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# Gender Differences in the Information Systems Managerial Ranks: An Assessment of Potential Discriminatory Practices

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## Abstract

*This paper examines the extent to which gender discrimination is a force affecting the senior managerial ranks of the information systems (IS) occupation. While the employment trends of women in the IS occupation is encouraging, data are presented that suggest that IS may not be immune to the problems of gender discrimination. Analyzing data gathered by the Society for Information Management (SIM), a problem suggestive of discriminatory practices was found.*

*Women receive lower salaries than men even when job level, age, education, and work experience are controlled.*

Keywords: IS management, personnel management, gender discrimination

ISRL Categories: AI0104, AI0118, EB, EH02

## Introduction

On July 2, 1965, the Civil Rights Act of 1964 became effective. This legislative action permeated many areas of American society; one portion of it—Title VII—addressed economic or employment opportunity. Congress included Title VII with the intent of ushering in an era of equitable practice in American businesses and to provide employment opportunities for people of all races, religions, national origin, and gender. Since the institution of the Civil Rights Act and the professed conformance of many business organizations to it through use of the "Equal Opportunity Employer" designation, much research has been conducted to assess changing employment patterns in the United States. The objective of that research has been to cultivate an understanding of the nature and degree of these changes, whether they are influenced directly by the Civil Rights Act, indirectly through changing societal attitudes, or in spite of these legislative progressions and societal changes.

This paper continues this line of research by focusing on the managerial levels<sup>1</sup> of the information systems (IS) occupation. The scope of our investigation addresses one dimension in which unequal employment opportunity, i.e., discrimination, has been, and perhaps still is, occurring—gender.

## *Inequities in the IS field?*

The prevailing consensus has cast the IS occupation as relatively immune from the serious discrimination patterns found in most other occupations, particularly when contrasted to those patterns found in typically male-dominated occupations such as manufacturing (Simons, 1981). Encouraging this "consensus," one argument suggests the IS occupation is devoid of discriminatory practices because it emerged *after*

discriminatory practices and sexist attitudes subsided in Western culture (Simons, 1981). Unfortunately, empirical evidence may suggest the "prevailing consensus" is wrong. Though the recent *trend* in IS employment figures is encouraging (see Table 1) and mirrors patterns occurring in non-IS business occupations (Forgionne and Peeters, 1982; Vaydanoff, 1980; Veiga, 1977), as of 1991 women accounted for 51.5 percent of accountants/auditors, 57.6 percent of personnel/labor relations managers, and 44.7 percent of financial managers, but only 33.7 percent and 34.0 percent of computer systems analysts and programmers respectively (Statistical Abstract of the United States, 1992).

**The nature of discrimination**

Gender discrimination, as well as other forms of discrimination, can be classified into two practices: access and treatment (Levitin, et al., 1971). Access discrimination places non-job-related qualifications on individuals, such as gender, race, age, and physical appearance among others, that limit or bar their recruitment. Treatment discrimination is manifested in salary, job level, and status-symbol discrepancies. Treatment discrimination results in differences in job outcomes between two groups comparable in work experience, education, and skills *after* access occurs. Though this study is principally concerned with treatment discrimination, a brief

discussion regarding access discrimination is merited.

Table 1 is *suggestive* of access discrimination, since these percentages reveal comparably lower female participation rates in the IS occupation when compared to other business occupations. However, in 1988 32.5 percent and 26.9 percent of computer science bachelor's and master's degrees, respectively, were awarded to women (Frenkel, 1990). These figures roughly match the 1988 employment statistics for women programmers and systems analysts (see Table 1). Therefore, if we assume that the hiring for computer programmers and analysts is done largely from colleges and universities, then the pool of new employees selected for access into *non-supervisory* positions corresponds approximately to the pool of applicants. This data would suggest that access discrimination may be occurring earlier: either during the socialization process when womens' attitudes about appropriate job roles are formed, during the college admissions process, or during the educational process (Frenkel, 1990). Comparison of Frenkel's (1990) results and 1988 census data reported in Table 1 suggests no access discrimination at the entry-level; however, it provides no information regarding potential discriminatory practices (treatment discrimination) at the managerial levels where greater problems are anticipated (Auster, 1989; Auster and Drazin, 1988; Steinberg and Shapiro, 1982). This paper therefore focuses on

**Table 1. Percent Female in Job Category**

Year	IS Occupations		Non-IS Occupations		
	Systems Analysts	Programmers	Accountants & Auditors	Personnel & Labor Relations Managers	Financial Managers
1970*	13.6%	24.2%	24.6%	21.2%	19.4%
1980*	22.5%	31.2%	38.1%	36.0%	31.4%
1985**	28.0%	34.3%	44.1%	44.5%	35.7%
1988†	29.5%	32.2%	49.6%	49.1%	42.4%
1991§	33.7%	34.0%	51.5%	57.6%	44.7%

\* Statistical Abstract of the United States - 1986 (1986).  
 \*\* Statistical Abstract of the United States - 1987 (1987).  
 † Statistical Abstract of the United States - 1990 (1990).  
 § Statistical Abstract of the United States - 1992 (1992).

discriminatory practices as they affect the IS managerial ranks. The following section reviews three perspectives on which discrimination research, including gender discrimination, is often based.

## Perspectives of Discrimination Research

Researchers investigating discrimination typically draw theoretical frameworks from, and base their propositions on, three perspectives. These include the economic, sociological, and psychological perspectives (Auster, 1989; England and McCreary, 1987; Larwood, et al., 1984).<sup>2</sup> The former two are macro (Auster, 1989) or broad (Larwood, et al., 1984) perspectives, focusing on structural features of the economy such as supply and demand forces within labor markets, or on structural features of society such as the overrepresentation of women in lower-paid occupations. The latter is micro (Auster, 1989) or narrow (Larwood, et al., 1984), focusing primarily on individuals' perceptual, cognitive, or behavioral biases as a source of discriminatory practices.<sup>3</sup>

### *The economic perspective*

The economic perspective attempts to explain discriminatory practices, e.g., wage and job-level inequalities, by viewing individuals in terms of human capital and addressing differences in capital formation as explanatory factors behind inequalities. For example, a general proposition of the economic perspective asserts that women have higher turnover rates, more career interruptions, less experience, education, mobility, and work-specific training (due primarily to family and child care responsibilities), and therefore, accrue less human capital value. Much inequality can be explained as a consequence of the differences in human capital formation. However, to the extent inequalities persist after differences in human capital are accounted for, the remaining inequalities *may be* attributable to discrimination and discriminatory practices (Olson and Frieze, 1987).

### *The sociological perspective*

The sociological perspective diverges into two schools of thought. The first emphasizes dif-

ferences in power positions among the discriminating and discriminated. The desire to sustain power and the fear of dominance by the previously discriminated provide explanations for continuing discriminatory practices. The second school focuses on structural differences in society and the economy, which result in inequalities. For example, gender wage inequality may be explained by differences in the proportion of male/female employment by industry and occupation or by various characteristics of the firm such as its size and extent of unionization. If women are disproportionately employed in, say lower-paying occupations, then a plausible explanation for wage inequality has been identified (Hartmann, et al., 1986). Consequently, inequalities do not prove the existence of discriminatory practices. However, to the extent these structural features erect barriers preventing equal access to specific industries, occupations, etc. for all, discrimination may occur.

### *The psychological perspective*

The psychological perspective focuses on individuals' perceptual, cognitive, and behavioral biases that may lead to discriminatory practices. The general research themes include analysis of various biasing influences such as stereotyping and socialization processes, typically set within a supervisor-subordinate relationship and often studied within particular contextual factors. Common contextual factors include: the amount of ambiguity and uncertainty surrounding the evaluation process due to characteristics of the subordinates' task environment; the extent of the supervisor's knowledge regarding the subordinates' work; and the degree of actual and/or perceived "fit" between subordinate attributes and role characteristics.

### *Purpose of the study*

Our study employs the economic perspective for theoretical and methodological support. It empirically examines the extent of treatment discrimination in a select group of IS managers by looking at the disparities in salaries and job level between men and women. Although this paper shows differences between men and women, it cannot state conclusively that these differences are a result of discrimination—an

acknowledged shortcoming of discrimination studies based on the economic perspective (Olson and Frieze, 1987). However, this does not discount the value of our findings, which may guide future managers along more informed decision-making processes regarding personnel hiring and advancement. As Olson and Frieze (1987) state:

Although the above discussion indicates that . . . analyses [based on the economic perspective] . . . cannot be used to determine unbiased estimates of the impact of discrimination . . . , nevertheless these studies can be useful for the insights they provide for policy (p. 176).

## Questions to Be Examined

To assess potential treatment discrimination, the research investigates differences in salary and job level between genders while controlling for some human capital factors.

The economic perspective examines differences between men and women in terms of differences in human capital. According to this perspective, men generally possess comparatively more work experience, formal training, skills, and mobility and fewer career interruptions, thereby accruing greater value in terms of human capital for comparable time periods. Women lag behind men in appreciating human capital value because of their historically disproportionate assumption of child-rearing responsibilities, forcing them to forego or postpone human capital-enhancing activities. Empirical data support this argument. The Department of Labor data indicate women consistently earn lower wages across all occupational groups, managerial and supervisory included, noting that in 1981 women's earnings as a percent of men's was 59.2 percent across all occupational groups (*Time of Change*, 1983). Similar figures for "Professional and Technical Workers" and "Managers and Administrators" occupations were 62.2 percent and 55.8 percent respectively. More recent studies report the continuance of inequitable salary levels. One study found that the annual salary differential between men and women in a large financial services organization ranged from \$342 at low job levels to \$2,340 at high job levels (Auster and Drazin, 1988). An extensive review of research studies examining salary differentials reports as much as

a \$4,000 gender difference, after controlling for other human capital factors, with a tendency for greater differences at higher job levels (Olson and Frieze, 1987).<sup>4</sup>

According to the economic perspective, our research method considers any remaining difference in salary by gender (after the other human capital factors' effects are accounted for) as *suggestive of* gender-based discriminatory practices (Olson and Frieze, 1987). The significant human capital factors were determined from the literature and available data and include age (Auster, 1989; Ebeling, et al., 1979; Forgionne and Peeters, 1982; Hulin and Smith, 1965; Weaver, 1978), work experience (Auster, 1989; England and McCreary, 1987; Hulin and Smith, 1965; Olson and Frieze, 1987), education (Auster, 1989; England and McCreary, 1987; Forgionne and Peeters, 1982; Weaver, 1978), and job level (Auster, 1989; Ebling, et al., 1979; Hulin and Smith, 1965; Olson and Frieze, 1987; Weaver, 1978).<sup>5</sup> The difference in salary by gender could also be the result of other forms of discrimination that covary with gender (perhaps race or sexual orientation) or other human capital factors not controlled for in this study. Therefore, our question is:

**Will women receive lower salaries than men, even when controlling for other human capital factors that may explain the salary inequities?**

Payment in terms of salary is a form of exchange between employers and employees for human capital services. Other forms of exchange may be non-monetary, such as promotions. Promotions lead to increases in job level. Similar to the argument presented above, women, because they possess less human capital, will receive fewer promotions and consequently occupy commensurately lower job levels in exchange for similar labor services. As described above, discrimination is *suggested by* differences in job level that remain after other human capital factors are accounted for. The other human capital factors include age, work experience, and education.<sup>6</sup> Therefore, our question is:

**Will women hold lower job levels than men, even when controlling for other human capital factors that may explain the job level inequities?**

## Method

The sample, the measures, and our analytic data procedures are discussed below.

### Sample

The focus of the study was on senior-level IS management because we felt the ability to detect discriminatory practices would be greatest in this group. Biases and discrimination are more likely to emerge under conditions of evaluation ambiguity, where the evaluation process assumes considerable subjectivity (Auster, 1989). The degree of subjectivity entering into an evaluator's judgement is expected to increase under conditions of task uncertainty<sup>7</sup> (Auster, 1989), which is presumed to increase at higher levels of the organization's hierarchy. Consequently, biases are more likely to enter into personnel evaluation decision-making processes at higher organizational levels because these roles have tasks that are inherently more uncertain. This argument is consistent with empirical findings that suggest that during salary allocation decisions for higher managerial levels, the salary differences between men and women are more pronounced, with the men receiving higher salaries (Auster and Drazin, 1988).

The data were collected through mail surveys conducted by the Society for Information Management (SIM) in 1989, 1991, and 1993. Our samples consisted of 487 subjects (1989), 513 subjects (1991), and 413 subjects (1993),<sup>8</sup> representing 32 percent (1989), 31 percent (1991), and 18 percent (1993) response rates respectively. The samples represent IS executives who occupy positions from manager to CEO, and who are members of SIM.<sup>9</sup>

The distribution of subjects was assessed by industry and organization size (as measured by annual revenues). Overall frequency distributions are listed with breakdowns by gender for each variable in Table 2. Though we cannot claim the samples are representative of SIM membership or the population of IS managers with these results, we *can* state that the samples include IS managers from a large cross-section of industries and organization sizes, and that there is no disproportionate representation of men or women in specific industries (for 1989 and 1991) or

organization sizes (for all three years) within these samples.<sup>10</sup>

### Measures

The frequency distributions and median values of the variables used for analyses are presented in Table 3. The variables were measured using scales developed by SIM and are used repeatedly by them in their annual membership survey.<sup>11</sup> The variables included age (AGE), annual salary (SALARY), work experience (IS YEARS), job level (REPORTING LEVEL), level of education (EDUCATION),<sup>12</sup> and gender (GENDER). The variables' scales are shown in the Appendix.<sup>13</sup>

All questionnaire items were standard demographic information that SIM has been collecting from its members for several years. In all cases, these items simply asked the respondent to check the category to which they belonged (e.g., "Please indicate your salary range and/or annual cash compensation." "How many years have you been in the IS profession?"). The original questionnaire was pretested by five SIM members to make certain that all the items were clear and meaningful to the population surveyed. No problems were detected during the pre-test and, given the careful development and review of the survey by SIM and its extended history of repeated use, we believe this provides substantial evidence of the instrument's face validity (Stone, 1978). Correlations among the variables are shown in Tables 4a and 4b.

### Analyses

The questions were analyzed using MANOVA. For each MANOVA procedure, any difference in salary and job level between the two gender groups was tested for significance after controlling for the other variables' expected influence on salary and job level.<sup>14</sup>

## Results

The results of our analyses follow and are summarized in Tables 5a and 5b. The first question was generally supported and the second was not.

**Question 1: Will women receive lower salaries than men, even when controlling for other human capital factors that may explain the salary inequities?**

Table 2. Industry and Organization Size Variables

Industry (Frequency Distribution)	All			Male			Female		
	1989 (n = 487)	1991 (n = 512)	1993 (n = 409)	1989 (n = 438)	1991 (n = 460)	1993 (n = 362)	1989 (n = 49)	1991 (n = 52)	1993 (n = 47)
Manufacturing	187 (38%)	230 (45%)	112 (27%)	174 (40%)	214 (46%)	102 (28%)	13 (26%)	16 (31%)	10 (21%)
Agriculture/ Construction	2 (< 1%)	2 (< 1%)	3 (< 1%)	2 (< 1%)	2 (< 1%)	3 (< 1%)	0 (0%)	0 (0%)	0 (0%)
Transportation/ Public Utilities	22 (4%)	41 (8%)	25 (6%)	20 (5%)	37 (8%)	23 (6%)	2 (4%)	4 (8%)	2 (4%)
Natural Resources/ Energy	18 (4%)	29 (6%)	15 (4%)	18 (4%)	27 (6%)	14 (4%)	0 (0%)	2 (4%)	1 (2%)
Printing/ Publishing	6 (1%)	5 (1%)	7 (2%)	4 (1%)	4 (1%)	4 (1%)	2 (4%)	1 (2%)	3 (6%)
Wholesale/ Retail Trade	25 (5%)	16 (3%)	14 (3%)	22 (5%)	13 (3%)	13 (4%)	3 (6%)	3 (6%)	1 (2%)
Finance/Insurance/ Real Estate	75 (15%)	63 (12%)	62 (15%)	67 (15%)	53 (11%)	53 (15%)	8 (16%)	10 (19%)	9 (19%)
Service: Business & Legal	66 (14%)	17 (3%)	30 (7%)	60 (14%)	16 (3%)	30 (8%)	6 (12%)	1 (2%)	0 (0%)
Education	32 (7%)	31 (6%)	15 (4%)	26 (6%)	26 (6%)	12 (3%)	6 (12%)	5 (10%)	3 (6%)
Government	15 (3%)	19 (4%)	19 (5%)	11 (3%)	16 (3%)	15 (4%)	4 (8%)	3 (6%)	4 (8%)
Other	39 (8%)	59 (11%)	107 (26%)	34 (8%)	52 (11%)	93 (26%)	5 (10%)	7 (13%)	14 (30%)
<b>Size:</b>	<b>All</b>			<b>Male</b>			<b>Female</b>		
<b>Annual Revenues</b>	<b>1989 (n = 399)</b>	<b>1991 (n = 453)</b>	<b>1993 (n = 366)</b>	<b>1989 (n = 369)</b>	<b>1991 (n = 410)</b>	<b>1993 (n = 325)</b>	<b>1989 (n = 30)</b>	<b>1991 (n = 43)</b>	<b>1993 (n = 41)</b>
Median Score	1-3 Billion	500-999 Million	500-999 Million	1-3 Billion	500-999 Million	500-999 Million	1-3 Billion	1-3 Billion	500-999 Million

Source: Society for Information Management, Chicago, IL.

The MANOVA analyses show that gender was significant in explaining variance in salary, in 1989 ( $p = .08$ ) and 1993 ( $p = .02$ ), even after job level, age, education (see Endnote 12), and work experience were controlled for. Examination of the salary median values by gender in Table 6 indicates women were one level below men in all three samples. Significance, however, was reached only for 1989 and 1993. The median interval values were \$100,000-124,999 for men versus \$75,000-99,999 for women. Question 1 was supported, which provides evidence *suggestive of treatment discrimination* in terms of salary differences within these data of SIM managers.

**Question 2: Will women hold lower job levels than men, even when controlling for other human capital factors that may explain the job level inequities?**

The results did not confirm our expectations. Job level was not significantly different between genders after controlling for age, education (see Endnote 12), and work experience.

## Discussion

Question 2 was not supported using REPORTING LEVEL as the dependent variable. REPORT-

Table 3. Descriptive Statistics

Variables	All			Male			Female		
	1989	1991	1993	1989	1991	1993	1989	1991	1993
Age (AGE)	(n = 487)	(n = 512)	(n = 412)	(n = 438)	(n = 460)	(n = 364)	(n = 49)	(n = 52)	(n = 48)
Median Score	45-49	45-49	45-49	45-49	45-49	45-49	40-44	40-44	40-44
Annual Salary (SALARY)	(n = 475)	(n = 499)	(n = 409)	(n = 426)	(n = 448)	(n = 361)	(n = 49)	(n = 51)	(n = 48)
Median Score	100,000-124,999	100,000-124,999	100,000-124,999	100,000-124,999	100,000-124,999	100,000-124,999	75,000-99,999	75,000-99,999	75,000-99,999
Reporting Levels to CEO (REPORTING LEVEL)	(n = 432)	(n = 468)	(n = 412)	(n = 393)	(n = 424)	(n = 364)	(n = 39)	(n = 44)	(n = 48)
Median Score	1	2	2	1	2	2	1	2	2
Work Experience (IS YEARS)	(n = 487)	(n = 513)	(n = 413)	(n = 438)	(n = 461)	(n = 365)	(n = 49)	(n = 52)	(n = 48)
Median Score	>20	21-25	21-25	>20	21-25	21-25	13-20	13-20/ 21-25*	21-25
Education (EDUCATION)	(n = 487)			(n = 438)			(n = 49)		
Median Score	Master	Not Available	Not Available	Master	Not Available	Not Available	Master	Not Available	Not Available

Source: Society for Information Management, Chicago, IL.

\*Denotes median value fell between the two SALARY levels indicated.

ING LEVEL measures job level by capturing the number of reporting levels between the subjects and their respective CEOs. After obtaining non-significant results on Question 2 using this variable, we decided to further test this question with the 1989 sample using a similar variable—job title (JOB TITLE). This variable employs a continuous scale and represents the subjects' job title; it correlates with REPORTING LEVEL at  $r = .36$ ,  $p < .01$ .<sup>15</sup> We considered using this variable initially, but were uncomfortable with its use because job titles can invoke different meanings for different people. The results for this analysis using JOB TITLE showed that GENDER still remained non-significant in explaining job level variance. This provides additional evidence that men and women with similar human capital value will have similar job levels and job titles. Two explanations could account for this. First, it could be an artifact of the SIM data since it may not be representative of SIM membership as a whole nor of the population of IS managers in general. Since association with SIM is voluntary and eligibility requirements somewhat stringent,

non-representativeness is a possibility. Second, organizations may be using job level as a method of tokenism; that is, granting advances in the organizational hierarchy without corresponding increases in salary in order to mitigate employee dissatisfaction. Analysis of median salary levels between genders for each reporting level revealed that women's salaries, with relative consistency, were approximately one salary level below that of men (see Table 6). Our data indicates that while women and men with similar human capital value may be given comparable positions within the organizational hierarchy, the salaries of women will be significantly less than their male counterparts. A more elaborate analysis of the actual tasks performed by men and women of comparable rank and title would be interesting. It may be that women, while promoted and given the appropriate rank, are not given the tasks that the IS organization considers critical to its successful functioning. Therefore, if the tasks performed by women are valued less than the tasks performed by men, this could account for why there are differences in pay but no



Table 4a. Correlation Coefficients (All Subjects)

	GENDER			AGE			SALARY			REPORTING LEVEL			IS YEARS			EDUCATION		
	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993
GENDER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AGE	.20**	.15**	.24**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SALARY	.18**	.06	.15**	.28**	.19**	.15**	—	—	—	—	—	—	—	—	—	—	—	—
REPORTING LEVEL†	-.05	-.02	-.08	-.09*	-.04	-.25**	-.15**	-.12**	-.08	—	—	—	—	—	—	—	—	—
IS YEARS	.11*	.12**	.11*	.37**	.43**	.54**	.19**	.06	.12*	.04	-.16**	—	—	—	—	—	—	—
EDUCATION	-.03	n/a	n/a	-.05	n/a	n/a	-.00	n/a	n/a	-.06	n/a	n/a	-.07	n/a	n/a	—	—	—

Table 4b. Correlation Coefficients (Men Below/Women Above Diagonal)

	GENDER			AGE			SALARY			REPORTING LEVEL			IS YEARS			EDUCATION		
	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993
GENDER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AGE	—	—	—	—	—	—	.28*	.29*	-.11	-.25	-.05	-.25	.39**	.55**	.70**	-.09	n/a	n/a
SALARY	—	—	—	.25**	.18**	.14**	—	—	—	-.19	.32*	.00	.21	.16	-.15	-.15	n/a	n/a
REPORTING LEVEL†	—	—	—	-.07	-.04	-.24**	-.15**	-.10*	-.08	—	—	—	-.13	-.01	-.18	.13	n/a	n/a
IS YEARS	—	—	—	.36**	.40**	.52**	.16**	.05	.12*	-.02	.04	-.15**	—	—	—	-.01	n/a	n/a
EDUCATION	—	—	—	-.04	n/a	n/a	.02	n/a	n/a	-.08	n/a	n/a	-.08	n/a	n/a	—	—	—

\*p < .05.

\*\*p < .01.

†Recall that lower REPORTING LEVEL values indicate higher levels within the organizational hierarchy.

n/a - not available.

Table 5a. MANOVA Results

Question 1 DV-SALARY	Sum of Squares			Degrees of Freedom			Mean Square			F			Significance of F		
	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993
Within Cells	1282.90	2156.37	1572.38	415	451	402	3.09	4.78	3.91						
Covariates*	127.52	120.49	27.95	4	3	3	31.88	40.16	9.32	10.31	8.40	2.38	.000	.000	.069
Gender	9.40	1.97	21.91	1	1	1	9.40	1.97	21.91	3.04	.41	5.60	.082	.521	.018

\*Covariates include REPORTING LEVEL, AGE, EDUCATION (except 1991, 1993), and IS YEARS.

Table 5b. MANOVA Results

Question 2 DV-REPORTING LEVEL	Sum of Squares			Degrees of Freedom			Mean Square			F			Significance of F		
	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993	1989	1991	1993
Within Cells	632.84	387.90	290.92	427	463	407	1.48	.84	.71						
Covariates*	6.92	2.05	17.53	3	2	2	2.31	1.02	8.77	1.56	1.22	12.26	.199	.295	.000
Gender	.71	.08	.21	1	1	1	.72	.08	.21	.49	.10	.29	.485	.751	.589

\*Covariates include AGE, EDUCATION (except 1991, 1993), and IS YEARS.

**Table 6. Median Salary Levels by Reporting Level and Gender**

Reporting Levels To CEO (REPORTING LEVEL)	1989		1991		1993	
	Men	Women	Men	Women	Men	Women
0 Levels Subject is CEO)	100,000-124,999	75,000-99,999	125,000-149,999	100,000-124,999	150,000-174,999	75,000-99,999
1 Level	100,000-124,999	75,000-99,999	100,000-124,999	100,000-124,999/ 125,000-149,999*	125,000-149,999	75,000-99,999
2 Levels	100,000-124,999	100,000-124,999/ 125,000-149,999*	100,000-124,999	100,000-124,999	100,000-124,999	75,000-99,999/ 100,000-124,999*
3 Levels	75,000-99,999	50,000-74,999	100,000-124,999	75,000-99,999	100,000-124,999	75,000-99,999
More Than 3 Levels	75,000-99,999/ 100,000-124,999*	75,000-99,999	100,000-124,999	50,000-74,999	100,000-124,999	50,000-74,999

\*Denotes median value fell between the two SALARY levels indicated.

differences in title. This would correspond to earlier findings that women, while given supervisory tasks in IS, essentially “hit a glass ceiling” and were never or rarely given the more senior managerial tasks that are critical to the successful functioning of the IS department and that probably pay better (Dubnoff and Kraft, 1986). Additionally, it may be that women are either unable to perform more critical tasks because of comparatively less experience or are unwilling because of other personal priorities outside their careers. Regardless of the reasons, continued monitoring of the SIM data is certainly warranted.

### Implications for Policy

This study has found significant salary differences between samples of male and female IS managers of the SIM membership, which is *suggestive of* treatment discriminatory practices. While this should not imply that all organizations in this sample have such practices, treatment discrimination dispels the myth of IS as an occupation less vulnerable to such unacceptable practices. Beyond the important issue of social justice and the legal liabilities that such practices create, gender discrimination has other potentially adverse consequences for the employing organization. Gender discrimination means non-job-related and non-performance-related factors are being used to determine who is rewarded. Therefore, the best qualified or most highly skilled workers may not be rewarded—to the detriment of the organization.

The maintenance of such discriminatory practices will become even more onerous once the shifting demographics sweeping this country are examined. While men accounted for 57 percent of the 1985 workforce, the labor market is becoming increasingly feminized (Johnston and Packard, 1987). Between 1985 and the year 2000, women will have accounted for 64 percent of the workers entering the job market (Johnston and Packard, 1987). Organizations that wish to sustain gender discriminatory policies will find a shrinking labor pool from which to recruit. We do not believe that gender discriminatory practices can be maintained in such an environment; consequently, organizations need to carefully examine and review their hiring, promotion, salary, and personnel practices. While examining gender discrimination is difficult and often emotionally charged, such examination is critical to the health and success of both the IS occupation and our increasingly technologically dependent society.

Finally, though not included in our formal analyses, the disproportionate number of male managers is noteworthy. We cannot conclude from this study that the problem of female underrepresentation is the result of access discriminatory practices. It is quite possible that women opt out of the profession as they reach a certain age to assume primary family care responsibilities. We do believe, however, that organizations have not been sensitive to the family care needs of either their female or male employees. Most organizational personnel prac-

tices were developed and institutionalized in a period when one member of the family worked outside the home and the other assumed primary family care responsibility (Johnston and Packard, 1987). With the increasing need for both parents to remain gainfully employed, and with the growth in single parent families, such practices and policies do not effectively accommodate the personnel realities of today. Organizations have no choice but to develop new and informed practices that will permit both work and family to productively coexist.

## Endnotes

<sup>1</sup> We focus on the managerial ranks as we believe this will be the group most impacted by discriminatory practices. Our rationale for this follows in the sections on Nature of Discrimination and Method Sample.

<sup>2</sup> See Auster (1989) and Larwood, et al. (1984) for reviews on all three paradigms and England and McCreary (1987) for a review of the former two.

<sup>3</sup> None is predominant or superior, and all are complementary, not competing, perspectives—collectively enriching the research process and revealing multiple underlying origins of discriminatory practices.

<sup>4</sup> See also Larwood and Gutek (1984) for a review of research studies assessing salary differentials across genders.

<sup>5</sup> We acknowledge that these factors do not exhaust all possible human capital factors that may potentially explain variance in our dependent variables.

<sup>6</sup> As with Question 1, selection of these human capital factors was based on a review of the literature and data availability.

<sup>7</sup> Task uncertainty is defined according to four dimensions: task predictability, task variability, task complexity, and task interdependence.

<sup>8</sup> The samples are disproportionately male. This has implications for the power of our analysis, but, as discussed later, the power level remains more than sufficient for analytic purposes.

<sup>9</sup> Since response to the questionnaire was voluntary, the samples' representativeness of SIM membership is suspect. We attempted to obtain statistics on the entire SIM membership for comparison to the samples, but unfortunately SIM does not maintain this information. SIM compared the 1989 sample results with 1991 sample results on some variables and found little difference. In fact, the 1991 report indicated: "For the most part, the profile of the responding companies in the survey closely matches the profile of the companies in the 1989 study." (Society for Information Management, 1991). (The 1989 report indicated the same regarding comparison to the 1987 study.) Though this does not directly address the concern regarding the samples' representativeness of SIM, at least the evidence suggests the sampling is consistent.

Additionally, SIM's representativeness of the population of IS managers at large is suspect. SIM has membership criteria requiring applicants to be in positions of "technology leadership." It may be that women have not reached these positions to be eligible for SIM membership, inhibiting the ability to generalize from these samples. Moreover, this would generally result in an SIM membership that is comparatively overrepresentative of more senior IS managers than the population of IS managers at large. However, we feel this latter issue reflecting a potential skewness in the samples works in favor of detecting potential discriminatory practices, since the existing body of empirical evidence suggests discriminatory practices have a greater chance of occurring at higher organizational levels (Auster, 1989; Auster and Drazin, 1988).

<sup>10</sup> To determine if there were any systematic differences or biases in the types and sizes of organizations employing men versus women, we tested for differences in industry type and organization size by gender using a chi-square test. No significant differences were detected even when applying a liberal significance level of .10, except for industry type by gender in 1993 at .09. Just to be certain that industry type did not confound the findings reported in the Results section, we ran all analyses controlling for industry type—none of the findings was affected, indicating that industry type has little if any explanatory power on our dependent variables in these data.

<sup>11</sup> Minor scale differences across samples exist, with the alterations generally extending higher-range values, e.g., higher salary levels reflecting general inflation trends and higher age levels reflecting an aging population of IS managers.

<sup>12</sup> Education was available only for 1989. However, since its predictive power was very low, as indicated by a .35 significance level of the t-value from the MANOVA analysis, we feel that its absence in 1991 and 1993 does not reduce to any large extent the subsequent analyses' validity.

<sup>13</sup> EDUCATION and GENDER use qualitative scales; the other variables use nominalized quantitative scales. Only scales from 1989 are provided. Since the subsequent scale changes were relatively minor as explained above, we saw no need to include them for 1991 and 1993.

<sup>14</sup> Despite the disproportionate number of male subjects—90 percent (1989), 90 percent (1991) and 88 percent (1993), the power of the regression analyses assuming medium effect size and a 5 percent alpha error level was well above the 80 percent level recommended (Cohen, 1987).

<sup>15</sup> See the Appendix for a description of the scale.

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## Appendix

### Variable Scales Used in the Study

#### Age (AGE)

- 1 - ' - 30'
- 2 - '30 - 34'
- 3 - '35 - 39'
- 4 - '40 - 44'
- 5 - '45 - 49'
- 6 - '50 - 54'
- 7 - '55 - 59'
- 8 - ' >60'

#### Annual Salary (SALARY)

- 1 - ' < 35,000'
- 2 - ' 35,000 - 49,999'
- 3 - ' 50,000 - 74,999'
- 4 - ' 75,000 - 99,999'
- 5 - '100,000 - 124,999'
- 6 - '125,000 - 149,999'
- 7 - '150,000 - 174,999'
- 8 - '175,000 - 199,999'
- 9 - '200,000 - 249,999'
- 10 - ' > 250,000'

#### Work Experience (IS YEARS)

- 1 - ' < 1 YEAR'
- 2 - '1 - 3 YEARS'
- 3 - '4 - 7 YEARS'
- 4 - '8 - 12 YEARS'
- 5 - '13 - 20 YEARS'
- 6 - ' >20 YEARS'

#### Job Level (REPORTING LEVEL)

- 0 - 'N/A'
- 1 - '0 LEVELS'
- 2 - '1 LEVELS'
- 3 - '2 LEVELS'
- 4 - '3 LEVELS'
- 5 - '>3 LEVELS'

#### Education (EDUCATION)

- 0 - 'NO EDUCATION'
- 1 - 'BACHELOR DEGREE'
- 2 - 'MASTER DEGREE'
- 3 - 'PHD DEGREE'

#### Gender (GENDER)

- 0 - 'FEMALE'
- 1 - 'MALE'

#### Job Title (JOB TITLE)

- 1 - 'CEO/CHAIRMAN/PRESIDENT'
- 2 - 'PRINCIPAL/PARTNER'
- 3 - 'CIO'
- 4 - 'CORPORATE/EXECUTIVE VP'
- 5 - 'ASSISTANT VP'
- 6 - 'DIRECTOR'
- 7 - 'MANAGER'
- 8 - 'PROFESSOR/ACADEMIC'
- 9 - 'OTHER'

#### Industry

- 1 - 'MANUFACTURING'
- 2 - 'AGRICULTURE/CONSTRUCTION/MINING'
- 3 - 'TRANSPORTATION/PUBLIC UTILITIES'
- 4 - 'NATURAL RESOURCES/ENERGY'
- 5 - 'PRINTING/PUBLISHING'
- 6 - 'RETAIL/WHOLESALE TRADE'
- 7 - 'FINANCE/INSURANCE/REAL ESTATE'
- 8 - 'SERVICE:BUSINESS & LEGAL'
- 9 - 'EDUCATION'
- 10 - 'GOVERNMENT'
- 11 - 'OTHER'

#### Organization Size in Annual Revenues

- 0 - 'N/A'
- 1 - ' < 50 MILLION'
- 2 - ' 50 - 99 MILLION'
- 3 - '100 - 249 MILLION'
- 4 - '250 - 499 MILLION'
- 5 - '500 - 999 MILLION'
- 6 - ' 1 - 3 BILLION'
- 7 - ' 3 - 4.9 BILLION'
- 8 - ' 5 - 9.9 BILLION'
- 9 - '10 - 14.9 BILLION'
- 10 - '15 - 19 BILLION'
- 11 - ' > 20 BILLION'