSING MGT REP	18	10	55.6
2352300	SENR HOUSING MGT REP	7	3	42.9
2356320	LEASING AGENT 2	8	4	50.0
2366100	PROPERTY MANAGER 1	4	4	100.0
2368100	HOUSING&CMTY DEV AST	8	5	62.5
2368200	HOUSING&CMTY DEV REP	10	7	70.0
2400200	PERSONNL STATUS EXMR	9	9	100.0
2408210	AFFIRM ACTN ASSNT 1	5	4	80.0
2414300	SENR HEALTH PLANNER	5	3	60.0
2414650	ASSNT CHF HLTH PLNNR	6	4	66.7
2426200	HEALTH INSUR DATA C A	5	3	60.0
2427000	CHILD SUPPRT SYS IM A	4	3	75.0
2450200	ECONOMIST	6	3	50.0
2450300	SENR ECONMST	6	6	100.0
2450310	SENR ECONMST BUS RSCH	4	3	75.0
2450320	SENR ECONMST LBR RSCH	13	13	100.0
2450400	ASSOC ECONST	12	5	41.7
2450420	ASSOC ECONST LAB RSCH	12	10	83.3
2450540	PRIN ECONOMIST REG EC	5	4	80.0
2450550	PRIN ECONOMIST LAB RS	7	7	100.0
2459166	PROGRAM RSCH SP 3 MUN	4	3	75.0
2459201	PROGRAM RSCH SP 1	10	4	40.0

2459202	PROGRAM RSCH SP 2	13	9	69.2
2459203	PROGRAM RSCH SP 3	20	17	85.0
2459204	PROGRAM RSCH SP 4	4	3	75.0
2459253	PROGRAM RSCH SP 3 C J	4	2	50.0
2459268	PROGRAM RSCH SP 3 TNS	5	5	100.0
2459270	PROGRAM RSCH SP 4 TNS	6	5	83.3
2459288	PROGRAM RSCH SP 3 TAX	4	3	75.0
2459312	PROGRAM RSCH SP 2 H S	7	4	57.1
2459313	PROGRAM RSCH SP 3 H S	4	4	100.0
2470201	MENTAL HYG PGM EV S 1	7	3	42.9
2470202	MENTAL HYG PGM EV S 2	20	14	70.0
2470203	MENTAL HYG PGM EV S 3	18	13	72.2
2470204	MENTAL HYG PGM EV S 4	18	15	83.3
2471300	SENR MUNCPL RSCH ASST	12	8	66.7
2501511	PRIN CLERK COLLECTION	6	3	50.0
2501519	PRIN CLERK MEDICAL	4	3	75.0
2501522	PRIN CLERK CORP SRCH	4	3	75.0
2501523	PRIN CLERK PROP CNTRL	7	6	85.7
2501600	HEAD CLERK	23	18	78.3
2501612	HEAD CLERK PERSONNEL	22	18	81.8
2501680	HEAD CLERK SURROGATE	8	7	87.5
2501800	CHF CLERK	20	19	95.0
2503600	HEAD FILE CLERK	8	8	100.0
2505200	EXAMS DELIVERY CLERK	4	3	75.0
7307500	CONST EQ RP PROD COOR	11	9	81.8
2522220	LEGAL ASSNT 2	9	6	66.7
2532200	MOTOR EQ REC ASSNT	7	6	85.7
2540520	SUPVG MOTOR VEH REP 2	25	21	84.0
2543100	INMATE RCRDS COORD 1	18	17	94.4
2543200	INMATE RCRDS COORD 2	12	10	83.3
2546100	MEDICAL CODNG CLK	5	5	100.0
2547510	ADMNV SERVS MANGR 1	12	12	100.0
2549100	ENERGY ASSTNC RVW AID	7	6	85.7
2549400	ENERGY ASSTNC RVW SPV	7	5	71.4
2551800	OFF SRVS MANAGER	4	4	100.0
2558400	PAYROLL CLERK 4	13	9	69.2
2562110	STUDENT LOAN CN R 1	20	19	95.0
2562120	STUDENT LOAN CN R 2	15	15	100.0
2562200	STUDENT LOAN CNTRL R	7	7	100.0
2564100	STUDENT AID ADJSTM EX	5	5	100.0
2592100	COLLCTN&CVL PRSCT S 1	7	7	100.0
2598000	CORRL VIDEOTAPE MONTR	7	4	57.1
2606400	INFO PROCSSG SPEC 4	5	4	80.0
2609200	SECRETARIAL ASSNT	20	15	75.0
2610600	HEAD STENOGRAPHER	5	3	60.0
2612600	HEAD HEARING REPORTER	4	3	75.0
2701300	PROCESS SERVER	7	3	42.9
2709100	MAIL&SUPPLY HELPER	135	79	58.5
2709200	MAIL&SUPPLY CLERK	23	16	69.6
2709300	SENR MAIL&SUPPLY CLK	22	16	72.7
2709500	PRIN MAIL&SUPLY CLK	20	14	70.0

2709600	HEAD MAIL&SUPLY CLK	13	10	76.9
2711200	OFF MACH OPER	21	14	66.7
2711300	SENR OFF MCH OP	6	4	66.7
2711340	SENR OFF MCH OP PHOTO	4	4	100.0
2712300	SENR CALC MACH OPER	4	3	75.0
2717200	OFFSET PRNT MCH OP	20	10	50.0
2717300	SENR OFFSET PRT MC OP	17	13	76.5
2717500	PRIN OFFSET PRT MC OP	19	16	84.2
2717600	HEAD OFFSET PRT MC OP	4	3	75.0
2762000	LITHOGRAPHIC PHOTOGR	4	3	75.0
2801100	JR ADMNV ASSNT	20	15	75.0
2801200	ADMNV ASSNT	29	25	86.2
2801300	SENR ADMNV ASSNT	23	19	82.6
2802410	PURE WATRS GRNTS AN 1	6	5	83.3
2802420	PURE WATRS GRNTS AN 2	11	10	90.9
2802430	PURE WATRS GRNTS AN 3	5	5	100.0
2810300	SENR ADMNV ANLST	17	13	76.5
2810400	ASSOC ADMNV ANLS	18	16	88.9
2810600	PRIN ADMNV ANALYST	9	8	88.9
2811000	SUPVR ADMNV ANALYSIS	10	6	60.0
2817300	SENR BUILDG SPACE ANL	16	10	62.5
2817400	ASSOC BULDG SPAC ANLS	4	4	100.0
2819100	SUBSTANCE ABS SUP SA1	4	3	75.0
2819620	SUBSTANCE ABS PGM S 2	19	15	78.9
2819630	SUBSTANCE ABS PGM S 3	9	7	77.8
2829601	ASSNT COMMR LABOR	7	5	71.4
2833310	ARTS PROGRAM ANLST 1	4	2	50.0
2833320	ARTS PROGRAM ANLST 2	21	17	81.0
2833340	ARTS PROGRAM ANLST 4	12	8	66.7
2834200	ASSOC CAPITAL PROG CO	4	3	75.0
2845620	HEALTH PROG ADMR 1 HS	16	10	62.5
2845630	HEALTH PROG ADMR 2 HS	12	10	83.3
2845670	HEALTH PROG ADMR 1 PH	13	11	84.6
2854900	REGNL DIR ENV CONSERV	7	6	85.7
2875110	GRANTS MANGMNT BDGT 1	4	4	100.0
2875120	GRANTS MGMT BDGT SP 2	4	4	100.0
2894210	REGNL ADMNR 1	5	4	80.0
3004600	HEAD HOUSEKEEPER	22	14	63.6
3004701	CHF HOUSEKEEPER 1	16	11	68.8
3004702	CHF HOUSEKEEPER 2	11	9	81.8
3016500	SUPVG JANITOR	20	15	75.0
3016600	HEAD JANITOR	20	15	75.0
3016820	CHF JANITOR 2	4	4	100.0
3018000	LOCKER ROOM ATTENDANT	4	2	50.0
3023010	PARKING LOT ATTDNT	14	10	71.4
3023100	PARKING SRVS ATTDNT	16	10	62.5
3023200	SENR PARKING SRVS ATT	9	8	88.9
3033000	LABORATORY CARETAKER	19	13	68.4
3041100	ASSEMBLY HALL CUSTOD	17	9	52.9
3042200	INST WORKER	41	18	43.9
3050100	WINDOW WASHER	8	4	50.0

3105100	DIETITIAN AIDE	8	5	62.5
3105200	DIETITIAN	21	16	76.2
3105500	SUPVG DIETITIAN	18	14	77.8
3110110	NUTRITION PGM REP 1	13	12	92.3
3110120	NUTRITION PGM REP 2	11	10	90.9
3110200	NUTRITION EDUC CNSLT	8	8	100.0
3110300	SENR NUTRITION S CSLT	5	5	100.0
3111100	NUTRITION SRVS CONSLT	21	14	66.7
3111300	SENR NUTRITIONIST	5	5	100.0
3111400	ASSOC NUTRITIONIST	4	4	100.0
3114300	INST FOOD ADMNSTRATOR	18	14	77.8
3117100	AGING SRVS NUTRTN C 1	5	5	100.0
3118100	ASSNT BAKER	9	3	33.3
3118200	BAKER	20	10	50.0
3119200	MEAT CUTTER	18	12	66.7
3126200	CORRL FCLTY AST FD MG	4	4	100.0
3130100	PASTEURZTN PLANT OPER	7	6	85.7
3302500	LAUNDRY SUPVR	32	17	53.1
3302600	HEAD LAUNDRY SUPVR	20	14	70.0
3302801	LAUNDRY MANAGER 1	4	3	75.0
3302802	LAUNDRY MANAGER 2	8	5	62.5
3305100	LINEN SORTER	7	6	85.7
3504400	ASSOC SCHOOL LIB SRV	4	4	100.0
3509400	ASSOC SCHOOL BUS MGT	13	10	76.9
3509500	SUPVR SCHL BUS MANGT	4	4	100.0
3511200	ASSNT EDUCL TESTING	10	9	90.0
3511400	ASSOC EDUCL TESTING	9	7	77.8
3513500	ASSOC OCCUPL SCH SUPV	4	3	75.0
3521370	ASSOC OCCUPL ED CVL R	5	4	80.0
3521400	ASSOC SPEC OCUPTL E S	5	3	60.0
3521410	ASSOC OCCUPL ED PR DV	4	3	75.0
3522400	ASSOC MATH EDUC	5	5	100.0
3523400	ASSOC ENGLISH EDUC	4	2	50.0
3525400	ASSOC SOC STUDIES ED	5	5	100.0
3525500	SUPVR BILINGUAL EDUC	5	5	100.0
3525700	ASSOC BILINGUAL EDUC	8	6	75.0
3530400	ASSOC READING EDUC	8	7	87.5
3533100	EDUC PRGM ASSNT 1	20	15	75.0
3533200	EDUC PRGM ASSNT 2	12	9	75.0
3535200	ASSNT HIGHER EDUC	6	5	83.3
3535400	ASSOC HIGHER EDUC	11	7	63.6
3536400	ASSOC TRANG SPEC EDUC	7	6	85.7
3541400	ASSOC EDUCL DATA SYS	4	3	75.0
3544400	ASSOC SCHOOL FIN AID	9	6	66.7
3549300	ASSOC SCHOOL DIST ORG	4	4	100.0
3551300	ASSNT SCHOOL LUNCH AD	10	9	90.0
3552310	ASSOC OCCUPL ED PR PL	5	3	60.0
3552400	ASSOC INDUS EDUC	4	4	100.0
3552440	ASSOC EDUCL PLNG&EVUL	10	10	100.0
3554500	ASSOC PHYS EDUC	4	3	75.0
3555470	ASSOC EDUC CHD HC	19	12	63.2

3559300	ASSNT EDUCL INTEGRTN	4	3	75.0
3559400	ASSOC EDUCL INTEGRTN	7	6	85.7
3560200	ASSNT EDUC RESEARCH	8	5	62.5
3560400	ASSOC EDUC RESEARCH	16	9	56.3
3561500	SUPVR EDUC CHLDRN H C	5	3	60.0
3564500	SUPVR SECONDARY EDUC	10	8	80.0
3569200	ASSNT EDUC DISADVNTGD	4	4	100.0
3569400	ASSOC EDUC DISADVNTGD	7	6	85.7
3569500	EDUC DISADV PROG AIDE	8	7	87.5
3570400	ASSOC VETERANS EDUC	10	7	70.0
3573400	ASSOC INSTR MATS HNDC	4	3	75.0
3583400	ASSOC EDUCL TELEVISN	4	3	75.0
3592500	SUPVR OCCUPL EDUC	7	7	100.0
3595400	ASSOC HIGHER OCC EDUC	4	3	75.0
3596400	ASSOC CONTG EDUC	12	8	66.7
3601200	ASSNT LIBRARIAN	20	19	95.0
3601300	SENR LIBRN	16	12	75.0
3601360	SENR LIBRN TECH PROC	9	8	88.9
3601370	SENR LIBRN MEDICINE	9	8	88.9
3601450	ASSOC LIBRN MED	4	3	75.0
3606200	ASSNT LIBRARY SRVS	5	3	60.0
3606400	ASSOC LIBRY SVS	5	4	80.0
3615200	MEDICAL RECORD TECH	20	16	80.0
3615300	MEDICAL RECORD ADMR	13	11	84.6
3615400	SENR MED RECORDS TECH	16	14	87.5
3615500	SUPVG MED RECD ADMR	19	18	94.7
3801241	SCIENTIST ARCHEOLOGY	5	5	100.0
3801310	SENR SCIENT ENTOMLGY	4	3	75.0
3802330	SENR CURATOR HISTORY	4	2	50.0
3814040	MUSEUM EXH SPEC PRD A	4	3	75.0
3817200	CONSERVTOR	5	4	80.0
3836200	HISTORIC CONS TECH	5	4	80.0
3837100	HISTORIC SITE ASSNT	14	13	92.9
3837202	HISTORIC SITE MGR 2	11	10	90.9
3840500	REGNL HSTRC PRESV SPV	4	2	50.0
3841200	HISTORIC PRESRVTN P A	10	9	90.0
3841400	HISTORIC PRESRVTN P A	4	2	50.0
3844200	INTERPRETIVE PGMS AST	11	8	72.7
3852020	ARCHIVIST 2	7	6	85.7
3915600	CURRICULUM CONTNT COR	6	6	100.0
3918200	REMEDIATION ASSNT	13	6	46.2
3920530	EDUC SUPVR GENERAL	18	14	77.8
3920535	EDUC SUPVR SPEC SBJCT	12	11	91.7
3920560	EDUC SUPVR VOCATIONAL	20	20	100.0
3920901	EDUC DIR 1	8	8	100.0
3920902	EDUC DIR 2	10	10	100.0
3923500	SUPVR CORRL FAC VOL T	4	3	75.0
3924400	OCCUPL REGIONAL SUPVR	4	4	100.0
3930100	HABILTATN SPEC 1	20	14	70.0
3930200	HABILTATN SPEC 2	17	9	52.9
3931010	VOC INSTRUCTOR 1	16	10	62.5

3931020	VOC INSTRUCTOR 2	23	19	82.6
3931030	VOC INSTRUCTOR 3	11	7	63.6
3931040	VOC INSTRUCTOR 4	23	19	82.6
3947210	DEV SPEC 1	12	5	41.7
3947220	DEV SPEC 2	18	12	66.7
3947230	DEV SPEC 3	20	15	75.0
3947250	DEV SPEC 5	9	6	66.7
3947300	DEV ASSNT	4	3	75.0
3965020	TEACHER 2	14	7	50.0
3965030	TEACHER 3	12	9	75.0
3965040	TEACHER 4	29	24	82.8
3972200	TEACHING ASSNT	11	10	90.9
4000100	ENGRG AIDE	18	13	72.2
4001200	CIVIL ENGR 1	27	24	88.9
4001220	CIVIL ENGR 1 PLNNG	22	16	72.7
4001240	CIVIL ENGR 1 STRUCTRS	26	20	76.9
4001250	CIVIL ENGR 1 TRFFC	21	17	81.0
4001270	CIVIL ENGR 1 PHYSCL R	17	15	88.2
4001280	CIVIL ENGR 1 MATRLS	17	15	88.2
4001300	CIVIL ENGR 2	24	20	83.3
4001320	CIVIL ENGR 2 PLNNG	19	17	89.5
4001340	CIVIL ENGR 2 TRFFC	18	15	83.3
4001350	CIVIL ENGR 2 STRUCTRS	19	15	78.9
4001360	CIVIL ENGR 2 PHYSCL R	5	5	100.0
4001390	CIVIL ENGR 2 MATRLS	11	10	90.9
4001400	CIVIL ENGR 3	21	18	85.7
4001420	CIVIL ENGR 3 PLNNG	10	10	100.0
4001430	CIVIL ENGR 3 PHYSCL R	6	5	83.3
4001460	CIVIL ENGR 3 STRUCTRS	17	16	94.1
4001490	CIVIL ENGR 3 TRFFC	13	13	100.0
4001940	CIVIL ENGR 4	6	6	100.0
4001950	CIVIL ENGR 5	18	16	88.9
4003200	ENGRG TECH	16	13	81.3
4003201	ENGRG TECH ENV QUAL	18	13	72.2
4003204	SENR ENGRG TECH S TST	4	4	100.0
4003206	PRIN ENGRG TECH S TST	4	3	75.0
4003300	SENR ENGRG TECH	22	18	81.8
4003301	SENR ENGRG TECH WTRPC	16	14	87.5
4003302	SENR ENGRG TECH AIRPC	17	10	58.8
4003303	SENR ENGRG TECH SOILS	10	7	70.0
4003304	SENR ENGRG TECH S W M	12	11	91.7
4003500	PRIN ENGRG TECH	20	17	85.0
4003506	PRIN ENGRG TECH W P C	19	17	89.5
4003507	PRIN ENGRG TECH A P C	14	11	78.6
4003508	PRIN ENGRG TECH SOILS	11	10	90.9
4003514	PRIN ENGRG TECH S W M	4	4	100.0
4010200	PARK ENGINEER	20	18	90.0
4010300	SENR PARK ENGINEER	11	11	100.0
4018000	JR ENGINEER	16	13	81.3
4021510	SUPVR RGNL TRNS P&D 1	5	3	60.0
4021520	SUPVR RGNL TRNS P&D 2	5	4	80.0

4025300	SENR HYDRAULIC ENGR	5	3	60.0
4027200	ASSNT SOILS ENGINEER	22	18	81.8
4027300	SENR SOILS ENGINEER	16	15	93.8
4027400	ASSOC SOILS ENGINEER	9	9	100.0
4028100	JR ENGINEERING GEOL	5	4	80.0
4028200	ASSNT ENGR GEOLOGIST	9	8	88.9
4028300	SENR ENGRG GEOLOGIST	18	14	77.8
4028400	ASSOC ENGRG GEOLGST	5	4	80.0
4043900	REGNL DIR TRANSPORTN	10	7	70.0
4046100	REGNL TRFFC ENGNR 1	4	4	100.0
4046200	REGNL TRFFC ENGNR 2	4	4	100.0
4053100	TRANS MAINTC ENGR 1	20	20	100.0
4053200	TRANS MAINTC ENGR 2	19	19	100.0
4053300	TRANS MAINTC ENGR 3	10	8	80.0
4205200	ASSNT BULDG ELEC ENGR	19	13	68.4
4205300	SENR BUILDG ELEC ENGR	8	5	62.5
4205400	ASSOC BULDG ELEC ENGR	6	6	100.0
4220200	ASSNT BULDG STRUC ENG	7	3	42.9
4220300	SENR BUILDG STRCT ENG	5	4	80.0
4220400	ASSOC BULDG STRU ENGR	7	4	57.1
4230200	ASSNT HEAT&VENTLG ENG	20	13	65.0
4230300	SENR HEAT&VENT ENGR	6	6	100.0
4230400	ASSOC HEAT&VENTG ENGR	4	3	75.0
4240200	ASSNT PLUMBING ENGR	14	8	57.1
4301200	ASSNT BULDG CONST ENG	17	12	70.6
4301300	SENR BUILDG CNSTR ENG	19	13	68.4
4301400	ASSOC BULDG CONST ENG	13	10	76.9
4303200	ASSNT SUPT CONSTR	23	21	91.3
4303300	SENR SUPT CONSTRUCTN	21	19	90.5
4303400	ASSOC SUPT CONST	6	5	83.3
4328200	BULDG CONST PGM MGR 2	12	6	50.0
4330200	ASSNT MECH CONST ENGR	20	15	75.0
4330300	SENR MECHL CONSTR ENG	6	6	100.0
4330400	ASSOC MECH CNSTR ENGR	12	11	91.7
4360100	JR ARCHL ESTMTR	4	2	50.0
4360200	ASSNT ARCHL ESTIMATOR	12	12	100.0
4360300	SENR ARCHL ESTIMATOR	5	3	60.0
4401200	ASSNT SANI ENGR	18	15	83.3
4401220	ASSNT SANI ENGR DSGN	12	5	41.7
4401300	SENR SANI ENGR	21	17	81.0
4401330	SENR SANI ENGR DSGN	8	6	75.0
4401400	ASSOC SANI ENGR	14	9	64.3
4401420	ASSOC SANI ENGR ENV C	24	19	79.2
4401430	ASSOC SANI ENGR S W M	23	19	82.6
4401520	PRIN SANITRY ENGR E C	6	5	83.3
4401530	PRIN SANITRY ENGR SWM	5	3	60.0
4403400	ASSOC SANI CONSTR ENG	16	15	93.8
4410300	SENR SANITARIAN	21	20	95.2
4417100	SANITARY CONST INSP 1	4	4	100.0
4417200	SANITARY CONST INSP 2	10	6	60.0
4426400	ASSOC AIR POL CTL ENG	21	18	85.7

4426500	PRIN AIR POL CTL ENGR	7	7	100.0
4435800	REGNL DIR ENV QU ENGR	6	6	100.0
4540200	ASSNT RAILROAD ENGR	12	9	75.0
4540300	SENR RAILROAD ENGR	7	5	71.4
4540400	ASSOC RAILROAD ENGR	4	4	100.0
4542100	TELECOMMUNCTNS AN 1	7	7	100.0
4542200	TELECOMMUNCTNS AN 2	23	20	87.0
4542300	TELECOMMUNCTNS AN 3	6	5	83.3
4542610	TELECOMMUNCTNS N T S1	4	4	100.0
4580300	SENR VALUATION ENGR	19	15	78.9
4580400	ASSOC VALUATION ENGR	16	10	62.5
4580500	PRIN VALUATION ENGR	8	8	100.0
4582000	ASSNT UTLTY ENGR	12	9	75.0
4601200	ASSNT TAX VAL ENGR	20	15	75.0
4601300	SENR TAX VALUATN ENGR	13	8	61.5
4601400	ASSOC TAX VALUATN ENG	4	2	50.0
4770100	ENGRG MATLS ANLST	4	3	75.0
4770300	SENR ENGRG MATLS ANL	7	7	100.0
4771100	ENGRG MATLS TECH	9	6	66.7
4771300	SENR ENGRG MATLS TECH	13	13	100.0
4771500	PRIN ENGRG MATLS TECH	16	15	93.8
4801100	JR ARCHITECT	4	4	100.0
4801200	ASSNT ARCHITECT	19	16	84.2
4801300	SENR ARCHITECT	17	10	58.8
4801400	ASSOC ARCHITECT	20	15	75.0
4901300	SENR ARCHL SPECS WRTR	6	3	50.0
4903200	ASSNT MECH SPEC WTR	4	3	75.0
4914300	SENR FACILITIES COORD	5	5	100.0
4917200	FACILITIES PLNNR 2	7	6	85.7
5001100	JR LANDSCAPE ARCHITCT	7	5	71.4
5001200	LANDSCAPE ARCHITECT	18	18	100.0
5001300	SENR LANDSCAPE ARCH	22	19	86.4
5001400	ASSOC LANDSCAPE ARCHT	4	4	100.0
5110100	DRAFTING ASSNT	5	3	60.0
5111000	DRAFTING AIDE	17	12	70.6
5111200	DRAFTING TECH	21	18	85.7
5111300	SENR DRFTG TECH GENL	9	4	44.4
5111301	SENR DRFTG TECH ARCHL	7	7	100.0
5111302	SENR DRFTG TECH ELECT	4	4	100.0
5111304	SENR DRFTG TECH STRCT	18	11	61.1
5111501	PRIN DRFTG TECH GENL	10	6	60.0
5111502	PRIN DRFTG TECH ARCHL	10	7	70.0
5111503	PRIN DRFTG TECH ELECT	6	5	83.3
5111504	PRIN DRFTG TECH MECHL	5	4	80.0
5111505	PRIN DRFTG TECH STRCT	22	13	59.1
5148200	MAPPING TECHN 2	15	12	80.0
5148300	MAPPING TECHN 3	9	5	55.6
5149200	MAPPING TECHNLGST 2	4	2	50.0
5150202	ASSNT LAND SURVEYOR 2	8	8	100.0
5150203	ASSNT LAND SURVEYOR 3	6	6	100.0
5150300	LAND SURVEYOR	6	4	66.7

5150410	SENR LAND SURVYR TRAN	8	8	100.0
5200700	CHF FORENSIC UNIT 1	10	8	80.0
5202101	REGNL MED CARE ADMR	20	13	65.0
5202200	MEDICAL CARE ADMR	21	17	81.0
5202400	ASSOC MED CARE ADMR	18	16	88.9
5202500	PRIN MED CARE ADMR	5	3	60.0
5207900	DIR PSYCHIATRIC CNTR	6	6	100.0
5207950	EXEC DIR PSYCHTRC CTR	17	12	70.6
5208900	DIR CHLDNS PSY CENTR	4	2	50.0
5210000	DEV CENTER SPEC	4	4	100.0
5210100	DEV DISBLTS PGM SPC 1	19	15	78.9
5210110	DEV DISBLTS PGM S1 DC	17	10	58.8
5210200	DEV DISBLTS PGM SPC 2	18	13	72.2
5210210	DEV DISBLTS PGM S2 DC	5	3	60.0
5210400	DEV DISBLTS PGM SPC 4	18	14	77.8
5210720	CHF DEV CNTR TRMNT SV	21	15	71.4
5210900	DIR DEVELMNTL CENTR	18	13	72.2
5211410	AREA OFFC DIR LNG T C	5	3	60.0
5211420	AREA OFFC DIR HOSP C	5	5	100.0
5211430	AREA OFFC DIR AMB C	5	3	60.0
5216101	REHAB ASSNT 1	16	14	87.5
5216202	REHAB ASSNT 2	20	16	80.0
5216500	WORKSHOP SPEC	9	8	88.9
5217203	REHAB PHYSICIAN 3	8	5	62.5
5218800	DEPUTY REGNL DIR MH S	5	3	60.0
5218900	REGNL DIR MENT HY SVS	5	4	80.0
5219850	DEPUTY CLNCL DIR I SV	6	4	66.7
5219900	CLINICAL DIR INPTNT S	9	9	100.0
5220410	MENTAL HLTH PGM SPC 1	12	8	66.7
5220420	MENTAL HLTH PGM SPC 2	10	7	70.0
5221700	CHF MEDICAL SRVS	14	11	78.6
5222600	DIR COMTY SRVS	19	14	73.7
5223700	AREA ADMR HLTH SYS MG	5	4	80.0
5226400	PHYSNS ASSNT	19	17	89.5
5228300	SENR EMERGY MD CR REP	10	5	50.0
5246110	ALCLSM PRGM SPEC 1	8	4	50.0
5246120	ALCLSM PRGM SPEC 2	4	2	50.0
5252100	CLINICAL PHYSN 1	23	10	43.5
5252200	CLINICAL PHYSN 2	19	11	57.9
5252300	CLINICAL PHYSN 3	4	2	50.0
5255210	TREATMNT TEAM LD M R	19	14	73.7
5255220	TREATMNT TEAM LD C&YS	20	17	85.0
5255230	TREATMNT TEAM LD M H	19	15	78.9
5256600	CHF MNTL HLTH CHLD TS	9	7	77.8
5256700	CHF MNTL HLTH TRM SRV	21	15	71.4
5256800	DEPUTY DIR TRTMNT SRV	15	12	80.0
5260201	PSYCHIATRIST 1	23	13	56.5
5260202	PSYCHIATRIST 2	18	12	66.7
5260203	PSYCHIATRIST 3	20	13	65.0
5266200	PSYCHIATRIST RSCH 2	6	3	50.0
5267710	DIR QULTY ASSURNC	20	16	80.0

5276900	DIR ALCOHLSM TRTMNT C	7	7	100.0
5277200	MEDICAL SPEC 2	19	15	78.9
5277201	MEDICAL SPEC 1	22	10	45.5
5277400	MEDICAL SPEC 3	14	11	78.6
5284402	PUBLIC H P 2 LMA PRG	11	10	90.9
5284430	PUBLIC H P 2 UTLZN RV	10	7	70.0
5284700	DISTRICT ADMR PUB HLT	8	8	100.0
5291101	COMP EXAMG PHYSN 1	17	12	70.6
5291102	COMP EXAMG PHYSN 2	4	3	75.0
5294000	RESIDENTL TRTMT FCL C	5	5	100.0
5302500	SUPVG BARBER	6	5	83.3
5303500	SUPVG BEAUTICIAN	7	5	71.4
5351201	DENTIST 1	20	12	60.0
5351202	DENTIST 2	21	16	76.2
5351203	DENTIST 3	18	15	83.3
5354200	PUBLIC H DENT LMAP	18	13	72.2
5354400	REGNL PUBLIC HLTH DNT	6	6	100.0
5355100	DENTAL TECHNICIAN	4	4	100.0
5500510	NURSE 1	21	16	76.2
5500520	NURSE 2	25	18	72.0
5500540	NURSE 2 PSY	19	14	73.7
5500550	NURSE REHAB 2	20	9	45.0
5500560	NURSE 2 ONCOLOGY	19	8	42.1
5500600	MENTAL HYG NRSG PGM C	21	20	95.2
5505100	NURSE PRCTNR	20	19	95.0
5506220	TEACHING&RSCH CTR N 2	21	5	23.8
5506230	TEACHING&RSCH CTR N 3	20	7	35.0
5510701	NURSE ADMR 1	20	14	70.0
5510720	NURSE ADMR 2	5	5	100.0
5510730	NURSE ADMR REHAB 1	13	10	76.9
5510750	NURSE ADMR PSY 1	20	15	75.0
5510760	NURSE ADMR 1 ONCOLOGY	21	15	71.4
5510775	NURSE ADMR PSY 2	9	7	77.8
5513200	UTILZTN REVW NRS	17	11	64.7
5517200	UTILZTN REVW COORD	20	17	85.0
5518700	COORD CMTY RESDNCS	8	5	62.5
5518800	COMTY RESDNC ASNT DIR	23	15	65.2
5518900	COMTY RESDNC DIR	21	17	81.0
5520200	MENTAL HYG SPC ADL TA	9	6	66.7
5526200	HEALTH SRVS NURSE	19	17	89.5
5534100	HEALTH PROG AIDE	6	4	66.7
5536100	HEALTH FACLTS SVY 1 N	20	12	60.0
5544200	MENTAL HYG HFWY H A 2	7	5	71.4
5550000	NURSE ANESTHETIST	8	3	37.5
5552500	SUPVR VOLUNTEER SRVS	10	6	60.0
5552700	COORD VOLUNTEER SRVS	22	15	68.2
5553200	CORRL VOL SRVS ASSNT	4	2	50.0
5553500	SUPVR CORRL FAC VOL S	20	15	75.0
5570500	MENTAL HYG THER AST 2	158	106	67.1
5577100	INTERMDT CARE F PG M1	22	17	77.3
5614207	CONSULT NR CMTY N&HHS	4	3	75.0

5614500	COMTY MNTL HLTH NR	21	19	90.5
5615505	COMTY NSG SV CSLT HHS	5	4	80.0
5616200	HOSP NSG SRVS CNSLT	20	10	50.0
5618800	REGNL HOSP NRSG S ADM	4	4	100.0
5700200	PHYSCL THER	30	21	70.0
5700300	SENR PHYSICAL THER	20	17	85.0
5700600	HEAD PHYSICAL THER	17	14	82.4
5700700	CONSULT PHYSICAL THER	10	6	60.0
5700800	CHF PHYSICAL THER	8	6	75.0
5702301	PHYSCL THER ASNT 1	16	13	81.3
5702302	PHYSCL THER ASNT 2	23	18	78.3
5900201	OCCUPL THERPY AST 1	18	12	66.7
5900202	OCCUPL THERPY AST 2	24	18	75.0
5901200	OCCUPL THERAPIST	21	15	71.4
5901300	SENR OCCUPL THER	19	14	73.7
5901600	HEAD OCCUPL THERAPIST	21	15	71.4
5901700	CHF OCCUPL THERAPIST	14	10	71.4
5903100	RECREATION ASSNT	54	31	57.4
5903200	RECREATION THER	20	10	50.0
5903202	RECREATION THER MUSIC	19	11	57.9
5903203	RECREATION THER DANCE	8	6	75.0
5903204	RECREATION THER A SS	17	10	58.8
5903300	SENR RECREATION THER	23	15	65.2
5903400	RECREATION WORKER	26	16	61.5
5903600	HEAD RECREATION THER	20	17	85.0
5903700	CHF RECREATION THERAP	19	15	78.9
5908100	RECREATION PRGM LDR 1	22	16	72.7
5909200	RECREATION PRGM LDR 2	15	13	86.7
5931200	AUDIOLOGIST	16	14	87.5
5932100	ASSNT SPEECH PTHOLGST	17	12	70.6
5932200	SPEECH PATHOLOGIST	17	12	70.6
5934100	SPEECH PATHLGY&A PC 1	11	9	81.8
5934200	SPEECH PATHLGY&A PC 2	11	9	81.8
5960000	MUSIC SUPERVISOR	4	3	75.0
5971200	HANDICRAFT INSTRUCTR	12	12	100.0
6101200	BACTERIOLOGIST	6	4	66.7
6101300	SENR BACTERIOLOGIST	19	14	73.7
6101330	SENR BACTERIOLGST VIR	9	8	88.9
6101400	ASSOC BACTRLGST	7	6	85.7
6104300	RESCH PHYSN 3	6	4	66.7
6107100	MASS SPCTRMTRY AN 1	5	3	60.0
6112300	SENR AQUATIC BIOLOGST	20	15	75.0
6112500	SUPVG AQUATIC BIOLGST	17	16	94.1
6114110	CONSERVN BIOLGST 2 EC	6	5	83.3
6114210	CONSERVN BIOLGST ECOL	4	2	50.0
6114220	CONSERVN BIOLGST AQTC	6	6	100.0
6114240	CONSERVN BIOLGST WLDL	6	6	100.0
6114300	SENR WILDLIFE BIOLGST	20	19	95.0
6114500	SUPVG WILDLIFE BIOLGS	17	14	82.4
6121400	ASSOC ANAL CHEMIST	4	3	75.0
6123200	BIOCHEMIST	14	5	35.7

6123300	SENR BIOCHEMIST	12	11	91.7
6125300	SENR ENGRG MATLS CHEM	4	2	50.0
6126300	SENR FOOD CHEMIST	5	5	100.0
6129300	SENR SANI CHEMIST	8	6	75.0
6129400	ASSOC SANI CHEMIST	4	4	100.0
6129500	PRIN SANITRY CHMST	5	3	60.0
6130300	SENR RADIOL HEALTH SP	7	6	85.7
6130450	ASSOC RADIOL HLTH SPE	7	6	85.7
6140230	PATHOLOGIST 3	16	13	81.3
6152300	SENR RADIOPHYSICIST	4	4	100.0
6154100	ENVIRNL CHEMIST 1	7	6	85.7
6160110	PSYCHOLOGIST 1	20	18	90.0
6160120	PSYCHOLOGIST 2	21	17	81.0
6160400	ASSOC PSYCHOLOGIST	23	19	82.6
6160500	PRIN PSYCHOLOGIST	20	17	85.0
6160600	CHF PSYCHOLOGIST	17	11	64.7
6161220	PSYCHOLOGY ASSNT 2	19	13	68.4
6161230	PSYCHOLOGY ASSNT 3	18	13	72.2
6162000	ASSNT RSCH SCIENTIST	19	14	73.7
6162201	RESCH SCIENT 1	20	13	65.0
6162202	RESCH SCIENT 2	18	13	72.2
6162203	RESCH SCIENT 3	19	12	63.2
6162204	RESCH SCIENT 4	18	10	55.6
6162205	RESCH SCIENT 5	21	17	81.0
6162216	RESCH SCIENT 6	22	19	86.4
6162217	RESCH SCIENT 7	16	12	75.0
6162218	RESCH SCIENT 8	20	11	55.0
6163100	ASSNT CANCER RSCH SCI	22	15	68.2
6163201	CANCER RSCH SCI 1	19	10	52.6
6163202	CANCER RSCH SCI 2	20	12	60.0
6163203	CANCER RSCH SCI 3	9	5	55.6
6163204	CANCER RSCH SCI 4	17	11	64.7
6163205	CANCER RSCH SCI 5	20	12	60.0
6163206	CANCER RSCH SCI 6	19	9	47.4
6163207	CANCER RSCH SCI 7	11	7	63.6
6164202	CANCER RSCH CLNCN 2	18	4	22.2
6164900	CHF CANCER RSCH CLNC	15	7	46.7
6202300	SENR LAB WORKER	8	6	75.0
6204200	LABORATORY TECH	21	14	66.7
6204310	SENR LAB TECH BACT	7	5	71.4
6204320	SENR LAB TECH BIOLOGY	5	3	60.0
6204325	SENR LAB TECH CHEM	19	16	84.2
6204350	SENR LAB TECH MICROBL	15	9	60.0
6204360	SENR LAB TECH BIOCHEM	12	8	66.7
6210300	SENR XRAY AIDE	6	4	66.7
6212200	RADIOL TECH	17	12	70.6
6212300	SENR RADIOL TECH	20	17	85.0
6214400	ELECTROENCPHGRPH R T	4	4	100.0
6215200	ELECTRONICS TECHN	6	3	50.0
6216200	LABORATORY EQ DESGNR	19	13	68.4
6216210	LABORATORY EQ DS ELS	9	5	55.6

6216220	LABORATORY EQ DS CMCT	4	3	75.0
6216300	SENR LAB EQUIP DESGNR	9	6	66.7
6218400	MEDICAL TECHNOLOGIST	19	17	89.5
6219300	SENR CENT MED SPL TCH	6	5	83.3
6219500	MEDICAL TEST ASSNT	5	4	80.0
6225110	MEBICAL LAB TECH 1 SA	5	4	80.0
6225200	MEDICAL LAB TECH 2	23	15	65.2
6232100	CLINICAL LAB CNSLT	9	9	100.0
6234000	CYTOTECHNOLOGIST	5	4	80.0
6236200	OPTICIAN	4	2	50.0
6242100	AUTOPSY AIDE	4	3	75.0
6301200	PHARMACIST	18	16	88.9
6301300	SENR PHARMACIST	22	19	86.4
6301400	PHARMACY CNSLT	16	14	87.5
6322200	NARC INVESTIGATOR	8	7	87.5
6322300	SENR NARC INVEST	10	8	80.0
6326800	ASSNT PHARMACY CNSLT	6	6	100.0
6403200	FOOD PROCESSING INSP	17	15	88.2
6410210	FOOD INSPECTOR 1	17	16	94.1
6410220	FOOD INSPECTOR 2	20	18	90.0
6410230	FOOD INSPECTOR 3	9	8	88.9
6411100	DAIRY PRODCTS SPEC 1	21	20	95.2
6411200	DAIRY PRODCTS SPEC 2	15	12	80.0
6421200	KOSHER FOOD INSPECTOR	6	6	100.0
6463100	PUBLIC H INSPECTOR	10	9	90.0
6467100	PUBLIC H REP 1	17	9	52.9
6467200	PUBLIC H REP 2	9	8	88.9
6467300	PUBLIC H REP 3	13	11	84.6
6501300	SENR ATTORNEY	22	15	68.2
6501400	ASSOC ATTY	24	14	58.3
6501412	ASSOC ATTY TAX	7	5	71.4
6501480	ASSOC ATTY REALTY	14	7	50.0
6501500	PRIN ATTY	15	12	80.0
6501516	PRIN ATTY SEC&PUB FNG	5	3	60.0
6501580	PRIN ATTY APPLS&OPNS	4	3	75.0
6503200	TITLE SEARCHER	19	17	89.5
6510100	ASSNT HEARING OFFCR	4	3	75.0
6510400	HEARING OFFICER	22	15	68.2
6510410	HEARING OFFICER PRL R	7	3	42.9
6510600	SUPVG HEAR OFFR	10	8	80.0
6516100	MEDICAID HRNG EXMR 1	9	7	77.8
6537200	LEGAL REPRESENTATIVE	4	3	75.0
6547200	UI REFEREE	19	12	63.2
6547300	SENR UI REFEREE	10	5	50.0
6552200	TRIAL EXAMINER	6	3	50.0
6553200	MOTOR VEH REFEREE	20	10	50.0
6553300	SENR MOTOR VEH REF	11	7	63.6
6578900	DIR REGIONAL ENF&LGAF	7	6	85.7
6584300	UTILITY HERNG SPEC 3	5	4	80.0
6602100	DENTAL SRVS RV ASNT 1	6	3	50.0
6605200	BEVERAGE CNTRL INVEST	19	14	73.7

6605300	SENR BEV CNTRL INVEST	20	13	65.0
6605500	SUPVG BEV CNTRL INVST	7	6	85.7
6606220	EXEC OFFR E	**8**	**8**	**100.0**
6606230	EXEC OFFR D	9	8	88.9
6613200	ASSNT LAND&CLMS ADJST	9	6	66.7
6613300	SENR LAND&CLAIMS ADJ	8	7	87.5
6630150	INVESTIGATIVE AIDE	7	4	57.1
6630200	INVESTIGATOR	18	15	83.3
6630300	SENR INVESTIGATOR	6	5	83.3
6631300	SENR PROFSL CNDCT INV	23	15	65.2
6631500	SUPVG PRFSL CNDCT INV	9	7	77.8
6633300	SENR SOC SRV CHLD S S	9	5	55.6
6633400	ASSOC SOC SV CHID S S	4	4	100.0
6636100	SOC SRV MEDCAD INV 1	14	10	71.4
6636200	SOC SRV MEDCAD INV 2	10	8	80.0
6640200	CONSUMER FRAUDS REP	4	3	75.0
6640300	SENR CNSMR FRAUDS REP	9	8	88.9
6643400	CORRL SRVS EMP INVSTR	7	3	42.9
6644200	MOTOR VEH INVEST	22	15	68.2
6644300	SENR MOTOR VEH INVEST	11	7	63.6
6646210	LAW DEPT INVEST 1	17	12	70.6
6646220	LAW DEPT INVEST 2	9	4	44.4
6652100	LICENSE INVEST 1	19	9	47.4
6652200	LICENSE INVEST 2	22	10	45.5
6652300	LICENSE INVEST 3	7	4	57.1
6662202	RESOURCES&REIMB AGT 2	20	15	75.0
6662300	SENR RSCS&RMB AGT	20	19	95.0
6662410	RESOURCES&REIMB PD S1	5	4	80.0
6662420	RESOURCES&REIMB PD S2	7	6	85.7
6662500	PRIN RESRCS&REIMB AGT	13	10	76.9
6664000	INSUR FRDS INVESTGTR	6	4	66.7
6665200	GAMES CHANCE INSPCTR	6	3	50.0
6674201	STANDS COMPLC ANLST 1	20	12	60.0
6674202	STANDS COMPLC ANLST 2	20	13	65.0
6674213	STANDS COMPLC AN 1ICF	14	4	28.6
6674223	STANDS COMPLC AN 2ICF	9	4	44.4
6681110	MINORTY BUS ENT L S 1	6	4	66.7
6681510	MINORITY BUS SPEC 1	8	3	37.5
6681520	MINORITY BUS SPEC 2	4	3	75.0
6690200	MEDICAL CONDCT INVEST	6	4	66.7
6690300	SENR MED CNDCT INVST	8	5	62.5
6805100	COMP CLAIMS INVEST 1	19	11	57.9
6805200	COMP CLAIMS INVEST 2	22	17	77.3
6805300	COMP CLAIMS INVEST 3	9	6	66.7
6811200	COMP CLAIMS EXAMINER	22	13	59.1
6811300	SENR COMP CLMS EXAMNR	22	18	81.8
6811400	ASSOC COMP CLMS EXMR	17	12	70.6
6811500	PRIN COMP CLMS EXMR	9	8	88.9
6813700	INSUR FD DST CLMS MGR	4	2	50.0
6818200	WORKERS COMP EXMR	20	19	95.0
6818300	SENR WKRS COMP EXMR	19	9	47.4

6818400	ASSOC WKRS COMP EXMNR	7	4	57.1
6818500	PRIN WKRS COMP EXMR	4	3	75.0
6818700	WORKERS COMP DSTC C M	6	4	66.7
6823200	UI INVESTIGATOR	22	15	68.2
6823300	SENR UI INVESTIGATOR	19	9	47.4
6823400	ASSOC U I INVSTGTR	5	5	100.0
6824300	SENR WKRS COMP REVW A	8	5	62.5
6824400	ASSOC WKRS COMP RVW A	14	10	71.4
6827100	COMP INVEST 1	21	12	57.1
6827200	COMP INVEST 2	7	4	57.1
6828100	CRIME VIC COMP C E 1	5	3	60.0
6830410	INSUR FD HRG REP 1	12	7	58.3
6830420	INSUR FD HRG REP 2	19	15	78.9
6831100	COMP CLAIMS LGL INV 1	7	5	71.4
6851200	UNDERWRITER	20	12	60.0
6851300	SENR UNDERWRITER	19	16	84.2
6851400	ASSOC UNDERWRITER	7	6	85.7
6862300	SENR UI HEARING REP	18	11	61.1
6862400	ASSOC U I HEARING REP	16	15	93.8
6863200	UI CLAIMS EXMR	21	15	71.4
6863300	SENR UI CLAIMS EXMR	22	15	68.2
6864200	UI REVIEWING EXMR	18	14	77.8
6864300	SENR UI REVIEWING EXR	9	6	66.7
6893300	MEDICAID CLMS EXMNR 3	8	6	75.0
6893400	MEDICAID CLMS EXMNR 4	4	3	75.0
6894100	SOC SRV DIS ANLST 1	19	14	73.7
6894200	SOC SRV DIS ANLST 2	19	12	63.2
6894300	SOC SRV DIS ANLST 3	18	14	77.8
6894400	SOC SRV DIS ANLST 4	16	14	87.5
6895100	SOC SRV DIS AIDE	6	5	83.3
6897710	DISABLTY DETRM RGNL A	5	4	80.0
6921000	CONST EQ OP	21	16	76.2
6921200	HIGHWAY EQUIP OPER	21	14	66.7
6921700	BRIDGE REPAIR SUPVR 2	18	15	83.3
6922101	BRIDGE REPAIR ASSNT	17	11	64.7
6922202	BRIDGE REPAIR MECH	22	17	77.3
6922303	BRIDGE REPAIR SUPVR 1	18	17	94.4
6933500	HIGHWAY MTC SUPVR 1	20	17	85.0
6933700	HIGHWAY MTC SUPVR 2	20	18	90.0
6961000	LABORER	24	18	75.0
6961500	LABOR SUPERVISOR	17	11	64.7
6962600	PAVEMENT MRKG SUPVR	19	16	84.2
6963600	SIGN CREW SUPVR	20	17	85.0
7002000	CARPENTER	23	13	56.5
7002700	SUPVG CARPENTER	19	12	63.2
7010000	MASON&PLASTERER	20	14	70.0
7010700	SUPVG MASON&PLASTERER	6	6	100.0
7020000	PAINTER	20	16	80.0
7020700	SUPVG PAINTER	19	17	89.5
7030000	ROOFER&TINSMITH	18	13	72.2
7100001	PLANT SUPT C	18	13	72.2

7100002	PLANT SUPT B	21	18	85.7
7100003	PLANT SUPT A	11	8	72.7
7101300	MAINTCE SUPVR 1	19	14	73.7
7101500	MAINTCE SUPVR 2	21	15	71.4
7106200	FACILITIES MGMT ASSNT	5	5	100.0
7107110	PUBLIC BLDGS MGR 1	10	8	80.0
7107120	PUBLIC BLDGS MGR 2	6	5	83.3
7132200	REFRIG MECHANIC	20	14	70.0
7141200	SEWAGE PLANT OPERATOR	14	10	71.4
7141300	SENR SWGE PLT OP	15	14	93.3
7141500	PRIN SEWAGE PLNT OPER	11	8	72.7
7141600	HEAD SEWAGE PLANT OPR	4	3	75.0
7150300	MAINTCE SUPVR 3	19	14	73.7
7150500	MAINTCE SUPVR 4	15	12	80.0
7202000	MAINTCE ASSNT	25	17	68.0
7202100	MAINTCE ASSNT CARPNTR	19	12	63.2
7202115	MAINTCE ASSNT LCKSMTH	13	10	76.9
7202130	MAINTCE ASSNT MSN&PLR	16	11	68.8
7202150	MAINTCE ASSNT PAINTER	20	14	70.0
7202170	MAINTCE ASSNT RFR&TNS	19	7	36.8
7202190	MAINTCE ASSNT PARKS	19	13	68.4
7221800	CHF LOCK OPERATOR	19	19	100.0
7223500	CANAL ELECTRICAL SUPV	7	7	100.0
7224000	CANAL STRCTR OPER	19	12	63.2
7225100	CANAL MTC SUPVR 1	15	15	100.0
7225200	CANAL MTC SUPVR 2	6	4	66.7
7225700	CANAL SECTION SUPT	7	6	85.7
7251300	CORE DRILL OPERATOR	9	6	66.7
7252200	ASSNT DRILL RIG OPER	19	13	68.4
7252300	DRILL RIG OPERATOR	20	16	80.0
7252400	WAREHOUSE EQUIP OPER	20	14	70.0
7260200	OVERHEAD CRANE OPER	11	6	54.5
7261200	CRANE&SHOVEL OPERATOR	20	20	100.0
7302200	FILTER PLANT OPERATOR	18	12	66.7
7302300	SENR FILTER PLANT OP	11	8	72.7
7307200	CONST EQ MECHANIC	20	17	85.0
7310300	ADAPTIVE EQUPMNT SPEC	10	7	70.0
7311100	GARAGE HELPER	8	5	62.5
7311200	GARAGE ATTENDANT	8	5	62.5
7312000	MOTOR EQ MECH	17	13	76.5
7313300	MOTOR EQ MTC SUPVR 1	17	12	70.6
7313500	MOTOR EQ MTC SUPVR 3	10	8	80.0
7313700	MOTOR EQ MTC COORD	28	24	85.7
7313800	TRANS MOTOR EQUP MNGR	10	9	90.0
7322000	LOCKSMITH	19	14	73.7
7324510	TRANS SUPVR 1	16	13	81.3
7331100	ELECTRICIAN	20	12	60.0
7331200	SUPVG ELECTRICIAN	17	10	58.8
7341150	TRAFFIC SIGNAL MECHNC	21	17	81.0
7341250	ASSNT SIG MECH	20	15	75.0
7341700	SUPVG TRFFC SGNL MECH	11	11	100.0

7342200	COMMUNCTNS OPER	4	2	50.0
7345010	MAINTCE ASSNT MECH	20	11	55.0
7345020	MAINTCE ASSNT PLMBR&S	20	13	65.0
7345060	MAINTCE ASSNT ELECTRN	20	13	65.0
7351000	MACHINIST	19	12	63.2
7352000	GEN MECHANIC	21	15	71.4
7354000	LABORATORY MECHN	21	13	61.9
7357000	ELECTRONIC EQUIP MECH	18	13	72.2
7359200	SHEET METAL WORKER	14	9	64.3
7360000	STEEL FABRICATOR	5	5	100.0
7361000	PLUMBER&STEAMFITTER	20	14	70.0
7361700	SUPVG PLUMBER&STMFTR	19	12	63.2
7367000	PUMPING PLANT OPER	4	3	75.0
7371000	WELDER	19	16	84.2
7389200	EQUIPMENT OPER INSTR	6	5	83.3
7440300	MAINTCE ASSNT MARINE	14	11	78.6
7443500	TENDER CAPTAIN	12	8	66.7
7444500	TUG CAPTAIN	10	9	90.0
7445100	DREDGE CRANE OPER	10	7	70.0
7445200	DREDGE OPERATOR	9	7	77.8
7445500	DREDGE CAPTAIN	5	4	80.0
7446500	DERRICK BOAT CAPTAIN	5	3	60.0
7447000	MARINE ENGINEER	17	14	82.4
7452000	MOTORIZED SCOW OPER	5	4	80.0
7501100	ASSNT STATNRY ENG	20	15	75.0
7501200	STATIONRY ENG	21	15	71.4
7501300	SENR STATIONARY ENGR	21	20	95.2
7501500	PRIN STATIONARY ENGR	22	16	72.7
7501600	HEAD STATIONARY ENGR	15	8	53.3
7511000	POWER PLANT HELPER	24	15	62.5
7511300	HEATG PLANT EQ SP 3	5	5	100.0
7605300	SENR AIRPORT DEV SPEC	7	5	71.4
7615000	TANDEM TRACTOR TRL OP	22	13	59.1
7734000	UPHOLSTERER	18	11	61.1
7744000	PRINTING SHOP HELPER	6	6	100.0
7744100	PRINTER	10	6	60.0
7744400	REGENTS PRINTER	15	9	60.0
7747200	SIGN PAINTER	14	11	78.6
7815000	LABOR STNDRD INVST	24	19	79.2
7815300	SENR LABOR STNDRD INV	17	16	94.1
7815500	SUPVG LABOR STNRD INV	14	13	92.9
7818200	BOILER INSPECTOR	18	11	61.1
7818300	SENR BOILER INSPECTOR	5	5	100.0
7840300	SENR INDUS HYGIENIST	16	14	87.5
7845120	GAS&PETROLM INSPCTR 2	16	15	93.8
7845130	GAS&PETROLM INSPCTR 3	4	4	100.0
7863200	FIELD REP FIRE 2	7	7	100.0
7866200	MOTOR VEH INSPECTOR	21	14	66.7
7866500	SUPVG MOTOR VEH INSP	9	7	77.8
7867000	CAMPUS SAFTY SPEC	6	5	83.3
7869300	TRANS HLTH&SFTY REP	8	7	87.5

7875200	RAILROAD EQUIP INSP	5	4	80.0
7884200	SAFETY&HLTH INSPTR	21	18	85.7
7884300	SENR SAFTY&HLTH INSPC	18	18	100.0
7884600	SUPVG SAFTY&HLTH INSP	16	16	100.0
7886000	FIRE SAFETY TECH	4	2	50.0
7886110	FIRE&SAFETY REP	13	13	100.0
7891700	CHF TELEPHONE TECH	4	4	100.0
7894300	SENR UTILITY RTS ANL	4	2	50.0
7895200	MOTOR CARRIER INVEST	13	9	69.2
7897100	WEIGHTS&MSURS SPC 1	4	2	50.0
7901300	PRODUCTION CNTRL SPVR	7	4	57.1
7902800	ASSNT INDUS SUPT	5	5	100.0
7902900	INDUS SUPT	9	7	77.8
7918500	QUALITY CONTRL SUPVR	7	6	85.7
7946501	GEN INDUS TRNG S MPM	4	4	100.0
7946514	INDUS TRNG SPVR 2 G M	19	15	78.9
7946518	INDUS TRNG SPVR 2 MPM	20	16	80.0
7946522	INDUS TRNG SPVR 2 S M	5	4	80.0
7946532	INDUS TRNG SPVR 2 WPM	20	13	65.0
7946534	INDUS TRNG SPVR 2 M M	5	4	80.0
8100100	SOC SRV ASSNT	17	10	58.8
8106200	SOC SRV REP	20	18	90.0
8107210	PSYCH SOC WKR 1	19	14	73.7
8107220	PSYCH SOC WKR 2	19	17	89.5
8107410	PSYCH SOC WK ASST 1	5	4	80.0
8107420	PSYCH SOC WK ASST 2	17	14	82.4
8107430	PSYCH SOC WK ASST 3	21	16	76.2
8107510	PSYCH SOC WK SUPVR 1	20	19	95.0
8107530	PSYCH SOC WK SUPVR 3	16	10	62.5
8108203	MEDICAL SOC WKR B	7	6	85.7
8109300	SENR DRG ABUS REH CNS	16	10	62.5
8111600	PUBLIC H SOC WRK CNST	19	14	73.7
8122000	CORR COUNSELOR	21	19	90.5
8122003	CORR COUNSELOR MIN GP	21	18	85.7
8122005	CORR COUNSELOR AIDE	9	7	77.8
8122300	SENR CORRECTION CNSLR	18	14	77.8
8123500	NETWORK PRGM ADMR	10	6	60.0
8126100	HUMAN RTS SPEC 1	18	16	88.9
8126300	HUMAN RTS SPEC 3	4	4	100.0
8130100	COMTY CLIENT SVS ASST	20	15	75.0
8132100	AGING SRVS REP	8	6	75.0
8132420	AGING SRVS PGM CORD 2	5	4	80.0
8132500	AGING SRVS AREA SUPVR	4	3	75.0
8133210	ECONOMIC OPP PGM R 1	6	4	66.7
8133220	ECONOMIC OPP PGM R 2	20	8	40.0
8133230	ECONOMIC OPP PGM R 3	4	3	75.0
8137010	SOC SRV PROG AIDE	8	6	75.0
8139100	WORKERS COMP S W1 55B	6	6	100.0
8139200	WORKERS COMP SOC W 2	5	5	100.0
8141110	CHILD PROTCTV SV S1SS	19	12	63.2
8141120	CHILD PROTCTV SVS S 2	10	6	60.0

8141300	CHILD PROTCTV SVS S 3	4	3	75.0
8154100	SOC SRV PROG SPEC	19	12	63.2
8154210	ENERGY PROGM SPEC 1	4	3	75.0
8154220	ENERGY PROGM SPEC 2	4	3	75.0
8154300	SENR SOC SRV PROG SPC	22	20	90.9
8154400	ASSOC SOC SV PRGM SPC	20	18	90.0
8154500	PRIN SOC SRV PROG SPC	5	4	80.0
8155300	SENR SOC SRV PLNG SPC	18	15	83.3
8156200	SOC SRV EMPL SPEC	6	6	100.0
8156300	SENR SOC SRV EMP SPEC	6	4	66.7
8159110	SOC WORK ASSNT 1	5	4	80.0
8159120	SOC WORK ASSNT 2	19	14	73.7
8159130	SOC WORK ASSNT 3	21	18	85.7
8159210	SOC WORKER 1	21	14	66.7
8159220	SOC WORKER 2	15	10	66.7
8159510	SOC WORK SUPVR 1	23	21	91.3
8159530	SOC WORK SUPVR 3	8	5	62.5
8160200	SOC SRV MEDL ASTC SPC	14	9	64.3
8160300	SENR SOC SRV MD AST S	20	17	85.0
8160400	ASSOC SOC SV MD AST S	8	7	87.5
8162021	MEDICAID RVW AN 2 MC	6	6	100.0
8162031	MEDICAID RVW AN 3 MC	6	4	66.7
8168200	CHILD WELFARE SPEC 2	5	5	100.0
8169101	YOUTH FACILITY DIR 1	19	13	68.4
8169202	YOUTH FACILITY DIR 2	15	11	73.3
8169300	YOUTH FACILITY DIR 3	10	7	70.0
8171200	EDUC COUNSELOR	18	14	77.8
8173200	YOUTH DIV CNSLR	22	18	81.8
8173300	SENR YOUTH DIV CNSLR	22	14	63.6
8173500	SUPVG YOUTH DIV CNSLR	13	10	76.9
8174200	FOSTER GRNDPRNT PGM C	8	5	62.5
8175800	YOUTH RESD ASSNT S PG	6	5	83.3
8179500	DISTRICT SPVR YTH R S	13	9	69.2
8179900	REGNL DIR YTH REHAB S	6	4	66.7
8191100	SUBSTANCE ABS PRJ C 1	7	3	42.9
8256200	YOUTH RESD ASSNT S AD	5	4	80.0
8281000	CHAPLAIN	20	16	80.0
8301400	INSTRUCTOR BLIND	4	4	100.0
8305420	METHADONE PGM RV SP 2	4	3	75.0
8311100	VENDING SRVS SPEC	11	8	72.7
8316600	DISTRICT MGR SV B 55B	9	7	77.8
8323300	MOBILITY INSTRUCTOR	7	6	85.7
8326001	VOC SPECIALIST 1	20	15	75.0
8332100	YOUTH LOCL ASTNC P S1	19	16	84.2
8332200	YOUTH LOCL ASTNC P S2	4	4	100.0
8341100	REHAB FACILITIES SPEC	8	6	75.0
8341200	REHAB CNSLR	5	4	80.0
8341260	REHAB CNSLR 1	13	8	61.5
8341270	REHAB CNSLR 2	23	15	65.2
8341610	SUPVR REHAB SRVS VOC	5	5	100.0
8344500	SUPVR VOC REHAB UNIT	15	14	93.3

8346100	VOC REHAB CNSLR A SS	5	5	100.0
8346200	VOC REHAB CNSLR	184	154	83.7
8346300	SENR VOC REHAB CNSLR	19	16	84.2
8346400	ASSOC VOC REHAB CNSLR	16	15	93.8
8351520	DISTRICT MGR VOC RE 2	8	7	87.5
8366010	ASSNT INMATE GRVNC PG	11	9	81.8
8366200	CORRL PROGM COORD	11	11	100.0
8366700	SUPVR INMATE GRVNC PG	17	14	82.4
8402200	OCCUPL ANALYST	14	12	85.7
8403340	SENR EMP CONSLT COUNS	6	5	83.3
8403380	SENR EMP CONSLT M GRP	5	3	60.0
8405200	EMPL COUNSLR	17	10	58.8
8405300	SENR EMP COUNSLR	19	9	47.4
8406200	EMPL SYS FLD SPPRT AN	4	2	50.0
8408200	EMPL SRVS REP	10	9	90.0
8411200	EMPL INTRVWR	20	16	80.0
8411300	SENR EMP INTERVIEWER	17	9	52.9
8415500	YOUTH PROG SUPVR	21	11	52.4
8416200	COMTY WORKER	4	4	100.0
8417200	RURAL EMPL REP	19	19	100.0
8426000	TEMP RELEASE INTVWR	16	15	93.8
8432410	EMPL SEC MANGR 4	19	16	84.2
8432420	EMPL SEC MANGR 3	19	18	94.7
8432430	EMPL SEC MANGR 2	18	16	88.9
8432440	EMPL SEC MANGR 1	9	8	88.9
8432700	EMPL SEC SUPT	19	13	68.4
8432900	EMPL SEC AREA DIR	4	4	100.0
8442200	YOUTH EMPL PRGM SPEC	4	4	100.0
8445200	STATE VETERAN CNSLR	20	17	85.0
8445600	EMPL INTRVWR DSAB VOP	19	12	63.2
8522200	PUBLIC WK WAGE INVEST	22	18	81.8
8522300	SENR PUBLIC WK WG INV	8	6	75.0
8541300	SENR BUS CNSLT	6	5	83.3
8545200	INDUS DEV REP	15	13	86.7
8548810	COMMERCE DIST ADMR 1	5	5	100.0
8602200	PAROLE OFFCR	22	16	72.7
8602300	SENR PAROLE OFFICER	20	14	70.0
8602500	SUPVG PAROLE OFFICER	18	12	66.7
8604200	PROBATION PGM CNSLT	16	15	93.8
8606400	CRMNL JSTC PRGM R 4	4	4	100.0
8614100	STATE PROBATION OFFCR	4	4	100.0
8619100	PROBATION PGM ADMR 1	5	4	80.0
8700100	CORR OFFICER	20	8	40.0
8700200	CORR SERGEANT	21	14	66.7
8700300	CORR LIEUT	21	14	66.7
8700400	CORR CAPTAIN	20	18	90.0
8700500	COMTY CORRL CTR ASSNT	7	5	71.4
8701000	BULDG GUARD	20	9	45.0
8705200	SECURITY OFFICER	16	13	81.3
8705300	SENR SECURITY OFFICER	4	2	50.0
8706000	INST SAFTY OFFCR	4	4	100.0

8708200	WARRANT&TRANSFER OFFR	13	9	69.2
8710100	IDENT SPEC 1	18	13	72.2
8710200	IDENT SPEC 2	10	6	60.0
8710300	IDENT SPEC 3	6	4	66.7
8714000	PARK PATROL OFFCR	24	21	87.5
8714500	SERGEANT PARK PATROL	22	17	77.3
8714750	LIEUTENANT PARK PTROL	14	11	78.6
8718200	SECURITY HSP TRT ASNT	19	12	63.2
8718220	SECURITY HSP TRT A A	12	5	41.7
8718300	SECURITY HSP SR TRT A	21	14	66.7
8718400	SECURITY HSP SPV TR A	12	10	83.3
8720200	CORR CLASS ANALYST	6	4	66.7
8720800	DEPUTY SUPT SECURY SV	18	15	83.3
8721800	DEPUTY SUPT PROGM SVS	20	16	80.0
8722800	DEPUTY SUPT ADMNV SVS	17	16	94.1
8730100	CAPITAL POLICE OFFCR	20	14	70.0
8730250	FIRE SAFETY OFFCR 1	4	4	100.0
8730300	CAPITAL POLICE SGT	11	6	54.5
8730400	CAPITAL POLICE LIEUT	4	4	100.0
8731100	SECURITY SRVS ASSNT 1	19	14	73.7
8731200	SECURITY SRVS ASSNT 2	12	8	66.7
8736900	DIR CORRL PRGM	4	3	75.0
8753200	CAMPUS PUB SFTY OFC 2	20	11	55.0
8753300	CAMPUS PUB SFTY SPV 0	21	16	76.2
8754100	CAMPUS PUB SFTY INVSG	19	14	73.7
8755100	SAFETY&SCRTY OFFR 1	20	15	75.0
8755150	CHF SAFTY&SCRTY OFF 1	7	4	57.1
8755200	SAFETY&SCRTY OFFR 2	20	17	85.0
8755250	CHF SAFTY&SCRTY OFF 2	19	18	94.7
8901000	MOTOR VEH LICENSE EXR	16	15	93.8
8901300	SENR MOTOR VEH LIC EX	13	9	69.2
8901500	PRIN MTR VEH LIC EXMR	14	13	92.9
8908800	ASSNT DIST DIR MTR VH	21	16	76.2
8908900	DISTRICT DIR MOTR VEH	16	15	93.8
8913200	HIGHWAY SFTY PROG REP	7	3	42.9
8925200	BODY REPAIR INSP	10	4	40.0
8931200	AUTO FCLTS INSP	21	17	81.0
8931300	SENR AUTO FACLTS INSP	14	10	71.4
8931500	SUPVG AUTO FACIL INSP	6	6	100.0
8934100	MOTOR VEH CNSMR S R 1	11	11	100.0
8937200	MOTOR VEH INS SV RP 2	5	4	80.0
8969500	SUPVG DRVR IMPRMT ADJ	7	6	85.7
8970400	DRIVER IMPRV ANALYST	13	10	76.9
8970900	SENR DRIVER IMPRV ANL	6	4	66.7

GROUPED RESPONSES

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APPENDIX G:

MAIN SURVEY: JOB TITLES DELETED DUE TO INADEQUATE RESPONSE RATE

Deleted Titles Due to Inadequate Response Rates

To-be-Estimated Titles

5503200	Operating Rm Tech
5503300	Senr Oper Rm Techn

Non-estimated Titles

395200	Insur Collector
1776600	OTB Operatns Anlst
2414400	Assoc. Health Planner
2523100	Latent Fingrprnt Exmr
2571100	Eligblty Revw Clk 1
2642100	Pathology Off Assnt 1
2700100	Off Assistant
3118600	Head Baker
3518500	Supvr Urban Sch Srvs
3521360	Assnt Occupl Ed Cvl R
3814030	Museum Exh Spec Rest
3950300	Career Dev Trng Spec
4361300	Senr Mechl Estimator
5210300	Dev Disblts Pgm Spc 3
5297600	Assnt Dir Cnty S Pg 0
5501200	Hosp Attendant 2
5506210	Teaching & Rsch Ctr Nl
5701100	Hosp. Physl Thrpy Aide
6104100	Resch Physn 1
6160112	Psychologist 1 Cor Sv
6163400	Assoc. Cancer Rsch Sci
6164600	Assoc. Chf Cr Rsch Cln
6204370	Senr Lab Tech Physiol
6212320	Senr Radiol Tech Thrp
6501470	Assoc. Atty Insurance
6506400	Assoc. Counsel
6515100	Health Dept. Hrg Exmr 1
6674203	Stands Comple. Anlst 3
6894500	Soc. Srv Dis Anlst 5
7353000	Laboratory Mechn Asst
7441700	Deckhand Supervisor
7711200	Bookbinder
7746200	Sign Shop Worker
7862220	Field Rep Code. Cmpl 2
7863100	Field Rep Fire 1
8108300	Senr Med Soc. Worker
8111400	Senr Public Hlth S W C
8144202	Comty Plcmnt Spec 2
8546200	Interntnl Trade Spc 2
8753100	Campus Pub Sfty Ofc 1
8960000	Highway Sfty Pgm Anl