CENTER FOR WOMEN IN GOVERNMENT AND CIVIL SOCIETY
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Pay Equity Study In New York State And Local Government

Conducted by the Center for Women in Government & Civil Society, Rockefeller College of Public Affairs & Policy, University at Albany, State University of New York

Foreword

In 2018, the New York State (NYS) Legislature enacted a law directing the President of the Civil Service Commission to study and publish a report evaluating wage disparities among public employees. The mandate was pursuant to state policies to ensure equitable compensation of public employees throughout New York State and to eliminate any wage disparities in public employment statewide. The Act posited that equitable compensation would be achieved when the "primary consideration in negotiating, establishing, recommending, and approving wages was the equivalent value of the job title content in relationship to other job titles and position classifications in civil service." This report documents the process and outcomes of a study of New York State's and a sample of local governments' wage compensation of public employees in compliance with the legislative act. The study's objectives were to (a) identify wage disparities in compensation of equivalent jobs (i.e., different jobs that are comparable when examining a composite of skills, effort, level of responsibility, supervisory relationships, and working conditions required to perform each job); and (b) recommend adjustments to eliminate any wage compensation disparities. The study was conducted for the NYS Department of Civil Service by the Center for Women in Government & Civil Society, Rockefeller College of Public Affairs & Policy, University at Albany, State University of New York.

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Executive Summary

The NYS Legislature enacted Chapter 403 of the Laws of 2018 that directed the President of the Civil Service Commission to study and publish a report evaluating wage disparities among public employees. A primary goal of the study was to identify job titles that have been undervalued because they have been historically dominated by women or minorities. Undervaluing due to unconscious bias, or bias associated with historical assumptions about underrepresented groups, is a violation of state policies that mandate equitable compensation of public employees throughout New York State and elimination of any wage disparities in public employment statewide.

The study's objectives were to: (a) identify wage disparities in compensation of equivalent jobs (i.e., different jobs that are comparable when examining a composite of skills, effort, level of responsibility, supervisory relationships, and working conditions required to perform each job); and (b) recommend adjustments to eliminate any wage compensation disparities. Below is the outcomes of the analyses related to wage compensation in the NYS civil service workforce, a sample of NYS local governments, and New York City.

New York State Workforce

A new survey, based partly on the state's previously used job content gathering tool, was developed to collect job information from employees. The survey was sent to a sample of 20,327 employees; and 8,872 responded. Responses were reflective of gender and race/ethnicity composition of the titles.

Using regression analyses, the study examined how salary grade, which represents the value of employees' work, is influenced by job content factors—representing the dimensions of work employees do—and the percent of female and/or percent of racial/ethnic minorities within the various job titles. A significant influence of percent of female or percent of racial/ethnic minorities within the various job titles may be seen as an indicator of bias. Initial findings indicated a significant influence for percent of female employees within job titles but not for percent of racial/ethnic minorities. These findings led to a further examination of the amount of devaluation of female-dominated job titles particularly at low and medium salary grade levels. The extent of devaluation ranges from -.95 to -.01 and, among 183 female-dominated titles included in the study, 38 job titles show more than .5 salary grade devaluation. The analysis shows what the implicit valuation of the new job content factors would be if the devaluation did not disproportionately affect female-dominated job titles.

Sample of New York State Local Governments

The sample included two upstate cities and five upstate counties. Many of the localities initially selected to participate refused; and a few localities that offered to participate lacked a sufficient employee pool to allow for appropriate analyses. In some localities, the entire workforce was asked to respond to the questionnaire; in others, samples were drawn.

For the sample of NYS local governments, it was not possible to determine gender domination based on job composition using the data provided by local jurisdictions, and so jobs were labeled as female-/male-dominated or gender-integrated based on national standards. In addition, there were no minority-dominated job titles; so this variable was deleted from the analyses of city and county governments.

The analyses show that, overall, being a "female-dominated job title" was a consistent negative predictor of job titles' salary across the local governments. This means that female-dominated jobs appear to be devalued across the local governments in the sample. The analyses indicate that the directions of the job content factors' influence are inconsistent across the local governments. In addition, the directions of the job content factors' influence are not always consistent with findings from the state analysis. Such inconsistency might be caused by several reasons, including the small sample sizes, use of median salary instead of salary grade, and other differences across localities. Similarly, there is a wide range of variability in the magnitude of the influence of a job title being female-dominated on salary. Still, despite the limitations, there is a consistent finding that female-dominated job titles may be devalued in their salary across the local governments. Using regression analyses, specific job titles were identified as potentially undervalued within the different localities. Although the results regarding local governments are inconclusive, the study team recommends that each local government further investigate the job titles identified as undervalued to determine if there might be unfair compensation.

New York City Workforce

The analysis of data collected from the New York City (NYC) workforce was conducted separately because its workforce and number of job titles are large in comparison with those of the other localities in this study. A total of 133 titles were included in the final analysis

To determine whether there was bias associated with gender composition of job titles, two different models were tested, one that identified female-dominated job titles based on national standards (similar to the local analyses) and the other using the percentage of female employees of each job title (similar to the state analysis). Findings indicate that neither of these variables has a significant influence on salary. Given some issues associated with the sampling and survey procedures, however, the sample cannot be considered representative of the NYC government workforce and so these results cannot be meaningfully interpreted.

Study Contributions, Recommendations and Limitations

The study team developed a new job content questionnaire (instrument) that reflects 21st century work contexts. The new instrument was developed based on an extensive review of the latest literature, and reviews of peer experts and human resources professionals. The new instrument more accurately captures job content characteristics to examine how the current pay policy implicitly values these job content factors and dimensions of work. The study identified female-dominated job titles that are devalued and that warrant further examination by human resources experts and managers. Although the study provides important insights that can help New York State and local governments eliminate implicit bias in wage setting practices, it has limitations. The study was conducted under extremely challenging conditions, during the first year of the COVID-19 pandemic. It was natural to expect that the study would be of lower priority than the more pressing issues of ensuring day-to-day operations and dealing with unprecedented uncertainty in how work is carried out. These challenges were reflected in the low response rate and in the lack of response from several titles that were deemed critical to the study.

Furthermore, the definition of minorities included all non-White incumbents, rather than underrepresented minorities. While the definition is more inclusive and sensitive to racial designations, it may have masked disparities faced by underrepresented minorities.

Additionally, statistical analysis cannot substitute for policy makers' judgment about how titles ought to be compensated. Decisions regarding wage compensation must balance statistical analyses with qualitative analyses and logical reasoning. They should integrate experts' perspectives into the process and compensate for the limitations of statistical analysis that may not consider the influence of other variables.

The study recommends developing a new wage compensation system for the state, based on the job content factors and items provided in this study; evaluating titles found devalued and developing relative weights based on additional analyses and assessments of these titles; and, perhaps, understanding the reasons that may have attributed to a discrepancy in wages. It is also recommended that NYS Department of Civil Service evaluate characteristics of titles that were excluded in the questionnaire to capture characteristics that might be missing because they were specific to particular job titles and titles that were included in the study but could not be examined because of non-response or low response rates. The local governments and New York City should also undertake a more robust study to assess pay gaps in their workforce. Finally, initiatives that attempt to change the imbalance created by the existence of gender nontraditional occupations and those that address the glass ceiling for women can go a long way to promote pay equity.

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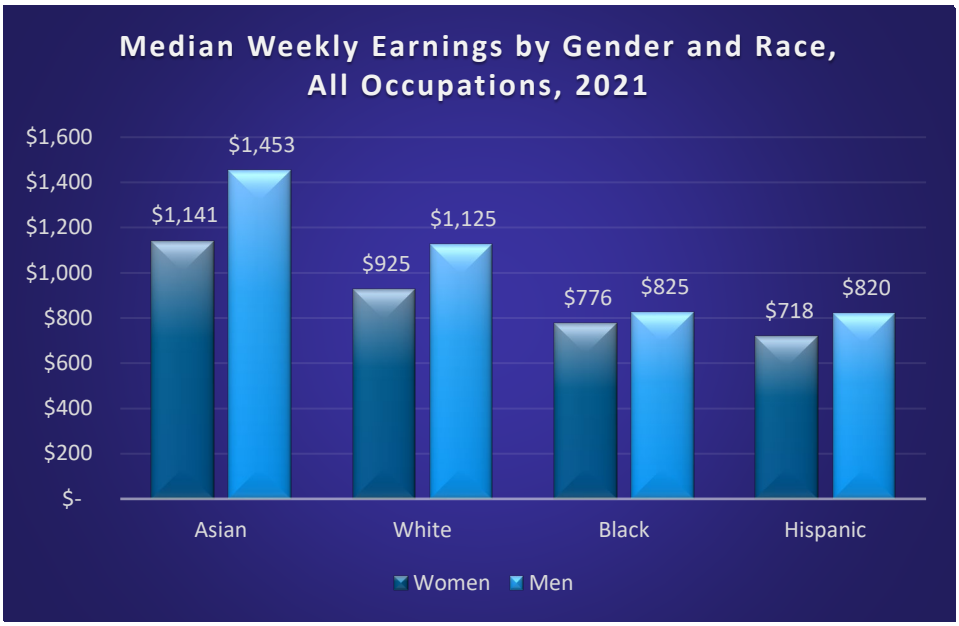
Introduction & Background

The Wage Gap

Women and underrepresented minorities often incur a wage penalty in the labor market that cannot be attributed to merit or qualifications. Nationwide, median earnings are highest among Asian women and men, followed by White, Black and Hispanic women and men, with women consistently earning less than males within their race/ethnicity (Bureau of Labor Statistics, 2021) (see Figure A). It is estimated that in 2020, women earned less than men in nearly every occupation whether the occupation was male- or female-dominated or gender-integrated. When race intersects with gender, it exacerbates the wage gap. Latina women in the service industry earn 65% of their Latino male counterparts, who in turn earn 78.9% of their non-Hispanic White male counterparts. The situation is similar for Black women in professional occupations who earn 81.8% of their Black male counterparts, who in turn earn only 79.5% of their non-Hispanic White male counterparts (Institute for Women's Policy Research, 2021).

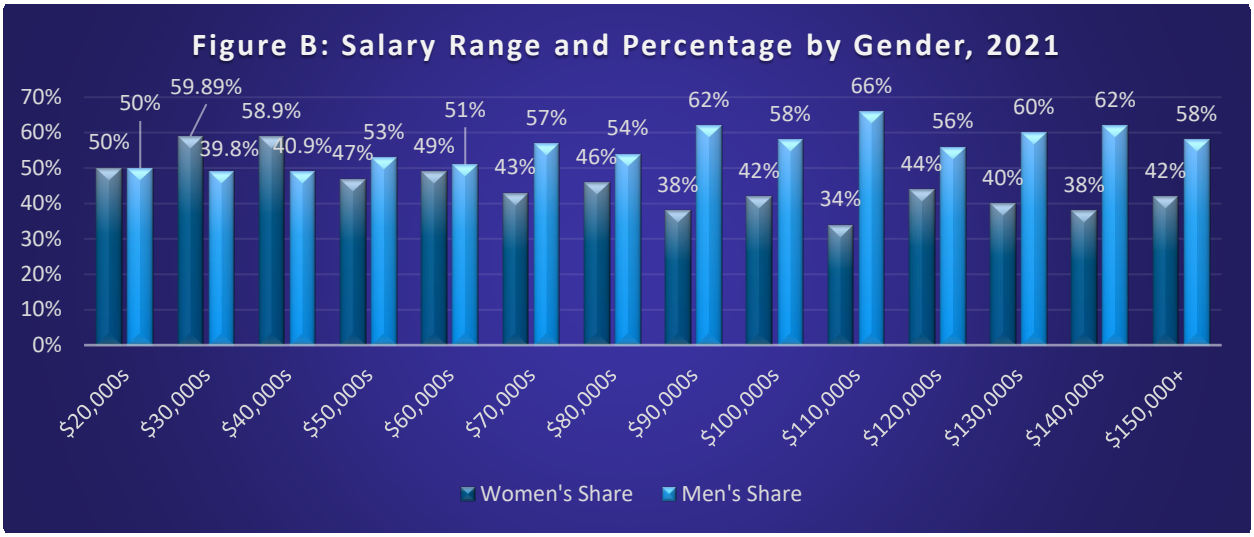


Laws that prohibit discrimination in wage setting are responsible for significant strides in expanding access to opportunity structures for everyone, regardless of gender, race and other social identities. The two primary statutes that prohibit discrimination based on gender, race, color, religion and national origin are the Equal Pay Act (EPA) of 1964 and Title VII of the Civil Rights Act of 1964. The EPA mandates that workplaces provide equal compensation for (a) equal work requiring similar skills (i.e., experience and education required to perform the job), effort (i.e., mental and physical capacity required to effectively carry out demands of the job) and responsibility (i.e., accountability); and (b) equal work performed under similar working conditions (physical environment in which the work is performed). Differences in compensation are allowed based on seniority, merit, and quantity and quality of work. Similarly, Title VII of the Civil Service Act of 1964 creates protected classes based on social differences, prohibits discrimination in wage compensation against these classes, and mandates provision of equal compensation between them and other dominant social identities, unless there are satisfactory reasons for the differentials in compensation (Collins & Feder, 2013). Civil service systems are

merit-based systems that provide equal pay for equal work and follow a structured process for wage compensation for incumbents who are in the same or comparable title.

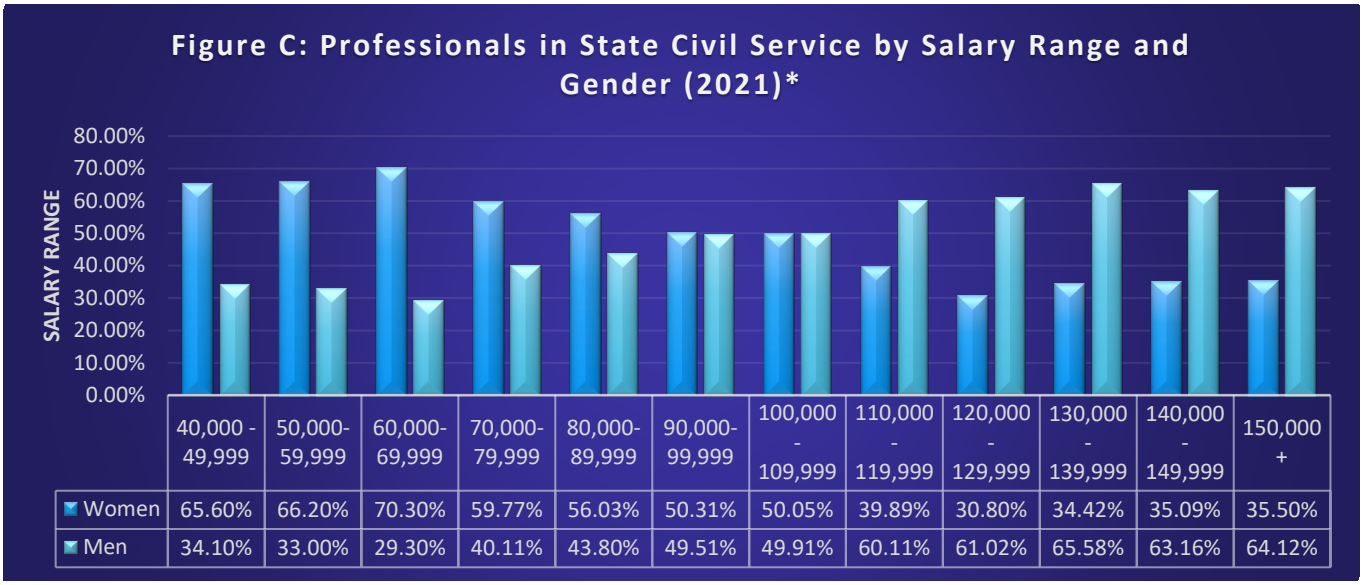
The NYS Department of Civil Service estimates that women's share of state civil service jobs has remained approximately equal to that of men during the last decade. In January 2021, there were 139,098 NYS civil service employees, excluding seasonal and hourly employees. The number of male employees was 70,298 (52%) and the number of female employees was 68,445 (48%). Average salary for male civil service employees was $68,057 while that of women civil service employees was $61,858. This means that, on average, in 2021, women earned 91 percent of what their male counterparts earned. While this represents an improvement over the 2010 gap of 13 percent (i.e., on average, women earned 87 percent of what men earned), there is still a 9 percent wage gap between what men earn and what women earn (NYS Department of Civil Service, 2021).

An analysis of the distribution of women along the salary continuum reveals that women hold the majority of jobs in the lower salary ranges, while men hold the majority of jobs in the higher salary ranges in the state workforce. Figure B shows the gender composition of earners in 14 salary ranges in the NYS civil service system (Database of New York State employees, 2021). As can be seen in Figure B, while progress has been made in closing the wage gap, there is still more work to be done to close this gap and increase the proportion of women holding higher salaried jobs.



While one could argue that the reason that women hold the majority of the jobs in the lower salary ranges is that women tend to hold jobs that are valued less in the job market, an analysis of female employees in the state workforce in the Federal Occupational Category (FOC) of "Professionals" shows they tend to earn less than men even within that category. Interestingly, women hold the majority of positions in the Professionals FOC in the state workforce (59%), but the percentage of women in lower salary ranges is higher than the percentage of men and, as the salary range rises, the percentage of women falls compared to that of their male

counterparts. Figure C shows women's and men's percentage in the Professionals FOC in NYS government (NYS employee database, 2021).



	40,000 - 49,999	50,000-59,999	60,000-69,999	70,000-79,999	80,000-89,999	90,000-99,999	100,000 - 109,999	110,000 - 119,999	120,000 - 129,999	130,000 - 139,999	140,000 - 149,999	150,000 +
Women	65.60%	66.20%	70.30%	59.77%	56.03%	50.31%	50.05%	39.89%	30.80%	34.42%	35.09%	35.50%
Men	34.10%	33.00%	29.30%	40.11%	43.80%	49.51%	49.91%	60.11%	61.02%	65.58%	63.16%	64.12%

*8.18% of professionals' gender is unknown

The situation is similar in the local government workforce where the International City/County Management Association (ICMA) estimated that while the number of women working in local government employment is roughly equal to that of men, women's representation in leadership is far from equal. ICMA estimates that the percentage of women chief administrative officers was 18.9% in 2020, falling from 20.1% in 2019 and 19.8% in 2012 (ICMA, 2021). Based on a count of its membership, ICMA estimates that in New York State, women make up 24% of the total local government workforce and 13% of chief administrative officers (ICMA, 2021). In addition, a study of local government employees sponsored by ICMA found that 85% of women and 58%of men believe that women face significantly more barriers in career advancement in local government than men do (ICMA, 2021).

Occupational Segregation: A Cause and Symptom of Economic Inequality

Today's labor market still features a segmented occupational system, i.e., segregated occupations where certain jobs are more likely to be performed by women or people of color, and other jobs are more likely to be performed by men or by White people. Such a system generally devalues occupations that have been traditionally labeled as female or minority jobs. Although jobs may be legally accessible to all, gendered and racialized socialization based on historical divisions of labor have created systematic gatekeeping and self-exclusions of minorities and women from traditionally White- and male-dominated occupations. Table A shows the overconcentration of women in certain occupations and their underrepresentation in others.

Table A: Male- and Female-Dominated Occupations and Women's Share

Male-Dominated Occupations		**Female-Dominated Occupations**	
Occupational Fields	***Women's Share***	***Occupational Fields***	***Women's Share***
Logging	3.2%	Preschool and Kindergarten Teachers	97.5%
Construction	9.1%	Speech-Language Pathologists	97.5%
Repair and Maintenance	10.9%	Dental Hygienists	97.1%
Mining, Quarrying, and Oil and Gas Extraction	13.4%	Secretaries and Administrative Assistants	94.6%
Transportation and Utilities	23.5%	Childcare Workers	94.4%

Occupational segregation is thus still prevalent in many occupations. According to the U.S Department of Education (2020), there are over 449 occupational categories that are considered nontraditional for females in several different fields. For example, fields such as (a) Agriculture, Food, and Natural Resources, (b) Architecture and Construction; (c) Science, Technology, Engineering and Mathematics; and (d) Transportation Distribution and Logistics are almost entirely male dominated. There are 262 occupational categories that are nontraditional for men. Certain titles within the fields of Arts, Audio/Visual Technology and Communication; Business Management and Administration; Health Sciences; Hospitality and Tourism; Finance; Human Services; Law, Public Safety, Corrections and Security; Manufacturing; and Information Technology and Marketing are male dominated while others are female dominated. Alternatively, the fields of Education and Training are almost entirely dominated by women (U.S Department of Education, 2020). A closer look at the horizontal segregation problem reveals pronounced exclusions of women in specific occupations where women's share is less than 1% (see Table B).

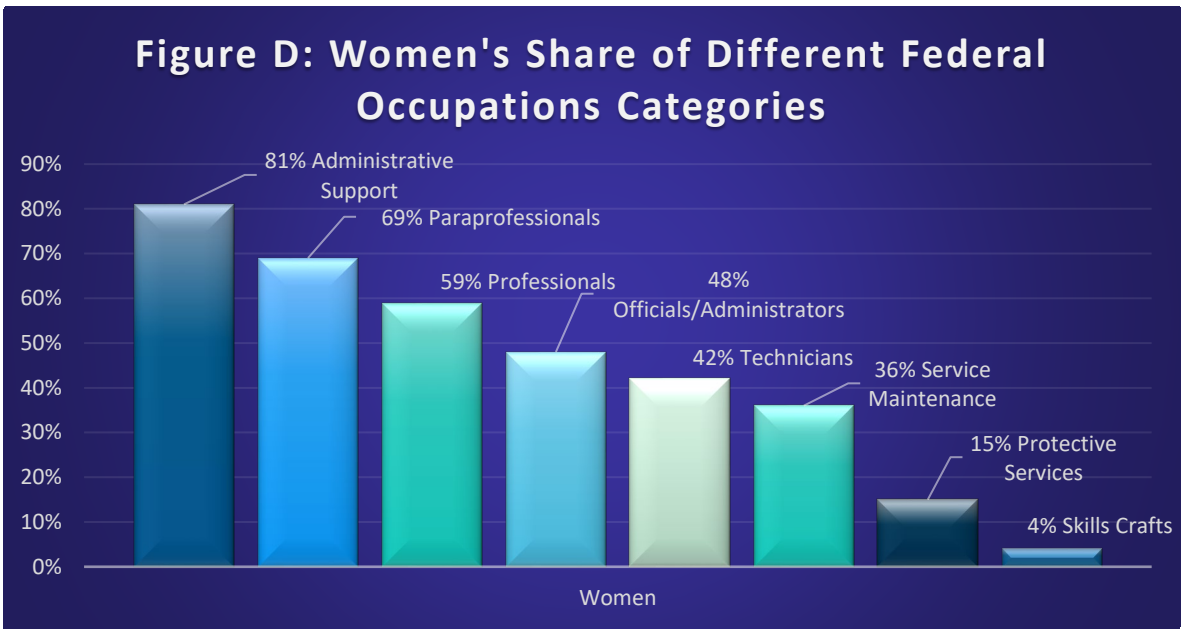
Table B: Occupational Segregation: A Closer Look

Occupations	***Women's Share***
Brick Masons, Block Masons, and Stone Masons	0.5%
Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics	0.5%
Electrical Power-Line Installers and Repairers	0.6%
Bus and Truck Mechanics and Diesel Engine Specialists	0.8%
Crane and Tower Operators	0.8%

According to the Bureau of Labor Statistics (2017), men represent 52% of the workforce, but dominate STEM fields, making up 73% of all STEM workers, while women make up 27% of STEM workers. Moreover, in some STEM fields, such as engineering and computer science, women only hold 15% and 25% of the jobs, respectively. This is even more important when we consider that women in STEM fields earn more than their female counterparts in non-STEM occupations (Martinez & Chistracht, 2021).

Moving from the national picture to the NYS civil service system, occupational segregation is pronounced in several FOCs. In the NYS civil service system, women are the majority in several

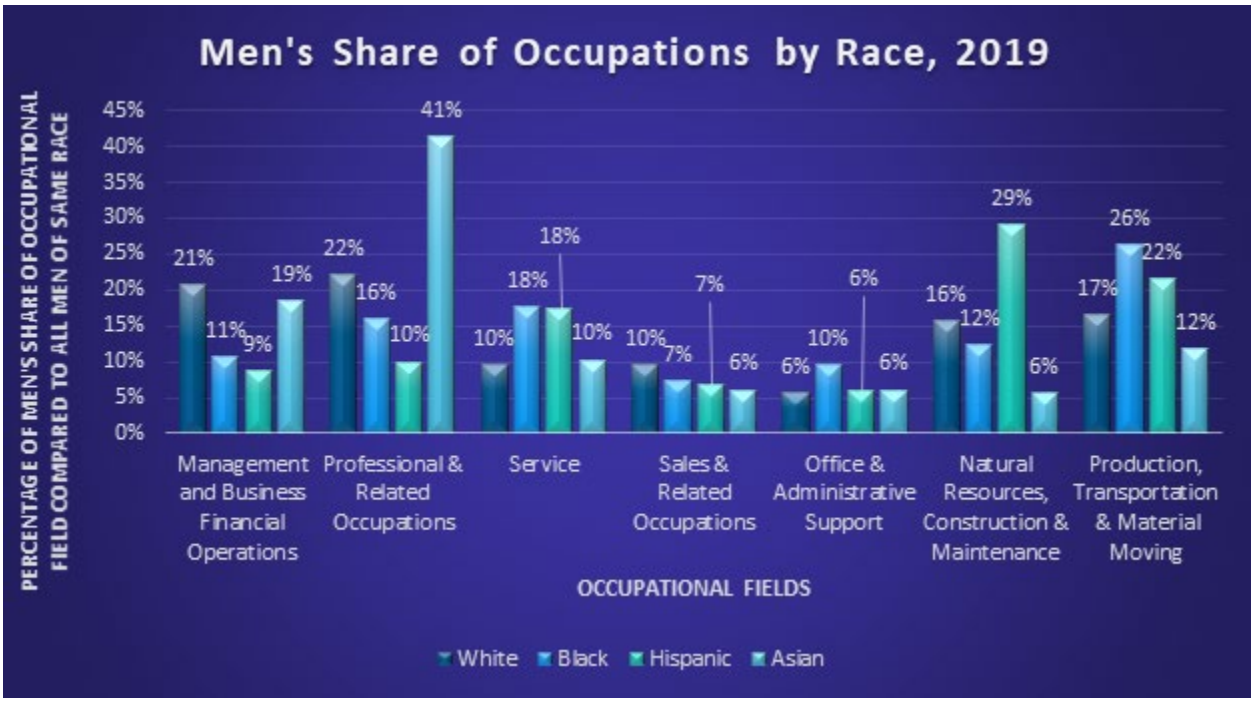
FOCs including Administrative Support and Paraprofessionals while men dominate Skills Crafts and Protective Services (see Figure D).

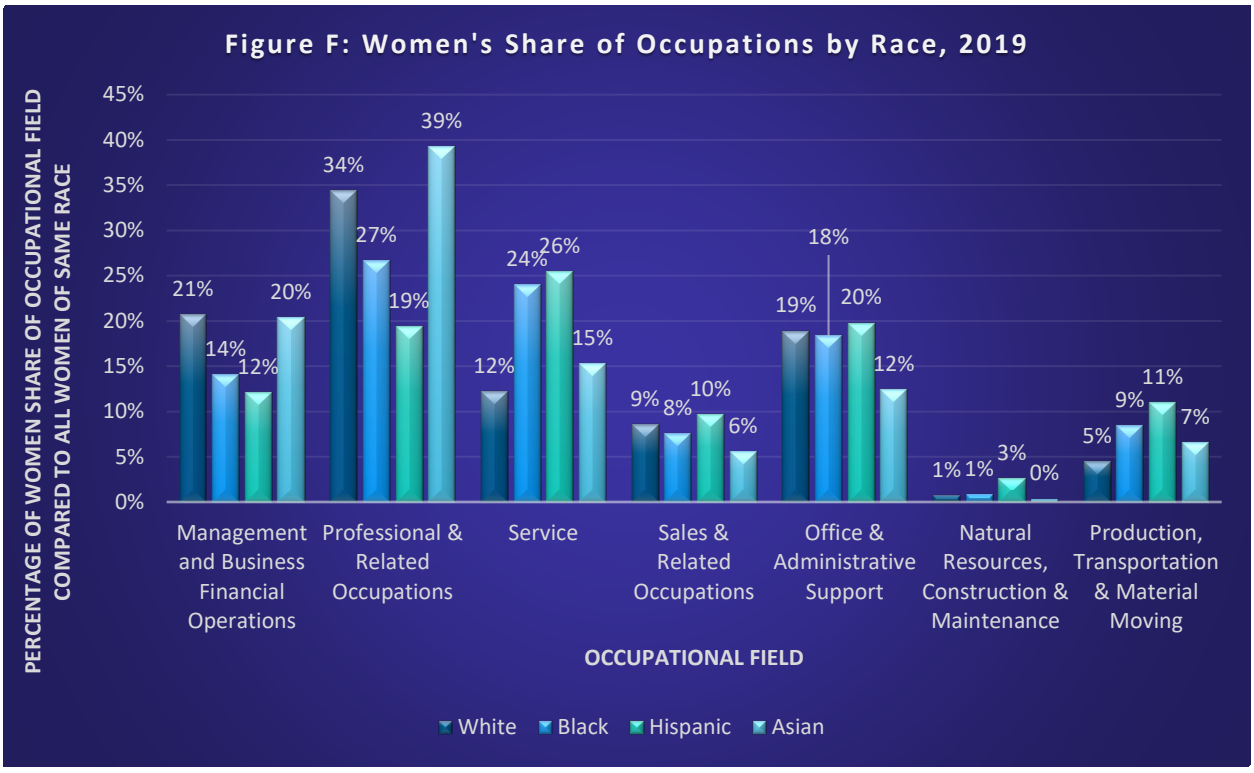


Occupational segregation and exclusions are not only a gender issue; they also affect racialized and minoritized groups who are underrepresented in specific sectors. Figure E shows that Hispanic and Black men are more likely to work in Production, Transportation and Material Moving, and Construction, while White and Asian men are more likely to work in Professional and related occupations, and in Management and Business Financial Operations. Figure F shows how the intersection of gender with race can create an additional layer of occupational segregation and exclusions, so that, for example, Hispanic women are more likely to work in Service occupations.[1]

Such segmentation of the market has been both a cause and a symptom of wage disparities. Women and minorities are paid less in female- and minority-dominated jobs not because these jobs require lower levels of skills, effort and responsibilities, but because there is a historical bias that deems tasks performed by women and minorities as inferior in value (Collins & Feder, 2013).

[1] Note that percentages in figures E and F are rounded and may exceed 100%.



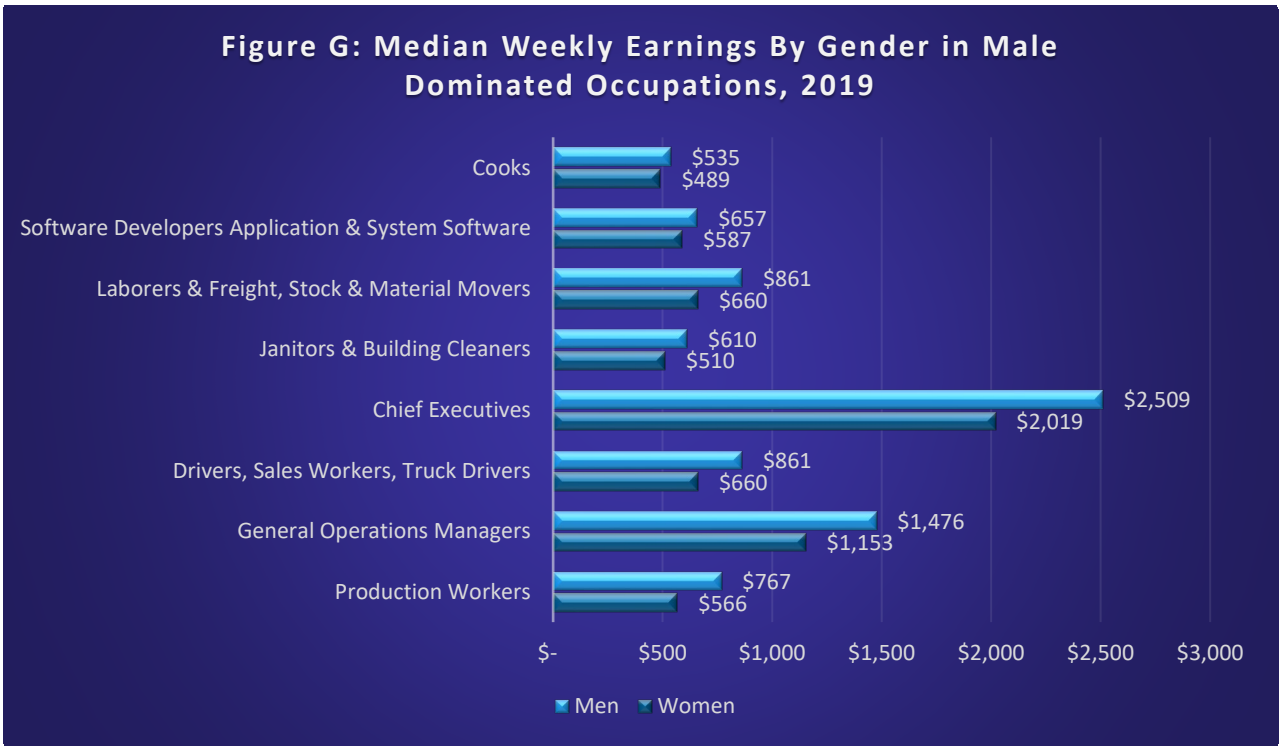


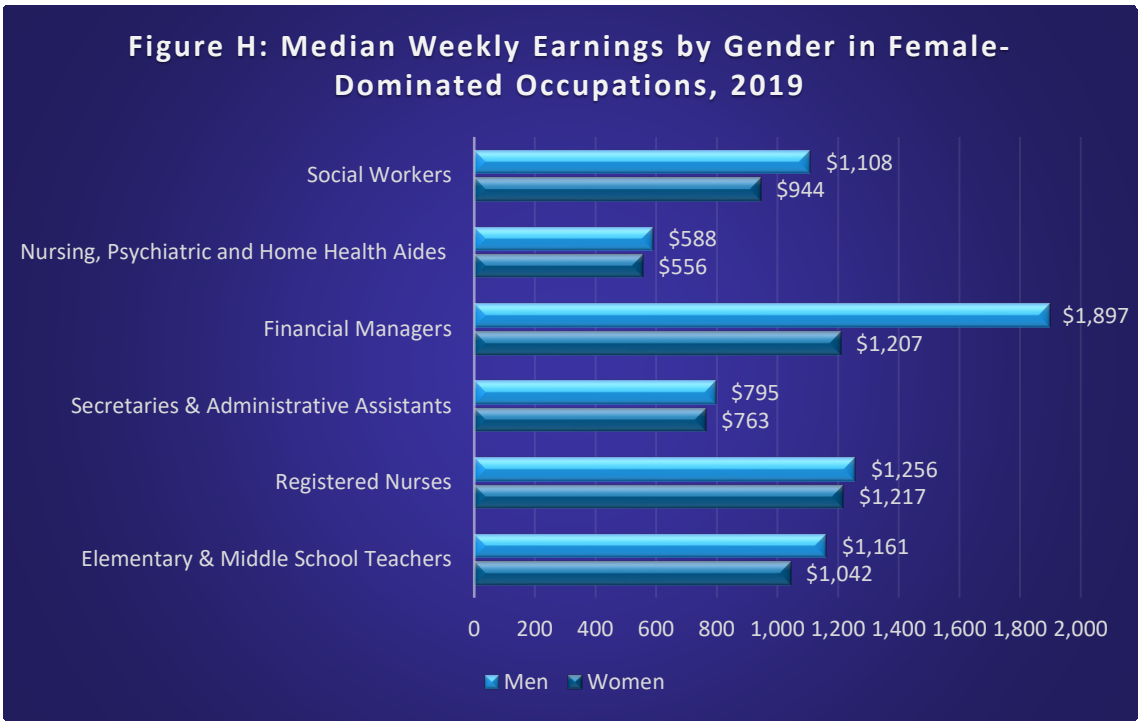
Andre and Velasquez (2015) posit that disparities in wages associated with segregated labor markets can lead to numerous negative outcomes. In particular, they can:

- create economic and social injustices against women and people of color;
- lead to resentment, tension, conflict, poor performance, and job dissatisfaction;

- incur a societal cost when (low-paying) female- and minority-dominated jobs fail to attract qualified individuals and lead to labor shortages in jobs that fill critical functions such as early childhood education;
- place a burden on the public assistance system when female- and minority-dominated occupations do not provide living wages and employees are forced to resort to public assistance, costing millions of dollars in taxpayers' money; and
- result in a loss of competitive advantage that is gained by organizations when compensation decisions are based solely on economic considerations.

Interestingly, even when women enter male-dominated occupations, they earn less than their male counterparts. Figure G shows median weekly earnings by gender in male-dominated occupations. On the other hand, as seen in Figure H, when men enter female-dominated occupations, they earn more than women in these occupations (Bureau of Labor Statistics, 2019). Thus, men consistently earn more than women in both male- and female-dominated occupations, providing evidence of the existence of implicit bias in how wages are determined. Figures G and H highlight that remnant of bias that implicitly and unconsciously influence how we devalue occupations that are dominated by women and people of color still exist and, indeed, that we consistently devalue the skills, knowledge and experiences that women and people of color bring to their work.





A study of women's participation in male-dominated occupations in the NYS civil service system reveals that women continue to be concentrated in lower salary ranges and are underrepresented or absent in higher salary ranges in certain occupations. For example, in occupational categories where salary ranges are generally lower than those of other categories, such as Trades, women are absent at the higher salary ranges in this FOC and are concentrated at the lower salary ranges. In addition, in higher paying fields such as Engineering, women are absent in the highest salary range and constitute 8 - 23% in all other salary ranges (NYS Department of Civil Service, 2020).

In the past decade, the U.S Congress addressed the issue of pay equity through several bills that were intended to provide remedies for the gender wage gap including the Paycheck Fairness Act (H.R. 1519/S. 3220) and the Fair Pay Act (HR. 1493/S. 788). These acts were intended to strengthen the idea of equal pay for equivalent work and called for studies to identify inequities.

In 2019, New York State amended labor laws to prohibit differential pay because of protected class status. The enacted law stated that "no employee with status within one or more protected class or classes shall be paid a wage at a rate less than the rate at which an employee without the status … in the same establishment for (a) equal work on a job the performance of which requires equal skill, effort and responsibility, and which is performed under similar working conditions, or (b) substantially similar work, when viewed as a composite of skill, effort, and responsibility, and performed under similar working conditions." The law provides for differential pay levels that are based on different levels of seniority, experience, merit quality of performance and/or quantity of production, but also provides for penalties to be

leveled against employers who provide differential wages that are based on protected class status. It also expands the scope of employees who have "protected class status" beyond gender and race and includes age, gender identity, sexual orientation and ethnicity. A driving force behind this study is the need to ensure that civil service jobs in New York State and local governments within New York State, regardless of who is performing them, are equally valued and compensated, when these jobs, while dissimilar, are performed by people who hold comparable responsibilities, employ equivalent skills and operate under similar conditions.

Study Goals and Objectives

With this purpose in mind, the NYS Legislature enacted Chapter 403 of the Laws of 2018 directing the NYS Department of Civil Service to publish a report that evaluates wage compensation for public employees and identifies possible disparities that are attributable to gender and race/ethnicity in titles that are segregated by gender and race/ethnicity. The act requires that, at a minimum, the report:

a) Identify segregated civil service job titles by gender and race and the method used to identify these titles;
b) Document civil service titles that are equivalent[2] and of comparable worth[3];
c) Assess the extent of wage disparities in civil service titles that are equivalent and of comparable worth; and
d) Recommend any adjustments needed of wage rates for equivalent civil service job tiles of comparable worth.

The study is consistent with New York State's policies of ensuring equitable compensation and advancing gender and racial justice. The legislation states that "it is the policy of the state to pursue establishment of equitable compensation relationships between female-dominated, male-dominated, and other segregated titles to eliminate wage disparities in public employment statewide.... Relationships are equitable when the primary consideration in negotiating, establishing, recommending, and approving total wages is the equivalent value of the job title content in relationship to other job titles and position classifications in civil service" (New York State Legislature, 2018).

[2] The NYS legislation defines equivalent jobs as jobs that are "dissimilar but whose requirements are equivalent when viewed as a composite of the job qualifications, kind of work performed, the level of responsibility for that work, the skills utilized, the effort required, and the working conditions required by the work."
[3] Titles that are deemed of comparable worth are defined by the legislation as the "equivalent value of two or more jobs where such value is used to establish compensation."

Organization of the Report

The report is organized in three parts. Part I provides a description of methodologies and the development of the data collection instrument used in the study. Part II presents the procedures and processes for data collection and discusses the analyses and findings from the study of the NYS public workforce and case studies of select NYS local governments. Part III discusses policy implications, recommendations, limitations, and conclusions.

Part I: Methodology

1.1. Introduction

Studies on "comparable worth" or "pay equity" are designed to determine whether salaries accurately reflect standards of job worth regardless of the sex or race/ethnicity of a typical job incumbent. Job characteristics, skills, and knowledge and demands of a particular job, rather than social identity, need to govern wage compensation practices.

Armstrong et al. (2005) underscore the critical importance of job evaluation as an effective approach for ensuring equal pay for work of equal value and determining grading and wage levels. Job evaluation efforts provide an opportunity to objectively quantify the relative value of a job and establish consistent grading and pay, hence complying with legal and ethical mandates. Although a level of subjective judgment is involved in conducting job evaluations and interpreting the value of one job relative to another, the evaluation approach should be done in a systematic and evidence-based manner where the job, not the person, is the unit of analysis and where the scope of the job is defined based on a factor-based framework. Several steps are involved in conducting a job evaluation, with each step providing a somewhat different perspective on the job content of different jobs. Job descriptions are generally developed by first reviewing current written descriptions about functions involved in each job, then administering a job content questionnaire to incumbents and, finally, having human resources professionals review the results of these steps. The outcome of this task is a comprehensive description of knowledge, skills, effort, responsibilities, working conditions, education, prior experiences, effort, and demands of the job. In this study, researchers developed an extensive job content questionnaire to capture the range of job content characteristics in New York State and local government workforces by (i) reviewing the job content questionnaire from a study conducted for a similar purpose by the Center for Women in Government & Civil Society in the 1980s, (ii) conducting an extensive literature review to identify key job characteristics generally used in job evaluations, and (iii) holding focus group meetings with peer/experts and human resources managers from state and local governments. For both state and local governments, incumbent responses for each job title were aggregated at the job title level to counteract any overvaluing or undervaluing of job functions in individual-level responses.

1.2. Developing the Job Content Questionnaire

The purposes of developing a job content questionnaire are (a) to capture features of the work that employees do at their jobs, (b) to understand variations in civil service grade levels and differentiation in job functions, and (c) to capture the employers' implicit policies in setting wages based on determined factors. In this case, an implicit policy refers to an equation that is derived from a statistical analysis that examines how the various job content features contribute to the salary or salary grade of a given job title and does not assume that the results

of the statistical analysis will be the same as an explicit policy (weighting of job content factors) that has been previously developed by employer.

As noted above, the development of the job content questionnaire began with the study team reviewing both the questionnaire developed for the same purpose in the 1980s under the auspices of the NYS Department of Civil Service and the instrument currently used by the Department of Civil Service that emerged partly from that study. The team also reviewed a wide range of job evaluation frameworks to identify developments in the field of job evaluation since the prior study. This step was especially important since the nature of many jobs and job demands have experienced changes since the 1980s. Job evaluation frameworks that informed development of the job content questionnaire included Factor Evaluation System (FES), Hay Plan, Iowa Plan, Minnesota Job Description Questionnaire, the Job Diagnostic Survey, Multipurpose Occupational Systems Analysis Inventory and the Occupational Information Network (O*Net) (Hackman & Oldham, 1974; Iowa Department of Administrative Services, 2022; Korn Ferry/Hay Group, 2015, 2017; National Center for O*NET Development, 2022; Office of Personnel Management, 2013; University of Minnesota, 1989; Vanderbilt University, 2012).

O*NET is a comprehensive database of worker attributes and job characteristics and was used extensively in the development of the job content questionnaire. The questionnaire focused on the following elements:

- The overall purpose of the job
- The environment in which incumbents perform the job
- The tasks and activities included in the job
- The types of knowledge, skills and abilities needed to perform the job
- Unique characteristics that influence the work

The study team tried to ensure questions in the job content questionnaire were clearly expressed, and ambiguous or potentially confusing terms were clarified and/or reworded. Development of demographic questions included in the questionnaire was guided by consultation with U.S. Census and the NYS Department of Civil Service customary identification of different categories of gender and race. Appendix A includes a copy of the questionnaire.

1.3. Pretesting the Job Content Questionnaire

The purposes of pretesting a questionnaire are to (a) ensure that questionnaire items represent important aspects of job content including tasks, responsibilities, effort and working conditions, (b) identify potential problems with questions such as ambiguous wordings, and (c) improve the overall quality of the questionnaire. To pretest the questionnaire, the following steps were undertaken:

(a) Questionnaire items were reviewed by a panel of national and state experts (eight experts participated in the review; see Appendix B).

(b) A focus group with NYS agencies' human resources managers was conducted to ensure that questionnaire items were appropriate for NYS employees.
(c) The instrument was distributed using Survey Monkey to 62 individuals from the study team and state employees who completed the questionnaire and provided feedback about the appropriateness of questions
(d) A review meeting was held with a county advisory committee.
(e) A review meeting was held with a city advisory committee.

Internal reviewers, focus group participants, advisory panel members and peer reviewers were asked to carefully review all items included in the questionnaire as well as to respond to open-ended questions about changes needed to (a) make language more understandable at a grade 8 reading level, and (b) ensure that content was comprehensive but not redundant, and appropriate for capturing job descriptions. The pretest was guided by the following questions:

- Is the phrasing of the questionnaire appropriate?
  - Are there places where simpler language can be used?
  - Are the questions leading?
  - Do any of the questions contain bias?

- Is all the information relevant and important?
  - Are there questions that are not needed?
  - Are there duplicative phrases or questions?
  - Are there repetitious phrases or questions?

- Are there any important knowledge, skills, or abilities that are missing?
- Are there any important job activities that are missing?
- Are there important elements of the work context that are missing?

- Are we reflecting the changes in the nature of work and the workforce?
  - Changes in how we use information and computing technology
  - Changes in leadership in workplace structures
  - Changes in the nature of the workforce

Those reviewers who were asked to complete the questionnaire were also asked to respond to the following questions:

- How long did it take you to complete the questionnaire?
- Are there spelling, grammar, or punctuation errors in the questionnaire?
- Did you experience any technical issues with Survey Monkey (the online survey platform) while taking the questionnaire?
- Are any questions in the questionnaire vague or unclear?

Based on the recommendations from the reviewers, the study team shortened the questionnaire length; improved the wording and instructions; deleted redundant items; included specific examples to clarify the types of tasks, behaviors, working conditions, and equipment; and included additional items based on the recommendations of reviewers. In addition, three different versions of the questionnaire were developed to accommodate differences across the three levels of government to be examined—state, city and county.

1.4. Piloting the Job Content Questionnaire

The goals of a pilot study are to (a) assess the entire survey procedure and identify potential problems with the proposed method, (b) assess the feasibility of the study design, (c) revise items to improve the design of the study, (d) provide an initial assessment of the reliability and validity of the proposed items as measures of job content, and (e) assess the response rate in low incumbency titles for representativeness of sample.

To conduct the pilot study, the team grouped all NYS job titles based on gender and race/ethnicity composition, as follows: female-/male-dominated, gender-integrated, minority-/White-dominated, and race-integrated titles.[4] It should be noted that the gender groupings, i.e., female-/male-dominated and gender-integrated titles, represent three groups, as do the race/ethnicity classifications, i.e., minority-/White-dominated and race-integrated titles. There was, however, overlap across the gender and race classifications, i.e., the groups are not mutually exclusive, and, for example, a female-dominated title could also be a minority-dominated title. Employees were then selected for the pilot study sample using systematic sampling procedures.

All titles were then organized into one of nine different categories based on the number of employees and the grade level [using NYS Department of Civil Service's grouping of salary grades (see Table 1.1)]. Thus, each of the six types of titles was stratified into nine groups as follows:

- small number/low grade;

[4] The approach used in developing a standard cut off for classifying titles was to consider the nature of the distributions of these variables and to use a common statistical formula to determine the cutoff. Since both variables have a binomial distribution (i.e., they can only take on two values; in this case, female/male and minority/nonminority), we based our calculation on statistical formulas from the binomial distribution: mean = proportion ($\boldsymbol{p}$) and standard deviation = $\sqrt{\boldsymbol{p} \times (\boldsymbol{1} - \boldsymbol{p})}$. Using the Federal standard that "female-dominated occupations are those in which women represent 75 percent or more of total employed" and NYS employment statistics (i.e., proportions of female and male employees are .5072 and .4928, respectively, with a standard deviation of .4999), we used the binomial formula to develop a working assumption that occupations are dominated by a group if they are 0.4857 standard deviations above the mean (0.4857 = (.75-.5072)/.4999)). The proportion of minority and White employees are .3223 and .6777, respectively. Using this approach, the cut-off for determining dominated occupations is .75 for female-dominated jobs (based on the federal standard), .74 (.4928+(.4857*.4999)) for male-dominated jobs, .55 (.3223+(.4857*.4673)) for minority-dominated jobs, and .90 (.6777+(.4857*.4673)) for White-dominated jobs.

- medium number/low grade;
- large number/low grade;
- small number/medium grade;
- medium number/medium grade;
- large number/medium grade;
- small number/high grade;
- medium number/high grade;
- large number/high grade

Table 1.1: NYS Grade Grouping			
FOC	**Low SG**	**Medium SG**	**High SG**
Paraprofessionals/Administrative Support	04-13	14-18	19-23
Professionals/Officials and Administrators	12-24	25/61-29/63	30/64-35/66; 36
Protective Service	03-15	16-19	20-25
Service Maintenance	01-08	09-13	14-20
Technicians/Skilled Craft	04-13	14-18	19-24; 25/61; 27

The team then randomly selected 10% of the titles within each of the nine groups. Within each selected title, 5% of employees in large titles and 10% in smaller titles were then randomly selected. Titles that were deemed critical to include in the sample by the NYS Department of Civil Service replaced those that were of similar size and grade in the selected sample. As a result, a total of 1,104 NYS employees were selected for the pilot study.

A final draft of the job content questionnaire was distributed to the 1,104 employees to determine if any final revisions needed to be made. The questionnaire was distributed to sampled employees electronically and data were collected via Survey Monkey. Appendix C provides a list of agencies with which pilot respondents are affiliated.

The response rate for the Pilot Study was 52.36%, with a total of 578 participants completing the questionnaire. Tables 1.2 and 1.3 show the demographic characteristics of respondents to the pilot questionnaire.

Table 1.2: Pilot Questionnaire Respondents by Gender	
Male	44.35%
Female	55.41%
Gender non-binary/non-conforming	0.25%

Table 1.3: Pilot Questionnaire Respondents by Race	
American Indian or Alaskan Native	2.95%
Asian	4.55%
Black, African American or African Heritage	16.09%

Table 1.3: Pilot Questionnaire Respondents by Race	
Hawaiian or Pacific Islander	0.25%
White or Caucasian	75.06%
Other	4.55%

1.5. Establishing Reliability and Validity of Questionnaire Items

To examine the validity and reliability of questionnaire items and proposed subfactors, the team conducted several statistical tests as follow:

- review of response variation;
- factor analyses to test the construct validity by confirming the underlying eight factors, their relationship with generated subfactors and the relationship between items and factors; and
- reliability analyses using Cronbach's alpha as a measure of internal consistency.

To choose compensable factors, the study team used the eight overarching (and overlapping) factors in the Quantitative Job Evaluation System (QJES) previously used by NYS government (Steinberg et al., 1986) (see Table 1.4). Subfactors and items associated with each of the factors were identified under each of the overarching factors using factor and reliability analyses. These analyses were conducted to ensure that items of similar job content were aligned and that subfactors showed internal consistency.

Table 1.4: Overarching Compensable Factors	
FACTOR I: EDUCATION AND EXPERIENCE	*FACTOR II: MANAGERIAL ACTIVITIES*
• Job experience • Academic preparation • Types of knowledge required to perform in this job title and the need for specialized skills	• Nature and extent of planning and scheduling activities • Setting operational practices • Authorizing expenditures • Influencing or preparing budgets • Developing agency or State policies • Directing organizational units
FACTOR III: SUPERVISION	*FACTOR IV: WRITTEN COMMUNICATIONS*
• Kind and degree of responsibility assigned for getting work done through others • Scope of operations supervised • Degree of autonomy in one's work • Control over operations of the units supervised	• Nature and extent of written communications involved in one's work, including completing forms, writing notes and memoranda, original writing and/or editing materials prepared by others

FACTOR V: WORK COMPLEXITY	*FACTOR VI: RESPONSIBILITY*
• Mental challenge including degree of repetitive or routine work; and the need for analysis, judgment, initiative, ingenuity or creativity • Complexity of information required and how information is gathered, evaluated, used or applied	• Impact of work performed on people, the organization (image, reputation) and the organization's resources • Responsibility for the prevention and control of loss, waste, damage and injury • Potential consequences of errors
FACTOR VII: ORAL COMMUNICATIONS	*FACTOR VIII: JOB DEMANDS*
• The nature and extent of spoken communication required to accomplish one's work • Teaching, advising, giving directions or providing instructions, leading and planning meetings and workshops, etc.	• The pace of work, and the nature and impact of time limits and constraints on decision making and the conduct of work • Work conditions such as task repetitiveness, physical demands and environmental conditions

Based on the results of the analyses of the pilot study data, the study team confirmed that there was evidence of construct validity and confirmed the underlying eight factors and internal structure of the dimensions. Thus, both evidence of content validity collected from the pretest and evidence of construct validity collected from factor analyses with pilot study data established the validity of the questionnaire items. Additionally, the study team confirmed that there was evidence of internal consistency reliability based on the value of Cronbach's alpha. Therefore, we concluded that the questionnaire had appropriate levels of reliability and validity and could be used as a tool to capture the range of job content characteristics in NYS and local government workforces.

1.6. Assigning Weights to the Factors and Calculating Total Points for Each Job

To determine the implicit weight of each factor, i.e., the relative contribution of each factor to the overall salary or "worth of the job," the study used a Policy Capturing System, which empirically identifies the current implicit pay practices of the employer using statistical (regression) analyses. The study team conducted multiple regression analyses to estimate the implicit "worth" of each job based on the weighted scores of the factors. The regression analyses used salary grade as the dependent variable for the state analyses and median salary as the dependent variable for local government analyses, and estimated coefficients for each factor that reflected the implicit weight given by the employer's current pay policies (New York State or local government). Total points for each job are calculated by inserting the score on each factor for each job title into the regression equation obtained from the policy capturing regression analysis and calculating implicit worth (England, 1992). Thus, results of the regression analysis allow for a comparison between the existing pay grade or salary and an estimated pay grade or salary based on the factor scores associated with each job.

Part II: Data Collection & Analyses

Introduction

Part II details processes and procedures used to collect data from state and local government employees and presents analyses of the data. This part is divided into three sections: Section 1 describes the study of the state's workforce, while Sections 2 and 3 are dedicated to the study of a sample of local government (outside of New York City) and New York City workforces, respectively.

SECTION 1: PAY EQUITY STUDY IN NEW YORK STATE

In this section, we present procedures for sampling employees from the NYS workforce, distributing the job content questionnaire to selected employees, conducting factor and reliability analyses to develop factors and subfactors, and developing procedures for data analysis and findings of the analyses.

Sampling Procedure

By definition, the size of the state workforce fluctuates daily. It was therefore necessary to choose a date to "freeze" the workforce universe to draw the sample for the full analysis; on February 18, 2020, the size of the workforce was 123,987 employees and the NYS Department of Civil Service provided a master list of employees for use in selecting individuals to participate in the questionnaire. The research team used Daniel's (1999) sample size formula to determine the ideal sample size. To calculate the sample size, the team assumed a 95% confidence level, a 1% margin of error, and a standard deviation of 0.5.[5] Using the pilot response rate (52.36%) as a predictor of the main questionnaire's response rate, the team used a random sampling procedure and oversampled from specific ethnic groups (Black and Other/Unknown) and specific types of titles (Female-dominated and Minority-dominated) whose response rates were substantially lower than the average response rate in the pilot survey. The final sample size was

[5] The formula for the sample size n is $n = N \times X / (X + N - 1)$, where $X = Z^2 \times p \times (1\text{-}p) / MOE^2$. Z is the critical value (z-score) of the normal distribution, MOE is the margin of error, p is the sample proportion, and N is the population size.

Table 2.1: Gender and Race/Ethnicity Characteristics of Sample					
Gender	Number	Percent	**Race/Ethnicity**	Number	Percent
Female	10,790	53.08%	**Nonminority (White)**	12,413	61.07%
Male	9,537	46.92%	**Minority**	7,914	38.93%
Total	20,327	100%	**Total**	20,327	100%

20,327 employees. Tables 2.1 and 2.2 show the distributions of the sample by gender, race/ethnicity, salary grade grouping, and job title gender and minority classifications.

Table 2.2: Gender and Minority Groupings and Salary Grade Groupings of Sample's Job Titles								
Job Title Gender Grouping	Number	Percent	**Job Title Minority Grouping**	Number	Percent	**Grade Level Grouping**	Number	Percent
Female-dominated	6,284	30.91%	**Minority-dominated**	2,239	11.01%	**High**	435	2.14%
Male-dominated	5,550	27.30%	**White-dominated**	1,980	9.74%	**Mid**	3,102	15.26%
Gender-integrated	8,493	41.78%	**Race -integrated**	16,108	79.24%	**Low**	16,790	82.60%
Total	20,327	100%	**Total**	20,327	100%	**Total**	20,327	100%

Distributing the Job Content Questionnaire

Most of the job content questionnaires were administered to the selected sample electronically via Survey Monkey, and U.S. postal mail was used to distribute questionnaires to employees who did not have regular and consistent access to a computer. Distribution of the questionnaire was made by the NYS Department of Civil Service and liaisons were identified in each agency to follow up with employees who received the questionnaire.

Preparing Data for Analysis

The research team prepared the data for analysis by removing all duplicate and anonymous responses and by matching respondents' demographic data to the master list provided by the NYS Department of Civil Service. The identity of questionnaire respondents who had not been included in the initial sample was verified and was incorporated into the data. After preparing the data for analysis, the sample included a total of 8,872 usable responses (response rate = 43.6 %).

Demographic Description of Respondents

Table 2.3 provides demographic data for state employees who responded to the job content questionnaire and shows that the majority of respondents were women (54.0%) and White (72.7%). The responses reflect the population.

An analysis of responses by title grouping is included in Appendix D and demonstrates that responses were reflective of gender and race/ethnicity composition of the titles.

Table 2.3: Demographic Data of State Questionnaire Respondents (Total 8,872)

	Number	***% of respondents***
Gender		
Male	4036	45.5
Female	4790	54
Gender non-binary/non-conforming	29	0.32
Missing	17	0.19
Race		
American Indian or Alaskan Native	88	0.99
Asian	417	4.7
Black, African American or African Heritage	1344	15.15
White or Caucasian	6455	72.76
Hawaiian or Pacific Islander	9	0.1
Other	268	3.02
Missing	291	3.28
Ethnicity		
Hispanic or Latinx	553	6.2

Factor and Reliability Analyses

Given the large number of items in the questionnaire, it was necessary to use factor and reliability analyses to develop a reasonable number of subfactors for use in subsequent analyses. Factor analysis statistically estimates if the items under each factor are aligned with each other in measuring the factor (concept), in this case various aspects of job content. A series of factor analyses were conducted using SPSS with the original responses to the questionnaire. Most items related to job content were measured using a 5-point scale and, where necessary, response ranges of items were converted from their original response ranges to a 5-point scale, e.g., items 2.15 and 2.16, so that they could be integrated into the subfactors. Although there is some overlap across the eight QJES factors, we were able to group items together under the eight factors and propose an initial set of subfactors. After several iterations of analyses, a set of subfactors were developed and these subfactors were classified according to the eight QJES factors. The analyses were conducted using numerous configurations of items to ensure that the items were grouped appropriately under the different subfactors. Items that had low factor loadings (factor loadings are an indication of alignment with other similar items) on all factors were not used in subsequent analyses. In deciding which items to include with which subfactors and which subfactors to include with

which factors, which was necessary for generating the final factor-based scales, we employed a balanced approach that considered both the results of the statistical analysis and logical reasoning. The final statistical analyses confirmed that the set of items included within each factor appropriately reflected the factor within which the items were grouped.

Next, reliability analyses were conducted using SPSS to confirm that the proposed subfactors and factors were aligned and that there was internal consistency across all items (reliability) contributing to a subfactor. Cronbach's alpha was used as the measure of internal consistency; a Cronbach's alpha value of .70 or greater is generally considered to be a good level of internal consistency. In a few cases, items were dropped from the analysis because they reduced the Cronbach's alpha score. Additionally, some items were deleted because the responses across a set of job titles were not consistent with what is known about those job titles, suggesting that the items were not well-understood by respondents. Finally, some items were excluded because they did not show sufficient variation to be useful in the analysis. Overall, items that correlated weakly with salary grade were deleted and those that were strongly correlated were retained. As a final step, we ran factor analyses for each factor to compute factor scores using the factor score coefficient matrix.

Reliability Analyses with Amended Data

As we began the analysis, the NYS Department of Civil Service reviewed the data and decided that some responses did not appropriately reflect the job content of employees in various titles, i.e., that some employees had overestimated the importance or frequency of performing certain activities. For example, in response to some questions about health care responsibilities, some employees in titles that have no direct care or health care duties indicated that they did perform these duties on a regular basis. As a result, a decision was made that staff at DCS would review and amend the data to align with what is currently known about these jobs. This task was similar to one performed by human resources professionals for the 1980s study.

After receiving the amended data, additional reliability analyses were run with the new data to test the reliability of the subfactors and factors. The reliability analyses confirmed that the original factors and subfactors still had strong reliabilities, indicating that the factor structure had essentially not changed. Since the reliabilities essentially remained the same, additional factor analyses were run to compute new factor scores using the revised factor score coefficient matrix from SPSS. Appendix E includes the final set of factors and subfactors and the results of the reliability analyses for the state workforce.

Procedures for Analyzing the Data

In order to analyze data at the job-title level, we used subfactor/factor scores that were calculated by averaging the responses of all individuals within each job title; this resulted in a

sample of 1,120 titles. After excluding titles with a low response rate (below 30%) and titles represented by only one employee, the study team focused on 776 job titles for the analysis.

To analyze the data, a series of Ordinary Least Squares (OLS) regression analyses was employed. In the analyses, the study team used the current salary grade of job titles as the dependent variable and the job content factors developed with the new job content questionnaire as the independent variables. By regressing the current salary grade on new job content factors, the study team intended to (1) exhibit how New York State has implicitly valued the dimensions of work reflected in changes in the workplace and technology over past decades, (2) investigate if jobs that are considered of comparable worth based on the new set of factors/subfactors reflect any devaluation based on gender and/or racial/ethnic composition of these jobs, and (3) present what the current (implicit) valuation would be without such devaluation influencing female-dominated or minority-dominated job titles.

The base model shows how the new job content factors are implicitly valued and reflected in the current salary grade. With the new factors incorporating dimensions of job content that have not been explicitly reflected in the existing job content factors (i.e., QJES), the regression coefficients of the base model represent the current implicit valuation of new job content factors. In addition, as the implicit valuation is also susceptible to potential bias, the study team further investigated the influence of gender and racial/ethnic bias by including the percentage of females ("percent female") and percentage of minorities ("percent minority") in the job titles as additional explanatory variables. By incorporating these variables, the adjusted model could specify the extent of devaluation existing in the implicit valuation based on the gender and/or minority composition of job titles. Such bias can be confirmed if the coefficients of these variables are significant and negative in the adjusted model. That is, significant negative coefficients would indicate that job titles could be valued less depending on their gender and minority composition, even with equal job content.

The extent of such devaluation could be identified by examining the coefficients of percent female and percent minority in the adjusted model. Compensating for the extent of devaluation disproportionately impacting female-dominated or minority-dominated job titles in the regression equation could offset devaluation in jobs that are of comparable worth but being compensated at different levels. After the "offsetting" process, the coefficients would exhibit what the current valuation of job content factors would be without the influence of devaluation of female-dominated or minority-dominated job titles.

Results of Data Analyses

The base model of the regression analysis (Model 1) representing the implicit valuation of the state government's compensation function can be expressed as follows:

$$\boldsymbol{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i + \epsilon},$$

where $\boldsymbol{Y}$ is the current salary grade of the job titles, $\boldsymbol{X_i}$ for $\boldsymbol{i = 1, \cdots, n}$ are new job content factors captured by the questionnaire, $\boldsymbol{\beta_i}$ are the coefficients of factors determined by the OLS regression analysis, $\boldsymbol{\beta_0}$ is the constant, and $\boldsymbol{\epsilon}$ is the error term.

It should be noted that current salary grades have been determined based on the eight QJES factors. These eight factors, however, are based on job content questionnaire items developed in the 1980s, and the work environment and the technology used in the workplace have changed since then. Hence, it was assumed that the analysis would demonstrate how the new dimensions of job content, which are not explicitly measured with the QJES factors, are valued implicitly and reflected in the current salary grade through policy decisions. Thus, as a base model, Model 1 depicts the current valuation of job content in state government, including the portion implicitly reflected in the current salary grade.

The results of the regression analysis of Model 1 are provided in Column (1) of Table 2.4. The results indicate that Factor 1C (Education and Licensure), Factor 1D (Experience), Factor 2 (Managerial Activities), Factor 4 (Written Communication), Factor 5 (Information and Data-related Work Complexity), and Factor 8A (Job Demands Associated with High-risk Physical Work) are significantly associated with the current salary grade of job titles. That is, the dimensions of job content measured by these factors are explicitly and implicitly reflected in the current valuation in the state government. However, while all other significant factors are positively associated with salary grade, Factor 8A shows a negative association with salary grade. In other words, job titles that involve a greater amount of work with job demands associated with high-risk physical effort are valued less in the state government.

To further investigate whether jobs of comparable worth (based on the job content factors) may be paid at different salary grades based on gender and/or minority composition of the jobs, “percent female” and “percent minority” were added as additional explanatory variables in Model 2. This new model will show whether these two variables are implicitly valued in the current salary grade in a way that negatively influences female-dominated and minority-dominated job titles. Model 2 is expressed as follows:

$$\boldsymbol{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i + \beta_{pf} \cdot (\%\, female) + \beta_{pm} \cdot (\%\, minority) + \epsilon},$$

where $\boldsymbol{\beta_{pf}}$ is the coefficient of the “percent female” variable, and $\boldsymbol{\beta_{pm}}$ is the coefficient of the “percent minority” variable determined by the coefficient of each variable.

The regression results from Model 2 [see Column (2) of Table 2.4.] indicate that the coefficient of “percent female” is statistically significant and negative, while the coefficient of “percent minority” is not significant. The coefficient of percent female is -.032 with a p-value near 0, meaning that the probability that the percent female variable has no effect is near 0. The 99% confidence interval, which ranges from -.044 to -.019, suggests a 1% chance that the true coefficient of percent female is outside this range. The significant coefficient of -.032 indicates that when the female percentage increases by 1 point, job titles are valued less by .032 “units

of salary grade" when all other variables in the model are held constant. Alternatively, the percent minority variable shows no significant association with salary grade.

Given that the percentage of minority employees is not a significant devaluing factor in the current implicit valuation, i.e., regardless of having a disproportionately large number of minority employees, minority-dominated job titles are not subject to devaluation, the study team focused all remaining analyses on female-dominated job titles. The finding that percent female is a significant devaluing factor should not, however, be understood to be direct evidence that female-dominated job titles are not paid at their comparable worth level, partially because most female-dominated job titles in the state workforce are in low and medium salary grade levels (see Table 1.1). Rather, further analyses were required to determine if the observed devaluation in fact leads to female-dominated job titles not being paid at their level of comparable worth.

After identifying the devaluation based on the gender composition of job titles in Model 2, further investigation of the impact of the proportion of females in job titles on the current valuation (NYS salary grade) was warranted. In Model 3, the influence of the percent female variable is further specified by including an interaction term between the grade level grouping variable (see Table 1.1) and percent female so that the devaluation based on the gender composition at low, medium, and high levels of salary grade could be distinguished.

The regression results from Model 3 [see Column (3) of Table 2.4] indicate there is a differential effect of the percent female variable depending on salary grade level. In particular, the coefficients of percent female are significant at the low and medium levels, and nonsignificant at the high level. Given that the coefficients at the low and medium levels are both significant, with p-values near 0, the probability that the percent female variable has no effect is near 0. The coefficients indicate that the magnitude of percent female at the low level (-.038) is greater than its magnitude at the medium level (-.021). The 99% confidence interval of the coefficients range from -.05 to -.026 at the low level and from -.035 to -.008 at the medium level, suggesting a 1% chance that the true coefficients of percent female are outside these ranges.

These results should be interpreted as follows. Among the job titles classified as "low" salary grade, when the female percentage increases by 1 point beginning at 75%, job titles are valued less by .038 "units of salary grade" when all other variables in the model are held constant. Similarly, among the job titles classified as "medium" salary grade, when the female percentage increases by 1 point beginning at 75%, job titles are valued less by .021 "units of salary grade" when all other variables in the model are held constant. This finding is aligned with the study team's understanding of the composition of job titles in the state workforce, having most female-dominated job titles at the low and medium levels, especially at the low level.

Nevertheless, the devaluation based on the gender composition of job titles does not only occur in the female-dominated titles. It impacts all job titles in the low and medium levels based on their gender compositions, whether or not they are female-dominated job titles. That

said, the extent of devaluation associated with female-dominated job titles can be seen as the extent of devaluation disproportionately impacting female-dominated job titles for having a disproportionately large number of female employees compared to other job titles. Thus, the findings suggest that female-dominated job titles at the low and medium levels may be undervalued due to the disproportionate gender composition that defines them as female-dominated. The extent of the devaluation affecting each female-dominated job title at the low and medium levels could be estimated by multiplying the coefficients of percent female by the percentage of females exceeding the 75% threshold of female-dominated job titles.

These findings led to further examination of the amount of devaluation of female-dominated job titles at low and medium salary grade levels. The extent of devaluation ranges from -.95 to -.01, and among 183 female-dominated titles included in the study, 38 job titles are influenced by more than .5 salary grade devaluation. The list of female-dominated titles, including their current salary grades, percentage of females, and the extent of devaluation, is provided in Appendix F. By offsetting the devaluation in jobs that are of comparable worth but being compensated at different levels, the regression model with the new job content factors can show what the implicit valuation of the new job content factors would be if the devaluation did not disproportionately affect female-dominated job titles. To do so, current salary grades were adjusted by compensating the salary grade of the female-dominated titles for devaluation. The adjusted salary grade ($\boldsymbol{Y'}$) is defined as follows:

$$\boldsymbol{Y' = Y - Low \cdot \beta_{pf1} \cdot (\%\, female - 75\%) - Med \cdot \beta_{pf2} \cdot (\%\, female - 75\%),}$$

where $\boldsymbol{Low}$ is a variable indicating that a job title is at the low salary grade level and $\boldsymbol{Med}$ is a variable indicating that a job title is at the medium salary grade level. The coefficient ($\boldsymbol{\beta_{pf1}}$) of the "percent female" at the "low" grade is -.038, and the coefficient ($\boldsymbol{\beta_{pf2}}$) of the "percent female" at the "medium" grade is -.021. Depending on the level of female-dominated job titles, each coefficient would be multiplied by the percentage points of females exceeding the 75% threshold in each title.

The adjusted model (Model 4), which offsets the devaluation associated with the disproportionate percentage of females, is expressed as follows:

$$\boldsymbol{Y' = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i + \epsilon}$$

where $\boldsymbol{Y'}$ is the adjusted salary grade compensated for devaluation disproportionate to female-dominated titles.

By regressing the adjusted salary grade on job content factors, Model 4 depicts what the current valuation of job content factors in the state workforce would be without devaluation of comparable worth implicit in the current salary grade disproportionately affecting low and medium female-dominated titles. The coefficients of job content factors and their significance are presented in Column (4) of Table 2.4. The regression results suggest that Factor 1C

(Education and Licensure), Factor 1D (Experience), Factor 2 (Managerial Activities), Factor 4 (Written Communication), Factor 5 (Information and Data-related Work Complexity), and Factor 8A (Job Demands Associated with High-risk Physical Work) remain as significant job content factors (although there is a slight change in the magnitude of the coefficients). Again, while all other significant factors are positively associated with salary grade, Factor 8A has a negative association with salary grade. In addition, although only significant at the 90% confidence level, Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients) became another significant job content factor with an increased magnitude of its coefficient from 0.262 to 0.312.

For comparison, the standardized coefficients of job content factors of the base model (Model 1) and the adjusted model (Model 4) are presented in Table 2.5. By standardizing the coefficients, job content factors' relative importance in valuation can be directly compared with each other. It should be noted that Factor 7 (Oral Communication) and Factor 8A (Job Demands Associated with High-risk Physical Work) are reversed in scale to present the relative importance of factors more clearly and consistently. In this way, the relative importance of all job content factors, including those negatively valued in the current valuation, can be expressed as relative weights in positive values.

Overall, the state government's current valuation of job content factors before and after the study team's adjustment remains broadly consistent, although there is a slight change in the magnitude of importance. These findings suggest that female-dominated jobs are unlikely to be compensated at the same level as other jobs with comparable worth (based on the new job content factors) but that the relative importance of the job content factors does not change after adjusting the model to account for devaluation associated with the disproportionate percentage of females. As shown in Table 2.6, the order of relative importance of job content factors remained the same before and after the adjustment, except for Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients), which was identified as an additional significant factor in the adjusted model.

Nevertheless, the comparison of the relative weights of job content factors of the two models would inform the associations between the job content factors and devaluation of some jobs with comparable worth, even though it may not confirm the cause of such devaluation, i.e., the mechanism that causes the devaluation. Examining the differences in the relative weights of each factor indicates that there is an association between undervaluation and Factor 1C (Education), Factor 8A (Job Demands Associated with High-risk Physical Work), and Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients), and between overvaluation and Factor 1D (Experience), Factor 4 (Written Communication), and Factor 5 (Information & Data-related Work Complexity). The relative weight of Factor 2 (Managerial Activities) seemed not associated with under or overvaluation.

Tables 2.7 and 2.8. present the relative weights of the factors by gender grouping and salary grade level grouping, which demonstrates how job content factors are associated with the

current valuation across female-dominated, male-dominated, and gender-integrated job titles, and job titles at the low, medium, high salary grade levels. Especially for female-dominated titles and low and medium level job titles, the comparison of relative weights before and after the adjustment clearly shows how the adjustment leads to changes of relative weights associated with the job content factors.

Based on this adjusted model, the comparable worth of job titles was estimated. The comparable worth captured by the job content factors free of disproportionate devaluation of female-dominated titles can be obtained by calculating the fitted (estimated) value of job titles under the adjusted model. The fitted value can be understood as the predicted value of a salary grade based on the adjusted model. The fitted value of the adjusted model is computed as follows:

$$\widehat{\boldsymbol{Y}} = \mathbf{4.151} + \mathbf{0.396} \times \boldsymbol{Factor}\ \mathbf{1A} + \mathbf{0.87} \times \boldsymbol{Factor}\ \mathbf{1B} + \mathbf{1.353} \times \boldsymbol{Factor}\ \mathbf{1C} + \mathbf{1.49} \times \boldsymbol{Factor}\ \mathbf{2} + \mathbf{0.166} \times \boldsymbol{Factor}\ \mathbf{3} + \mathbf{1.225} \times \boldsymbol{Factor}\ \mathbf{4} + \mathbf{1.213} \times \boldsymbol{Factor}\ \mathbf{5} - \mathbf{0.297} \times \boldsymbol{Factor}\ \mathbf{6} - \mathbf{1.672} \times \boldsymbol{Factor}\ \mathbf{7} + \mathbf{0.312} \times \boldsymbol{Factor}\ \mathbf{8},$$

where $\widehat{\boldsymbol{Y}}$ indicates the fitted value of the regression model, i.e., the comparable worth of job titles expressed on a scale of salary grade.

The formula for computing the comparable worth resembles the pay policy formula for deciding the current salary grade. Nevertheless, the fitted value (or comparable worth) should not be understood as a substitute for the current salary grade, and the formula derived from the regression equation of Model 4 clearly cannot and should not be understood as a replacement for the existing pay formula for determining salary grades. Rather, the regression equation presented here is meant to exhibit how the state government is implicitly valuing the job content factors that have been newly identified and refined through our new survey instrument. That is, the regression equation can only demonstrate how the job content factors are implicitly valued by the state government (description), but not how they "should be valued" in the pay policy (prescription). Thus, the fitted value that is estimated based by the equation only represents the comparable worth of job titles in relation to the job content factors explicitly included in the survey instrument.

Ultimately, the regression equation in the current study needs to be adjusted and modified based on policy decisions that would develop a new pay policy formula (compensation model) using the newly identified factors. The current pay policy formula of the QJES was developed in the 1980s through a process of policy setting based on "a priori" reasoning, i.e., determining what factors should be valued and how much these factors should be valued in the future by adjusting and modifying the regression equations provided by the Center in 1986. Therefore, the current equation requires further refinement and adjustment through a policy decision-making process. That is, the statistical analyses presented here can inform the development of a revised pay policy, but any decision about such revisions should be guided by additional data gathered from human resources professionals.

Most importantly, the estimated comparable worth cannot and should not be directly compared with the current salary grade to determine if a particular job title is unfairly valued. The current salary grade is based on the eight QJES factors, but the comparable worth estimated in this study is based on job content factors that have been newly captured and refined to reassess the dimensions of job content. Thus, these two are different and not directly comparable. On the other hand, the comparable worth estimated by the regression models could serve as a reference for comparing and understanding the job titles within the current valuation of the state government.

Table 2.4: Results of Regression Analyses Used for Identifying Devaluation of Jobs of Comparable Worth

Variables	(1) Base model	(2) with % female	(3) with Level × % female	(4) Adjusted Model
Factor 1A (Office- and Administration-related Knowledge and Skills)	0.344	0.835**	0.821**	0.396
Factor 1C (Education/Licensure)	0.869**	0.875**	0.962**	0.870**
Factor 1D (Experience)	1.363**	1.308**	1.125**	1.353**
Factor 2 (Managerial Activities)	1.498**	1.456**	1.248**	1.490**
Factor 3 (Supervision)	0.184	0.079	0.084	0.166
Factor 4 (Written Communication)	1.251**	1.086**	1.031**	1.225**
Factor 5 (Information & Data-related Work Complexity)	1.228**	1.052**	1.138**	1.213**
Factor 7 (Oral Communication)	-0.278	-0.345	-0.370	-0.297
Factor 8A (Job Demands Associated with High-risk Physical Work)	-1.616**	-2.492**	-2.534**	-1.672**
Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients)	0.262	0.577**	0.677**	0.312+
% female		-0.032**		
% minority		0.005		
Low × % female			-0.038**	
Medium × % female			-0.021**	
High × % female			0.011	
Constant	3.996**	6.625**	7.432**	4.181**
Observations	776	776	776	776
R-squared	0.835	0.845	0.853	0.835

** p<0.01, * p<0.05, + p<0.1

Table 2.5: Comparison of Relative Weights of Base and Adjusted Models

	(1)	(2)
Factors	Current weights	Adjusted weights
Factor 1A (Office- and Administration-related Knowledge and Skills)	0.037	0.043
Factor 1C (Education/Licensure)	0.226**	0.227**
Factor 1D (Experience)	0.377**	0.376**
Factor 2 (Managerial Activities)	0.174**	0.174**
Factor 3 (Supervision)	0.033	0.030
Factor 4 (Written Communication)	0.190**	0.187**
Factor 5 (Information & Data-related Work Complexity)	0.110**	0.109**
Factor 7 (Oral Communication)	0.029	0.031
Factor 8A (Job Demands Associated with High-risk Physical Work)	0.179**	0.186**
Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients)	0.031	0.037+
Observations	776	776
R-squared	0.835	0.820

** p<0.01, * p<0.05, + p<0.1

Table 2.6: Order of Job Content Factors by Relative Importance

	(1)	(2)
Factors	Current weights	Adjusted weights
Factor 1D (Experience)	.377**	.376**
Factor 1C (Education/Licensure)	.226**	.227**
Factor 4 (Written Communication)	.191**	.187**
Factor 8A (Job Demands Associated with High-risk Physical Work)	.179**	.186**
Factor 2 (Managerial Activities)	.174**	.174**
Factor 5 (Information and Data-related Work Complexity)	.110**	.109**
Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients)	.031	.037+
Factor 1A (Job Knowledge and Skills)	.037	.043
Factor 3 (Supervision)	.033	.030
Factor 7 (Oral Communication)	.029	.031

** p<0.01, * p<0.05, + p<0.1

Table 2.7: Relative Weights Before and After Adjustment by Title Gender Grouping

Factors	(1) Base FD	(2) Adjusted FD	(3) MD	(4) GI
Factor 1A (Job Knowledge and Skills)	0.076	0.071	0.091	0.047
Factor 1C (Education/Licensure)	0.319**	0.321**	0.121**	0.208**
Factor 1D (Experience)	0.203**	0.200**	0.284**	0.497**
Factor 2 (Managerial Activities)	0.193*	0.201*	0.193*	0.120**
Factor 3 (Supervision)	0.075	0.068	-0.040	0.027
Factor 4 (Written Communication)	0.250**	0.254**	0.186**	0.152**
Factor 5 (Information and Data-related Work Complexity)	0.112+	0.108+	0.202**	0.068**
Factor 7 (Oral Communication)	0.073	0.066	0.061	-0.005
Factor 8A (Job Demands Associated with High-risk Physical Work)	0.091	0.082	0.335**	0.159**
Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients)	0.020	0.013	0.020	0.037
Observations	183	183	176	417
R-squared	0.790	0.790	0.849	0.863

(FD=Female-Dominated; MD=Male-Dominated; GI=Gender-Integrated)

Table 2.8: Relative Weights Before and After Adjustment by Title Level Grouping

Factors	(1) Base Low	(2) Adjusted Low	(3) Base Med	(4) Adjusted Med	(5) High
Factor 1A (Job Knowledge and Skills)	0.061	0.069	-0.002	0.004	0.125
Factor 1C (Education/Licensure)	0.309**	0.308**	0.284**	0.285**	0.073
Factor 1D (Experience)	0.242**	0.243**	0.341**	0.338**	0.648**
Factor 2 (Managerial Activities)	0.140**	0.139**	0.240**	0.243**	-0.031
Factor 3 (Supervision)	0.063	0.059	-0.052	-0.055	0.055
Factor 4 (Written Communication)	0.205**	0.201**	0.153**	0.151**	0.099
Factor 5 (Information and Data-related Work Complexity)	0.154**	0.152**	0.097**	0.094**	0.068
Factor 7 (Oral Communication)	0.049	0.051	0.028	0.031	0.089
Factor 8A (Job Demands Associated with High-risk Physical Work)	0.194**	0.204**	0.235**	0.240**	0.219*
Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients)	0.044	0.053	0.048+	0.049+	0.070
Observations	483	483	241	241	52
R-squared	0.767	0.768	0.877	0.877	0.844

SECTION 2: PAY EQUITY STUDY IN LOCAL GOVERNMENT

This section describes the study of wage compensation for a sample of local governments (outside of New York City). The sample includes two cities and five counties. It should be noted that recruitment of local governments proved challenging and most of the selected local governments originally identified for the sample opted out of the study, citing lack of capacity to engage in the study, COVID-19 related adjustments and the challenges of operating remotely.

In addition to the challenges cited above, there were difficulties in collecting data for the analysis of local governments as the study team coordinated with multiple localities under enormous pressure during the pandemic. The relatively small size of the governments of the participating localities and limited resources in administering the questionnaire led to smaller sample sizes than would generally be seen as appropriate for a study like this. In a similar vein, some job titles had no responses, leading to a smaller number of job titles available for analysis. In fact, the sample size of some local governments in the study dropped below the necessary number of job titles to perform regression analyses (a general rule of thumb is 10-20 observations per independent variable); thus, no analyses are presented here for those localities. Thus, although three cities and six counties participated in the study, one city and one county were dropped from the analyses and the sample should not be viewed as representative of local governments in New York State.

In addition, it should be noted that regression analyses using small sample sizes cannot accurately provide results consistent with true population parameters and/or valid statistical tests. Due to these issues, it should be assumed that analyses could be biased, i.e., not generalizable to the larger population of job titles within the localities. Thus, the analyses focus on "outlier" job titles, i.e., jobs that have large discrepancies with the regression estimates, that each local government might consider for further investigation.

Sampling Procedures

The study team initially selected a sample of local governments that would be representative of localities around the state. This sample included the larger cities in upstate New York and one county from each of the 10 regions designated by Empire State Development (https://esd.ny.gov/regions). However, as noted above, some local governments opted out of the study and some that did participate did not end up with enough job titles in the database to allow the study team to perform regression analyses. All localities that participated in the study provided a

Table. 2.9: Number of Job Titles in Each Sample

County	Job titles	City	Job titles
County 1	99	City 1	82
County 2	136	City 2	64
County 3	96		
County 4	122		
County 5	123		

database of their employees and/or a sample of their employees in titles selected for this study. The databases included names of the employees, as well as their job titles and salaries. Table 2.9 shows the number of job titles examined within each of the seven localities presented in this section.

Data Analysis Procedure

Prior to analyzing the data, separate factor and reliability analyses were conducted with city and county databases (i.e., all cities were aggregated into one database and all counties were aggregated into a second database). Building on the structure of the state factors, new factors and subfactors were developed for city and county governments. Although the new factor structures developed for the city and county analyses are very similar to the state factor structure, there are some differences, which reflect differences between state, county, and city workforces. Appendices G and H include the final sets of factors and subfactors and the results of the reliability analyses for the county and city workforces, respectively.

After excluding outliers (based on salary information) from the data of each locality, a series of regression analyses were conducted using the new factor structures. In addition to the minor changes made to the factors and subfactors, there are two major differences between the regression analyses conducted for the state government and those conducted for the city and county governments. First, in the state analyses, the dependent variable was the job title's salary grade, while the dependent variable for the local government analyses was the job title's median salary, i.e., the midpoint salary within each job title. Second, in the state analyses, job titles were labeled as female-/male-dominated or gender-integrated or minority-/White-dominated or race integrated based on the current composition of the jobs. Given the data provided by the local governments, it was not possible to determine the job composition and so jobs were labeled as female-/male-dominated or gender-integrated based on national standards. In addition, there were no minority-dominated job titles, and so this variable was deleted from the analyses of city and county governments. In addition, in cases where there were large salary differences within a job title, job titles were divided into separate groups of "high" and "low" salary.

Table 2.10 presents the results of the regression analyses conducted for the seven localities. In these analyses, the study estimated the predicted salary of each job title—indicating the salary each job title would be paid—based on the job content factors using the regression analysis within each local government.

Regression Results

Table 2.10: Results by Locality

VARIABLES	(1) County 1	(2) County 2	(3) County 3	(4) County 4	(5) County 5	(6) City 1	(7) City 2
Factor 1A (Office- and Administration-related Knowledge and Skills)	-2,788.35	-2,253.164	-2,295.189	1,120.065	-2,293.703	-917.449	6,041.599
Factor 1B (Computing and Equipment Knowledge and Skills)	151.319	-973.291	852.471	-2,438.371	-327.052	682.164	-16,568.726
Factor 1C (Education/Licensure)	7,219.592	6,115.740	6,502.912	4,362.384	4,375.971	3,343.950	3,088.801
Factor 1D (Experience)	2,201.387	2,320.518	121.369	1,732.924	3,089.406	1,441.703	5,747.892
Factor 2 (Managerial Activities)	2,315.554	2,679.821	6,980.983	6,440.547	3,799.301	3,477.723	393.378
Factor 3 (Supervision)	2,749.776	5,493.400	1,532.992	1,351.471	3,700.857	3,819.080	4,314.882
Factor 4 (Written Communication)	2,879.799	1,144.595	-1,304.280	631.977	1,723.456	240.563	3,744.220
Factor 5 (Information & Data-related Work Complexity)	2,012.173	-1,191.843	1,880.660	310.167	-953.273	2,914.458	4,836.162
Factor 6 (Responsibility)	4,146.741	3,177.429	-815.515	-142.789	-538.356	3,468.819	-2,995.122
Factor 7 (Oral Communication)	-2,797.505	-4,596.881	-1,218.166	-1,525.241	294.202	-1,291.401	970.550
Factor 8A (Job Demands Associated with High-risk Physical Work)	-3,194.917	-844.470	-2,600.840	-3,318.536	6,895.060	-3,760.774	1,270.487
Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients)	-1,912.802	-299.401	1,329.704	2,009.998	-1,483.764	2,224.836	10,379.184
Female-dominated	-4,244.059	-3,334.710	-4,780.882	-8,115.262	-4,788.086	-5,815.846	-8,081.261
Constant	18,389.450	21,320.513	30,725.518	28,614.155	16,093.117	9,626.950	-21.694
Observations	99	136	94	121	123	78	64

The analyses show that, overall, the variable “female-dominated job title” was a consistent negative predictor of job titles’ salary across the local governments in the regression analyses. This means that, holding all job content factors constant, female-dominated jobs appear to be devalued across the local governments in the sample. As mentioned above, there are issues associated with regression analyses based on small samples and results need to be considered carefully. One important issue here is that the results of the seven regression analyses indicate that the directions of the job content factors’ influence are inconsistent across the local governments. In addition, the directions of the job content factors’ influence are not always consistent with findings from the state analysis. Such inconsistency might be caused by several reasons, including the small sample sizes, use of median salary rather than salary grade as a dependent variable, and other differences across localities. Similarly, there is a wide range of variability in the magnitude of the influence of a

job title being female dominated on salary. Still, despite the limitations, there is a consistent finding that there could be a devaluation of salary for female-dominated job titles across the local governments. Within the subsections on the individual localities, there is a list of female-dominated job titles that might be overvalued or undervalued for each local government (excluding any job title with only one incumbent). While the results presented in this section are inconclusive, the study team recommends that each local government further investigate the job titles on the lists to determine if there might be unfair compensation.

These results are also shown graphically within each of the subsections on the individual localities. In the graphs, the solid black line ($\boldsymbol{y = x}$) indicates where the predicted salary ($\boldsymbol{x}$) equals the current salary ($\boldsymbol{y}$) of job titles. The area above the line is where the current salary is higher than the predicted salary ($\boldsymbol{y > x}$), and the area below the line is where the predicted salary is lower than the current salary ($\boldsymbol{y < x}$). This visualization is provided to offer insights for further understanding pay equity in the local governments in this study.

One way to interpret the graph is that the regression analysis suggests that job titles located in the area below the line could be undervalued. However, as a statistical estimate, a predicted salary comes with a range (confidence interval). The grey area around the line indicates the range within the 95% confidence interval of the predicted salary grade, meaning that it is 95% certain that the true predicted salary is within this range. Thus, even when a job title is below the line, but within the range of 95%, it is not certain if its salary is undervalued. The job titles falling significantly below the line, i.e., below the grey area, indicate possible undervaluation as their current salary is significantly lower than the predicted salary. In each graph, 95% confidence intervals (CIs) of predicted salary are displayed as thresholds for identifying job titles with a possible significant undervaluation.

County Government Study

1. County 1

In this county, the questionnaire was sent to all employees (n = 575), i.e., the sample is the population of employees. The study team received 213 responses (response rate = 37.04%) from 99 job titles. Table 2.11 shows County 1 Response Data.

Table 2.11: County 1 Response Data

Total Employees	Total # of Titles	Sampled Yes-No	Total # of Responses	Response Rate	# Female Dominated Titles	# of Responses in FD Titles	# Male Dominated Titles	# of Responses in MD Titles	# Gender Integrated Titles	Number of Responses in GI Titles	Titles w/ 2 or more responses
575	198	N	213	37.04%	32	76	35	90	32	47	36

Figure 2.1: Female-dominated Predicted Salary (County 1)

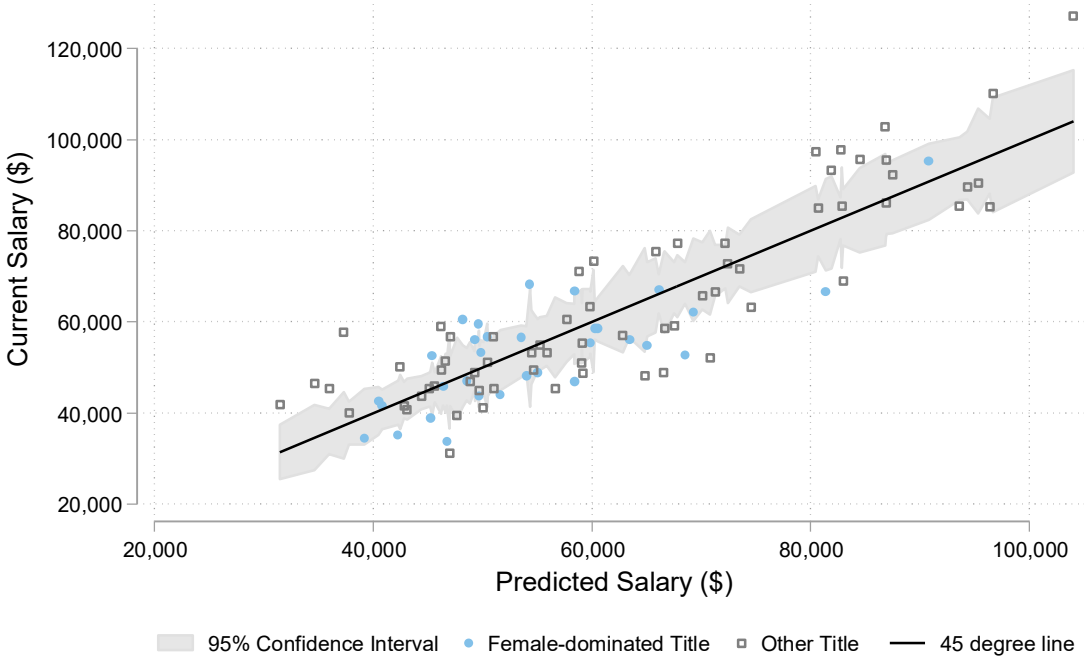


Table 2.12: Female-dominated titles: Over and Under the 95% CI: County 1

Female-dominated titles over the 95% CI	***Female-dominated titles below the 95% CI***
Human Resources Assistant	Account Clerk Typist
Principal Social Welfare Examiner	Case Supervisor Grade B
Senior Case Manager	Clerk
	Community Service Worker
	Senior Account Clerk Typist
	Senior Social Welfare Examiner
	WIC Nutritionist
	WIC Peer Counselor

2. County 2

In County 2, the questionnaire was sent to all employees (n = 567), i.e., the sample is the population of employees. The study team received 290 responses (response rate = 51.50%) from 136 job titles.

Table 2.13: County 2 Response Data

Total Employees	Total # of Titles	Sampled Yes-No	Total # of Responses	Response Rate	# Female Dominated Titles	# of Responses in FD Titles	# Male Dominated Titles	# of Responses in MD Titles	# Gender Integrated Titles	Number of Responses in GI Titles	Titles w/ 2 or more responses
567	193	N	290	51.50%	45	110	31	63	60	117	48

Figure 2.2: Female-dominated Predicted Salary (County 2)

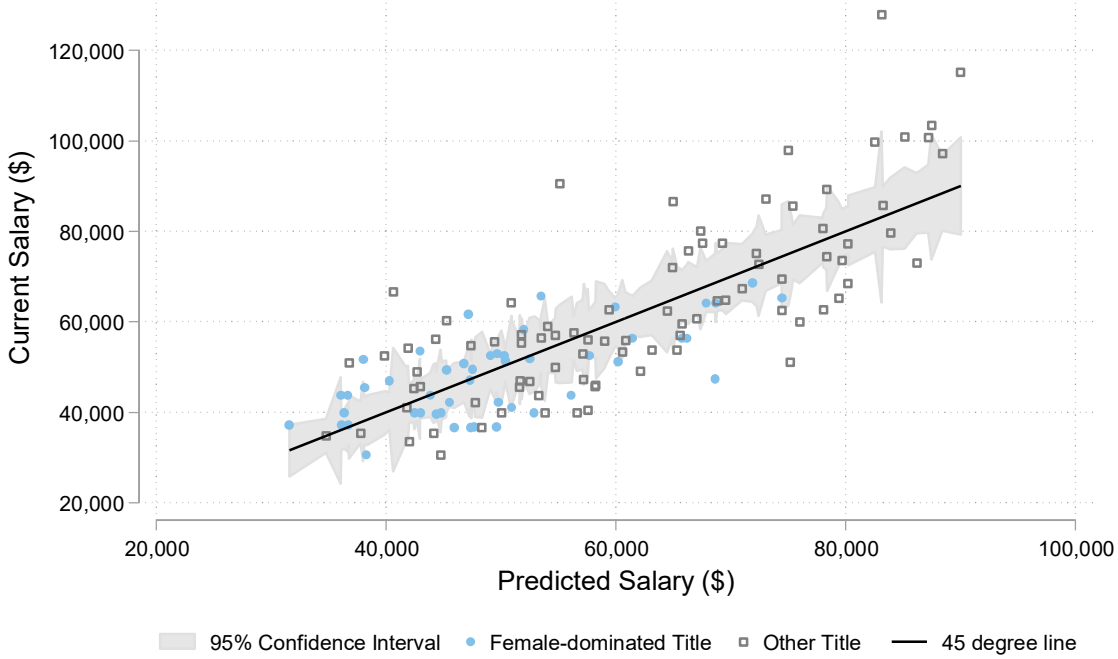


Table 2.14: Female-dominated titles: Over and Under the 95% CI: County 2

Female-dominated titles over the 95% CI	*Female-dominated titles below the 95% CI*
Community Health Nurse	Aging Services Caseworker
Principal Financial Clerk	Case Supervisor Grade B
Public Health Sanitarian	Child Care Worker
Registered Professional Nurse-MH	Family Advocate
Social Welfare Examiner	Human Resources Clerk
	MH Clinical Social Worker
	Principal Social Welfare Examiner
	Senior Client Service Outreach Assistant
	Senior Recording Clerk
	Specialist Service/Aging

3. County 3

In County 3, the questionnaire was sent to all employees (n = 471), i.e., the sample is the population of employees. The study team received 174 responses (response rate = 36.94%) from 96 job titles. We dropped two job titles—part-time County Fire Coordinator and part-time County Historian—from the analysis to reduce the influence of extreme outliers.

Table 2.15: County 3 Response Data											
Total Employees	Total # of Titles	Sampled Yes-No	Total # of Responses	Response Rate	# Female Dominated Titles	# of Responses in FD Titles	# Male Dominated Titles	# of Responses in MD Titles	# Gender Integrated Titles	Number of Responses in GI Titles	Titles w/ 2 or more responses
471	178	N	174	36.94%	35	75	29	50	32	49	28

Figure 2.3: Female-dominated Predicted Salary (County 3)

Table 2.16: Female-dominated titles: Over and Under the 95% CI: County 3

Female-dominated titles over the 95% CI	*Female-dominated titles below the 95% CI*
Senior Social Welfare Examiner	Account Clerk
Staff Resource Assistant-High	Aging Services Aide
	Case Supervisor Grade B
	Caseworker
	Principal Social Welfare Examiner
	Senior Caseworker
	Senior Account Clerk
	Staff Resources Assistant II

4.

In County 4, the questionnaire was sent to all employees (n = 796), i.e., the sample is the population of employees. The study team received 245 responses (response rate = 30.78%) from 122 job titles. We dropped one job title, District Attorney, from the analysis to reduce the influence of the extreme outlier.

Table 2.17: County 4 Response Data

Total Employees	Total # of Titles	Sampled Yes-No	Total # of Responses	Response Rate	# Female Dominated Titles	# of Responses in FD Titles	# Male Dominated Titles	# of Responses in MD Titles	# Gender Integrated Titles	Number of Responses in GI Titles	Titles w/ 2 or more responses
796	227	N	245	30.78%	47	136	24	39	51	70	35

Figure 2.4: Female-dominated Predicted Salary (County 4)

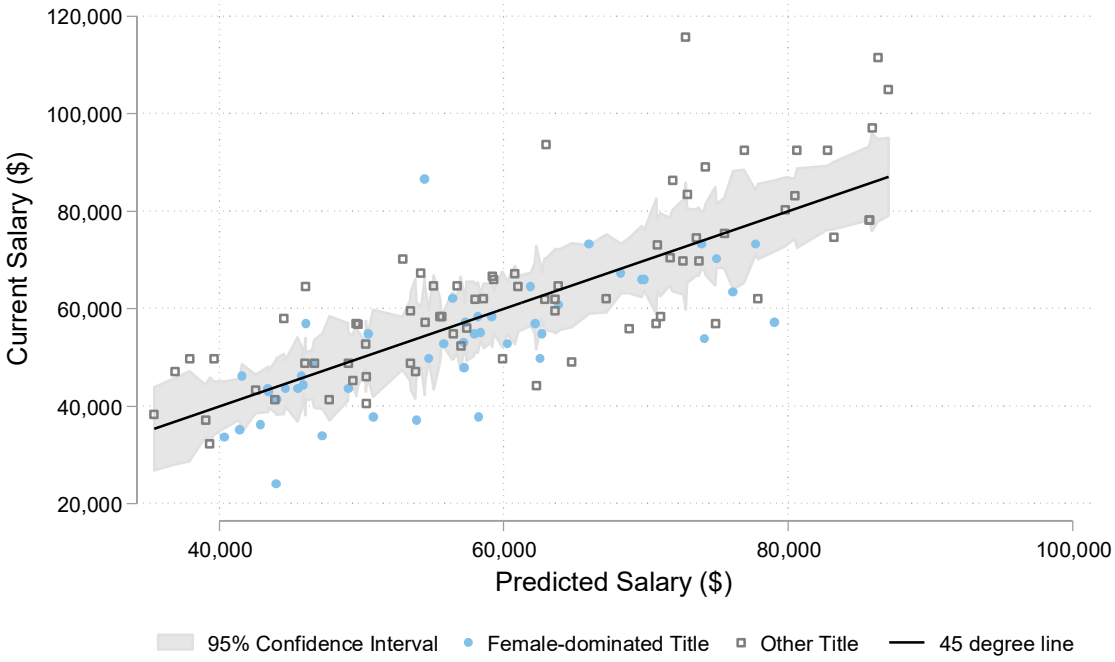


Table 2.18: Female-dominated titles: Over and Under the 95% CI: County 4

Female-dominated titles over the 95% CI	*Female-dominated titles below the 95% CI*
	Account Clerk
	Clerk
	Human Resource Technician
	Keyboard Specialist
	Nutrition Services Aide
	Nutrition Services Assistant
	Registered Professional Nurse-Low
	Senior Social Welfare Examiner
	Social Welfare Examiner Trainee

5. County 5

In County 5, the questionnaire was sent to all employees (n = 987), i.e., the sample is the population of employees. The study team received 178 responses (response rate = 18.03%) from 123 job titles.

Table 2.19: County 5 Response Data											
Total Employees	Total # of Titles	Sampled Yes-No	Total # of Responses	Response Rate	# Female Dominated Titles	# of Responses in FD Titles	# Male Dominated Titles	# of Responses in MD Titles	# Gender Integrated Titles	Number of Responses in GI Titles	Titles w/ 2 or more responses
987	341	N	178	18.03%	54	91	30	41	39	46	36

Figure 2.5: Female-dominated Predicted Salary (County 5)

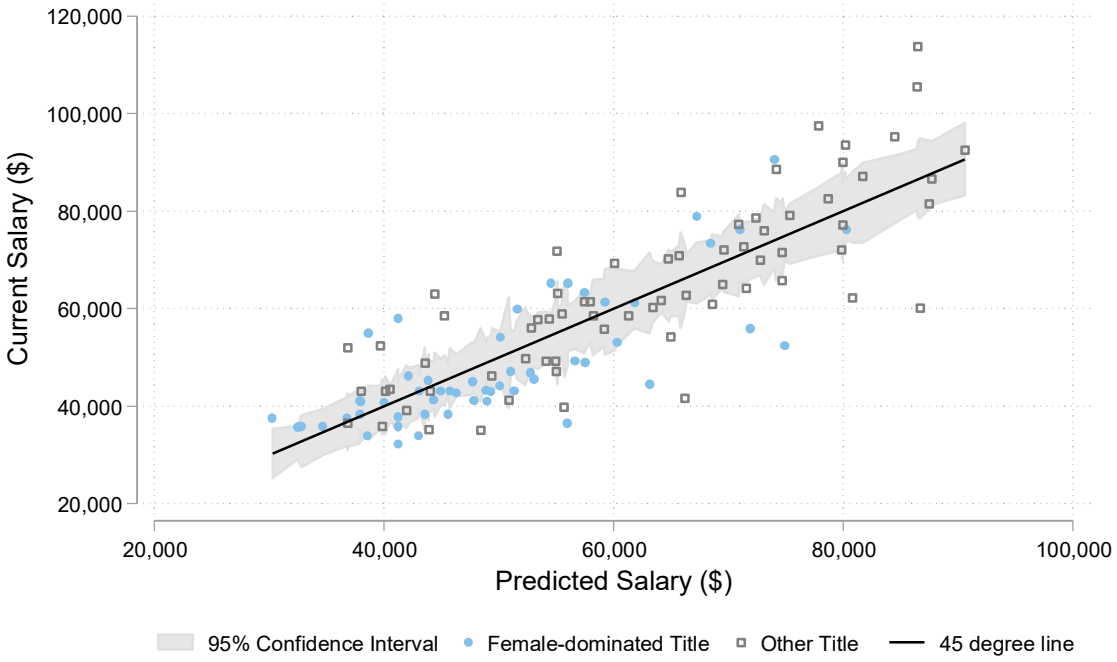


Table 2.20: Female-dominated titles: Over and Under the 95% CI: County 5

Female-dominated titles over the 95% CI	***Female-dominated titles below the 95% CI***
Community Health Nurse (PH)	Account Clerk/Database
Registered Professional Nurse	Aging Service Assistant
Social Welfare Examiner	Assistant Social Worker II
Typist	Assistant Social Worker II
	Case Supervisor
	Caseworker
	Clerk
	County Clerk's Worker I
	Principal Account Clerk
	Principal Payroll Clerk
	Principal Social Welfare Examiner

Senior Account Clerk/Database
Senior Social Welfare Examiner
Ward Clerk

City Government Study

1. City 1

In City 1, the questionnaire was sent to all employees (n = 1,374), i.e., the sample is the population of employees. The study team received 103 responses (response rate = 7.57%) from 82 job titles. We excluded four job titles—Chief of Police, Corporation Counsel, Deputy Chief Fire/Emergency and Building Services, and Police Commander—from the analysis to reduce the influence of extreme outliers.

Table 2.21: City 1 Response Data

Total Employees	Total # of Titles	Sampled Yes-No	Total # of Responses	Response Rate	# Female Dominated Titles	# of Responses in FD Titles	# Male Dominated Titles	# of Responses in MD Titles	# Gender Integrated Titles	Number of Responses in GI Titles	Titles w/ 2 or more responses
1,374	259	N	103	7.57%	14	19	31	38	37	46	14

Figure 2.6: Female-dominated Predicted Salary (City 1)

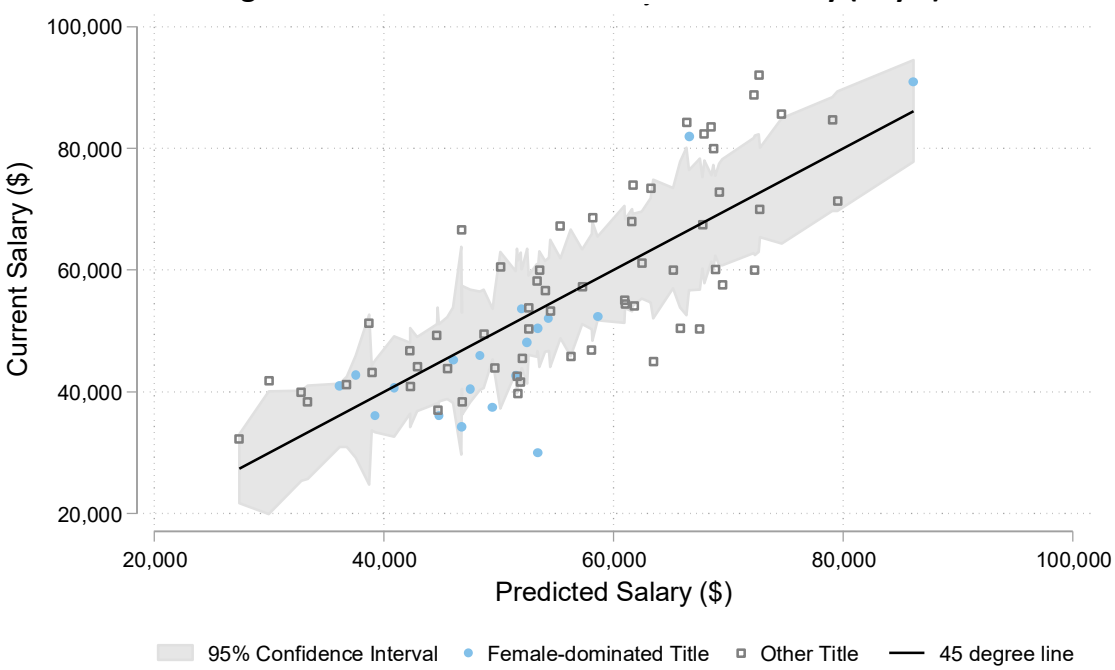


Table 2.22: Female-dominated titles: Over and Under the 95% CI: City 1

Female-dominated titles over the 95% CI	*Female-dominated titles below the 95% CI*
	Account Clerk
	Communications Coordinator
	Confidential Secretary

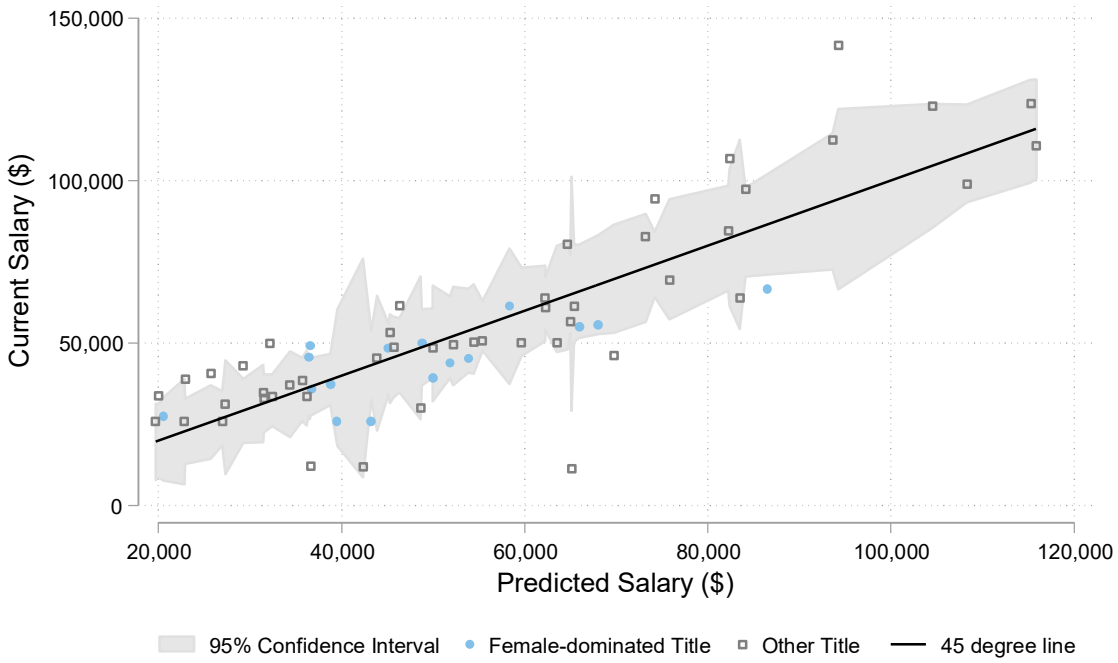
2. City 2

In City 2, 33% of employees in each job title were randomly selected for the sample after excluding job titles with fewer than five incumbents. As a result, among a total of 3,405 employees, 802 employees were sent the questionnaire. The study team received 206 responses (response rate = 25.69%) from 64 job titles.

Table 2.23: City 2 Response Data

Total Employees	Total # of Titles	Sampled Yes-No	Total # of Responses	Response Rate	# Female Dominated Titles	# of Responses in FD Titles	# Male Dominated Titles	# of Responses in MD Titles	# Gender Integrated Titles	Number of Responses in GI Titles	Titles w/ 2 or more responses
3,405	64	Y	206	25.69%	17	62	35	125	12	19	41

Figure 2.7: Female-dominated Predicted Salary (City 2)



In City 2, the work performed in female-dominated job titles appears to be valued relatively fairly—or better even—among low-level salary job titles.

Table 2.24: Female-dominated titles: Over and Under the 95% CI: City 2

Female-dominated titles over the 95% CI	***Female-dominated titles below the 95% CI***
Clerk II	Librarian II
Clerk III/Typing/Part-Time–High	Literacy Aid/Part-Time

SECTION 3: PAY EQUITY STUDY IN NEW YORK CITY

Sampling Procedures

The sampling procedure for New York City (NYC) was somewhat similar to that used for the state study, although there were some key differences. First, we excluded all job titles with fewer than four (4) employees, which is a large percentage of NYC government jobs (48%). We then focused on job titles with a "large" number of employees, i.e., those in the 25th percentile. As this study is primarily focused on titles that are gender-disproportionate, the study team included all female-dominated titles (27) and male-dominated job titles (24), and randomly selected 33% of the gender-integrated titles (43), resulting in a sample of 94 (out of 727) job titles for the analysis. The number of employees included in the sample was slightly less than 80,000, which was about 40% of the NYC workforce.

However, the survey was not administered as initially planned, so a response rate could not be determined. Individuals in job titles not originally included in the sample responded to the survey; thus, the sample included more than 94 titles. A more important issue, however, was that there were no responses from multiple job titles that had been included in the sample. As a result, the sample of job titles is not representative of the NYC workforce.

Table 2.25: New York City Response Data

Total Employees	Total # of Titles	Sampled Yes-No	Total # of Responses	Response Rate	# Female Dominated Titles	# of Responses in FD Titles	# Male Dominated Titles	# of Responses in MD Titles	# Gender Integrated Titles	# of Responses in GI Titles	# of Responses in undefined Titles	Titles w/ 2 or more responses
193,964	1,634	Y	2,880	-	24	1,438	33	150	76	1,135	157	93

After aggregating the individual survey data at the title level, a total of 150 job titles was identified in our data. Eight job titles with fewer than four incumbents and nine job titles without sufficient title information were excluded from the database, resulting in 133 job titles in our final database.

Data Analysis Procedure

As was done with the other local governments, factor and reliability analyses were conducted with the NYC data before running the regression analyses. Using the prior analyses as a starting point, new factors and subfactors were developed for the NYC study. Again, the new factor structure was very similar to the other factor structures, with some changes reflecting differences between the NYC workforce and the other workforces examined in this study. Appendix I includes the final set of factors and subfactors and the results of the reliability analyses for the NYC workforce.

Table 2.26 presents the results of the regression analyses conducted with the data collected from NYC employees. Regression analyses were conducted based on two different models. One used a binary variable that identified female-dominated job titles based on national standards (similar to the local analyses); the other used the percentage of female employees of each job title (similar to the state analysis).

Table 2.26: Results of New York City

	(1)	(2)
VARIABLES	Female-dominated category	% Female
Factor 1A (Office- and Administration-related Knowledge and Skills)	-10,430.217*	-11,634.739*
Factor 1C (Education/Licensure)	6,494.476**	6,459.551**
Factor 1D (Experience)	6,087.396**	6,171.724**
Factor 2 (Managerial Activities)	-3,570.873	-3,616.269
Factor 3 (Supervision)	10,688.985**	10,720.029**
Factor 4 (Written Communication)	5,796.397+	6,322.213+
Factor 5 (Information & Data-related Work Complexity)	6,912.071+	7,581.004*
Factor 6 (Responsibility)	-6,898.534	-6,954.258
Factor 7 (Oral Communication)	3,922.225	4,390.306
Factor 8A (Job Demands Associated with High-risk Physical Work)	4,253.270	5,737.899
Factor 8B (Job Stressors Associated with Working with Difficult Patients and Clients)	-5,233.489	-6,181.324
Female-dominated	-3,201.931	
% Female		19.665
		(97.274)
Constant	33,586.046*	29,982.135+
	(13,932.210)	(15,577.704)
Observations	133	133
R-squared	0.529	0.528

Robust standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

Although the directions of the influence are different between these two measures, regression coefficients for both the female-dominated binary variable and the percentage female variable indicate that they have no significant influence on salary. Given the issues with the sampling and survey procedures, however, these results cannot be meaningfully interpreted since the sample is not representative of the NYC workforce.

Figure 2.8: Female-dominated Predicted Salary

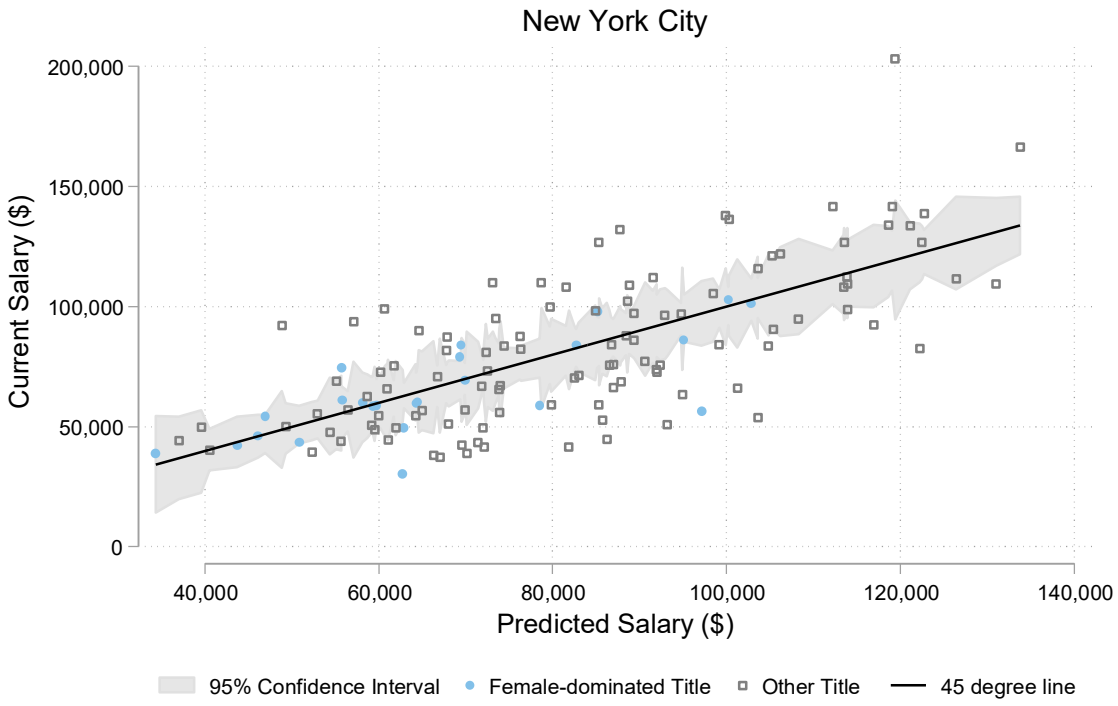


Figure 2.27: Female-dominated titles: Over and Under the 95% CI: New York City

Female-dominated titles over the 95% CI
Staff Nurse
Supervisor III (Social Services)

Female-dominated titles below the 95% CI
Paralegal Aide
Supervisor I (social Services)

Part III: Recommendations & Policy Implications

This study focused on the question of whether female- and minority-dominated titles in NYS government and in a sample of local governments in the state are devalued; and, if they are, which ones are devalued. Identifying the reasons for the devaluation is beyond the scope of this study. Achieving gender equity is a complex endeavor that requires thoughtful effort not only in answering the question of what titles are undervalued but also in identifying the varied reasons that may have led to devaluation besides gender and racial bias, i.e., variables that may have contributed to devaluation that were not captured by this study. This type of assessment would pave the way for the development of appropriate weights for compensation and elimination of any implicit bias inherent in wage-setting practices. The section below discusses the contributions and implications of the current study as well as its limitations, and offers recommendations for building on the work that was done here.

Contributions and Implications of the Study

The main purposes of this study were to evaluate wage compensation for public employees in New York State and a sample of localities within the state and to identify possible disparities that are attributable to gender and race/ethnicity in titles that are segregated by gender and race/ethnicity. To evaluate wage compensation and identify possible disparities, it was necessary to conduct a job evaluation of civil service jobs that would accurately describe key job content characteristics including knowledge, skills, effort, responsibilities, working conditions, education, prior experiences, effort, and demands of the job. While a job evaluation system has been used for NYS titles, the instrument was designed in the 1980s and may not fully reflect the current nature of work. Since the 1980s, the nature of work has changed, making it necessary to develop a new instrument that reflects the range of technological and cultural changes that have occurred over the last 30 years. As such, a key task for this study was to develop a new job content questionnaire with updated factors and subfactors that could be used for quantitative job evaluations. The new questionnaire was developed based on an extensive review of the most recent literature and reviews of peer experts and human resources professionals. Appendix J includes a comparison between the current job evaluation system and the updated factors and subfactors resulting from the study.

The statistical analyses based on the updated instrument and presented in Part II indicate that some female-dominated titles are undervalued. Indeed, the regression models provided evidence of the devaluation. By including the additional explanatory variables in the analysis, i.e., variables that describe the gender composition of jobs, overall, and at different levels, the study team confirmed that the percentage of females in a job title has a statistically significant influence on job titles' compensation even when holding constant the effect of job content

characteristics. The undervaluation disproportionately influences female-dominated job titles that have more than 75% female employees, i.e., female-dominated job titles. A finding that is most interesting is the differences in undervaluation across job title levels, i.e., the degree of devaluation is most pronounced in the low and medium salary levels. This is an issue that needs to be examined further in connection with the other jobs in the state workforce.

Study Limitations

As noted in Part II, there were various challenges that occurred in conducting this study. In addition, a correlational study that relies on self-reported data has certain limitations. Thus, while this study provides some important contributions to the understanding of wage compensation in New York State and a sample of its local government, the challenges and limitations of this study need to be taken into consideration when examining the results in Part II.

Shifting Priorities Under COVID-19

Shortly after the study started, the COVID-19 pandemic hit New York State. This unprecedented event created a turbulent period around the world; and initially New York State was one of the states hit hardest by the novel virus. One of the greatest changes during this period was the uncertainty experienced by some employees as they scrambled to figure out how to fulfill their work obligations remotely when telework capabilities were not yet fully set up. Furthermore, some employees were being assigned new tasks to assist with pandemic response efforts.

There is no doubt that the study was conducted under unusual and challenging circumstances where employees possibly viewed completing a job content questionnaire at a very low, perhaps the lowest, priority when compared to balancing logistics of everyday work with childcare, eldercare and home-schooling responsibilities, and staying safe from a deadly disease. In some cases, employees were redeployed to support the emergency response to the pandemic. Priorities were redirected to the pandemic response. Low response rates in some cases can certainly be attributed to the external environment in which the study was conducted, and a major limitation of the study is the lack of responses from incumbents of certain job titles that were deemed critical to this study, which led to these jobs being excluded from the analyses.

Definition of Minorities

A second limitation of this study relates to the definitions of minority and minority-dominated jobs. In this study, the term ‘minority’ includes individuals who are not identified as White, and the designation of minority-dominated job titles is based on individuals who are not identified as White. While this initially seemed to be a wise decision with respect to equity and inclusion considerations and in meeting the expectations of the legislative mandate, which did not specify a definition for ‘minority,’ it may mask a critical fact that Asians perform better than

Whites in some occupations and record the highest levels of income in some fields. Thus, this broad definition of 'minority' may have contributed to the findings that there is no undervaluation in minority-dominated jobs. Had the definition of 'minority' been limited to underrepresented minorities (URM), i.e., African Americans, Hispanic and Native Americans, there may have been different findings; it is possible that there is devaluation of titles that are dominated by URM.

Limitations of Statistical Analysis

While statistical analysis can inform policy makers about certain issues, it cannot be a substitute for policy makers' judgments about how titles ought to be compensated. For example, overlap across elements of job content factors may lead to some variables being heavily weighted in the regression analysis because they explain a lot of variance (and thus remove 'opportunities' for other factors to explain variance in pay policy), but this does not necessarily mean that there should be a policy decision that they should be weighted heavily in a pay policy. One example of this occurred with respect to Factor 8A (Job Demands Associated with High-risk Physical Work), which was consistently significant in the regression equations, but would probably not be considered by policy makers as one of the more important variables. Similar, although less obvious, other examples may exist. In general, decisions regarding wage compensation must balance statistical analyses with qualitative analyses and logical reasoning, thus integrating human resources professionals' perspectives into the process and compensating for the limitations of statistical analyses that may not consider the influence of other variables.

Limitations of the Local Government Studies

While the study team started with a systematic sampling procedure that selected the largest cities and a representative county from each of the 10 economic regions of New York State. As the study progressed, it became apparent that such a sampling procedure would have to be abandoned. Many of the selected local jurisdictions withdrew from the study, citing lack of capacity and pandemic pressures on staff. The sample of localities that participated in the study was far from representative of local government across New York State. Moreover, the sample was further reduced because the response rates from several local governments were too low to generate any meaningful findings. Additionally, in several cases, only a single individual in a job title responded and this individual's response was included in the analysis to avoid exclusion of titles from the study. Given that questionnaire responses for each job title were aggregated at the job title level (in both state and local government analyses) to counteract any overvaluing or undervaluing of job functions based on individual responses, this constitutes a serious limitation in the local government studies. It should also be noted that NYC's employees' response rate was extremely low, and we cannot assume that the employees who did respond within each job title are representative of the employees in that job title. Overall, these issues raise concerns about the results generated from the local government studies.

In addition, sampling procedures were customized and tailored to the specific context of each locality. In some instances, sampling was not desirable due to the low number of employees in a locality, and so the questionnaire was sent to all employees, including part-time employees and individuals in unique job titles, i.e., the incumbent was the only person in the job title. In other instances, sampling was based on inclusion of all large titles and all incumbents within these titles were sent a questionnaire to avoid a perception of inequity, i.e., exclusions of some employees and inclusion of others. Thus, the sampling procedures varied across local governments and did not always follow standard sampling procedures.

Another issue that influenced the analysis of the local jurisdictions relates to the identifications of job titles as female-/male-dominated or gender-integrated or minority-/White-dominated or race-integrated. The study is based on the premise that there may be unconscious bias in setting wages for female- and minority-dominated titles. Thus, the analyses focus on a comparison between female- and minority-dominated titles and male-dominated and gender-integrated titles. However, for the local jurisdictions, it was challenging to identify titles based on gender and minority domination/integration. Unlike analysis of the NYS workforce, which used the current composition of titles to categorize job titles, studies of local governments needed to rely on another measure. The use of the national gender nontraditional occupational designation was found to be appropriate, and titles were categorized based on this designation. In the analyses of local governments in this study, the examination of whether there is devaluation in minority-dominated titles was dropped because all but one participating government had a sufficient number of employees who self-identified under any of the minority categories. In New York City, race-integrated titles were the norm and so no titles could be statistically identified as minority-dominated. Thus, the small number of minorities in most localities and the large number of minorities in NYC rendered pursuit of this research question moot.

Finally, all local jurisdictions provided salary, rather than salary grade, information, and so median salary was used as the dependent variable for the local governments. Unlike salary grade, the dependent variable used in the state analyses, salary may be influenced by seniority or other job-related variables; indeed, in many cases, individuals in the same job title had different salaries. While median salary may be a reasonable substitute for salary grade, it is not clear whether other elements of pay have influenced the findings.

Recommendations for Future Action

While there are clear limitations to the study and the results should be considered with caution, the study team believes the findings suggest some ideas for future action.

Develop a new QJES for determining compensation

The study developed a new job content questionnaire that both modified items that were created previously and which led to the establishment of QJES and added new items to reflect changes in work since QJES was developed in the 1980s. The new instrument developed factors and subfactors that have high reliability, and we recommend that a new QJES be developed that includes the new subfactors. The study team does not believe that the weights generated from the regression analyses that revealed devaluation of female-dominated jobs should be used for weighting factors in a revised QJES. Nonetheless, it is interesting to note that the comparison of the standardized coefficients of job content factors of the base model (without any adjustment for proportions of females within the job title) with those of the adjusted model (where salary grade is adjusted to compensate for devaluation associated with the disproportionate percentage of females in female-dominated job titles) shows consistency in terms of those factors that are related to overvaluing vs. undervaluing of certain jobs as well as in the relative weighting of the job content factors, i.e., the order of job content factors by relative importance remained essentially the same (see Tables 2.5 and 2.6 in Part II). Thus, these weights may provide a starting point for thinking about weights for a revised QJES. We would also recommend that, in developing a new system, particular attention be paid to the medium and low salary grade jobs, given that study showed differential weights by salary grade level (low, medium, high).

The study's findings related to the devaluation in some female-dominated titles provides some important insights into this issue. While devaluation may not be entirely attributable to implicit bias in compensation, there may be a proportion that is due to bias. The analyses found that the devaluation ranges from .01 to .09, which corresponds to less than one grade. Of course, the statistical analyses do not capture an intentional plan, but describe the implicit weighting of job content factors that need to be fine-tuned. The study team recommends that NYS Department of Civil Service evaluate the titles found to be devalued to identify if there are legitimate reasons for the variance.

Evaluate characteristics of titles not included in the study and titles eliminated from the analyses because of few or no responses

In developing the job content questionnaire, it was important to find a balance between identifying the full range of job characteristics and including job content items that are unique to particular jobs. As such, the questionnaire (and the proposed factors and subfactors) do not address all characteristics of all job titles and so some jobs may seem undervalued because the factors do not fully describe the content of those jobs. For example, the questionnaire does not fully capture characteristics of the occupation of teachers. In addition, since several critical job titles had few or no respondents, and were therefore not included in the regression analyses, an analysis needs to be undertaken to identify any characteristics that are not adequately represented in the job content factors.

Conduct Further In-Depth Studies Examining Local Government Wage Compensation

While findings of a sample of local government indicate that the variable 'female-dominated job title' was a consistent negative predictor of job titles' salary and that female-dominated jobs appear to be devalued across the local governments in the sample, there is a need for further examination of job titles deemed undervalued in this study to determine if there is unfair compensation of these titles. The small sample size and the use of the median salary rather than salary grade as a dependent variable are limitations that need to be addressed in future studies. With respect to New York City, it is recommended that further study of a representative sample of the NYC workforce be undertaken to ensure meaningful and generalizable results. It should also be noted that NYC currently examines pay equity issues, but in a manner different from the approach we took; it would be reasonable to examine their approach more closely to determine what lessons can be learned.

Investigate programs and other opportunities that address gender domination of particular jobs and the glass ceiling women face

The state and local jurisdictions should identify and implement best practices for recruiting and retaining women and men into gender non-traditional occupations. Such efforts will go a long way in deconstructing the historical gender bias in wage setting. In addition, state and local jurisdictions should research and implement programs that have been successful in helping women advance to leadership positions and thus increased the percentage of women in high paying titles. While the focus on pay equity is a step in the right direction, an equally important issue to address is the barriers and challenges that women face in male-dominated jobs across the organizational hierarchy.

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Appendices

Appendix A: Wage Compensation Questionnaire: New York State

1. DEMOGRAPHIC INFORMATION

1.1. With what race(s) do you identify? *Check all that apply*

American Indian or Alaskan Native
Asian
Black, African American or African Heritage
White or Caucasian
Hawaiian or Pacific Islander
Other (Please specify)

1.2. Are you Hispanic or Latinx?

Yes
No

1.3. What is your gender?

Male
Female
Gender non-binary/non-conforming

1.4. What is the highest diploma or degree you earned in school or through equivalency?

Less than a high school diploma
A high school diploma or GED equivalent
Trade or Technical Certificate
Some college credits but no degree
Associate Degree (e.g., AA, AS)
Bachelor's Degree (e.g., BA, BS)
Master's Degree (e.g., MA, MS, MBA)
Doctoral/Professional Degree (e.g., PhD., MD, JD)

1.5. Over the course of a year, please indicate the percentage of time you spend in the following work locations. (Your answer should reflect pre-COVID-19 work arrangements and should add up to 100%)

Office building
Customer service counter
Laboratory or research facility
Group home or residential setting
Psychiatric/correctional facility
Equipment shop, power plant, etc.
Field (e.g., police, audit work, etc.)
Outdoors (e.g., roads, parks, etc.)
Educational institutions, including library
Remote/Telecommuting

1.6. Additional Information

2. JOB ACTIVITIES – INTERACTIONS WITH OTHERS

2.1. The following questions ask about interactions associated with assisting/caring for others. To what extent are these types of interactions important to perform your job well?

	Not part of my job	Not an important part of my job	Somewhat important part of my job	Important part of my job	Very important part of my job
a. providing direct care					
b. providing medical attention					
c. providing emotional support					

2.2. To what extent is each of these types of interactions important to perform your job well?

	Not part of my job	Not an important part of my job	Somewhat important part of my job	Important part of my job	Very important part of my job
a. Coaching, directing, motivating and developing others					
b. Delivering presentations					
c. Teaching and training (excluding direct reports)					
d. Participating on teams, including collaborating with individuals to solve problems or coordinating activities within your Department					
e. Managing teams, including team building, coordinating team activities across multiple Departments, or evaluating team performance					
f. Building relationships, including establishing trust, credibility, empathy, and motivation					
g. Conducting conflict resolution and negotiation to reach agreement or settle a dispute					

2.3. External communication with certain individuals can be integral to performing our jobs effectively. Which of the following individuals do you communicate with as an important part of your job?

	Yes	No
a. Patients		
b. Former inmates		
c. Other service recipients		
d. Public		
e. Lobbyists and advocates		
f. Media		
g. Individuals in other government agencies		
h. Suspects in criminal matters		
i. Other		

2.4. Internal communication with certain individuals can be integral to performing our jobs effectively. Which of the following individuals do you communicate with as an important part of your job?

	Yes	No
a. Immediate co-workers and supervisors		
b. Individuals reporting to you		
c. Individuals in your agency outside your work unit		
d. Senior leadership and executive staff		
e. Clients, patients, or inmates		
f. Other		

2.5. In interacting with others, you may need to use particular approaches. Using the scale below, please indicate the extent to which each type of approach is important to perform your job well.

	Not part of my job	Not an important part of my job	Somewhat important part of my job	Important part of my job	Very important part of my job
a. Being sensitive to differences you might have with others so you can work with them effectively					
b. Using negotiating and influencing skills in order to change behavior of clients or external constituents/employees					
c. Reading and managing others' emotional states					

2.6. Below is a list of different activities associated with gathering information or data needed to do your job. How frequently do you perform the following activities?

	Never	Rarely	Occasionally	Often	Very often
a. Receive and obtain information from relevant sources					
b. Categorize information					
c. Soliciting advice from coworkers, supervisors, or others in similar positions					
d. Using digitized records, databases, or online resources					
e. Estimating quantifiable characteristics of products, events, or information, including estimating sizes, distances, quantities, and quality					
f. Determining time, costs, resources, or materials needed to perform a work activity					

g. Applying legal requirements, including those related to confidentiality and HIPPA

h. Detecting changes in circumstances or events
I Inspecting equipment, structures, or materials to identify the cause of errors, problems or defects
j. Monitoring processes, materials or surroundings

2.7. Below is a list of different ways that you might analyze or evaluate information or data. How frequently do you perform the following activities?

Never Rarely Occasionally Often Very often

a. Apply scientific methods and/or mathematics to solve problems
b. Apply basic data analytic methods (means, percentages, developing charts) to identify and/or solve problems
c. Apply intermediate-level data analytic methods (correlations, differences between groups) to describe a problem or issue
d. Apply advanced data analytic methods (regression, ANOVA, SEM) to conduct research
e. Use 'Big Data' analytic techniques, e.g., creation and management of databases

2.8. Do you do any of the following in your job? (*Check all that apply.*)

a. Articulate what data should be gathered to answer problems
b. Gather facts (like library research, salary survey)
c. Analyze information (like recognizing patterns in information, interpreting reports, identifying problems)
d. Synthesize information (combining information from many sources to create something new)
e. Evaluate information (like critiquing a report, not correcting a form)
f. Create theories, discover new knowledge, test hypotheses
g. N/A

2.9. Below is a list of various ways in which you might work with various types of equipment. To what extent is each of the following activities important to performing your job well?

Not part of my job | Not an important part of my job | Somewhat important part of my job | Important part of my job | Very important part of my job

a. Using or operating a personal computer
b. Using computer-related devices such as scanners and printers
c. Using other types of standard office equipment such as copiers, fax machines, shredders
d. Using manually powered tools such as rakes, hammers, hand trucks, wheelbarrows
e. Using electrically powered hand tools such as hand-held drills, soldering irons, circular saws
f. Using measuring devices such as rulers, micrometers, thermometers, blood pressure monitors, tape measures
g. Operating kitchen equipment for food preparation
h. Using cleaning equipment for polishing floors, etc.
i. Operating mobile powered tools or equipment such as lawn mowers
j. Using stationary tools or equipment such as drill presses, table saws, milling equipment
k. Using specialized drawing or writing devices such as templates, drafting tools
l. Using technical, scientific or medical equipment such as autoclaves, centrifuges, microscopes, drones
m. Using technical, scientific or medical equipment such as radars, x-rays, CT scanners, MRI imagers
n. Using motor vehicles to transport others (e.g. patients, inmates)
o. Driving highway vehicles such as cars, vans, trucks, tractor trailers
p. Operating off-road vehicles such as bulldozers, tractors, haul trucks
q. Carrying weapons including handguns, rifles, batons, tasers

2.10. To what extent is each of the following activities important to performing your job?

Not part of my job | Not an important part of my job | Somewhat important part of my job | Important part of my job | Very important part of my job

a. Setting up technical equipment
b. Designing technical equipment
c. Correcting malfunctions involving technical equipment
d. Inspecting and testing equipment to identify the cause of errors, problems or defects with diagnostic

equipment if needed
e. Repairing and maintaining electronic equipment and software

2.11. Which statement comes closest to describing your supervisory responsibility in your job? *If you choose the first option "I do not supervise other workers," please go directly to question 2.14.*

a. I do not supervise other workers
b. I am an assistant supervisor. I take over when the supervisor of my unit or section is not available, and do supervisory activities under their direction
c. I am a first line supervisor of a small group of workers. I arrange work schedules, coordinate the workflow of multiple people, review work to ensure efficiency, and provide training to new employees
d. I am a first line supervisor of a larger section or work unit. I supervise other workers, plan the activities of the unit, and represent the unit within the Department
e. I am a second line supervisor or higher. Supervisors of several units, sections or departments report to me

2.12. Are you responsible for:

	Yes	No
a. Finding a replacement when someone calls in sick or does not show up for work		
b. Preventing other people from wasting time		
c. Preventing damage to or waste of equipment or supplies		
d. Evaluating direct reports' performance		
e. Providing on-the-job training		
f. Coaching for performance improvement and career advancement		

2.13. How many staff members do you supervise directly or indirectly? (Add all the people that you supervise directly and all the people who report to those you supervise.)

Less than 5 | 5 – 10 | 11 – 25 | 26 – 40 | More than 40

2.14. Below are lists of various types of job responsibilities. Using the scale below, please indicate the extent to which these functions are an important part of your job responsibilities.

	Not at all	To a minor extent	To some extent	To a large extent	To a very great extent
a. Spending money within a set budget					
b. Proposing a budget for a unit					
c. Proposing a budget for a facility					
d. Proposing a budget for a whole agency					
e. Hiring and firing other workers, directly or indirectly					
f. Providing performance feedback to employees					
g. Proposing State policy					
h. Rotating tasks between yourself and your colleagues					
i. Deciding who will do which tasks					
j. Prioritizing competing tasks or setting priorities among competing demands					
k. Monitoring compliance with legal and ethical standards					
l. Making sure others are physically safe					
m. Safeguarding others' emotional and mental wellbeing					
n. Enabling others to expand their knowledge, skills, or abilities					
o. Addressing requests from people such as the public, clients, elected officials, patients, etc.					
p. Leading major change initiatives					
q. Developing new and original ideas to address problems or new work requirements					
r. Identifying performance objectives					
s. Developing plans to achieve objectives					
t. Implementing plans to achieve objectives					
u. Measuring performance on the achievement of objectives					

2.15. What role do you have in planning the work you do? (*Choose one*)

I do not plan my work
I plan my own work only
I plan my work and the work for other workers

I plan my work and the work for my unit or section

2.16. Think of the work activity that you plan farthest in advance, how far in advance do you plan this activity? (*Choose one*)

I do not plan my work schedule
Less than a day ahead
Between one day and a week ahead
A week or two ahead
Between two weeks and a month ahead
One or two months ahead
Three to six months ahead
More than six months ahead

2.17 . Additional Information

3. WORK CONTEXT

3.1. Please indicate your level of agreement with each of the following statements.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
a. My job allows me a level of autonomy in decision making					
b. My job allows me a level of autonomy in how to do my work day-to-day (work methods)					
c. My job allows me a level of autonomy in how quickly I do my work					
d. My job allows me a level of autonomy in what task to do first					
e. My job allows me a level of autonomy in what specific tasks to do					
f. My job allows me a level of autonomy in deadlines for completing tasks					

3.2 In some jobs, people work at a single task; in other jobs, people work on several tasks during the course of the day. Please choose the statement that best describes the variety of tasks you perform in your job on most days.

a. My job generally involves a single task
b. My job involves a few different tasks, but I tend to work on a single task each day
c. My job involves a few different tasks, and I tend to work on each of these tasks every day
d. My job involves performing a wide range of tasks, but I tend to work on one at most a few tasks each day
e. My job involves performing a wide range of tasks, and I tend to work on many or most of these tasks each day

3.3. Using the scale below, please indicate the extent to which you agree with each statement.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
a. The results of my work are likely to significantly affect the lives of other people					
b. The job has a large impact on people outside the Department					

3.4. Below are types of effects that a mistake on the job could have on your Department. Please use the following scale to assess the potential effects of such mistakes on your agency.

	Almost no effect	A minor effect	A moderate effect	A considerable effect	A major effect
a. Reputation or image of your unit					
b. Reputation or image of your State agency					
c. Health or safety of another person					
d. My health and safety					
e. Damage to equipment					
f. Fiscal loss					
g. Barriers to public access to benefits or services					

3.5. To what extent does your job involve doing a "whole" and identifiable piece of work? That is, is the job a complete piece of work that has an obvious beginning and end? Or is it only a small part of the overall piece of work, which is finished by other people or by automatic machines?

a. My job is only a tiny part of the overall piece of work; the results of my activities cannot be seen in the final product or service
b. My job is a moderate-sized "chunk" of the overall piece of work; my own contribution can be seen in the final outcome
c. My job involves doing the whole piece of work, from start to finish; the results of my activities are easily seen in the final product or service

3.6. To what extent is completing your work task dependent on other people completing their tasks?

Not at all To a minor extent To some extent To a large extent To a very great extent

3.7. Below is a list of tasks or job demands where you might experience undesirable stress. Using the scale below, please indicate how likely it is that these tasks or job demands will lead to stress. Skip item if it is not applicable.

Very unlikely Unlikely Somewhat likely Likely Very likely

a. Making quick decisions
b. Multiple people making time sensitive demands and requests
c. Feeling rushed on the job, because people are waiting, emails need to be answered, the telephone is always ringing, etc.
d. Feeling that my work is piling up faster than I can complete it
e. Getting things done in a hurry to meet a deadline
f. Having to learn new skills or information just to keep up on the job
g. Having conflicting demands (for example, being asked to give better service and also to help more people)
h. Providing direct care of patients
i. Telling people (e.g., other workers, clients, the public) things they do not want to hear
j. Dealing directly with individuals displaying inappropriate, impatient or demanding behaviors (not co-workers)
k. Dealing directly with clients who are diagnosed with mental health issues (not co-workers)
l. Working overtime on weekends without pay and without time off (compensatory time)
m. Working multiple mandated shifts
n. Working rotating shifts
o. Feeling interrupted to take on an unforeseen task
p. Dealing with armed or dangerous individuals
q. Working long periods at a quick pace
r. Direct exposure to verbal and/or physical abuse from clients or patients
s. Isolation (i.e., minimal opportunities for work-related interactions with others)
t. Exposure to traumatic situations

3.8. Below is a list of task demands where people might experience challenges in their job. Using the scale, please indicate how often you face such demands.

Never Seldom Sometimes Often Most of the time

a. Meeting precise quality standards
b. Assessing the quality of your own work
c. Solving unforeseen problems on your own
d. Performing monotonous tasks
e. Performing complex tasks
f. Learning new things

3.9. How often do you travel overnight as a requirement for the job (*not in commuting to your job*)?

Never
Less than one night a month
One to four nights a month
More than four nights a month

3.10. Below is a list of working conditions. Using the scale below, please indicate how often you work in any of these conditions.

Never Seldom Sometimes Often Most of the time

a. Extreme temperature or weather such as conditions hotter than 90 degrees or colder than 40 degrees (like blacktop paving, cold storage room, extreme wind, or heat from kitchen facilities)
b. Unhealthy, infectious or toxic fumes or materials (like car fumes, asbestos, stripping solution, contaminated medical instruments or ammonia)
c. Physical handling of sick or injured people
d. Poor lighting
e. In- or under-water working spaces
f. Cramped or confined workspaces
g. Dealing with people in crisis and trauma (e.g., people who threaten to harm themselves)
h. Extremely loud noises at levels that require hearing protection
i. Pollution or with foreign substances that require protective gear, clothing, or breathing equipment
j. Radiation at levels that require protective gear or monitoring equipment
k. Physical dangers from people (patients, the public, lawbreakers, inmates
l. Physical dangers from the environment (e.g., slippery floors or working surfaces, unstable floors or working surfaces, high or elevated working surfaces, exposure to high speed traffic, working in remote areas)
m. Working with exposed moving mechanical parts or sharp objects
n. Risk of electrical shock
o. Working with explosives

3.11. How much risk of being physically hurt is there for you in your job? (*Choose one*)

No special risk
Some risk
A high degree of risk, special safety precautions are needed
A high degree of unpredictable risk even when safety precautions are followed

3.12. Are your duties and responsibilities typical with those of other employees in your current/acting job title?

Yes No I do not know

3.13. Additional Information

4. KNOWLEDGE, SKILLS AND ABILITIES

4.1. Below is a list of various types of knowledge. Using the scale, please indicate to what extent people in your job title need to have each type of knowledge to effectively perform their job.

Not at all To a minor extent To some extent To a large extent To a very great extent

a. Laws, legal codes, legal procedures, government regulations or other law-related knowledge
b. Principles, concepts and theories related to biological, chemical or physical sciences (including medicine and dentistry)
c. Principles and concepts related to social and behavioral sciences
d. Principles and concepts related to humanities and fine arts
e. Knowledge related to disseminating information and communicating with different parties
f. Knowledge related to policies and procedures related to public safety and security
g. Knowledge related to materials, methods, and tools involved in the construction, repair and maintenance of various structures, roads and highways
h. Knowledge related to computer electronics, including circuit boards, processors, chips, electronic equipment, and computer hardware
i. Knowledge related to design and development of computer software, including applications, databases and programming language
j. Knowledge related to design, use, repair and maintenance of equipment and tools
k. Knowledge related to administration and management, such as strategic planning, resource allocation, workforce planning, performance management and coordination of people and resources

within Department
l. Knowledge related to principles, practices and theories of education, learning and teaching
m. Knowledge related to principles, practices and theories of leadership including structuring assignments, delegating, motivating direct reports and providing support, ethical principles for guiding decisions and judgement
n. Knowledge related to administrative and clerical procedures and systems such as word processing, managing files and records, transcription, designing forms, and other office procedures and terminology
o. Knowledge related to tools and principles of design, such as production of technical plans, blueprints, drawings, and models
p. Knowledge related to principles and practices of economics and accounting including assembly, analysis and reporting of financial or statistical data
q. Knowledge related to survey techniques, polling, focus groups, and other social research methods
r. Knowledge related to areas of mathematics including algebra, geometry, calculus, and statistics, and their applications
s. Knowledge related to principles and procedures for human resources management, including recruitment, selection, training, compensation and benefits, labor relations, and personnel information systems
t. Knowledge related to principles and practices of direct physical or mental healthcare service?

4.2. Below is a list of various types of skills and abilities. Using the scale, please indicate to what extent people in your job title need to have each type of skill or ability.

Not at all To a minor extent To some extent To a large extent To a very great extent
a. Basic level of writing (e.g., writing standard letters and filling out forms)
b. Intermediate level of writing (e.g., writing letters or memos, writing meeting minutes, editing the writing of others, or creating media announcements, news releases, newsletters, or speeches)
c. Advanced level of writing (e.g., writing lengthy reports or manuals, including scholarly or technical reports or manuals that require significant amounts of original writing)
d. Training and curriculum design and development
e. Time management, including prioritizing tasks, setting or adhering to deadlines, and balancing multiple requests
f. Organization of schedules (making appointments, sending reminders)
g. Ethical reasoning involving application of ethical principles to specific contexts and decisions
h. Analysis of technical systems including equipment selection, operation and control, maintenance, programming and design
i. Analysis of Departmental systems such as identifying measures of systems performance and costs/benefits of alternative actions
j. Memorizing facts and procedures
k. Critical thinking including analyzing rules to address problems and/or analyzing problems to generate rules
l. Reading and comprehending complex documents and materials related to job
m. Conflict management
n. Food preparation
o. Cleaning skills, including adherence to sanitation and health standards
p. Updating of procedures based on recent developments
q. Physical dexterity, such as coordination between your arms and hands, using your hands to adjust equipment or making precise movements with your fingers
r. Physical flexibility, such as being able to bend, stretch, twist, or reach out with your body, arms, and/or legs
s. Physical strength, such as being able to exert muscle force repeatedly or continuously over time
t. Physical stamina, such as being able to exert yourself physically over long periods of time without getting winded or out of breath

4.3. Does your job require a license or certification?

Yes No

4.4. How long does it take for people to learn to do your job competently if they have not previously held a similar position?

1 month or less
1 to 6 months
6 months to 1 year
1 to 2 years
2 years
More than 2 years

4.5. Additional Information

Appendix B: Peer Review Experts

1. Meredith Boehringer, Korn Ferry Hay Group
2. Dennis Dresang, University of Wisconsin-Madison
3. Deb Figart, Stockton University
4. Hongseok Lee, University at Albany
5. Edward Levine, University of South Florida
6. Fred Morgeson, Michigan State University
7. Ellen Rubin, University at Albany
8. Edmund Stazyk, University at Albany

Appendix C: Pilot Respondents' Agency Affiliations

Agency
Addiction Services and Supports, Office of
Aging, Office for the
Agriculture & Markets, Department of
Alcoholic Beverage Control Board
Budget, Division of the
Canal Corporation
Children & Family Services, Office of
Civil Service, Department of
Comptroller, Office of
Correction, Commission of
Corrections & Community Supervision, Department of
Criminal Justice Services, Division of
Education, Department of
Environmental Conservation, Department of
Financial Services, Department of
Gaming Commission
General Services, Office of
H Helen Hayes
H Vet Home Mont
Health, Department of
Higher Education Services Corporation
Homeland Security and Emergency Services, Division of
Housing & Community Renewal, Division of
Information Technology Services, Office of
Justice Center
Labor, Department of
Law, Department of
Medicaid Inspector General, Office of
Mental Health, Office of
Motor Vehicles, Department of
Parks & Recreation, Office of
People with Developmental Disabilities, Office of
Public Service, Department of
State Inspector General, Office of
State Insurance Fund
State Police, Division of
State, Department of
SUNY-Administration, Colleges + Universities

Agency
Taxation and Finance, Department of
Temporary & Disability Assistance, Office of
Thruway Authority
Transportation, Department of
Veterans Affairs, Division of
Workers Compensation Board

Appendix D: State Survey Response Rate by Gender and Race/Ethnicity Title Groupings

Response Rate by Gender and Race/Ethnicity Title Grouping		
Gender	***Number***	***% of respondents***
Female-dominated titles		
Male	401	14.683
Female	2,318	84.877
Gender non-binary/non-conforming	7	0.256
Missing Values	5	0.183
Total	**2,731**	
Male-dominated titles		
Male	1,884	88.867
Female	212	10.0
Gender non-binary/non-conforming	11	0.518
Missing Values	13	0.613
Total	**2,120**	
Gender-integrated titles		
Male	1,656	42.846
Female	2,197	56.843
Gender non-binary/non-conforming	10	0.258
Missing Values	2	**0.051**
Total	**3,865**	
Minority-dominated titles		
Race	***Number***	***% of respondents***
American Indian or Alaskan Native	9	1.120
Asian	92	11.457
Black, African American or African Heritage	301	37.484
Hawaiian or Pacific Islander	1	0.124
Other	42	5.230
Minority Total	***445***	***55.417***
White or Caucasian	292	36.363
Missing Value	66	8.219

Total	**803**	
White-dominated titles		
Race	***Number***	***% of respondents***
American Indian or Alaskan Native	12	0.968
Asian	11	0.887
Black, African American or African Heritage	26	2.098
Hawaiian or pacific Islander	0	0.0
Other	25	2.017
Minority Total	***74***	***5.972***
White or Caucasian	1,143	92.251
Missing Value	22	1.775
Total	**1,239**	
Race-integrated titles		
Race	***Number***	***% of respondents***
American Indian or Alaskan Native	64	0.958
Asian	302	4.525
Black, African American or African Heritage	1,000	14.983
Hawaiian or pacific Islander	8	0.119
Other	201	3.011
Total Minority	***1,575***	***23.599***
White or Caucasian	4,899	73.404
Missing Value	200	2.996
Total	**6,674**	

Appendix E: Results of Factor Analysis & Reliability Scores

Factor 1: Education and Experience

Factor 1A: Office- and Administration-related Knowledge and Skills (α = .785)
Factor 1 Subfactor A-1: Performing Routine Office Tasks
Factor 1 Subfactor A-2: Advanced Education/ Specialized Knowledge
Factor 1 Subfactor A-3: Administration Knowledge
Factor 1 Subfactor A-4: Organizing Skills

Factor 1 Subfactor A-1: Performing Routine Office Tasks (α = .783)
2.9a Using or operating a personal computer
2.9b Using computer-related devices such as scanners and printers
2.9c Using other types of standard office equipment such as copiers, fax machines, shredders
4.1n Knowledge related to administrative and clerical procedures and systems such as word processing, managing files and records, transcription, designing forms, and other office procedures and terminology

Factor 1 Subfactor A-2: Advanced Education/Specialized Knowledge (α = .715)
4.1a Laws, legal codes, legal procedures, government regulations or other law-related knowledge
4.1c. Principles and concepts related to social and behavioral sciences
4.1d Principles and concepts related to humanities and fine arts
4.1e Knowledge related to disseminating information and communicating with different parties
4.1l Knowledge related to principles, practices, and theories of education, learning and teaching.

Factor 1 Subfactor A-3: Administration Knowledge (α = .871)
4.1k Knowledge related to administration and management, such as strategic planning, resource allocation, workforce planning, performance management and coordination of people and resources within Department
4.1m Knowledge related to principles, practices and theories of leadership including structuring assignments, delegating, motivating direct reports and providing support, ethical principles for guiding decisions and judgement
4.1s Knowledge related to principles and procedures for human resources management, including recruitment, selection, training, compensation and benefits, labor relations, and personnel information systems

Factor 1 Subfactor A-4: Organizing Skills (α = .759)
4.2e Time management, including prioritizing tasks, setting or adhering to deadlines, and balancing multiple requests
4.2f Organization of schedules (making appointments, sending reminders)
4.2p Updating of procedures based on recent developments

Factor 1B: Computing and Equipment Knowledge and Skills (α = .686) *(Factor dropped from analysis)*
Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems
Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software

Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems (α = .807)

2.6i Inspecting equipment, structures, or materials to identify the cause of errors, problems, or defects
2.6j Monitoring processes, materials, or surroundings.
2.9k Using specialized drawing or writing devices such as templates, drafting tools
4.1g Knowledge related to materials, methods, and tools involved in the construction, repair and maintenance of various structures, roads, and highways
4.1o Knowledge related to tools and principles of design, such as production of technical plans, blueprints, drawings, and models
4.2h Analysis of technical systems including equipment selection, operation and control, maintenance, programming, and design
4.2i Analysis of Departmental systems such as identifying measures of systems performance and costs/benefits of alternative actions

Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software (α = .856)
2.10a Setting up technical equipment
2.10b Designing technical equipment
2.10c Correcting malfunctions involving technical equipment
2.10d Inspecting and testing equipment to identify the cause of errors, problems or defects with diagnostic equipment if needed
2.10e Repairing and maintaining electronic equipment and software
4.1h Knowledge related to computer electronics, including circuit boards, processors, chips, electronic equipment, and computer hardware
4.1i Knowledge related to design and development of computer software, including applications, databases, and programming language

Factor 1C: Education/Licensure
Required Education/Licensure

Factor 1D: Experience
Required Experience

Factor 2: Managerial Activities

Factor 2: Managerial Activities (α = .912)
Factor 2 Subfactor A: Planning and Goal Setting (Managing Change)
Factor 2 Subfactor B: Managing Work Units

Factor 2 Subfactor A: Planning and Goal Setting (Managing Change) (α = .915)
2.14c Proposing a budget for a facility
2.14d Proposing a budget for a whole agency
2.14g Proposing state policy
2.14j Prioritizing competing tasks or setting priorities among competing demands
2.14k Monitoring compliance with legal and ethical standards
2.14p Leading major change initiatives
2.14q Developing new and original ideas to address problems or new work requirements
2.14r Identifying performance objectives
2.14s Developing plans to achieve objectives

2.14t Implementing plans to achieve objectives
2.14u Measuring performance on the achievement of objectives
2.15 Role in planning work
2.16 How far in advance you schedule your work

Note: *Items 2.15 & 2.16 were converted to 5-point scale (from 4-point & 8-point scales).*

Factor 2 Subfactor B: Managing Work Units (α = .877)
2.14b Proposing a budget for a unit
2.14e Hiring and firing other workers, directly or indirectly
2.14f Providing performance feedback to employees
2.14h Rotating tasks between yourself and your colleagues
2.14i Deciding who will do which tasks
2.14n Enabling others to expand their knowledge, skills, or abilities

Factor 3: Supervision

Factor 3: Supervision (α = .793)
Factor 3 Subfactor A: Team-related Behaviors
Factor 3 Subfactor B: Direct Supervision
Supervision

Factor 3 Subfactor A: Team-related Behaviors (α = .846)
2.2a Coaching, directing, motivating and developing others
2.2d Participating on teams, including collaborating with individuals to solve problems or coordinating activities within your department
2.2e Managing teams, including team building, coordinating team activities across multiple Departments, or evaluating team performance
2.2f Building relationships, including establishing trust, credibility, empathy, and motivation

Factor 3 Subfactor B: Direct Supervision (α = .922)
2.4b (Internal communication) Individuals reporting to you
2.12a Finding a replacement when someone calls in sick or does not show up for work
2.12b Preventing other people from wasting time
2.12c Preventing damage to or waste of equipment or supplies
2.12d Evaluating direct reports' performance
2.12e Providing on-the-job training
2.12f Coaching for performance improvement and career advancement

Supervision
2.11 Which statement comes closest to describing your supervisory responsibility in your job?

Factor 4: Written Communication

Factor 4: Written Communication (α = .798)
Factor 4 Subfactor A: Intermediate Level of Writing

Factor 4 Subfactor B: Advanced Level of Writing

Factor 4 Subfactor A: Intermediate Level of Writing
4.2b Intermediate level of writing (e.g., writing letters or memos, writing meeting minutes, editing the writing of others, or creating media announcements, news, releases, newsletters, or speeches)
Factor 4 Subfactor B: Advanced Level of Writing
4.2c Advanced level of writing (e.g., writing lengthy reports or manuals, including scholarly or technical reports or manuals that require significant amounts of original writing)

Factor 5: Information & Data-related Work Complexity

Factor 5: Information & Data-related Work Complexity (α = .823)
Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving
Factor 5 Subfactor B: Using Advanced Analytic Methods
Factor 5 Subfactor C: Gathering Information
Factor 5 Subfactor D: Analyzing Information
Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge

Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving (α = .842)
2.6e Estimating quantifiable characteristics of products, events, or information, including estimating sizes, distances, quantities, and quality
2.6f Determining time, costs, resources, or materials needed to perform a work activity
2.7a Apply scientific methods and/or mathematics to solve problems
2.7b Apply basic data analytic methods (means, percentages, developing charts) to identify and/or solve problems

Factor 5 Subfactor B: Using Advanced Analytic Methods (α = .765)
2.7c Apply intermediate-level data analytic methods (correlations, differences between groups) to describe a problem or issue
2.7d Apply advanced data analytic methods (regression, ANOVA, SEM) to conduct research
2.7e Use 'Big Data' analytic techniques, e.g., creation and management of databases
2.8f Create theories, discover new knowledge, test hypotheses
4.1q Knowledge related to survey techniques, polling, focus groups, and other social research methods

Factor 5 Subfactor C: Gathering Information (α = .832)
2.6a Receive and obtain information from relevant sources
2.6b Categorize information
2.6c Soliciting advice from coworkers, supervisors, or others in similar positions
2.6d Using digitized records, databases, or online resources
2.8a Articulate what data should be gathered to answer problems
2.8b Gather facts (like library research, salary survey)

Factor 5 Subfactor D: Analyzing Information (α = .822)
2.6g Applying legal requirements, including those related to confidentiality and HIPPA
2.6h Detecting changes in circumstances or events
2.8c Analyze information (like recognizing patterns in information, interpreting reports, identifying problems)
2.8d Synthesize information (combining information from many sources to create something new)

2.8e Evaluate information (like critiquing a report, not correcting a form)
4.2g Ethical reasoning involving application of ethical principles to specific contexts and decisions.
4.2k Critical thinking including analyzing rules to address problems and/or analyzing problems to generate rules
4.2l Reading and comprehending complex documents and materials related to job

Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge (α = .673)
4.1p. Knowledge related to principles and practices of economics and accounting including assembly, analysis and reporting of financial or statistical data
4.1r Knowledge related to areas of mathematics including algebra, geometry, calculus, and statistics and their applications

Factor 6: Responsibility

Factor 6: Responsibility ***(Factor dropped from analysis)***
Factor 6 Subfactor A: Impact of Mistakes
Factor 6 Subfactor B: Impact on People

Factor 6 Subfactor A: Impact of Mistakes (α = .799)
3.4a Reputation or image of your unit
3.4b Reputation or image of your State agency
3.4f Fiscal loss
3.4g Barriers to public access to benefits or services

Factor 6 Subfactor B: Impact on People (α = .728)
3.3a The results of my work are likely to significantly affect the lives of other people
3.3b The job has a large impact on people outside the Department

Factor 7: Oral Communication

Factor 7: Oral Communication (α = .712)
Factor 7 Subfactor A: Teaching, Training and Making Presentations
Factor 7 Subfactor B: Maintaining Positive Interactions

Factor 7 Subfactor A: Teaching, Training and Making Presentations (α = .810)
2.2b Delivering presentations
2.2c Teaching and training (excluding direct reports)
4.2d Training and curriculum design and development

Factor 7 Subfactor B: Maintaining Positive Interactions (α = .856)
2.2g Conducting conflict resolution and negotiation to reach agreement or settle a dispute
2.5a Being sensitive to differences you might have with others so you can work with them effectively
2.5b. Using negotiating and influencing skills in order to change behavior of clients or external constituents/employees
2.5c Reading and managing others' emotional states
2.14o Addressing requests from people such as the public, clients, elected officials, patients, etc.
3.7i Telling people things they do not want to hear
4.2m Conflict management

Factor 8A: Job Demands Associated with High-risk Physical Work

Factor 8A: Job Demands Associated with High-risk Physical Work (α = .894)
Factor 8A Subfactor A: Working in Atypical Work Conditions
Factor 8A Subfactor B: Working under High-risk Conditions
Factor 8A Subfactor C: Physical Skills and Abilities
Factor 8A Subfactor D: Ensuring Safety
Factor 8A Subfactor E: Working with Trades Equipment

Factor 8A Subfactor A: Working in Atypical Work Conditions (α = .928)
3.10a Extreme temperature or weather such as conditions hotter than 90 degrees or colder than 40 degrees (like blacktop paving, cold storage room, extreme wind, or heat from kitchen facilities)
3.10b Unhealthy, infectious or toxic fumes or materials (like car fumes, asbestos, stripping solution, contaminated medical instruments or ammonia)
3.10d Poor lighting
3.10f Cramped or confined workspaces
3.10h Extremely loud noises at levels that require hearing protection
3.10l Physical dangers from the environment (e.g., slippery floors or working surfaces, unstable floors or working surfaces, high or elevated working surfaces, exposure to high speed traffic, working in remote areas)
3.10m Working with exposed moving mechanical parts or sharp objects
3.10n Risk of electrical shock

Factor 8A Subfactor B: Working Under High-risk Conditions (α = .669)
3.10e In- or under-water working spaces
3.10i Pollution or with foreign substances that require protective gear, clothing, or breathing equipment
3.10j Radiation at levels that require protective gear or monitoring equipment
3.10o Working with explosives
3.11 Risk of being physically hurt

Factor 8A Subfactor C: Physical Skills and Abilities (α = .948)
4.2q Physical dexterity, such as coordination between your arms and hands, using your hands to adjust equipment or making precise movements with your fingers
4.2r Physical flexibility, such as being able to bend, stretch, twist, or reach out with your body, arms, and/or legs
4.2s Physical strength, such as being able to exert muscle force repeatedly or continuously over.
4.2t. Physical stamina, such as being able to exert yourself physically over long periods of time without getting winded or out of breath

Factor 8A Subfactor D: Ensuring Safety (α = .885)
2.14l Making sure others are physically safe
3.4c Health or safety of another person
3.4d My health and safety
3.4e Damage to equipment

Factor 8A Subfactor E: Working with Trades Equipment (α = .914)
2.9d Using manually powered tools such as rakes, hammers, hand trucks, wheelbarrows
2.9e Using electrically powered hand tools such as hand-held drills, soldering irons, circular saws
2.9f Using measuring devices such as rulers, micrometers, thermometers, blood pressure monitors, tape measures
2.9i Operating mobile powered tools or equipment such as lawn mowers
2.9j Using stationary tools or equipment such as drill presses, table saws, milling equipment
2.9o Driving highway vehicles such as cars, vans, trucks, tractor trailers
2.9p Operating off-road vehicles such as bulldozers, tractors, haul trucks
4.1j Knowledge related to design, use repair, and maintenance of equipment and tools

Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients

Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients (α = .911)
Factor 8B Subfactor A: Caring for/ Assisting Patients/Clients
Factor 8B Subfactor B: Hazards from Working with People
Factor 8B Subfactor C: Public Safety Work (Police and Mental Health)

Factor 8B Subfactor A: Caring for/Assisting Patients/Clients (α = .861)
2.1a Providing direct care
2.1b Providing medical attention
2.1c Providing emotional support
2.14m Safeguarding others' emotional and mental wellbeing
3.7h Providing direct care of patients
3.7j Dealing directly with individuals displaying inappropriate, impatient or demanding behaviors (not co-workers)
3.7k Dealing directly with clients who are diagnosed with mental health issues (not co-workers)

Factor 8B Subfactor B: Hazards from Working with People (α = .839)
3.10c Physical handling of sick or injured people
3.10g Dealing with people in crisis and trauma (e.g., people who threaten to harm themselves)
3.10k Physical dangers from people (patients, the public, lawbreakers, inmates)

Factor 8B Subfactor C: Public Safety Work (Police and Mental Health) (α = .740)
2.3a (External Communication) Patients
2.4e (Internal Communication) Clients, patients or inmates
2.9n Using motor vehicles to transport others (e.g., patients, inmates)

2.9q Carrying weapons including handguns, rifles, batons, tasers
3.7p Dealing with armed or dangerous individuals
3.7t Exposure to traumatic situation
4.1f Knowledge related to policies and procedures related to public safety and security
4.1t Knowledge related to principles and practices of direct physical or mental healthcare service

Appendix F: List of Devalued Titles with More than Four Responses

Title Name	Title Grade	Race Group	Devaluation
Administrative Assistant 1	11	Minor-integrated	-0.78
Administrative Assistant 2	15	Minor-integrated	-0.48
Administrative Specialist 1	18	Minor-integrated	-0.46
Administrative Specialist 2	23	White-dominated	-0.49
Affirmative Action Administrator 2	23	Minority-dominated	-0.19
Associate Administrative Analyst	23	White-dominated	-0.04
Associate in Education Children with Disabilities	26	Minor-integrated	-0.27
Associate in Education Improvement Services	26	Minor-integrated	-0.09
Child Protective Services Specialist 1	16	Minor-integrated	-0.19
Children & Family Services Specialist 1	18	Minor-integrated	-0.16
Community Mental Health Nurse	19	Minor-integrated	-0.27
Customer Service Representative 1	9	Minor-integrated	-0.09
Dental Assistant	8	Minor-integrated	-0.82
Developmental Assistant 2	13	Minor-integrated	-0.05
Developmental Disabilities Program Specialist 1	21	Minor-integrated	-0.10
Dietitian 2	18	Minor-integrated	-0.67
Disability Analyst 2	20	Minor-integrated	-0.13
Employment Counselor	18	Minor-integrated	-0.28
Fair Hearings Specialist 2	18	Minor-integrated	-0.25
Habilitation Specialist 1	14	Minor-integrated	-0.03
Habilitation Specialist 2	17	Minor-integrated	-0.06
Head Account Clerk	18	Minor-integrated	-0.31
Health Care Surveyor 2 Nursing	19	Minor-integrated	-0.17
Health Information Management Technician 1	13	Minor-integrated	-0.06
Health Services Nurse	15	Minor-integrated	-0.41
Health Systems Specialist 1	18	Minor-integrated	-0.36
Health Systems Specialist 3	23	Minor-integrated	-0.22
Hospital Nursing Services Consultant	22	Minor-integrated	-0.65
Hospital Patient Services Clerk 1	7	Minor-integrated	-0.66
Human Resources Specialist 1	18	Minor-integrated	-0.14
Human Resources Specialist 2	23	Minor-integrated	-0.32
Inmate Records Coordinator 1	14	White-dominated	-0.53
Inmate Records Coordinator 2	18	White-dominated	-0.53
Institution Steward	23	White-dominated	-0.73
Labor Services Representative Spanish Language	16	Minority-dominated	-0.09
Law Department Document Specialist	9	Minor-integrated	-0.95
Legal Assistant 2	17	Minor-integrated	-0.12
Licensed Master Social Worker 1	18	Minor-integrated	-0.35
Licensed Master Social Worker 2	20	Minor-integrated	-0.17
Licensed Practical Nurse	10	Minor-integrated	-0.43

Title Name	Title Grade	Race Group	Devaluation
Medicaid Eligibility Examiner 2	14	Minor-integrated	-0.17
Medical Assistant	8	Minor-integrated	-0.58
Medical Assistance Specialist 1	18	Minor-integrated	-0.21
Medical Care Representative	19	Minor-integrated	-0.68
Motor Vehicle Representative	9	Minority-dominated	-0.07
Motor Vehicle Representative Spanish Language	9	Minority-dominated	-0.23
Nurse 1	14	Minor-integrated	-0.11
Nurse 2	16	Minor-integrated	-0.42
Nurse 2 Psychiatric	16	Minor-integrated	-0.06
Nurse 2 Rehabilitation	16	Minor-integrated	-0.75
Nurse 3 Psychiatric	20	Minor-integrated	-0.10
Nurse Administrator 1	20	Minor-integrated	-0.59
Nurse Practitioner Family Health	24	Minor-integrated	-0.46
Nurse Practitioner Psychiatry	24	Minor-integrated	-0.38
Nursing Assistant 2	8	Minority-dominated	-0.23
Nursing Assistant Certified	8	Minor-integrated	-0.43
Nursing Station Clerk 1	7	Minor-integrated	-0.66
Offender Rehabilitation Aide	13	Minor-integrated	-0.62
Office Assistant 1 Keyboarding	6	Minor-integrated	-0.63
Office Assistant 2	9	Minor-integrated	-0.25
Office Assistant 2 Calculations	9	Minor-integrated	-0.07
Office Assistant 2 Customer Service	9	Minor-integrated	-0.29
Office Assistant 2 Keyboarding	9	Minor-integrated	-0.69
Office Assistant 3	14	Minor-integrated	-0.04
Office Assistant 3 Calculations	14	Minor-integrated	-0.01
Office Assistant 3 Human Resources	14	Minor-integrated	-0.42
Payroll Examiner 2	15	White-dominated	-0.05
Pharmacy Aide	7	Minor-integrated	-0.11
Physical Therapy Assistant 2	14	Minor-integrated	-0.23
Program Aide	13	Minor-integrated	-0.44
Public Health Nutritionist 1	22	Minor-integrated	-0.68
Rehabilitation Counselor 2	19	Minor-integrated	-0.01
Rehabilitation Hospital Nursing Assistant 2	8	Minority-dominated	-0.40
Senior Occupational Therapist	18	Minor-integrated	-0.53
Senior Physical Therapist	18	Minor-integrated	-0.04
Senior Vocational Rehabilitation Counselor	22	Minor-integrated	-0.12
Senior Workers Compensation Examiner	18	Minor-integrated	-0.41
Social Work Assistant 2	14	Minority-dominated	-0.12
Social Work Assistant 3	17	Minor-integrated	-0.17
Supervising Motor Vehicle Representative 2	17	Minor-integrated	-0.25
Teaching & Research Center Licensed Practical Nurse	10	Minor-integrated	-0.39
Teaching & Research Center Nurse 2	16	Minor-integrated	-0.50

Title Name	Title Grade	Race Group	Devaluation
Teaching & Research Center Nurse 3	20	Minor-integrated	-0.36
Teaching & Research Center Specialty Nurse	18	Minor-integrated	-0.44
Training Specialist 1 Mental Hygiene	18	Minor-integrated	-0.06
Transportation Office Assistant 2	11	White-dominated	-0.68
Treatment Team Leader Developmental Disabilities	61	Minor-integrated	-0.07
Verbatim Reporter 1	17	Minor-integrated	-0.21
Vocational Rehabilitation Counselor	19	Minor-integrated	-0.02
Vocational Rehabilitation Counselor Assistant	13	Minor-integrated	-0.43
Workers Compensation Examiner	14	Minor-integrated	-0.07

Appendix G: Results of Factor Analysis & Reliability Scores – County

Factor 1: Education and Experience

Factor 1A: Office- and Administration Related Knowledge and Skills (α = .766)
Factor 1 Subfactor A-1: Advanced Education/ Specialized Knowledge
Factor 1 Subfactor A-2: Administration Knowledge
Factor 1 Subfactor A-3: Organizing Skills

Factor 1 Subfactor A-1: Advanced Education/Specialized Knowledge (α = .794)
4.1a Laws, legal codes, legal procedures, government regulations or other law-related knowledge
4.1b Principles, concepts and theories related to biological, chemical or physical sciences (including medicine and dentistry)
4.1c. Principles and concepts related to social and behavioral sciences
4.1d Principles and concepts related to humanities and fine arts
4.1e Knowledge related to disseminating information and communicating with different parties
4.1l Knowledge related to principles, practices, and theories of education, learning and teaching.

Factor 1 Subfactor A-2: Administration Knowledge (α = .808)
4.1k Knowledge related to administration and management, such as strategic planning, resource allocation, workforce planning, performance management and coordination of people and resources within Department
4.1m Knowledge related to principles, practices and theories of leadership including structuring assignments, delegating, motivating direct reports and providing support, ethical principles for guiding decisions and judgement
4.1s Knowledge related to principles and procedures for human resources management, including recruitment, selection, training, compensation and benefits, labor relations, and personnel information systems

Factor 1 Subfactor A-3: Organizing Skills (α = .676)
4.2e Time management, including prioritizing tasks, setting or adhering to deadlines, and balancing multiple requests
4.2f Organization of schedules (making appointments, sending reminders)
4.2j Memorizing facts and procedures
4.2p Updating of procedures based on recent developments

Factor 1B: Computing and Equipment Knowledge and Skills (α = .719)
Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems
Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software

Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems (α = .781)
2.6i Inspecting equipment, structures, or materials to identify the cause of errors, problems, or defects
2.6j Monitoring processes, materials, or surroundings.
2.9k Using specialized drawing or writing devices such as templates, drafting tools
4.1g Knowledge related to materials, methods, and tools involved in the construction, repair and maintenance of various structures, roads, and highways
4.1o Knowledge related to tools and principles of design, such as production of technical plans, blueprints, drawings, and models

4.2h Analysis of technical systems including equipment selection, operation and control, maintenance, programming, and design
4.2i Analysis of Departmental systems such as identifying measures of systems performance and costs/benefits of alternative actions

Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software (α = .872)
2.10a Setting up technical equipment
2.10b Designing technical equipment
2.10c Correcting malfunctions involving technical equipment
2.10d Inspecting and testing equipment to identify the cause of errors, problems or defects with diagnostic equipment if needed
2.10e Repairing and maintaining electronic equipment and software
4.1h Knowledge related to computer electronics, including circuit boards, processors, chips, electronic equipment, and computer hardware
4.1i Knowledge related to design and development of computer software, including applications, databases, and programming language

Factor 1C: Education/Licensure
Reported Education/Licensure

Factor 1D: Experience
Time to Learn to Do Job Competently

Factor 2: Managerial Activities

Factor 2: Managerial Activities (α = .936)
Factor 2 Subfactor A: Planning and Goal Setting (Managing Change)
Factor 2 Subfactor B: Managing Work Units

Factor 2 Subfactor A: Planning and Goal Setting (Managing Change) (α = .923)
2.14c Proposing a budget for a facility
2.14d Proposing a budget for a whole agency
2.14g Proposing County policy
2.14j Prioritizing competing tasks or setting priorities among competing demands
2.14k Monitoring compliance with legal and ethical standards
2.14p Leading major change initiatives
2.14q Developing new and original ideas to address problems or new work requirements
2.14r Identifying performance objectives
2.14s Developing plans to achieve objectives
2.14t Implementing plans to achieve objectives
2.14u Measuring performance on the achievement of objectives
2.15 Role in planning work
2.16 How far in advance you schedule your work

Note: *Items 2.15 & 2.16 were converted to 5-point scale (from 4-point & 8-point scales).*

Factor 2 Subfactor B: Managing Work Units (α = .878)
2.14b Developing a budget for a unit
2.14e Hiring and firing other workers, directly or indirectly
2.14f Providing performance feedback to employees
2.14h Rotating tasks between yourself and your colleagues
2.14i Deciding who will do which tasks
2.14n Enabling others to expand their knowledge, skills, or abilities

Factor 3: Supervision

Factor 3: Supervision (α = .752)
Factor 3 Subfactor A: Team-related Behaviors
Factor 3 Subfactor B: Direct Supervision
Supervision

Factor 3 Subfactor A: Team-related Behaviors (α = .835)
2.2a Coaching, directing, motivating and developing others
2.2d Participating on teams, including collaborating with individuals to solve problems or coordinating activities within your department
2.2e Managing teams, including team building, coordinating team activities across multiple Departments, or evaluating team performance
2.2f Building relationships, including establishing trust, credibility, empathy, and motivation

Factor 3 Subfactor B: Direct Supervision (α = .867)
2.12a Finding a replacement when someone calls in sick or does not show up for work
2.12b Preventing other people from wasting time
2.12c Preventing damage to or waste of equipment or supplies
2.12d Evaluating direct reports' performance
2.12e Providing on-the-job training
2.12f Coaching for performance improvement and career advancement

Supervision
2.11 Which statement comes closest to describing your supervisory responsibility in your job?

Factor 4: Written Communication

Factor 4: Written Communication (α = .767)
Factor 4 Subfactor A: Basic Level of Writing
Factor 4 Subfactor B: Intermediate Level of Writing

Factor 4 Subfactor A: Basic Level of Writing
4.2a Basic level of writing (e.g., writing standard letters and filling out forms)
Factor 4 Subfactor B: Intermediate Level of Writing
4.2b Intermediate level of writing (e.g., writing letters or memos, writing meeting minutes, editing the writing of others, or creating media announcements, news, releases, newsletters, or speeches)

Factor 5: Information & Data-related Work Complexity

Factor 5: Information & Data-related Work Complexity (α = .829)
Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving
Factor 5 Subfactor B: Using Advanced Analytic Methods
Factor 5 Subfactor C: Gathering Information
Factor 5 Subfactor D: Analyzing Information
Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge

Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving (α = .796)
2.6e Estimating quantifiable characteristics of products, events, or information, including estimating sizes, distances, quantities, and quality
2.6f Determining time, costs, resources, or materials needed to perform a work activity
2.7a Apply scientific methods and/or mathematics to solve problems
2.7b Apply basic data analytic methods (means, percentages, developing charts) to identify and/or solve problems

Factor 5 Subfactor B: Using Advanced Analytic Methods (α = .691)
2.7d Apply intermediate-level data analytic methods (correlations, differences between groups) to describe a problem or issue
2.7e Apply advanced data analytic methods (regression, ANOVA, SEM) to conduct research
2.7f Use 'Big Data' analytic techniques, e.g., creation and management of databases
4.1q Knowledge related to survey techniques, polling, focus groups, and other social research methods

Note: *Items 2.7d, 2.7e and 2.7f in the County questionnaire are labeled 2.7c, 2.7d, and 2.7e, respectively, in the City and State questionnaires.*

Factor 5 Subfactor C: Gathering Information (α = .787)
2.6a Receive and obtain information from relevant sources
2.6b Categorize information
2.6c Soliciting advice from coworkers, supervisors, or others in similar positions
2.6d Using digitized records, databases, or online resources
2.8a Articulate what data should be gathered to answer problems
2.8b Gather facts (like library research, salary survey)

Factor 5 Subfactor D: Analyzing Information (α = .823)
2.6g Applying legal requirements, including those related to confidentiality and HIPPA
2.6h Detecting changes in circumstances or events
2.8c Analyze information (like recognizing patterns in information, interpreting reports, identifying problems)
2.8d Synthesize information (combining information from many sources to create something new)
2.8e Evaluate information (like critiquing a report, not correcting a form)
4.2g Ethical reasoning involving application of ethical principles to specific contexts and decisions.
4.2k Critical thinking including analyzing rules to address problems and/or analyzing problems to generate rules
4.2l Reading and comprehending complex documents and materials related to job

Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge (α = .704)
4.1p. Knowledge related to principles and practices of economics and accounting including assembly, analysis and reporting of financial or statistical data
4.1r Knowledge related to areas of mathematics including algebra, geometry, calculus, and statistics and their applications

Factor 6: Responsibility

Factor 6: Responsibility (α = .749)
Factor 6 Subfactor A: Impact of Mistakes
Factor 6 Subfactor B: Impact on People
Factor 6 Subfactor C: Ensuring Safety
Factor 6 Subfactor D: Time and Workload
Factor 6 Subfactor E: Quality Standards

Factor 6 Subfactor A: Impact of Mistakes (α = .776)
3.4a Reputation or image of your unit
3.4b Reputation or image of your department
3.4f Fiscal loss
3.4g Barriers to public access to benefits or services

Factor 6 Subfactor B: Impact on People (α = .790)
3.3a The results of my work are likely to significantly affect the lives of other people
3.3b The job has a large impact on people outside the Department

Factor 6 Subfactor C: Ensuring Safety (α = .836)
2.14l Making sure others are physically safe
2.14m Safeguarding others' emotional and mental wellbeing
3.4c Health or safety of another person
3.4d My health and safety
3.4e Damage to equipment

Factor 6 Subfactor D: Time and Workload (α = .912)
3.7a Making quick decisions
3.7b Multiple people making time sensitive demands and requests
3.7c Feeling rushed on the job, because people are waiting, emails need to be answered, the telephone is always ringing, etc.
3.7d Feeling that my work is piling up faster than I can complete it
3.7e Getting things done in a hurry to meet a deadline
3.7f Having to learn new skills or information just to keep up on the job
3.7g Having conflicting demands (for example, being asked to give better service and also to help more people)
3.7o Feeling interrupted to take on an unforeseen task
3.7q Working long periods at a quick pace
3.7r Direct exposure to verbal and/or physical abuse from clients or patients

Factor 6 Subfactor E: Quality Standards (α = .813)
3.8a Meeting precise quality standards
3.8b Assessing the quality of your own work
3.8c Solving unforeseen problems on your own
3.8e Performing complex tasks
3.8f Learning new things

Factor 7: Oral Communication

Factor 7: Oral Communication (α = .707)
Factor 7 Subfactor A: Teaching, Training and Making Presentations
Factor 7 Subfactor B: Maintaining Positive Interactions

Factor 7 Subfactor A: Teaching, Training and Making Presentations (α = .754)
2.2b Delivering presentations
2.2c Teaching and training (excluding direct reports)
4.2d Training and curriculum design and development

Factor 7 Subfactor B: Maintaining Positive Interactions (α = .854)
2.2g Conducting conflict resolution and negotiation to reach agreement or settle a dispute
2.5a Being sensitive to differences you might have with others so you can work with them effectively
2.5b. Using negotiating and influencing skills in order to change behavior of clients or external constituents/employees
2.5c Reading and managing others' emotional states
2.14o Addressing requests from people such as the public, clients, elected officials, patients, etc.
3.7i Telling people (e.g., other workers, clients, the public) things they do not want to hear
4.2m Conflict management

Factor 8A: Job Demands Associated with High-risk Physical Work

Factor 8A: Job Demands Associated with High-risk Physical Work (α = .840)
Factor 8A Subfactor A: Working in Atypical Work Conditions
Factor 8A Subfactor B: Working Under High-risk Conditions
Factor 8A Subfactor C: Physical Skills and Abilities
Factor 8A Subfactor D: Working with Trades Equipment

Factor 8A Subfactor A: Working in Atypical Work Conditions (α = .876)
3.10a Extreme temperature or weather such as conditions hotter than 90 degrees or colder than 40 degrees (like blacktop paving, cold storage room, extreme wind, or heat from kitchen facilities)
3.10b Unhealthy, infectious or toxic fumes or materials (like car fumes, asbestos, stripping solution, contaminated medical instruments or ammonia)
3.10d Poor lighting
3.10f Cramped or confined workspaces
3.10h Extremely loud noises at levels that require hearing protection
3.10l Physical dangers from the environment (e.g., slippery floors or working surfaces, unstable floors or working surfaces, high or elevated working surfaces, exposure to high speed traffic, working in remote areas)
3.10m Working with exposed moving mechanical parts or sharp objects
3.10n Risk of electrical shock

Factor 8A Subfactor B: Working Under High-risk Conditions (α = .686)
3.10e In- or under-water working spaces
3.10i Pollution or with foreign substances that require protective gear, clothing, or breathing equipment
3.10j Radiation at levels that require protective gear or monitoring equipment
3.10o Working with explosives
3.11 Risk of being physically hurt

Factor 8A Subfactor C: Physical Skills and Abilities (α = .890)
4.2q Physical dexterity, such as coordination between your arms and hands, using your hands to adjust equipment or making precise movements with your fingers
4.2r Physical flexibility, such as being able to bend, stretch, twist, or reach out with your body, arms, and/or legs
4.2s Physical strength, such as being able to exert muscle force repeatedly or continuously over time.
4.2t. Physical stamina, such as being able to exert yourself physically over long periods of time without getting winded or out of breath

Factor 8A Subfactor D: Working with Trades Equipment (α = .894)
2.9d Using manually powered tools such as rakes, hammers, hand trucks, wheelbarrows
2.9e Using electrically powered hand tools such as hand-held drills, soldering irons, circular saws
2.9f Using measuring devices such as rulers, micrometers, thermometers, blood pressure monitors, tape measures
2.9i Operating mobile powered tools or equipment such as lawn mowers
2.9j Using stationary tools or equipment such as drill presses, table saws, milling equipment
2.9o Driving highway vehicles such as cars, vans, trucks, tractor trailers
2.9p Operating off-road vehicles such as bulldozers, tractors, haul trucks
4.1j Knowledge related to design, use repair, and maintenance of equipment and tools

Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients

Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients (α = .907)
Factor 8B Subfactor A: Caring for/ Assisting Patients/Clients
Factor 8B Subfactor B: Hazards from Working with People
Factor 8B Subfactor C: Public Safety Work (Police and Mental Health)

Factor 8B Subfactor A: Caring for/Assisting Patients/Clients (α = .836)
2.1a Providing direct care
2.1b Providing medical attention
2.1c Providing emotional support
3.7h Providing direct care of patients
3.7j Dealing directly with individuals displaying inappropriate, impatient or demanding behaviors (not co-workers)
3.7k Dealing directly with clients who are diagnosed with mental health issues (not co-workers)

Factor 8B Subfactor B: Hazards from Working with People (α = .770)
3.10c Physical handling of sick or injured people
3.10g Dealing with people in crisis and trauma (e.g., people who threaten to harm themselves)

3.10k Physical dangers from people (patients, the public, lawbreakers, inmates)

Factor 8B Subfactor C: Public Safety Work (Police and Mental Health) (α = .779)
2.3a (External Communication) Patients
2.4d (Internal Communication) Clients, patients or inmates
2.9n Using motor vehicles to transport others (e.g., patients, inmates)
2.9q Carrying weapons including handguns, rifles, batons, tasers
3.7p Dealing with armed or dangerous individuals
3.7t Exposure to traumatic situation
4.1f Knowledge related to policies and procedures related to public safety and security
4.1t Knowledge related to principles and practices of direct physical or mental healthcare service

Note: *Item 2.4d in the County questionnaire is labeled 2.4e in the City and State questionnaires.*

Appendix H: Results of Factor Analysis & Reliability Scores – City

Factor 1: Education and Experience

Factor 1A: Office- and Administration-related Knowledge and Skills (α = .841)
Factor 1 Subfactor A-1: Advanced Education/ Specialized Knowledge
Factor 1 Subfactor A-2: Administration Knowledge
Factor 1 Subfactor A-3: Organizing Skills

Factor 1 Subfactor A-1: Advanced Education/Specialized Knowledge (α = .821)
4.1a Laws, legal codes, legal procedures, government regulations or other law-related knowledge
4.1b Principles, concepts and theories related to biological, chemical or physical sciences (including medicine and dentistry)
4.1c. Principles and concepts related to social and behavioral sciences
4.1d Principles and concepts related to humanities and fine arts
4.1e Knowledge related to disseminating information and communicating with different parties
4.1l Knowledge related to principles, practices, and theories of education, learning and teaching

Factor 1 Subfactor A-2: Administration Knowledge (α = .841)
4.1k Knowledge related to administration and management, such as strategic planning, resource allocation, workforce planning, performance management and coordination of people and resources within Department
4.1m Knowledge related to principles, practices and theories of leadership including structuring assignments, delegating, motivating direct reports and providing support, ethical principles for guiding decisions and judgement
4.1s Knowledge related to principles and procedures for human resources management, including recruitment, selection, training, compensation and benefits, labor relations, and personnel information systems

Factor 1 Subfactor A-3: Organizing Skills (α = .808)
4.2e Time management, including prioritizing tasks, setting or adhering to deadlines, and balancing multiple requests
4.2f Organization of schedules (making appointments, sending reminders)
4.2j Memorizing facts and procedures
4.2p Updating of procedures based on recent developments

Factor 1B: Computing and Equipment Knowledge and Skills (α = .732)
Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems
Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software

Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems (α = .812)
2.6i Inspecting equipment, structures, or materials to identify the cause of errors, problems, or defects
2.6j Monitoring processes, materials, or surroundings.
2.9k Using specialized drawing or writing devices such as templates, drafting tools
4.1g Knowledge related to materials, methods, and tools involved in the construction, repair and maintenance of various structures, roads, and highways
4.1o Knowledge related to tools and principles of design, such as production of technical plans, blueprints, drawings, and models
4.2h Analysis of technical systems including equipment selection, operation and control, maintenance, programming, and design

4.2i Analysis of Departmental systems such as identifying measures of systems performance and costs/benefits of alternative actions

Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software (α = .840)
2.10a Setting up technical equipment
2.10b Designing technical equipment
2.10c Correcting malfunctions involving technical equipment
2.10d Inspecting and testing equipment to identify the cause of errors, problems or defects with diagnostic equipment if needed
2.10e Repairing and maintaining electronic equipment and software
4.1h Knowledge related to computer electronics, including circuit boards, processors, chips, electronic equipment, and computer hardware
4.1i Knowledge related to design and development of computer software, including applications, databases, and programming language

Factor 1C: Education/Licensure
Reported Education/Licensure

Factor 1D: Experience
Time to Learn to Do Job Competently

Factor 2: Managerial Activities

Factor 2: Managerial Activities (α = .926)
Factor 2 Subfactor A: Planning and Goal Setting (Managing Change)
Factor 2 Subfactor B: Managing Work Units

Factor 2 Subfactor A: Planning and Goal Setting (Managing Change) (α = .926)
2.14c Proposing a budget for a facility
2.14d Proposing a budget for a whole agency
2.14g Proposing City policy
2.14j Prioritizing competing tasks or setting priorities among competing demands
2.14k Monitoring compliance with legal and ethical standards
2.14p Leading major change initiatives
2.14q Developing new and original ideas to address problems or new work requirements
2.14r Identifying performance objectives
2.14s Developing plans to achieve objectives
2.14t Implementing plans to achieve objectives
2.14u Measuring performance on the achievement of objectives
2.15 Role in planning work
2.16 How far in advance you plan your work

Note: *Items 2.15 & 2.16 were converted to 5-point scale (from 4-point & 8-point scales).*

Factor 2 Subfactor B: Managing Work Units (α = .867)
2.14b Proposing a budget for a unit
2.14e Hiring and firing other workers, directly or indirectly
2.14f Providing performance feedback to employees

2.14h Rotating tasks between yourself and your colleagues
2.14i Deciding who will do which tasks
2.14n Enabling others to expand their knowledge, skills, or abilities

Factor 3: Supervision

Factor 3: Supervision (α = .865)
Factor 3 Subfactor A: Team-related Behaviors
Factor 3 Subfactor B: Direct Supervision
Supervision

Factor 3 Subfactor A: Team-related Behaviors (α = .858)
2.2a Coaching, directing, motivating and developing others
2.2d Participating on teams, including collaborating with individuals to solve problems or coordinating activities within your department
2.2e Managing teams, including team building, coordinating team activities across multiple Departments, or evaluating team performance
2.2f Building relationships, including establishing trust, credibility, empathy, and motivation

Factor 3 Subfactor B: Direct Supervision (α = .957)
2.4b (Internal communication) Individuals reporting to you
2.12a Finding a replacement when someone calls in sick or does not show up for work
2.12b Preventing other people from wasting time
2.12c Preventing damage to or waste of equipment or supplies
2.12d Evaluating direct reports' performance
2.12e Providing on-the-job training
2.12f Coaching for performance improvement and career advancement

Supervision
2.11 Which statement comes closest to describing your supervisory responsibility in your job?

Factor 4: Written Communication

Factor 4: Written Communication (α = .848)
Factor 4 Subfactor A: Intermediate Level of Writing
Factor 4 Subfactor B: Advanced Level of Writing

Factor 4 Subfactor A: Intermediate Level of Writing
4.2b Intermediate level of writing (e.g., writing letters or memos, writing meeting minutes, editing the writing of others, or creating media announcements, news, releases, newsletters, or speeches)
Factor 4 Subfactor B: Advanced Level of Writing
4.2c Advanced level of writing (e.g., writing lengthy reports or manuals, including scholarly or technical reports or manuals that require significant amounts of original writing)

Factor 5: Information & Data-related Work Complexity

Factor 5: Information & Data-related Work Complexity (α = .841)

Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving
Factor 5 Subfactor B: Using Advanced Analytic Methods
Factor 5 Subfactor C: Gathering Information
Factor 5 Subfactor D: Analyzing Information
Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge

Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving (α = .841)
2.6e Estimating quantifiable characteristics of products, events, or information, including estimating sizes, distances, quantities, and quality
2.6f Determining time, costs, resources, or materials needed to perform a work activity
2.7a Apply scientific methods and/or mathematics to solve problems
2.7b Apply basic data analytic methods (means, percentages, developing charts) to identify and/or solve problems

Factor 5 Subfactor B: Using Advanced Analytic Methods (α = .790)
2.7c Apply intermediate-level data analytic methods (correlations, differences between groups) to describe a problem or issue
2.7d Apply advanced data analytic methods (regression, ANOVA, SEM) to conduct research
2.7e Use 'Big Data' analytic techniques, e.g., creation and management of databases
4.1q Knowledge related to survey techniques, polling, focus groups, and other social research methods

Factor 5 Subfactor C: Gathering Information (α = .831)
2.6a Receive and obtain information from relevant sources
2.6b Categorize information
2.6c Soliciting advice from coworkers, supervisors, or others in similar positions
2.6d Using digitized records, databases, or online resources
2.8a Articulate what data should be gathered to answer problems
2.8b Gather facts (like library research, salary survey)

Factor 5 Subfactor D: Analyzing Information (α = .829)
2.6g Applying legal requirements, including those related to confidentiality and HIPPA federal, state, and local laws
2.6h Detecting changes in circumstances or events
2.8c Analyze information (like recognizing patterns in information, interpreting reports, identifying problems)
2.8d Synthesize information (combining information from many sources to create something new)
2.8e Evaluate information (like critiquing a report, not correcting a form)
4.2g Ethical reasoning involving application of ethical principles to specific contexts and decisions.
4.2k Critical thinking including analyzing rules to address problems and/or analyzing problems to generate rules
4.2l Reading and comprehending complex documents and materials related to job

Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge (α = .748)
4.1p. Knowledge related to principles and practices of economics and accounting including assembly, analysis and reporting of financial or statistical data
4.1r Knowledge related to areas of mathematics including algebra, geometry, calculus, and statistics and their applications

Factor 6: Responsibility

Factor 6: Responsibility (α = .732)
Factor 6 Subfactor A: Impact of Mistakes
Factor 6 Subfactor B: Impact on People
Factor 6 Subfactor C: Ensuring Safety
Factor 6 Subfactor D: Time and Workload
Factor 6 Subfactor E: Quality Standards

Factor 6 Subfactor A: Impact of Mistakes (α = .773)
3.4a Reputation or image of your unit
3.4b Reputation or image of your city agency
3.4f Fiscal loss
3.4g Barriers to public access to benefits or services

Factor 6 Subfactor B: Impact on People (α = .833)
3.3a The results of my work are likely to significantly affect the lives of other people
3.3b The job has a large impact on people outside the Department.

Factor 6 Subfactor C: Ensuring Safety (α = .859)
2.14l Making sure others are physically safe
2.14m Safeguarding others' emotional and mental wellbeing
3.4c Health or safety of another person
3.4d Your health and safety
3.4e Damage to equipment

Factor 6 Subfactor D: Time and Workload (α = .918)
3.7a Making quick decisions
3.7b Multiple people making time sensitive demands and requests
3.7c Feeling rushed on the job, because people are waiting, emails need to be answered, the telephone is always ringing, etc.
3.7d Feeling that my work is piling up faster than I can complete it
3.7e Getting things done in a hurry to meet a deadline
3.7f Having to learn new skills or information just to keep up on the job
3.7g Having conflicting demands (for example, being asked to give better service and also to help more people)
3.7o Feeling interrupted to take on an unforeseen task
3.7q Working long periods at a quick pace
3.7r Direct exposure to verbal and/or physical abuse from clients or patients

Factor 6 Subfactor E: Quality Standards (α = .876)
3.8a Meeting precise quality standards
3.8b Assessing the quality of your own work
3.8c Solving unforeseen problems on your own
3.8e Performing complex tasks
3.8f Learning new things

Factor 7: Oral Communication

Factor 7: Oral Communication (α = .713)
Factor 7 Subfactor A: Teaching, Training and Making Presentations
Factor 7 Subfactor B: Maintaining Positive Interactions

Factor 7 Subfactor A: Teaching, Training and Making Presentations (α = .748)
2.2b Delivering presentations
2.2c Teaching and training (excluding direct reports)
4.2d Training and curriculum design and development

Factor 7 Subfactor B: Maintaining Positive Interactions (α = .844)
2.2g Conducting conflict resolution and negotiation to reach agreement or settle a dispute
2.5a Being sensitive to differences you might have with others so you can work with them effectively
2.5b. Using negotiating and influencing skills in order to change behavior of clients or external constituents/employees
2.5c Reading and managing others' emotional states
2.14o Addressing requests from people such as the public, clients, elected officials, patients, etc.
3.7i Telling people (e.g., other workers, clients, the public) things they do not want to hear
4.2m Conflict management

Factor 8A: Job Demands Associated with High-risk Physical Work

Factor 8A: Job Demands Associated with High-risk Physical Work (α = .892)
Factor 8A Subfactor A: Working in Atypical Work Conditions
Factor 8A Subfactor B: Working Under High-risk Conditions
Factor 8A Subfactor C: Physical Skills and Abilities
Factor 8A Subfactor D: Working with Trades Equipment

Factor 8A Subfactor A: Working in Atypical Work Conditions (α = .927)
3.10a Extreme temperature or weather such as conditions hotter than 90 degrees or colder than 40 degrees (like blacktop paving, cold storage room, extreme wind, or heat from kitchen facilities)
3.10b Unhealthy, infectious or toxic fumes or materials (like car fumes, asbestos, stripping solution, contaminated medical instruments or ammonia)
3.10d Poor lighting
3.10f Cramped or confined workspaces
3.10h Extremely loud noises at levels that require hearing protection
3.10l Physical dangers from the environment (e.g., slippery floors or working surfaces, unstable floors or working surfaces, high or elevated working surfaces, exposure to high speed traffic, working in remote areas)
3.10m Working with exposed moving mechanical parts or sharp objects
3.10n Risk of electrical shock

Factor 8A Subfactor B: Working Under High-risk Conditions (α = .820)
3.10e In- or under-water working spaces
3.10i Pollution or with foreign substances that require protective gear, clothing, or breathing equipment
3.10j Radiation at levels that require protective gear or monitoring equipment
3.10o Working with explosives
3.11 Risk of being physically hurt

Factor 8A Subfactor C: Physical Skills and Abilities (α = .933)
4.2q Physical dexterity, such as coordination between your arms and hands, using your hands to adjust equipment or making precise movements with your fingers
4.2r Physical flexibility, such as being able to bend, stretch, twist, or reach out with your body, arms, and/or legs
4.2s Physical strength, such as being able to exert muscle force repeatedly or continuously over time.
4.2t. Physical stamina, such as being able to exert yourself physically over long periods of time without getting winded or out of breath

Factor 8A Subfactor D: Working with Trades Equipment (α = .914)
2.9d Using manually powered tools such as rakes, hammers, hand trucks, wheelbarrows
2.9e Using electrically powered hand tools such as hand-held drills, soldering irons, circular saws
2.9f Using measuring devices such as rulers, micrometers, thermometers, blood pressure monitors, tape measures
2.9i Operating mobile powered tools or equipment such as lawn mowers
2.9j Using stationary tools or equipment such as drill presses, table saws, milling equipment
2.9o Driving highway vehicles such as cars, vans, trucks, tractor trailers
2.9p Operating off-road vehicles such as bulldozers, tractors, haul trucks
4.1j Knowledge related to design, use repair, and maintenance of equipment and tools

Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients

Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients (α = .793)
Factor 8B Subfactor A: Caring for/ Assisting Patients/Clients
Factor 8B Subfactor B: Hazards from Working with People
Factor 8B Subfactor C: Public Safety Work (Police and Mental Health)

Factor 8B Subfactor A: Caring for/Assisting Patients/Clients (α = .858)
2.1a Providing direct care
2.1b Providing medical attention
2.1c Providing psychiatric support
3.7h Providing direct care of patients
3.7j Dealing directly with individuals displaying inappropriate, impatient or demanding behaviors (not co-workers)
3.7k Dealing directly with clients who are diagnosed with mental health issues (not co-workers)

Factor 8B Subfactor B: Hazards from Working with People (α = .900)
3.10c Physical handling of sick or injured people
3.10g Dealing with people in crisis and trauma (e.g., people who threaten to harm themselves)
3.10k Physical dangers from people (patients, the public, lawbreakers, inmates)

Factor 8B Subfactor C: Public Safety Work (Police and Mental Health) (α = .786)
2.3a (External Communication) Patients/clients
2.9n Using motor vehicles to transport others (e.g., patients, inmates)
2.9q Carrying weapons including handguns, rifles, batons, tasers
3.7p Dealing with armed or dangerous individuals

3.7t Exposure to traumatic situation
4.1f Knowledge related to policies and procedures related to public safety and security
4.1t Knowledge related to principles and practices of direct physical or mental healthcare service

Appendix I: Results of Factor Analysis & Reliability Scores – NYC

Factor 1: Education and Experience

Factor 1A: Office- and Administration-related Knowledge and Skills (α = .860)
Factor 1 Subfactor A-1: Advanced Education/ Specialized Knowledge
Factor 1 Subfactor A-2: Administration Knowledge
Factor 1 Subfactor A-3: Organizing Skills

Factor 1 Subfactor A-1: Advanced Education/Specialized Knowledge (α = .809)
4.1a Laws, legal codes, legal procedures, government regulations or other law-related knowledge
4.1c. Principles and concepts related to social and behavioral sciences
4.1d Principles and concepts related to humanities and fine arts
4.1e Knowledge related to disseminating information and communicating with different parties
4.1l Knowledge related to principles, practices, and theories of education, learning and teaching.

Factor 1 Subfactor A-2: Administration Knowledge (α = .903)
4.1k Knowledge related to administration and management, such as strategic planning, resource allocation, workforce planning, performance management and coordination of people and resources within Department
4.1m Knowledge related to principles, practices and theories of leadership including structuring assignments, delegating, motivating direct reports and providing support, ethical principles for guiding decisions and judgement
4.1s Knowledge related to principles and procedures for human resources management, including recruitment, selection, training, compensation and benefits, labor relations, and personnel information systems

Factor 1 Subfactor A-3: Organizing Skills (α = .838)
4.2e Time management, including prioritizing tasks, setting or adhering to deadlines, and balancing multiple requests
4.2f Organization of schedules (making appointments, sending reminders)
4.2j Memorizing facts and procedures
4.2p Updating of procedures based on recent developments

Factor 1B: Computing and Equipment Knowledge and Skills (α = .629) (Factor dropped from analysis)
Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems
Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software

Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems (α = .810)
2.6i Inspecting equipment, structures, or materials to identify the cause of errors, problems, or defects
2.6j Monitoring processes, materials, or surroundings.
2.9k Using specialized drawing or writing devices such as templates, drafting tools
4.1g Knowledge related to materials, methods, and tools involved in the construction, repair and maintenance of various structures, roads, and highways
4.1o Knowledge related to tools and principles of design, such as production of technical plans, blueprints, drawings, and models
4.2h Analysis of technical systems including equipment selection, operation and control, maintenance, programming, and design

4.2i Analysis of Departmental systems such as identifying measures of systems performance and costs/benefits of alternative actions

Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software (α = .855)
2.10a Setting up technical equipment
2.10b Designing technical equipment
2.10c Correcting malfunctions involving technical equipment
2.10d Inspecting and testing equipment to identify the cause of errors, problems or defects with diagnostic equipment if needed
2.10e Repairing and maintaining electronic equipment and software
4.1h Knowledge related to computer electronics, including circuit boards, processors, chips, electronic equipment, and computer hardware
4.1i Knowledge related to design and development of computer software, including applications, databases, and programming language

Factor 1C: Education/Licensure
Reported Education/Licensure

Factor 1D: Experience
Time to Learn to Do Job Competently

Factor 2: Managerial Activities

Factor 2: Managerial Activities (α = .941)
Factor 2 Subfactor A: Planning and Goal Setting (Managing Change)
Factor 2 Subfactor B: Managing Work Units

Factor 2 Subfactor A: Planning and Goal Setting (Managing Change) (α = .941)
2.14c Proposing a budget for a facility
2.14d Proposing a budget for a whole agency
2.14g Proposing City policy
2.14j Prioritizing competing tasks or setting priorities among competing demands
2.14k Monitoring compliance with legal and ethical standards
2.14p Leading major change initiatives
2.14q Developing new and original ideas to address problems or new work requirements
2.14r Identifying performance objectives
2.14s Developing plans to achieve objectives
2.14t Implementing plans to achieve objectives
2.14u Measuring performance on the achievement of objectives
2.15 Role in planning work
2.16 How far in advance you plan your work

Note: *Items 2.15 & 2.16 were converted to 5-point scale (from 4-point & 8-point scales).*

Factor 2 Subfactor B: Managing Work Units (α = .919)
2.14b Proposing a budget for a unit
2.14e Hiring and firing other workers, directly or indirectly
2.14f Providing performance feedback to employees

2.14h Rotating tasks between yourself and your colleagues
2.14i Deciding who will do which tasks
2.14n Enabling others to expand their knowledge, skills, or abilities

Factor 3: Supervision

Factor 3: Supervision (α = .906)
Factor 3 Subfactor A: Team-related Behaviors
Factor 3 Subfactor B: Direct Supervision
Supervision

Factor 3 Subfactor A: Team-related Behaviors (α = .892)
2.2a Coaching, directing, motivating and developing others
2.2d Participating on teams, including collaborating with individuals to solve problems or coordinating activities within your department
2.2e Managing teams, including team building, coordinating team activities across multiple Departments, or evaluating team performance
2.2f Building relationships, including establishing trust, credibility, empathy, and motivation

Factor 3 Subfactor B: Direct Supervision (α = .949)
2.4b (Internal communication) Individuals reporting to you
2.12a Finding a replacement when someone calls in sick or does not show up for work
2.12b Preventing other people from wasting time
2.12c Preventing damage to or waste of equipment or supplies
2.12d Evaluating direct reports' performance
2.12e Providing on-the-job training
2.12f Coaching for performance improvement and career advancement

Supervision
2.11 Which statement comes closest to describing your supervisory responsibility in your job?

Factor 4: Written Communication

Factor 4: Written Communication (α = .837)
Factor 4 Subfactor A: Intermediate Level of Writing
Factor 4 Subfactor B: Advanced Level of Writing

Subfactor A: Intermediate Level of Writing
4.2b Intermediate level of writing (e.g., writing letters or memos, writing meeting minutes, editing the writing of others, or creating media announcements, news, releases, newsletters, or speeches)
Subfactor B: Advanced Level of Writing
4.2c Advanced level of writing (e.g., writing lengthy reports or manuals, including scholarly or technical reports or manuals that require significant amounts of original writing)

Factor 5: Information & Data-related Work Complexity

Factor 5: Information & Data-related Work Complexity (α = .857)
Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving
Factor 5 Subfactor B: Using Advanced Analytic Methods
Factor 5 Subfactor C: Gathering Information
Factor 5 Subfactor D: Analyzing Information
Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge

Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving (α = .875)
2.6e Estimating quantifiable characteristics of products, events, or information, including estimating sizes, distances, quantities, and quality
2.6f Determining time, costs, resources, or materials needed to perform a work activity
2.7a Apply scientific methods and/or mathematics to solve problems
2.7b Apply basic data analytic methods (means, percentages, developing charts) to identify and/or solve problems

Factor 5 Subfactor B: Using Advanced Analytic Methods (α = .808)
2.7c Apply intermediate-level data analytic methods (correlations, differences between groups) to describe a problem or issue
2.7d Apply advanced data analytic methods (regression, ANOVA, SEM) to conduct research
2.7e Use 'Big Data' analytic techniques, e.g., creation and management of databases
4.1q Knowledge related to survey techniques, polling, focus groups, and other social research methods

Factor 5 Subfactor C: Gathering Information (α = .759)
2.6a Receive and obtain information from relevant sources
2.6b Categorize information
2.6c Soliciting advice from coworkers, supervisors, or others in similar positions
2.6d Using digitized records, databases, or online resources
2.8a Articulate what data should be gathered to answer problems
2.8b Gather facts (like library research, salary survey)

Factor 5 Subfactor D: Analyzing Information (α = .859)
2.6g Applying legal requirements, including those related to confidentiality and HIPPA federal, state, and local laws
2.6h Detecting changes in circumstances or events
2.8c Analyze information (like recognizing patterns in information, interpreting reports, identifying problems)
2.8d Synthesize information (combining information from many sources to create something new)
2.8e Evaluate information (like critiquing a report, not correcting a form)
4.2g Ethical reasoning involving application of ethical principles to specific contexts and decisions.
4.2k Critical thinking including analyzing rules to address problems and/or analyzing problems to generate rules
4.2l Reading and comprehending complex documents and materials related to job

Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge (α = .773)
4.1p. Knowledge related to principles and practices of economics and accounting including assembly, analysis and reporting of financial or statistical data
4.1r Knowledge related to areas of mathematics including algebra, geometry, calculus, and statistics and their applications

Factor 6: Responsibility

Factor 6: Responsibility (α = .742)
Factor 6 Subfactor A: Impact of Mistakes
Factor 6 Subfactor B: Impact on People
Factor 6 Subfactor C: Ensuring Safety
Factor 6 Subfactor D: Time and Workload
Factor 6 Subfactor E: Quality Standards

Factor 6 Subfactor A: Impact of Mistakes (α = .789)
3.4a Reputation or image of your unit
3.4b Reputation or image of your city agency
3.4f Fiscal loss
3.4g Barriers to public access to benefits or services

Factor 6 Subfactor B: Impact on People (α = .802)
3.3a The results of my work are likely to significantly affect the lives of other people
3.3b The job has a large impact on people outside the Department.

Factor 6 Subfactor C: Ensuring Safety (α = .880)
2.14l Making sure others are physically safe
2.14m Safeguarding others' emotional and mental wellbeing
3.4c Health or safety of another person
3.4d Your health and safety
3.4e Damage to equipment

Factor 6 Subfactor D: Time and Workload (α = .923)
3.7a Making quick decisions
3.7b Multiple people making time sensitive demands and requests
3.7c Feeling rushed on the job, because people are waiting, emails need to be answered, the telephone is always ringing, etc.
3.7d Feeling that my work is piling up faster than I can complete it
3.7e Getting things done in a hurry to meet a deadline
3.7f Having to learn new skills or information just to keep up on the job
3.7g Having conflicting demands (for example, being asked to give better service and also to help more people)
3.7o Feeling interrupted to take on an unforeseen task
3.7q Working long periods at a quick pace

Factor 6 Subfactor E: Quality Standards (α = .840)
3.8a Meeting precise quality standards
3.8b Assessing the quality of your own work
3.8c Solving unforeseen problems on your own
3.8e Performing complex tasks

Factor 7: Oral Communication

Factor 7: Oral Communication (α = .703)
Factor 7 Subfactor A: Teaching, Training and Making Presentations

Factor 7 Subfactor B: Maintaining Positive Interactions

Factor 7 Subfactor A: Teaching, Training and Making Presentations (α = .755)
2.2b Delivering presentations
2.2c Teaching and training (excluding direct reports)
4.2d Training and curriculum design and development

Factor 7 Subfactor B: Maintaining Positive Interactions (α = .881)
2.2g Conducting conflict resolution and negotiation to reach agreement or settle a dispute
2.5a Being sensitive to differences you might have with others so you can work with them effectively
2.5b. Using negotiating and influencing skills in order to change behavior of clients or external constituents/employees
2.5c Reading and managing others' emotional states
2.14o Addressing requests from people such as the public, clients, elected officials, patients, etc.
3.7i Telling people (e.g., other workers, clients, the public) things they do not want to hear
4.2m Conflict management

Factor 8A: Job Demands Associated with High-risk Physical Work

Factor 8A: Job Demands Associated with High-risk Physical Work (α = .875)
Factor 8A Subfactor A: Working in Atypical Work Conditions
Factor 8A Subfactor B: Working Under High-risk Conditions
Factor 8A Subfactor C: Physical Skills and Abilities
Factor 8A Subfactor D: Working with Trades Equipment

Factor 8A Subfactor A: Working in Atypical Work Conditions (α = .929)
3.10a Extreme temperature or weather such as conditions hotter than 90 degrees or colder than 40 degrees (like blacktop paving, cold storage room, extreme wind, or heat from kitchen facilities)
3.10b Unhealthy, infectious or toxic fumes or materials (like car fumes, asbestos, stripping solution, contaminated medical instruments or ammonia)
3.10d Poor lighting
3.10f Cramped or confined workspaces
3.10h Extremely loud noises at levels that require hearing protection
3.10l Physical dangers from the environment (e.g., slippery floors or working surfaces, unstable floors or working surfaces, high or elevated working surfaces, exposure to high speed traffic, working in remote areas)
3.10m Working with exposed moving mechanical parts or sharp objects
3.10n Risk of electrical shock

Factor 8A Subfactor B: Working Under High-risk Conditions (α = .742)
3.10e In- or under-water working spaces
3.10i Pollution or with foreign substances that require protective gear, clothing, or breathing equipment
3.10j Radiation at levels that require protective gear or monitoring equipment
3.10o Working with explosives
3.11 Risk of being physically hurt

Factor 8A Subfactor C: Physical Skills and Abilities (α = .942)
4.2q Physical dexterity, such as coordination between your arms and hands, using your hands to adjust equipment or making precise movements with your fingers

4.2r Physical flexibility, such as being able to bend, stretch, twist, or reach out with your body, arms, and/or legs
4.2s Physical strength, such as being able to exert muscle force repeatedly or continuously over time.
4.2t. Physical stamina, such as being able to exert yourself physically over long periods of time without getting winded or out of breath

Factor 8A Subfactor D: Working with Trades Equipment (α = .867)
2.9d Using manually powered tools such as rakes, hammers, hand trucks, wheelbarrows
2.9e Using electrically powered hand tools such as hand-held drills, soldering irons, circular saws
2.9f Using measuring devices such as rulers, micrometers, thermometers, blood pressure monitors, tape measures
2.9i Operating mobile powered tools or equipment such as lawn mowers
2.9j Using stationary tools or equipment such as drill presses, table saws, milling equipment
2.9o Driving highway vehicles such as cars, vans, trucks, tractor trailers
2.9p Operating off-road vehicles such as bulldozers, tractors, haul trucks
4.1j Knowledge related to design, use repair, and maintenance of equipment and tools

Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients

Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients (α = .901)
Factor 8B Subfactor A: Caring for/ Assisting Patients/Clients
Factor 8B Subfactor B: Hazards from Working with People
Factor 8B Subfactor C: Public Safety Work (Police and Mental Health)

Factor 8B Subfactor A: Caring for/Assisting Patients/Clients (α = .801)
2.1a Providing direct care
2.1b Providing medical attention
2.1c Providing psychiatric support
3.7h Providing direct care of patients
3.7j Dealing directly with individuals displaying inappropriate, impatient or demanding behaviors (not co-workers)
3.7k Dealing directly with clients who are diagnosed with mental health issues (not co-workers)

Factor 8B Subfactor B: Hazards from Working with People (α = .909)
3.10c Physical handling of sick or injured people
3.10g Dealing with people in crisis and trauma (e.g., people who threaten to harm themselves)
3.10k Physical dangers from people (patients, the public, lawbreakers, inmates)

Factor 8B Subfactor C: Public Safety Work (Police and Mental Health) (α = .761)
2.3a (External Communication) Patients/clients
2.9n Using motor vehicles to transport others (e.g., patients, inmates)
2.9q Carrying weapons including handguns, rifles, batons, tasers
3.7p Dealing with armed or dangerous individuals
3.7t Exposure to traumatic situation
4.1f Knowledge related to policies and procedures related to public safety and security
4.1t Knowledge related to principles and practices of direct physical or mental healthcare service

Appendix J: Comparison between QJES and Current Study

QJES	UAlbany Current Study
Factor 1 Education & Experience (.330)	***Factor 1 Education & Experience***
Q14 Years of school required (.0) Q15 Diploma required (1-6) (.45) Q16 Is license, certificate or registration required (.0) Q17 Experience required (1-4) (.44 Quals) Q17 Experience required (1-4) (.19 Incumbents) Q18 How long does it take for people to learn to do your job competently *after* they start the job? (0 to 36 months) (.07) Q19 Do people in your job work with machines as an important part of their job? (Note: computer, copier, typewriter, drill press, mixer, mangle, vaporizer and floor scrubber are all machines.) (1-4) Q20 (-.10) [Q68-Q74 (1-4 scale)] Q68 Operate simple equipment (.0) Q69 Operating equipment requiring limited training (.0) Q70 Operating complex equipment requiring specialized training (.0) Q71 Operating heavy equipment or vehicles (.0) Q72 Using hand tools and instruments (.0) Q73 Using precision hand tools and instruments (.0) Q74 Using heavy power tools or instruments (.0)	*Factor 1A: Office- and Administration-related Knowledge and Skills* *Factor 1 Subfactor A-1: Performing Routine Office Tasks* 2.9a Using or operating a personal computer 2.9b Using computer-related devices such as scanners and printers 2.9c Using other types of standard office equipment such as copiers, fax machines, shredders 4.1n Knowledge related to administrative and clerical procedures and systems such as word processing, managing files and records, transcription, designing forms, and other office procedures and terminology *Factor 1 Subfactor A-2: Advanced Education/ Specialized Knowledge* 4.1a Laws, legal codes, legal procedures, government regulations or other law-related knowledge 4.1c. Principles and concepts related to social and behavioral sciences 4.1d Principles and concepts related to humanities and fine arts 4.1e Knowledge related to disseminating information and communicating with different parties 4.1l Knowledge related to principles, practices, and theories of education, learning and teaching. *Factor 1 Subfactor A-3: Administration Knowledge* 4.1k Knowledge related to administration and management, such as strategic planning, resource allocation, workforce planning, performance management and coordination of people and resources within Department 4.1m Knowledge related to principles, practices and theories of leadership including structuring assignments, delegating, motivating direct reports and providing support, ethical principles for guiding decisions and judgement 4.1s Knowledge related to principles and procedures for human resources management, including recruitment, selection, training, compensation and benefits, labor relations, and personnel information systems

QJES	UAlbany Current Study
	Factor 1 Subfactor A-4: Organizing Skills 4.2e Time management, including prioritizing tasks, setting or adhering to deadlines, and balancing multiple requests 4.2f Organization of schedules (making appointments, sending reminders) 4.2p Updating of procedures based on recent developments
	Factor 1B: Computing and Equipment Knowledge and Skills *Factor 1 Subfactor B-1: Monitoring and Analyzing Materials, Equipment and Systems* 2.6i Inspecting equipment, structures, or materials to identify the cause of errors, problems, or defects 2.6j Monitoring processes, materials, or surroundings. 2.9k Using specialized drawing or writing devices such as templates, drafting tools 4.1g Knowledge related to materials, methods, and tools involved in the construction, repair and maintenance of various structures, roads, and highways 4.1o Knowledge related to tools and principles of design, such as production of technical plans, blueprints, drawings, and models 4.2h Analysis of technical systems including equipment selection, operation and control, maintenance, programming, and design 4.2i Analysis of Departmental systems such as identifying measures of systems performance and costs/benefits of alternative actions *Factor 1 Subfactor B-2: Working with Technical & Computer Equipment, Hardware and Software* 42.10a Setting up technical equipment 2.10b Designing technical equipment 2.10c Correcting malfunctions involving technical equipment 2.10d Inspecting and testing equipment to identify the cause of errors, problems or defects with diagnostic equipment if needed 2.10e Repairing and maintaining electronic equipment and software 4.1h Knowledge related to computer electronics, including circuit boards, processors, chips, electronic equipment, and computer hardware 4.1i Knowledge related to design and development of computer software, including applications, databases, and programming language
	Factor 1C: Education/Licensure

QJES	UAlbany Current Study
	Required Education/Licensure
	Factor 1D: Experience Required Experience
Factor 2 Managerial Activities (.055)	***Factor 2 Managerial Activities***
Q33 Keeping others informed about agency programs, policies, etc. (1-4) (.05) Q44 Role in setting operating practices (1-5) (.16) Q45 Role in planning what work to do (1-4) (.13) Q46 How far in advance plan work activity (Form B, 0-6) (.21) Q46 How far in advance plan work activity (Form G, 1-7) (.21) Q51 Manage more than one group/organizational unit (1-4) (.0) Q52 Manage multiple work groups (1-4) (.0) Q53 Manage an agency (1-4) (.0) Q75 How much control for proposing budget for unit (1-4) (.10) Q76 How much control for proposing budget for agency (1-4) (.0) Q81 Propose state policy (.29)	*Factor 2 Subfactor A: Planning and Goal Setting (Managing Change)* 2.14c Proposing a budget for a facility 2.14d Proposing a budget for a whole agency 2.14g Proposing state policy 2.14j Prioritizing competing tasks or setting priorities among competing demands 2.14k Monitoring compliance with legal and ethical standards 2.14p Leading major change initiatives 2.14q Developing new and original ideas to address problems or new work requirements 2.14r Identifying performance objectives 2.14s Developing plans to achieve objectives 2.14t Implementing plans to achieve objectives 2.14u Measuring performance on the achievement of objectives 2.15 Role in planning work 2.16 How far in advance you schedule your work
	Factor 2 Subfactor B: Managing Work Units 2.14b Proposing a budget for a unit 2.14e Hiring and firing other workers, directly or indirectly 2.14f Providing performance feedback to employees 2.14h Rotating tasks between yourself and your colleagues 2.14i Deciding who will do which tasks 2.14n Enabling others to expand their knowledge, skills, or abilities
Factor 3 Supervision (.124)	***Factor 3 Supervision***
Q32 Settling disputes on the job (1-4) (-.07) Q48 How many supervised (0-100) (.13) Q49 What kind of supervisory responsibility (1-5) (.34) Q50 Supervising members of a work group (1-4) (.0) Q54 Scheduling, supervising, evaluating individuals in similar operations (1-4) (.0) Q54 Scheduling, supervising, evaluating individuals in diverse operations (1-4) (.0) Q77 How much direct others when boss not there (1-4) (.0) Q78 Responsible for finding replacements (1-4) (-.24)	*Factor 3 Subfactor A: Team-related Behaviors* 2.2a Coaching, directing, motivating and developing others 2.2d Participating on teams, including collaborating with individuals to solve problems or coordinating activities within your department 2.2e Managing teams, including team building, coordinating team activities across multiple Departments, or evaluating team performance 2.2f Building relationships, including establishing trust, credibility, empathy, and motivation

QJES	**UAlbany Current Study**
Q79 How much say about hiring/firing (1-4) (.18) Q80 How much estimate training needs of others (1-4) (.14) Q83 How much told what specific tasks to do (1-4) (-.16) Q84 How much can decide what to do first (1-4) (.13)	*Factor 3 Subfactor B: Direct Supervision* 2.4b (Internal communication) Individuals reporting to you 2.12a Finding a replacement when someone calls in sick or does not show up for work 2.12b Preventing other people from wasting time 2.12c Preventing damage to or waste of equipment or supplies 2.12d Evaluating direct reports' performance 2.12e Providing on-the-job training 2.12f Coaching for performance improvement and career advancement
	Supervision 2.11 Which statement comes closest to describing your supervisory responsibility in your job?
Factor 4 Written Communications (.213)	***Factor 4 Written Communications***
Q21 Copying written facts (1-4) (-.26) Q22 Basic writing (forms, standard letters) (1-4) (-.19) Q23 Writing original letters/memos/meeting minutes (1-4) (.30) Q24 Editing the writing of others (1-4) (.33) Q25 Writing technical reports/manuals (1-4) (.12) Q27 Reading detailed policies, procedures, etc. (1-4) Q34 Negotiating about services, procedures, etc. (1-4) Q36 Answering complaints from public (1-4) Q62 Contact with employees outside agency (1-4) Q63 Provide info, analyses or services used outside unit (1-4) Q64 Provide info, analyses or services used outside agency (1-4)	4.2a Basic level of writing (e.g., writing standard letters and filling out forms) *Factor 4 Subfactor A: Intermediate Level of Writing* 4.2b Intermediate level of writing (e.g., writing letters or memos, writing meeting minutes, editing the writing of others, or creating media announcements, news, releases, newsletters, or speeches) *Factor 4 Subfactor B: Advanced Level of Writing* 4.2c Advanced level of writing (e.g., writing lengthy reports or manuals, including scholarly or technical reports or manuals that require significant amounts of original writing)
Factor 5 Work Complexity (.153)	**Factor 5 Information & Data-related Work Complexity**
Q26 Reading letters or inquires (1-4) (.12) Q28 Reading complicated reports/journals (1-4) (.32) Q40 Filing letters, records (1-4) (-.30) Q41 Getting background information (1-4) (-.13) Q42 Using scientific or abstract knowledge (1-4) Q43 Deciding what information is needed (1-4) (.13) Q47 Using information (gather to create) (0-5) (.14) Q86 How much do same thing every day (1-4) (-.14) Q88 How often new/unexpected problems (1-4) (.08) Q98 Use common sense to make simple decisions (1-4) Q99 Perform work according to set routine (1-4)	*Factor 5 Subfactor A: Using Data Analytic Methods for Problem Solving* 2.6e Estimating quantifiable characteristics of products, events, or information, including estimating sizes, distances, quantities, and quality 2.6f Determining time, costs, resources, or materials needed to perform a work activity 2.7a Apply scientific methods and/or mathematics to solve problems 2.7b Apply basic data analytic methods (means, percentages, developing charts) to identify and/or solve problems

QJES	UAlbany Current Study
Q100 Work where considerable change from routine possible (1-4) Q101 Perform tasks clearly & directly related (1-4) Q102 Work with set procedures & specific guidelines (1-4) Q103 Work with general, non-specific guidelines (1-4) Q104 Make decisions when wide range of solutions (1-4) Q105 Make decisions where limited number of solutions (1-4) Q106 Make decisions based on complex or scientific info (1-4)	*Factor 5 Subfactor B: Using Advanced Analytic Methods* 2.7c Apply intermediate-level data analytic methods (correlations, differences between groups) to describe a problem or issue 2.7d Apply advanced data analytic methods (regression, ANOVA, SEM) to conduct research 2.7e Use 'Big Data' analytic techniques, e.g., creation and management of databases 2.8f Create theories, discover new knowledge, test hypotheses 4.1q Knowledge related to survey techniques, polling, focus groups, and other social research methods
	Factor 5 Subfactor C: Gathering Information 2.6a Receive and obtain information from relevant sources 2.6b Categorize information 2.6c Soliciting advice from coworkers, supervisors, or others in similar positions 2.6d Using digitized records, databases, or online resources 2.8a Articulate what data should be gathered to answer problems 2.8b Gather facts (like library research, salary survey)
	Factor 5 Subfactor D: Analyzing Information 2.6g Applying legal requirements, including those related to confidentiality and HIPPA 2.6h Detecting changes in circumstances or events 2.8c Analyze information (like recognizing patterns in information, interpreting reports, identifying problems) 2.8d Synthesize information (combining information from many sources to create something new) 2.8e Evaluate information (like critiquing a report, not correcting a form) 4.2g Ethical reasoning involving application of ethical principles to specific contexts and decisions. 4.2k Critical thinking including analyzing rules to address problems and/or analyzing problems to generate rules 4.2l Reading and comprehending complex documents and materials related to job

QJES	UAlbany Current Study
	Factor 5 Subfactor E: Mathematics- and Financial-related Knowledge 4.1p. Knowledge related to principles and practices of economics and accounting including assembly, analysis and reporting of financial or statistical data 4.1r Knowledge related to areas of mathematics including algebra, geometry, calculus, and statistics and their applications
Factor 6: Responsibility (.052)	***Factor 6: Responsibility***
Q 4 Dealing with upset clients/public (1-4) (-.11) Q 5 Dealing with emotionally troubled clients (1-4) Q85 How free to decide how quickly to work? (1-4) Q87 How much variety job has most of time (1-4) (.20) Q89 Responsible for preventing others wasting time (1-4) (.38) Q90 Responsible for preventing damage/waste (1-4) (-.21) Q91 How much damage to equipment could mistake cause (1-4) (-.30) Q92 How much could mistake hurt name of unit (1-4) (.14) Q93 How much could mistake hurt name of agency (1-4) (.24) Q94 How much could mistake harm health/safety of others (1-4) Q95 Involves precautions to avoid injury to others (1-4) Q96 Errors could result in major injuries to others (1-4) Q97 Mistakes could directly result in death of others (1-4) Q107 Opportunity to improve methods, make decisions (1-4) Q108 Work without instructions from supervisor (1-4) Q109 Supervisor reviews quantity/quality of work (1-4) Q110 Supervisor instructions only in unusual situations (1-4)	*Factor 6 Subfactor A: Impact of Mistakes* 3.4a Reputation or image of your unit 3.4b Reputation or image of your State agency 3.4f Fiscal loss 3.4g Barriers to public access to benefits or services *Factor 6 Subfactor B: Impact on People* 3.3a The results of my work are likely to significantly affect the lives of other people 3.3b The job has a large impact on people outside the Department.
Factor 7: Oral Communication (.076)	***Factor 7: Oral Communication***
Q29 Answering questions from public (1-4) (-.22) Q30 Advising or supervising clients/patients/inmates (1-4) (-.05) Q31 Teaching or instructing formally (1-4) (-.17) Q35 Explaining (giving directions/instructions) (1-4) (.12) Q37 Giving speeches (1-4) (.14)	*Factor 7 Subfactor A: Teaching, Training and Making Presentations* 2.2b Delivering presentations 2.2c Teaching and training (excluding direct reports) 4.2d Training and curriculum design and development

QJES	UAlbany Current Study
Q38 Planning meetings/workshops (1-4) (-.13) Q39 Leading meetings/workshops (1-4) (.56) Q57 Directly supervising institutionalized persons (1-4) Q58 Restraining or physically controlling other people (1-4) Q59 Negotiating where difference of opinion/intent exists (1-4) Q60 Work-related communication with employees in immediate unit (1-4) Q61 Work-related communication with employees in same agency (1-4) Q82 How often deal with professionals outside agency (1-4) (.40) Q115 Conflict, disagreements or strained relationships w/others (1-4)	*Factor 7 Subfactor B: Maintaining Positive Interactions* 2.2g Conducting conflict resolution and negotiation to reach agreement or settle a dispute 2.5a Being sensitive to differences you might have with others so you can work with them effectively 2.5b. Using negotiating and influencing skills in order to change behavior of clients or external constituents/employees 2.5c Reading and managing others' emotional states 2.14o Addressing requests from people such as the public, clients, elected officials, patients, etc. 3.7i Telling people things they do not want to hear 4.2m Conflict management
Factor 8: Job Demands (.107)	***Factor 8A: Job Demands Associated with High-risk Physical Work***
Q1 How often make quick decisions (1-4) (.18) Q2 How often feel rushed (1-4) (-.06) Q3 Feel pressure meet deadlines/get done hurry (1-4) (.14) Q6 Working where hot >90 or cold <40 (1-4) (-.12) Q7 Work where unhealthy, infectious, toxic fumes (1-4) Q8 Cleaning others dirt or garbage (1-4) (-.11) Q9 Working with constant noise (1-4) (-.15) Q10 (.07) Q11 Strenuous physical activity (1-4) (-.12) Q12 Doing short task over & over again for long time (1-4) (-.43) Q13 How much risk of being hurt (1-4) Q65 Lifting or carrying objects up to 50 lbs. (1-4) Q66 Lifting or carrying objects or people over 50 lbs. (1-4) Q67 Climbing (other than stairs) (1-4) Q111 Risk work-related accident involving car/other mobile (1-4) Q112 Risk of accidents falling from heights (1-4) Q113 Risk of accidents with machines/equipment (1-4) Q114 Fire of extremely hot objects (1-4)	*Factor 8A Subfactor A: Working in Atypical Work Conditions* 3.10a Extreme temperature or weather such as conditions hotter than 90 degrees or colder than 40 degrees (like blacktop paving, cold storage room, extreme wind, or heat from kitchen facilities) 3.10b Unhealthy, infectious or toxic fumes or materials (like car fumes, asbestos, stripping solution, contaminated medical instruments or ammonia) 3.10d Poor lighting 3.10f Cramped or confined workspaces 3.10h Extremely loud noises at levels that require hearing protection 3.10l Physical dangers from the environment (e.g., slippery floors or working surfaces, unstable floors or working surfaces, high or elevated working surfaces, exposure to high speed traffic, working in remote areas) 3.10m Working with exposed moving mechanical parts or sharp objects 3.10n Risk of electrical shock

QJES	UAlbany Current Study
Q116 Dangerous chemicals (1-4) Q117 Special protective clothing/safety aids must be worn (1-4) Q118 Excessive light (1-4) Q119 Excessive noise (1-4) Q121 Substantial vibrations (1-4) Q122 Infections or contagious disease (1-4) Q123 Physical attacks by animals (1-4) Q124 Physical attacks by people (1-4) Q125 Poor weather (1-4) Q126 Radioactive contamination (1-4) Q127 Exposed to hazards/conditions threaten safety/health (1-4)	*Factor 8A Subfactor B: Working Under High-risk Conditions* 3.10e In- or under-water working spaces 3.10i Pollution or with foreign substances that require protective gear, clothing, or breathing equipment 3.10j Radiation at levels that require protective gear or monitoring equipment 3.10o Working with explosives 3.11 Risk of being physically hurt
	Factor 8A Subfactor C: Physical Skills and Abilities 4.2q Physical dexterity, such as coordination between your arms and hands, using your hands to adjust equipment or making precise movements with your fingers 4.2r Physical flexibility, such as being able to bend, stretch, twist, or reach out with your body, arms, and/or legs 4.2s Physical strength, such as being able to exert muscle force repeatedly or continuously over. 4.2t. Physical stamina, such as being able to exert yourself physically over long periods of time without getting winded or out of breath
	Factor 8A Subfactor D: Ensuring Safety 2.14l Making sure others are physically safe 3.4c Health or safety of another person 3.4d My health and safety 3.4e Damage to equipment
	Factor 8A Subfactor E: Working with Trades Equipment 2.9d Using manually powered tools such as rakes, hammers, hand trucks, wheelbarrows 2.9e Using electrically powered hand tools such as hand-held drills, soldering irons, circular saws 2.9f Using measuring devices such as rulers, micrometers, thermometers, blood pressure monitors, tape measures 2.9i Operating mobile powered tools or equipment such as lawn mowers 2.9j Using stationary tools or equipment such as drill presses, table saws, milling equipment 2.9o Driving highway vehicles such as cars, vans, trucks, tractor trailers 2.9p Operating off-road vehicles such as bulldozers, tractors, haul trucks 4.1j Knowledge related to design, use repair, and maintenance of equipment and tools

QJES	UAlbany Current Study
	Factor 8B: Job Stressors Associated with Working with Difficult Patients and Clients
	Factor 8B Subfactor A: Caring for/ Assisting Patients/Clients 2.1a Providing direct care 2.1b Providing medical attention 2.1c Providing emotional support 2.14m Safeguarding others' emotional and mental wellbeing 3.7h Providing direct care of patients 3.7j Dealing directly with individuals displaying inappropriate, impatient or demanding behaviors (not co-workers) 3.7k Dealing directly with clients who are diagnosed with mental health issues (not co-workers)
	Factor 8B Subfactor B: Hazards from Working with People 3.10c Physical handling of sick or injured people 3.10g Dealing with people in crisis and trauma (e.g., people who threaten to harm themselves) 3.10k Physical dangers from people (patients, the public, lawbreakers, inmates)
	Factor 8B Subfactor C: Public Safety Work (Police and Mental Health) 2.3a (External Communication) Patients 2.4e (Internal Communication) Clients, patients or inmates 2.9n Using motor vehicles to transport others (e.g., patients, inmates) 2.9q Carrying weapons including handguns, rifles, batons, tasers 3.7p Dealing with armed or dangerous individuals 3.7t Exposure to traumatic situation 4.1f Knowledge related to policies and procedures related to public safety and security 4.1t Knowledge related to principles and practices of direct physical or mental healthcare service