THE EFFECTS OF MARKET SURVEY RATES, JOB EVALUATION AND JOB GENDER ON JOB PAY

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Abstract

The present study investigates the effects of current pay, market surveys, job evaluation points, job gender, and rater sex on pay rates for jobs. 406 compensation administrators assigned new pay rates to nine jobs in one of two matched job sets: either all predominantly female, or all predominantly male. The two sets were matched on all quantitative data (current rate, market rate, and job evaluation points), but varied in terms of job titles and descriptions. Multiple analyses of variance and regression analyses were performed to determine whether job gender had a significant effect on assigned pay rates, holding other factors constant. Regardless of the analysis employed, no evidence of gender bias was found. Limitations and suggestions for future research are offered.

During the past two decades, considerable attention has been focused on the earnings gap between men and women. Early research attempted to explain this gap as a function of individual differences in human capital characteristics (see Milkovich, 1980). Individual earnings of men and women were regressed on such variables as education and work experience to determine how much of the pay differential could be attributed to gender differences in human capital acquisition. The unexplained part of the differential, or residual, was then attributed to "discrimination."

Unfortunately, most of these early studies used only crude measures (if any) of the different jobs held by men and women. However, as individual earnings equations began to incorporate better measures of the jobs held by men and women (e.g., Gerhart & Milkovich, 1987; Rosenbaum, 1985), they were able to explain a significantly larger proportion of the earnings gap.

It has now become clear that the major source of the earnings gap is not differential compensation for men and women doing the same work, but rather the segregation of men and women into different jobs that are paid differently (Treiman & Hartmann, 1981). Thus, the question arises as to whether the different tasks that typify "men's work" and "women's work" are compensated in a way that represents equal pay for equal contribution or value added.

Consequently, recent research has focused more directly on the determinants of compensation for jobs, rather than for individuals. For example,researchers have considered the extent to which job analysis and job evaluation procedures might lead to differential evaluations of the "worth" of male-dominated versus female-dominated jobs. In particular, the judgments of job analysts and job evaluators have been scrutinized for

evidence of cognitive or evaluative biases that might lead to undervaluation of female-dominated work (e.g., Arvey, 1986).

Studies of this type seek to determine whether, holding other factors constant, the gender composition of jobs influences perceptions of job worth as assessed via job evaluation. Although these studies stop short of examining job pay decisions, they examine one of its common inputs: job evaluation results (Belcher, 1974; Milkovich & Newman, 1987; Treiman & Hartmann, 1981).

Findings from this research are decidedly mixed. Several studies have found little evidence that gender composition influences job evaluation outcomes. For example, Schwab and Grams (1985) found that sex composition, manipulated via proportions of male or female incumbents embedded in a job description, had no effect on either absolute or relative (to two other jobs) job evaluation ratings in a sample of 103 compensation professionals. Similar results were found for a college student sample (Grams & Schwab, 1985), with the single exception that gender composition appeared to affect ratings on the compensable factor "job complexity". Both studies did find, however, that information about current market wages had a substantial impact on the evaluation points assigned.

These studies led Grams and Schwab (1985) to conclude that there is little evidence of direct gender bias in job evaluation. However, the possibility of "indirect" bias via knowledge of differential market pay for men's and women's work did receive support.

Arvey, Passino and Lounsbury (1977) found that sex of the job incumbent (as manipulated by photographs and voices of alleged "incumbents") had no effect on job analysis results using the Position Analysis Questionnaire

(PAQ). However, as Grams and Schwab (1985) note, it is unclear whether subjects responded to the jobs per se or to the individuals performing them.

Doverspike and Barrett (1984) obtained job evaluation scores for 105 male-dominated and 105 female-dominated jobs using a 15-scale Comprehensive Job Evaluation Technique. Results suggested that although particular scales appeared to be biased either for or against female-dominated jobs, as a whole the job evaluation instrument differentiated male and female- dominated jobs equally well.

On the other hand, Mahoney and Blake (1979 & 1987) reported that the perceived femininity of 20 well-known occupations accounted for a significant proportion of variance in assigned salaries, controlling for the effects of perceived job requirements. However, the authors acknowledge two potential difficulties with their results (see also Grams & Schwab, 1985). First, given a correlation of .83 between assigned and actual salaries, subjects may have assigned salaries on the basis of "what <u>is</u>" rather than "what should be". Second, it is possible that the inclusion of the "perceived masculinity/femininity" item sensitized subjects to gender issues and thus triggered sexual stereotypes that might not otherwise have occurred.

In contrast, a marginally significant job evaluation point differential in <u>favor</u> of female-typed jobs was reported by Mount and Ellis (1987) for two jobs with identical descriptions but different, sex-typed titles (orderly vs. nurse's aide; YMCA vs. YWCA recreation director). A potential weakness of this study, however, is that the subjects (52 job evaluators responsible for implementing comparable worth) had received extensive training in job evaluation and pay discrimination. Thus, subjects may have "bent over backwards" not to slight jobs that appeared to be female-dominated.

A number of potential explanations exist for these differences across studies. For example, subjects have ranged from naive students to experienced job evaluators with substantial comparable worth training. Sex composition has been manipulated in a variety of ways (job titles, incumbent photographs and voices, explicit provision of gender information), some of which are likely to present stronger demand characteristics than others (Mount & Ellis, 1987). Some studies have looked at a single job, others at sets of jobs. Finally, gender manipulations have been embedded in designs encompassing a variety of other independent variables (e.g., job descriptions, current pay rates).

Given the importance of the issue and the ambiguity of previous results, several authors have called for additional scrutiny of job evaluation as a measurement process. For example, Arvey (1986), McArthur (1985), and Treiman (1979) suggest additional investigation of the various points at which cognitive biases might enter into judgments of job worth (e.g., differential perception or attention in job description, analysis, and evaluation). Additionally, Doverspike and Barrett (1984) and Treiman and Hartmann (1981) point to the potential importance of the properties of the job evaluation instrument (e.g., choice of compensable factors, factor anchors, and factor weights).

Although further job evaluation research is surely to be encouraged, it must nevertheless be remembered that job evaluation is only one of many factors that determine job pay (e.g., Schwab, 1980 & 1985). A review of basic compensation literature reveals that job pay is based on some combination of past pay relationships, market surveys, collective bargaining, individual negotiation, supply and demand characteristics, compensation

strategies, and job evaluation (e.g., Belcher, 1974; Milkovich & Newman, 1987; Patten, 1977). Indeed, some argue that job evaluation serves primarily to "capture" or model these other factors, particularly market wages (e.g., Fox, 1962; Livernash, 1957; McCormick, 1981; Schwab, 1980). Moreover, although job evaluation is a common practice in large organizations, its use is by no means universal (Mahoney, Rosen & Rynes, 1984).

Anecdotal evidence also points to the importance of factors other than job evaluation in determining job pay. For example, an examination of comparable worth-related litigation reveals that where market survey and job evaluation results conflict, judges tend to view market estimates as more "objective" and compelling (e.g., Spaulding v. University of Washington (1984), Christensen v. State of Iowa (1977), Lemons v. City and County of Denver (1980), American Nurses Assn. v. State of Illinois (1985), State of Washington v. AFSCME (1985). In addition, a recent compensation roundtable concluded that economic conditions are causing external comparisons to become more, rather than less, important in determining job pay (Levine, 1987).

Even more compelling are recent studies suggesting that the possession of information about current pay rates may influence job evaluation outcomes (e.g., Grams & Schwab, 1985; Mount & Ellis, 1987; Schwab & Grams, 1985). To the extent that these results generalize, it would appear that current pay can have both a direct effect (via market surveys) and an indirect effect (via assigned job evaluation points) on job pay.

The pervasive role of current pay as a determinant of future pay suggests that any comprehensive effort to understand job pay determination must incorporate market, as well as job evaluation, information. At least two recent studies have made advances in this direction.

Based on the "cobweb theory" of wage fluctuations (e.g., Freeman, 1975), Johnson and Ash (1986) developed a proxy measure for relative changes in labor supply and demand for 55 occupations over a six-year time period. When added to measures of job content (as assessed via the Position Analysis Questionnaire), this labor market variable explained significant additional variance in wages over the six-year period. Moreover, the variance explained by the market variable appeared to be largely independent of the sex composition of the jobs studied.

Doverspike, Racicot and Hauenstein (1987) conducted three policy-capturing studies to examine the joint impact of job grade and market pay rate for nine hypothetical jobs in a large midwestern city. In each study, job grade was found to have a larger impact than market rate on subjects' minimal salary recommendations. However, no information was presented as to the particular grades and market rates presented, or to their correlation. Thus, no conclusions can be drawn as to the likely generalizability of their findings, as the levels, ranges, and intercorrelations of independent variables have been found to have a substantial impact on relative proportions of variance explained in policy-capturing research (e.g., Rynes, Schwab & Heneman, 1983).

The present study extends previous research by examining how compensation administrators assign pay to jobs in the face of multiple, and sometimes conflicting, pieces of information about job worth (current salary, market rate, and job evaluation points). In addition, it examines whether the same "rules" are applied in assigning pay to male-dominated versus female-dominated jobs. This is accomplished by having each subject evaluate only one of two sets of job descriptions (either predominantly female or

predominantly male), holding quantitative job worth information constant (i.e., current pay, market rate, job evaluation points). Thus, the present study adds to previous research by examining the effects of job gender in the context of both market and job evaluation information.

In light of previous recommendations that job evaluation committees include equivalent numbers of men and women (e.g., Treiman & Hartmann, 1981), the study also examines the impact of rater sex on pay assignments. Additional support for examining this variable comes from research suggesting that sex may have an impact on perceptions of appropriate pecuniary rewards (e.g., Huber, 1988; Major & Konar, 1984). It should be noted that not all studies have found rater sex effects, however (e.g., Grams & Schwab, 1985; Mahoney & Blake, 1987).

The study incorporates a number of other previously recommended features as well (e.g., Arvey, 1986; McArthur, 1985; Hartmann, 1985). For example, subjects are professional compensation administrators rather than convenience samples of inexperienced college students. Moreover, these administrators are drawn from a wide variety of public and private sector organizations. Because surprisingly large pay differentials exist across organizations (e.g., Dunlop, 1957; Hay Group, Inc., 1984; Treiman & Hartmann, 1981), it is important that pay research include subjects from a broad range of organizations.

The present study also disentangles the effects of market wages and job evaluation points on pay determination. This was accomplished by creating orthogonal job evaluation and market rate manipulations. In contrast, analogous field research has been hampered by high intercorrelations (typically .6 to .8) between salaries and job evaluation points (see Remick,

1981), which impede the ability to unambiguously attribute pay differentials to specific sources (Rynes, Schwab & Heneman, 1983).

Finally, the job data are based on a real-world comparable worth study (State of Washington) that has attracted considerable attention in the academic, legal and popular presses (Remick, 1981; Ehrenberg & Smith, 1987; State of Washington v. AFSCME, 1985; Treiman & Hartman, 1981).

In line with the bulk of previous research regarding job evaluation and job pay determinants (e.g., Arvey et al., 1977; Grams & Schwab, 1985; Johnson & Ash, 1986; Schwab & Grams, 1985), no differences in pay assignments are expected on the basis of either job gender or rater sex. On the other hand, it is expected that assigned pay rates will exhibit significant relationships with all three quantitative measures of "worth" (current pay, market rate, job evaluation points).

Although it is not the primary focus of the present research, we further predict that market variables (current pay and market rate) will explain more variance in assigned pay than will job evaluation points. This is expected due to anecdotal evidence that market rates and historical relationships are given higher priority in establishing job pay, as well as the greater standardization and familiarity of monetary units (dollars) relative to job evaluation units ("worth" points). Although this prediction is not consistent with Doverspike et al. (1987), numerous potential explanations exist for their results (e.g., low variability in market rate manipulations, high intercorrelations between market rate and job grade).

Method

Sample

The initial sample consisted of 2000 randomly selected members of the American Compensation Association. This original list was reduced to 1324 by excluding all members with addresses outside the continental United States, duplicate individuals from a single organizational location, compensation consultants, and a holdout sample of 125 for pretesting and manipulation checks. Four hundred fifty questionnaires were returned, for a response rate of 34%. However, missing data resulted in an effective sample size of 406 for most analyses.

Respondents were almost equally divided by sex (53% male, 46% female, 1% unknown). The average age of respondents was 38, average time in current organization was 5.3 years, and average total compensation experience was 8.6 years. Respondents were virtually identical to the original sample in terms of sex composition; however, a higher proportion of respondents than nonrespondents were from the public sector (13% v. 6%).

Design and Procedures

In order to examine whether the same "rules" are used in determining pay for male- versus female-dominated jobs, each subject received a questionnaire containing one of two job sets: either predominantly female or predominantly male. Jobs in each set had previously been identified as at least 70% female-dominated, or 70% male-dominated, by the State of Washington comparable worth study (Remick, 1981). Across the two sets, all quantitative data (current pay, market rate, job evaluation points) were identically matched and thereby held constant.

To insure that the quantitative information would be equally credible in both the male- and female-dominated job sets, each "male" job was matched with a "female" job on the basis of actual pay rates in the State of Washington study (e.g., Remick, 1981; Ehrenberg & Smith, 1987). Thus, for example, the Administrative Services Manager (female) was paired with the Maintenance Mechanic II (male) because their salaries varied by less than $5 per week.

Although State of Washington pay rates are admittedly not perfect proxies for national market averages, Washington's salaries were based on market surveys that included pay information from other states. Moreover, because considerable pay variability exists for the same job across industries, organizations, and regions (e.g., Hay Group, 1984; Rynes & Milkovich, 1986), it is unlikely that small deviations from national averages would cause data based on Washington's salaries to appear implausible to compensation administrators. Furthermore, our pay figures need not be perfect estimates of national averages; rather, it is only necessary that they be realistic enough that compensation administrators perceive the data as credible in making their pay determinations. Finally, these assumptions were checked via two pretests, which revealed no problems with the credibility of the pay manipulations.

Although it is also possible that relative market wages for paired jobs diverged somewhat between the Washington comparable worth study and 1986, occupational differentials have been shown to be surprisingly consistent over time. For example, a regression of 1985 median weekly earnings on 1975 earnings in seven of the occupational categories covered in this study

resulted in an adjusted R^2 of .98 (data taken from U.S. Department of Commerce, 1980 and U.S. Department of Labor, 1987).

Originally, 32 jobs (16 male, 16 female) were selected for the research. However, on the basis of two pretests (N = 15 each), a decision was made to retain only 18 jobs (9 pairs) in the final research. This was done primarily to reduce the time required to complete the questionnaire and, hopefully, to thereby increase the response rate.

For generalizability purposes, jobs were chosen with an eye to including as wide a salary range as possible (see Rynes et al., 1983). This was somewhat difficult, however, as there were few low-paying male jobs to match with the lowest-paying female jobs. A similar problem occurred at the high-paying end, where there were few well-paid female jobs to match with male-dominated ones. The final job sets included a range of monthly salaries (inflated to 1986 levels) from $1200 to $2190.

Manipulations. To determine the impact of market surveys and job evaluation points on job pay, over and above the impact of current pay, market survey results and job evaluation point results were orthogonally manipulated in relation to current pay. This design was accomplished in several stages.

First, for each job pair (e.g., Administrative Services Manager and Maintenance Mechanic II), a current pay rate was derived from the average of the two rates. (On average, salaries for the matched jobs differed by $20 per month). This average was then rounded to the nearest $10. The resultant figure was then inflated to 1986 levels using percent changes in average earnings (as reported in Bureau of Labor Statistics, 1985, and Commerce Clearing House, 1986).

Next, market survey and job evaluation manipulations were created and then crossed to produce an orthogonal 3 x 3 matrix. This was accomplished in several steps. First, three levels of market rates were defined: 6% below current rate, no change from current rate (although rates were actually manipulated +/- 1% or 2% to avoid identical figures for market rate and current pay), and 6% above current rate. Then, three of the job pairs were (randomly) assigned market rates that were 6% below their current rates, three had market rates 1% or 2% below or above current rate, and three had rates 6% above. Note that each of the market rates produced by this procedure is uniquely linked to a single job pair, as the nine market rates are derived from the nine original salary figures.

The job evaluation manipulation was similarly constructed, but in two steps. First, baseline job evaluation points were created by multiplying the current pay rate by a factor of .4. This created a set of job evaluation scores that were precisely co-linear with current rates, but on a different scale to avoid subject detection of the manipulation. Then, job evaluation levels were created in an identical manner to the market rate manipulation: 6% lower than baseline, no change, and 6% higher than the job evaluation base. Finally, each of these three manipulation levels was randomly assigned to three jobs, in such a way as to create the 3 x 3 orthogonal design reflected in the last two columns of Table 1.

Insert Table 1 about here

A final manipulation involved the order in which administrators received information about market survey rates and job evaluation points. Half the administrators received market information first, the other half, job evaluation first. Thus, there were four different versions of the

questionnaire: (1) male job set/market rate first; (2) male job set/job evaluation first; (3) female job set/market first; and (4) female job set/job evaluation first.

In summary, then, each subject assigned new pay rates to a set of nine jobs. However, any given subject evaluated only male-dominated, or female-dominated, jobs. Thus, the final design encompassed two between-subject manipulations (order and job gender), one non-manipulated between-subjects factor (rater sex), and two within-subject, repeated measures factors (job evaluation points and market rates) which were both generated from current pay rates.

Administration. Each subject received a booklet of 9 jobs, all of which were either predominantly male or predominantly female. For each job, participants were given: (1) the job title (taken from the Washington study), (2) a brief job description (taken primarily from the Dictionary of Occupational Titles, U.S. Department of Labor, 1977, with occasional supplementation from the Occupational Outlook Handbook, U.S. Department of Labor, 1986, and a university job description manual), (3) the current pay rate (1986 midpoint salary values for each matched job pair), (4) the manipulated market survey rate, and (5) the manipulated job evaluation rate. Their task was to assign a new pay midpoint to each of the 9 jobs.

In assigning new pay rates, subjects were instructed to use the same criteria they would use in their own organizations. For example, if a subject's organization placed greater weight on salary surveys than on job evaluation, the subject was instructed to apply that same prioritization scheme assigning new job rates. These instructions were verbally reinforced via phone calls to each of the approximately 1300 questionnaire recipients.

Manipulation Checks. Because no explicit information was given to subjects regarding gender composition of the jobs, subsequent questionnaires were sent to approximately 100 holdout sample members as a manipulation check of job gender perceptions. Subjects were given a randomly ordered list of the 18 job titles and descriptions, and asked to estimate the percentage of male incumbents in each job category.

Results based on 34 respondents showed that, on average, the nine predominantly female job categories were perceived to be 70% female. Predominantly male jobs were perceived to be 86% male. The somewhat lower average in the female set is attributable to the presence of four female-dominated jobs that were perceived to have relatively high proportions (at least 40%) of male incumbents: administrative services manager, editor, statistical reports compiler, and employment interviewer.

Another way of examining these perceptions is to look at the differences in "perceived maleness" between the two jobs in each job pair. This analysis reveals an average difference of 56%, ranging from a low of 33% (for maintenance mechanic versus administrative services manager) to a high of 83% (electrician versus registered industrial nurse).

Although it would have been preferable to have stronger perceptions of "femaleness" for at least some of the the jobs, it should be noted that our manipulation check represents a very conservative test of whether our experimental subjects would have realized, if directly asked, that the 9-job sets were either male- or female-dominated. Specifically, in the actual experiment, subjects received nine jobs of one sex type, many of which are clearly identifiable as female-dominated (e.g., clerk, secretary, nurse). In contrast, the manipulation check presented both male- and female-dominated

jobs, in random order. Had jobs been presented in single-sex sets, as was the case in the actual experiment, estimated proportions would almost certainly have revealed greater perceived gender-domination.

Also, it should be kept in mind that we did not want sex composition to be a blatantly salient factor to experimental subjects, as we wished to avoid flagging the comparable worth issue. Rather, our intention was to see whether subtle gender-based differences emerge even when decision maker attention is being focused only on current pay, job evaluation, and market surveys.

Finally, it was possible to perform a number of empirical tests to determine whether job pairs with weaker gender-identification (e.g., those involving the editor or administrative services manager) yielded different pay patterns from those with stronger gender identification (e.g., those involving the secretary or nurse). These are elaborated in the third and fourth analyses below.

Analyses

The principal research objective was to determine whether job gender had an independent influence on the assignment of new pay rates. A secondary objective was to determine the relative effect sizes of market versus job evaluation information on pay assignments. In addition, there was interest in determining whether rater sex or order of information presentation (market first vs. job evaluation first) influenced pay assignments. These questions were examined via four analyses, summarized in Table 2.

Insert Table 2 about here

In the first two analyses, the dependent variables were based on changes between original (i.e., "current") rates and new job rates. The first

analysis focused on absolute difference scores, the second on percentage changes. Both analyses were performed because of differences of opinion as to whether pay increase budgets should be allocated across jobs in terms of (roughly) equal dollars, versus equal percentages (under percentage-based allocations, highly paid jobs get relatively "richer", and poor jobs "poorer"; Belcher, 1974).

Independent variables were the same in both analyses. Specifically, pay changes were examined as a function of: (a) between-subjects factors (job gender, order of information, and rater sex) and (b) within-subject factors (market rate and job evaluation point manipulations).

The third and fourth analyses used regression analyses to examine new pay rates, as opposed to difference or change scores, as the dependent variable. That is, rather than examining the differences between current and new rates, the regressions looked at the new pay rate as a function of the current rate, in conjunction with the previous independent variables (i.e., market rate, job evaluation points, job gender, order, and rater sex).

In the third analysis, data from all subjects were combined in a between-subjects analysis based on 3654 total observations (406 subjects, 9 observations each). To provide results in a format comparable to that from the ANOVAs, both market rate and job evaluation manipulations were dummy coded (one variable to reflect "up 6%", one to reflect "down 6%", with the "no change" conditions serving as the omitted categories).

Because each subject provides nine observations, this analysis poses a potential problem in terms of correlated error terms. The effect of this autocorrelation is to provide inefficient, but unbiased, estimates of independent variable effects. Thus, although analyses with correlated error

terms may make it difficult to demonstrate statistical significance (at least with small sample sizes), they do not result in biased coefficients.

To get a better sense of the possible effects of the correlated error terms, an additional regression was run that included a dummy variable for each subject (see also Olson, Dell'Omo & Jarley, 1987). These dummies reflect the propensity of each subject to assign relatively high (or low) pay rates to the job set as a whole, and thus remove the variance due to idiosyncratic subject decision rules.

Next, to assess the potential impact of differences in perceived gender-dominance, three additional regressions were run. The first included a variable reflecting the perceived "percent males" in each job, as estimated by the subjects who responded to the manipulation check survey. The second included a variable representing the <u>difference</u> in perceived maleness between the male-dominated and female-dominated job in each job pair [e.g., electrician (95%) minus nurse (12%) = 83%]. The third included this same difference variable, but excluded the dummy reflecting the job gender set (male- or female-dominated). Significance testing of these coefficients provides a way of determining whether our results are affected by the differential perceptions of gender-dominance across individual jobs and job pairs.

In the fourth and final analysis, nine separate between-subjects regressions (N = 406) were run, one for each job pair. Specifically, for each pair, new pay rates were regressed on dummy variables reflecting job gender (1 = female), order (1 = job evaluation first), and rater sex (1 = female) and each of their interactions. This was done to see whether any particular job pairs yielded idiosyncratic rate assignment patterns. Note

that autocorrelation is not a problem in these analyses, as each subject provides only one observation per regression.

Particular interest was focused on the possibility of significant effects for job gender, since these might indicate potential problems with the credibility of current pay figures for one, or both, jobs in specific job matches. Additionally, taken as a set, these regressions provide additional evidence as to whether results for job pairs with weaker perceived gender-dominance (e.g., those involving the editor or administrative services manager) reflect different patterns from those with stronger gender differentiation (e.g.,registered nurse or secretary II). Specifically, if gender dominance has an impact on pay assignments, one would expect stronger gender effects for the pairs with greater gender differentiation (job pairs 1, 4, 6, 8 and 9) than for those with less clear differentiation (pairs 2, 3, 5 and 7).

Results

Because responses were not exactly proportional to the total surveys mailed in terms of experimental conditions (i.e., male vs. female job set; market rate presented first vs. job evaluation first), slightly unequal cell sizes were obtained across the four conditions. However, these differences were very small. Furthermore, correlational analysis based on contrast coding revealed negligible relationships among the three between-subjects factors ($r = .07$ between job gender and rater sex, .03 between job gender and order, and -.03 between order and sex.) Consequently, all responses were retained for subsequent analyses.

Results of the first two analyses (analysis of variance on raw difference scores and percent change scores) are shown in Table 3. None of the between-

subjects factors (job gender, order, rater sex) or their interactions were significant in either analysis. Thus, as hypothesized, sources of variance other than those signalling job worth do not appear to have contributed to pay adjustments in any systematic fashion.

Insert Table 3 About Here

As hypothesized, within-subject analyses revealed significant main effects for both the market rate and job evaluation manipulations. Also consistent with our predictions, the size of the market effect was substantially larger than the job evaluation effect. For example, in Analysis 1, the squared canonical correlation for the market manipulation (analogous to omega squared for a between-subjects factor) was .59, as opposed to .15 for the job evaluation manipulation.

In addition, the market rate x job evaluation interaction was significant in both analyses. Examination of cell means suggested that the nonlinear effect was primarily concentrated in the job pair where both the market rate and job evaluation points were 6% higher than baseline (secretary II and security guard). This is illustrated in Table 4, which gives cell means for Analysis 1.

Insert Table 4 about here

The market rate x job evaluation interaction is also reflected in two 3-way interactions. First, in both Analysis 1 and Analysis 2, there was also a three-way interaction between market rate, job evaluation, and job gender. Cell means suggested that there was a tendency to under-reward three of the male-dominated jobs (equipment mechanic I, maintenance mechanic II, and security guard) relative to their female-dominated counterparts (editor, administrative services manager and secretary II). Second, in Analysis 2

(but not 1), there was a three-way interaction between market rate, job evaluation points, and rater sex. Cell means suggested that female administrators had a greater tendency than males to underreward the job pair where both market rate and job points were 6% above baseline (pair one; secretary II and security guard).

Finally, both analyses revealed one more three-way interaction: JE x JG x Order. Cell means suggested that male-dominated jobs with lower-than-baseline job evaluation points (equipment mechanic I, revenue compliance officer, and custodian) were underrewarded relative to their female-dominated counterparts (editor, research librarian, and clerk typist II) when market rates were presented first. However, this pattern did not hold for jobs where evaluation points were either at baseline, or 6% above baseline.

The third set of analyses, the between-subjects regressions, tell a similar story (Table 5). Again, job gender has a nonsignificant effect on both new rates and difference scores. Moreover, holding current rate constant in the analysis of new rates, market manipulations (both up and down) again have larger standardized coefficients than their analogous job evaluation counterparts (market up 6% = .10 vs. job evaluation up = .04; market down = -.07 vs. job evaluation down = -.05). In addition, the market rate x job evaluation interaction is again significant. The negative sign indicates that as market rate and job evaluation points both increase, subjects provided less-than-additive increments to new pay rates. Thus, this finding is also consistent with previous analysis of variance results.

Insert Table 5 about here

The regression that included dummy variables for each subject produced exactly the same significant and nonsignificant effects. As such, those

findings are not reported here. However, the similarity of results across equations suggests that autocorrelation does not pose a significant problem in interpreting the findings reflected in Table 5.

As a further test of the potential influence of job gender on assigned pay rates, three regressions were run incorporating the gender-dominance perceptions of subjects involved in the manipulation check. Recall that the first of these included a variable reflecting perceived "percent male" for each job, while the latter two reflected the difference in "perceived maleness" between the jobs in each pair (the first included the job gender dummy, the second did not). In none of these regressions was the gender-dominance coefficient significant, again suggesting that perceptions of job gender were not impacting on results.

Finally, the nine between-subjects regressions for each job pair (Analysis 4) were examined in terms of job gender, order, rater sex, and their two- and three-way interactions. (The other variables -- current pay, market rate, and job evaluation points -- are constants in these analyses). Of the 63 possible effects (9 equations, 7 effects each), only three significant effects were found: a rater sex effect for Job Pair 7, a job gender x rater sex interaction for Job Pair 6, and a job gender x rater sex x order effect for Job Pair 4. Given that these were significant only at $p < .05$, this is the number of effects that would be expected by chance alone.

Also, keep in mind that in no equation was the main effect for job gender significant. Therefore, as in preceding analyses, there is no evidence of of differential pay assignment patterns for job pairs with more strongly perceived gender-typing on the female jobs.

Discussion

No matter how the data are analyzed, job gender does not appear to have systematically affected pay assignments. Rather, our subjects appear to have based their pay decisions on the relevant quantitative data reflecting job "worth": current pay, market survey rates and job evaluation points. In this way, our results are similar to those of Grams and Schwab (1985), Schwab and Grams (1985), and Johnson and Ash (1986), who also found no evidence of differential decision rules for jobs with varying gender patterns.

In contrast to the only other available study to simultaneously examine the effects of job evaluation and market surveys on job pay (Doverspike et al., 1987), present results suggest that market rates are stronger determinants of job pay than are job evaluation points. It is difficult to assess the causes of this difference, as Doverspike et al. do not provide information about how their manipulations were determined. In the present case, however, the market rate and job evaluation manipulations were carefully constructed to be both (a) independent of each other and (b) equal in size (i.e., +/- 6%). As such, we are reasonably confident that our results reflect the true relative contribution of these factors to subjects' job pay decisions, at least for these eighteen jobs. In any event, the large impact of market rates on job pay in this study reinforces the need to expand future job pay research beyond studies of job evaluation alone.

Although the absence of significant effects for job gender is encouraging, it should be recognized that the possibility of "indirect" discrimination still exists (e.g., Schwab & Grams, 1985). That is, to the extent that either market survey or job evaluation results themselves reflect previous discrimination and/or cognitive bias, our results suggest that

decisions about job pay are likely to incorporate these biases. This reinforces the need for additional research into the various inputs into pay decisions, such as job evaluation (see Arvey, 1986) and market surveys (Rynes & Milkovich, 1986).

We hesitate to place too much emphasis on the few significant interactions in our study, as the number of effects is only slightly greater than would be expected by chance alone. Still, we conjecture that most of our interactions reflect idiosyncratic reactions to particular job pairs. For example, three of the four significant interactions involve a nonadditive relationship between market rates and job evaluation points. This interaction, in turn, appears to be concentrated in a single job pair: secretary II and security guard. Specifically, subjects did not appear to give the full pay increment that would be predicted by the +6% (market), +6% (job evaluation) combination. We believe it is more likely that this reflects the particular content of these two jobs, rather than any general tendency to underreward when both pieces of information suggest a job is underpaid. Still, the question is an empirical one that should be examined in future research.

Again, although we do not wish to make too much of our interactions, there is at least a hint of potential pay bias against jobs with a heavy physical content. Specifically, in two of the three-way interactions, jobs of a physical nature (i.e., equipment mechanic, maintenance mechanic, security guard, custodian) were given less pay than their "office" counterparts (editor, interviewer, secretary, clerk typist). Thus, future research might examine job "physicality", in combination with gender composition, to

determine whether either, or both, contributes to differential reward policies.

Of course, to the extent that non-office biases (or any others) exist, additional research would be necessary to determine the underlying causes. For example, it may be that white collar staff administrators undervalue any work that does not take place in office settings. Alternatively, they may perceive physical laborers as less marketable in today's service economy, and thus feel less pressure to compensate them generously.

We believe the present research extends previous knowledge in a number of ways. First, it strongly suggests that factors other than job evaluation (e.g., current pay or market rates) dominate decisions about job pay. Moreover, it does so in a carefully constructed experiment designed to facilitate the clear attribution of differences in job pay to specific sources. As such, present results reinforce recent trends in the literature to examine determinants of job pay other than job evaluation (e.g., market surveys, labor market conditions).

Second, the gender manipulation is subtle, relative to much previous research. Subjects were not asked to explicitly contrast male- or female-dominated jobs, nor were they provided with explicit gender composition information. Although some might argue that our manipulation was <u>too</u> subtle, we believe this to be a less significant problem than gender obtrusiveness in an era of heightened sensitivity to comparable worth. Moreover, many of the biases discussed in the job evaluation literature are indeed very subtle, and hypothesized to operate with only minimal gender cues (see Arvey, 1986; McArthur, 1985). Finally, we performed a wide variety of empirical tests incorporating the degree of perceived gender dominance, and in no case

found any relationship between the strength of gender-typing and pay assignments.

The sample represents yet another advantage of the present study. Present results are based on more than 400 subjects from a wide range of organizations. This represents a far larger sample size than in previous related research (e.g., Schwab & Grams had 103 subjects; Mount & Ellis, 53; Doverspike et al. had 34, 73, and 197 in their three studies). Moreover, our power to detect real effects is even further enhanced by the nine repeated measures per subject (Keppel, 1973), creating a total of 3654 observations. Additionally, we used actual compensation administrators rather than students (in contrast to Doverspike, et al., 1987; Grams & Schwab, 1985; and Mahoney & Blake, 1987). Finally, our subjects had not been explicitly trained in comparable worth issues (as in Mount & Ellis, 1987), and thus were probably less likely to consciously try not to discriminate against female-dominated jobs.

Despite the strengths of the present research, there are also some potential limitations. For example, although this study moves beyond most previous research in incorporating additional pay determinants besides job evaluation, there are still many additional factors that are likely to affect job pay (e.g., presence or absence of collective bargaining, organizational culture, business strategy). As such, it would be highly desirable if future research were to incorporate some of these variables.

Secondly, the present results reflect hypothetical, rather than actual, pay allocation decisions. Therefore, it is possible that these same administrators might use different models in compensating jobs in their own organizations. However, some comforting evidence as to the external validity

of policy capturing techniques is provided by Olson et al. (1987), who showed that experimentally generated policy-capturing models for a sample of labor arbitrators were excellent predictors of their arbitral decisions in actual labor disputes.

Third, the present study matched male- and female-dominated jobs on the basis of pay rates in the Washington comparable worth study. This raises two potential objections. First, it could be argued that the jobs might instead have been matched on job evaluation points (rather than actual pay rates), and that the resultant pairings would likely have been different. This is unquestionably true. However, we believe that matching on actual pay rates was a better choice in terms of producing a credible experimental task for respondents.

Our logic follows from the fact that pay rates are based on a common metric (money) that is widely understood across a wide variety of settings. In contrast, job evaluation systems have unique compensable factors, factor weights, and point totals, such that any given system produces a somewhat idiosyncratic point total for any given job. Comparable worth studies have routinely revealed disparities in assessed "worth" for gender-dominated jobs, depending on whether worth is measured in terms of current pay or job evaluation points. Thus, it was feared that matching on the basis of job evaluation points would yield unrealistic market rate manipulations for at least some of the jobs. These in turn would be more likely to be detected by compensation administrators than would deviations in job evaluation points, given the greater generality of monetary (versus job evaluation) metrics. Nevertheless, future studies matching jobs on evaluation points rather than current pay would be highly desirable.

The second potential limitation of matching jobs on Washington study pay rates is that these rates may not be perfectly representative of 1986 national rates. Although this is certainly the case, the main requirement for the present study is that the stated rate for each job be realistic enough to be credible to compensation administrators. We believe our data satisfy this requirement, as there were no objections to the pay rates in either of our pretests (where we specifically asked for examples of problematic manipulations), or in the experiment itself. Also, as indicated earlier, Washington pay rates were themselves based on salary surveys covering other states, and relative pay for jobs and occupations has been quite stable over time.

Unfortunately, any study that attempts to determine the influence of job gender on job pay is likely to be confounded by the fact that, in reality, men and women tend to hold different jobs in our economy. Therefore, no single study can deal with all the potential problems that arise in attempting to determine the effects of gender, holding other factors constant, because other factors (e.g., job content) are <u>not</u> constant. Consequently, progress in this area must be made through a series of studies, where subsequent research improves upon the limitations of earlier efforts.

A number of general research directions would be useful in extending the results of this, and previous, studies. First, additional factors believed to influence job pay (e.g., collective bargaining, business environment) need to be studied in conjunction with the present variables. Second, in-depth studies of pay determination in single organizations are needed, given that additional variables (as well as more detailed information about the present ones) undoubtedly shape organizational pay structures (see

also Hartmann, 1985; Schwab & Grams, 1985). Finally, at the risk of triggering comparable worth reactivity among subjects, studies that examine how pay is determined across jobs of varying gender compositions (predominantly male, predominantly female, gender neutral) would be particularly helpful.

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Table 1

Study Design: Job Pairs (in order of presentation), Current Pay, Job Evaluation Baseline, and Market and Job Evaluation Manipulations

	Job Pair	Salary Midpoint	Job Evaluation Base**	Market Rate	Job Evaluation
1.	Secretary II	$1350	540	$1430	570
	Security Guard			(+6%)	(+6%)
2.	Employment Interviewer	$1570	630	$1665	640
	Maintenance Mechanic I			(+6%)	(N.C.*)
3.	Editor	$1770	710	$1880	665
	Equipment Mechanic I			(+6%)	(-6%)
4.	Registered Nurse	$2190	880	$2230	930
	Electrician			(N.C.*)	(+6%)
5.	Admin. Services Manager	$1880	750	$1860	740
	Maintenance Mechanic II			(N.C.*)	(N.C.*)
6.	Clerk Typist II	$1200	480	$1190	450
	Custodian			(N.C.*)	(-6%)
7.	Statistical Reports Compiler	$1310	540	$1230	555
	Caretaker			(-6%)	(+6%)
8.	Program Assistant I	$1440	580	$1355	570
	Warehouse Worker I			(-6%)	(N.C.*)
9.	Research Librarian	$ 1690	680	$1590	635
	Revenue Compliance Officer			(-6%)	(-6%)

* No Change: Job evaluation points were within +/-2% of baseline; Market rate was within +/- 2% of current rate.

** Job Evaluation Base = Salary Midpoint x .4.

Table 2

Summary of Analyses

Analysis	Dependent Variable	Independent Variables
1. **Mixed Analysis of Variance:** 3654 observations	**New Rate minus Current Rate**	**Between Subjects:** Job Gender; Order; Rater Sex **Within-Subject:** Market Rate; Job Evaluation Points
2. **Mixed Analysis of Variance:** 3654 observations	**Percent Change:** $\frac{\text{New Rate - Current Rate}}{\text{Current Rate}}$	**Between-Subjects:** Job Gender; Order; Rater Sex **Within-Subject:** Market Rate; Job Evaluation Points
3. **Between-Subjects OLS Regressions:** 3654 observations	**New Rate**	**Between-Subjects** Job Gender (Dummy); Order (Dummy); Rater Sex (Dummy)

(Table 2 continued on next page)

			Repeated Factors
			Current Rate
			Market Manipulation (3 dummies, 1 omitted)
			Job Evaluation (3 dummies, 1 omitted)
4.	**Nine Between-Subjects OLS Regressions:** (One for each job pair; N = 406 each)	**New Rate**	**Between-Subjects:** Job Gender (Dummy); Order (Dummy); Rater Sex (Dummy)

Table 3

Analysis of Variance Results: Analyses 1 and 2

Source	df	F-Value (Analysis 1)	F-Value (Analysis 2)
Between-subjects			
Job Gender	1	.31	.29
Order	1	2.42	2.47
Rater Sex	1	.22	.23
JG x O	1	.00	.02
JG x RS	1	.00	.00
O x RS	1	.00	.00
JG x RS x O	1	2.06	1.96
Error	398		
MSE		(66,293)	(.03)
Within-subjects			
Market Rate	2	330.84**	358.22**
Job Evaluation	2	32.92**	40.10**
MR x JE	4	15.19**	6.07**
MR x JG	2	1.56	1.34
MR x O	2	.67	.93
MR x RS	2	1.18	1.40
MR x JG x O	2	1.88	1.34
MR x JG x RS	2	1.05	1.51
MR x O x RS	2	.06	.06
MR x JG x RS x O	2	.40	.57

(Table 3 continued on next page)

JE x JG	2	.03	.02
JE x O	2	.03	.13
JE x RS	2	1.80	2.59
JE x JG x O	2	3.10*	3.04*
JE x JG x RS	2	.54	.65
JE x O x RS	2	.26	.26
JE x JG x RS x O	2	.57	.62
MR x JE x JG	4	2.59*	2.54*
MR x JE x O	4	.31	.29
MR x JE x RS	4	2.02	2.68*
MR x JE x JG x O	4	.35	.48
MR x JE x JG x RS	4	.90	1.03
MR x JE x RS x O	4	1.22	1.51
MR x JE x RS x O x JG	4	1.58	1.16
MSE: (MR)	796	(7465)	(.003)
MSE: (JE)	796	(9176)	(.003)
MSE: (MR x JE)	1592	(5769)	(.002)

* $p < .05$

** $p < .01$

Table 4

Cell Means Illustrating the Market Rate x Job Evaluation Interaction: Analysis 1

	Market Manipulation		
Job Evaluation Manipulation	Down 6%	No Change	Up 6%
Down 6%	-28.8	4.3	69.5
No Change	-11.2	26.3	97.3
Up 6%	9.9	58.3	76.9

Table 5

Analysis 3: Between-Subject Regressions on New Rate and Percent Change

Independent Variable	Standardized Coefficient: New Rate	Standardized Coefficient: Percent Change
Intercept	0.00	0.00
Market Up	.10*	.26*
Market Down	- .07*	-.21*
Job Evaluation Up	.03*	.10*
Job Evaluation Down	- .05*	-.15*
Current Rate	.92*	N/A
Job Gender	.01	.02
Order	.02*	.06
Rater Sex	.00	.00
Market Rate x Job Evaluation	- .06*	-.15*
Job Gender x Rater Sex	.00	.00
Adjusted R^2:	**.88**	**.11**

* Significant at $p < .01$