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Does the glass ceiling exist? : an empirical test of a large organization

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**Does the glass ceiling exist: An empirical test of a large
organization**

Graham, Tracy Ann, M.S.

San Jose State University, 1992

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DOES THE GLASS CEILING EXIST?:
AN EMPIRICAL TEST OF A LARGE ORGANIZATION

A Thesis

Presented to
the Faculty of the Department of Psychology
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Tracy Ann Graham

August, 1992

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ABSTRACT

DOES THE GLASS CEILING EXIST?: AN EMPIRICAL TEST OF A LARGE ORGANIZATION

by Tracy A. Graham

The purpose of this study was to determine if a glass ceiling exists for female or non-white employees at a Fortune 500 computer company. Subjects consisted of 1354 technical employees with bachelors degrees, e.g. - engineering, and 1154 technical employees with masters degrees. All subjects entered the company at 2 entry levels: Level 1 (bachelors degree) or Level 2 (masters degree).

Looking at number of promotions, Level 1 female employees averaged fewer promotions than Level 1 male employees. Non-white employees in both levels averaged fewer promotions than white employees. An hierarchical multiple regression analysis was calculated to predict current level of employees in the company. After controlling for an employee's experience before entering the company, tenure at the company, and performance at the company, when predicting current level of an employee, the race of an employee added significant predictive ability for Level 1 employees and marital status added significant predictive ability for Level 2 employees.

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Does the Glass Ceiling Exist?:
An Empirical Test of a Large Organization

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Running head: GLASS CEILING

Footnotes

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Abstract

The purpose of this study was to determine if a glass ceiling exists for female or non-white employees at a Fortune 500 computer company. Subjects consisted of 1354 technical employees with bachelors degrees, e.g. - engineering, and 1154 technical employees with masters degrees. All subjects entered the company at 2 entry levels: Level 1 (bachelors degree) or Level 2 (masters degree). Looking at number of promotions, Level 1 female employees averaged fewer promotions than Level 1 male employees. Non-white employees in both levels averaged fewer promotions than white employees. An hierarchical multiple regression analysis was calculated to predict current level of employees in the company. After controlling for an employee's experience before entering the company, tenure at the company, and performance at the company, when predicting current level of an employee, the race of an employee added significant predictive ability for Level 1 employees and marital status added significant predictive ability for Level 2 employees.

Does the Glass Ceiling Exist?:

An Empirical Test of a Large Organization

The faces of America's workforce are changing. Today, over 50% of employees in the workforce are women or minorities (Department of Labor, 1991). However, a 1990 federal study involving 94 randomly selected Fortune 1000 companies found that only 16.9% of women and 6% of minorities are in management (Department of Labor, 1990). If over 50% of America's workforce are women and minorities how can it be that only 23% of these workers are managers? Some say the answer lies below the glass ceiling.

The term "glass ceiling" has been widely used since the 1980s and is perhaps best defined by the Department of Labor. The glass ceiling is a set of invisible, real or perceived, barriers that appear to stymie the executive advancement opportunities of women and minorities (Department of Labor, 1991). Specifically, it is believed that the sex or race of an individual may keep him/her from reaching the ranks of top, or even middle, management. A female or minority employee may not be allowed into the upper ranks of management by the white male hierarchy that normally comprises upper management. If it is true that a glass ceiling exists in our workforce, it is a barrier some feel must be removed. Not only does the glass ceiling constitute blatant discrimination against members of the American workforce, it is also

cutting our pool of potential leaders and managers to less than half of what it could be (Department of Labor, 1991).

Explanations of the Glass Ceiling

Different possible reasons for the glass ceiling, if it does exist, have been proposed. These reasons, or explanations, can be grouped into four major categories. The first explanation is that the glass ceiling is in fact justified. This theory posits that women and minorities are less qualified than white males and therefore should not be represented equally in management. Women and minorities are less skilled and less educated than white males and should be at lower levels in the workforce. Proponents of this theory also point out that women, as a whole, have not been in the workforce as long as men and therefore a woman should not expect to reach the top levels of management, regardless of her qualifications (Fierman, 1990).

The second explanation of the glass ceiling can be described as personal beliefs that some managers have regarding women. Many managers, when deciding who among their employees to promote, may not even consider a woman for a promotion. Some managers believe that if a promotion requires longer hours or a transfer out of the area, female employees would not be interested due to family obligations (Fierman, 1990; Gest, 1991).

A second belief some white males hold regarding women stems from

the fact that most men who are now top managers did not encounter women and minorities on their climb up the corporate ladder. This fact reinforces the negative stereotype that women and minorities do not belong in management and may also make it seem acceptable for women and minorities not to be promoted into management (Smith, 1989).

The third explanation of the glass ceiling can be categorized as perceived differences between white male employees and other employees. Some male managers are not comfortable working with women and minorities because they perceive them to be different from themselves. Men may be ill at ease working with women and minorities, and perhaps not trust them as much as someone they see as similar to themselves (Fierman, 1990).

Another perceived difference is the idea that male employees and female employees practice different leadership styles (Segal, 1991). Since it is widely believed that women manage differently than men, it follows that if this were true women would not possess the same type of leadership skills as men (Rosener, cited in Rivers, 1991). When assessing a woman's leadership skills, a male manager may not find those skills he feels are critical to good leadership and therefore may pass her over for promotion. This leads to a common bias towards women, the idea that the traits they possess are inappropriate or deficient for the job of management (Morrison, 1990). For

example, women are thought to be too concerned with the feelings of others and not aggressive enough to be successful managers. Other misperceptions about women's abilities include the idea that women communicate differently, and therefore less effectively, than men (Lewis, 1991). Also, some male managers may mistake a woman's lack of authoritarianism for a lack of confidence in her abilities (Segal, 1991).

The fourth explanation of the glass ceiling arises from the methods an organization uses to locate potential managers. First, many top executives use promotion through networking to locate managers, offering promotions to subordinates similar to themselves - other white males. Women and minorities may not be given serious consideration for promotions because they are perceived to be different from the manager who makes the promotion decision and may not seem to be a good fit for the team (Department of Labor, 1991). A major drawback to this promotion through networking is that it limits the applicant pool to friends and acquaintances of the manager and often excludes women and minorities. This drawback could severely limit the influx of innovative ideas and new sources of creativity into the corporate world (Department of Labor, 1991).

A second method of locating potential managers is the use of executive search firms (Department of Labor, 1991). Many of these firms do not need to

be concerned with equal employment opportunity and unless they are specifically instructed to do so, they may not necessarily include women and minorities in their applicant pools ("Executive Searches," 1991).

Research on the Glass Ceiling

In 1991, a large-scale study was conducted by the Department of Labor to see if a glass ceiling exists in the American workforce today (Department of Labor, 1991). This study analyzed nine randomly selected Fortune 500 companies, including PepsiCo and Sterling Drug, to determine whether or not they discriminate on the basis of gender or race. The Department of Labor found that there is a point in the organizational structure of some companies beyond which women and minorities have not advanced. In the nine Fortune 500 companies studied it was also found that minorities plateau at an even lower level than do women. This study strongly supports the existence of a glass ceiling.

In a second study conducted to test the existence of a glass ceiling, Gold & Pringle (1988) interviewed 50 middle and senior managers with comparable training, work experience, and education. They found that female managers averaged fewer promotions than male managers and therefore did not climb as far up the corporate ladder. In their interviews, both men and women cited past training, experience, and personal skill as major factors

contributing to their promotions. Interestingly, women felt that a major inhibitor to their success was poor organizational attitudes toward women in a male environment.

If a glass ceiling does exist, as previous research has indicated, factors contributing to it must be identified. The following research corresponds to the different explanations of the glass ceiling mentioned above.

The first explanation of the glass ceiling, that women and minorities are less qualified for management positions than are white males and therefore less able to be successful managers, was tested in a study by Jaskolka, Beyer, and Trice (1985). In their study of 474 managers, they found that education and length of service in an organization were positively related to success in the company. Specifically, managers with a higher educational level and a longer tenure in the company had a higher degree of success, as measured by salary and hierarchical level. It was also found that, after controlling for education level and organizational tenure, being female and non-white were negatively related to financial success, but not hierarchical success. These findings indicate that even if female and minority employees are receiving the same number of promotions as white male employees, they are not receiving the same salary as white male employees at the same hierarchical level. Although this study did not find a glass ceiling limiting the promotions of

women and minorities, it does support the existence of a "financial" glass ceiling.

The third explanation of the glass ceiling, that women do not possess the necessary and appropriate traits for the job of management, was tested in a study conducted by Judy Rosener (cited in Rivers, 1991). This study, using 400 matched pairs of males and females, found that men and women practice different management styles. Rosener found that successful women managers practice interactive leadership, encouraging participation in decision-making and motivating others by sharing information and power. This contrasts sharply with the traditional "male" leadership style, with its reliance on a chain of command and its use of rewards and punishments. Thus, although this study found male and female leadership styles to be different, it did not find that the "female" leadership style was inappropriate. In addition, Rosener concluded from her study that the "female" management style is more personal, more democratic, and more flexible than the traditional "male" leadership style and may be the most successful way to manage in the corporation of the future.

In a second study testing the idea that women do not possess appropriate traits for management, Donnell and Hall, using a sample of 2000 matched pairs of men and women, found that male employees and female

employees do not practice significantly different management styles (Donnell & Hall, cited in Morrison, 1990). Therefore, it would be logical to conclude that if men and women use the same type of management style, neither is more inherently qualified to be in management. Indeed, Donnell and Hall concluded from their study that the low number of women in management cannot be explained away by the idea that women use a different type of management style than men (Donnell & Hall, cited in Morrison, 1990).

A comprehensive review of literature pertaining to the glass ceiling indicated that the glass ceiling exists in many companies and across many industries. However, most studies testing for a glass ceiling are based on anecdotal evidence rather than research evidence. Many researchers and experts have an opinion on the glass ceiling and its causes, but very few documented, empirical studies have been conducted. Also, in several studies claiming the existence of a glass ceiling, women and minorities were asked if they had hit the glass ceiling; the opinions of the subjects were used rather than an objective study of their personnel records. Unfortunately, studies using anecdotal evidence or opinions are subject to bias by both the subjects - who may tell the experimenter what he/she wants to hear, and the experimenter - who may actively search for subjects who feel they have hit the glass ceiling. These biases, and others, almost certainly influence the outcome of the

studies.

In contrast, the present study will determine if a glass ceiling exists by statistically analyzing personnel records documenting the advancement of employees in an organization. This will eliminate the bias of anecdotal and opinion studies by objectively analyzing personnel data to determine if a glass ceiling exists.

Purpose and Hypotheses

The purpose of this study is to determine if a glass ceiling exists in a Fortune 500 computer company and, if it does exist, what factors may be contributing to it. The hypotheses to be investigated are as follows:

1. After controlling for level of education and level of employee at entry into the company, female employees will not be advancing as far up the corporate hierarchy as are male employees. Controlling for education and entry level ensures that female employees enter the company with the same education and at the same level as male employees and therefore should receive the same number of promotions.
2. After controlling for level of education and level of employee at entry into the company, minority employees will not be advancing as far up the corporate hierarchy as are white employees.

If differences in promotion rates are found for either female or minority

employees, this study will attempt to identify potential underlying factors. Previous research has indicated that several factors may account for differing progression rates between white males, and females and minorities. Specifically, the amount of experience gained prior to entry into the company (Gold & Pringle, 1988), the level of education completed (Gould & Penley, 1984), the length of service an employee has at the present company (Lewis, 1991; Jaskolka et al., 1985), performance on the job at the present company (Suzuki & Narapareddy, 1988), and marital status (Pfeffer & Ross, 1982) have been named as possible reasons white males progress faster than do women and minorities. An additional variable, citizenship status, has been found anecdotally to reduce the possibility of promotion among minorities who speak with a foreign accent (Swoboda, 1991). In his article, Swoboda cites other possible reasons for discrimination against non-U.S. citizens, including culture, appearance, ancestry, and birthplace (Swoboda, 1991). The above variables will be examined to determine if they predict progression and if so, how much of progression they actually account for.

If it is determined that there is a glass ceiling for either women or minorities and it is not due to a lack of qualifications, it would suggest that organizations must do something to ensure an equal promotion rate of all qualified employees. It has been estimated that women and minorities make

up over 50% of today's workforce and that this number will increase dramatically in the coming years (Department of Labor, 1991; Dominguez, 1991). It will become essential for the companies of the future to attract and retain the best and brightest workers this country has to offer, regardless of gender or race. For this reason, the implications of this study are to point companies in a direction of change and to help them see which norms and practices may be preventing them from reaching their fullest potential.

METHOD

Subjects

Subjects used in this study consist of 2508 employees at a Silicon Valley computer company. All subjects are exempt employees who entered the company as individual contributors within 3 years after earning a college degree. 1354 (54.0%) of the subjects possess bachelors degrees in a technical field (e.g., engineering, computer science) and 1154 (46.0%) possess both bachelors and masters degrees in a technical field. All subjects entered the company at 2 entry levels (hereafter referred to as Level 1 (bachelors degree) and Level 2 (masters degree)). Descriptive statistics for Level 1 and Level 2 employees are presented in Tables 1-4.

Measures

All information for these subjects was taken from computerized

Table 1

Descriptive Statistics of Level 1 Employees (n=1354)Demographics

Gender	<u>Male</u> 1046 77.3%	<u>Female</u> 308 22.7%	
Race	<u>White</u> 1153 85.2%	<u>Asian</u> 152 11.2%	<u>Minority</u> ¹ 49 3.6%
Marital Status	<u>Married</u> 415 30.6%	<u>Single</u> 939 69.4%	
Citizenship status	<u>U.S. Citizen</u> 1272 93.9%	<u>Not U.S. Citizen</u> 82 6.1%	

Experience Variables

Outside Company (years)	<u>Mean</u> 4.10	<u>S.D.</u> 3.42
At Company (years)	4.27	3.19
Performance Rating 1 (low) - 3 (high)	1.76	0.38

¹American Indian, Black, and Hispanic

Table 2

Descriptive Statistics of Level 2 Employees (n=1154)Demographics

Gender	<u>Male</u>	<u>Female</u>	
	1026	128	
	88.9%	11.1%	
Race	<u>White</u>	<u>Asian</u>	<u>Minority¹</u>
	520	602	32
	45.1%	52.2%	2.8%
Marital Status	<u>Married</u>	<u>Single</u>	
	428	726	
	37.1%	62.9%	
Citizenship status	<u>U.S. Citizen</u>	<u>Not U.S. Citizen</u>	
	450	704	
	39.0%	61.0%	

Experience Variables

	<u>Mean</u>	<u>S.D.</u>
Outside Company (years)	6.03	3.14
At Company (years)	3.83	3.07
Performance Rating 1 (low) - 3 (high)	1.70	0.38

¹American Indian, Black, and Hispanic

Table 3

Means, Standard Deviations of Experience Variables by Gender

LEVEL 1

	<u>Male (n=1046)</u>	<u>Female (n=308)</u>
	<u>Mean</u> <u>(S.D.)</u>	<u>Mean</u> <u>(S.D.)</u>
Experience outside company (years)	4.02 (3.17)	4.41 (4.16)
Experience at company (years)	4.42 (3.24)	3.77 (2.93)
Performance Rating 1 (low) - 3 (high)	1.76 (.38)	1.75 (.39)

LEVEL 2

	<u>Male (n=1046)</u>	<u>Female (n=128)</u>
	<u>Mean</u> <u>(S.D.)</u>	<u>Mean</u> <u>(S.D.)</u>
Experience outside company (years)	5.96 (3.11)	6.63 (3.36)
Experience at company (years)	3.90 (3.10)	3.22 (2.68)
Performance Rating 1 (low) - 3 (high)	1.70 (.38)	1.70 (.39)

Table 4

Means, Standard Deviations of Experience Variables by Race

LEVEL 1

	<u>White</u> (n=1153)	<u>Asian</u> (n=152)	<u>Minority</u> ¹ (n=49)
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
Experience outside company (years)	4.10 (3.48)	3.96 (2.93)	4.58 (3.63)
Experience at company (years)	4.37 (3.20)	3.66 (2.81)	3.77 (3.71)
Performance Rating 1 (low) - 3 (high)	1.77 (.38)	1.65 (.39)	1.71 (.37)

LEVEL 2

	<u>White</u> (n=520)	<u>Asian</u> (n=602)	<u>Minority</u> ¹ (n=32)
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
Experience outside company (years)	6.26 (3.30)	5.85 (2.97)	5.68 (3.48)
Experience at company (years)	4.14 (3.24)	3.60 (2.91)	2.88 (2.51)
Performance Rating 1 (low) - 3 (high)	1.73 (.37)	1.67 (.38)	1.65 (.35)

¹American Indian, Black and Hispanic

personnel records kept by the company. The specific variables looked at were: work experience gained before entering the present company (in years), highest degree earned before entering the present company, length of service at the present company (in years), and level of performance at the present company.

Work experience gained before entering the company was measured using the following formula: age of employee - length of service at present company - 20. This formula takes into account the fact that the employee began work at the company within three years after earning a college degree and presumes that the employee began gaining work experience after the age of 20, typically a person's junior year in college.

Performance at the present company was measured by the average score of the last five performance appraisals an employee received. If an employee had not received five appraisals, an average was taken of all appraisals the employee has received. Performance appraisals are based on quarterly reports written by the employee, direct input from the employee and his/her supervisors, and input from clients the employee works with. Appraisals are given to each employee yearly in a group session where an employee's supervisors, a human resources professional, and a performance appraisal facilitator meet to discuss the employee's accomplishments

throughout the past year. At this meeting, all supervisors list three strong points and three areas of development for the employee, with examples. The group then discusses the overall performance of the employee and reaches a consensus on the rating he/she is given.

Based on previous research, demographic variables used in this study were: gender, race, marital status (married or single), and citizenship status. The race variable was divided into three categories: white, Asian, and minority (American Indian, Black, and Hispanic). Asian employees comprise a separate category because they cannot be included in the white category and they do not qualify as a minority because they are highly represented in the company. At some levels of the company, including Level 2, Asian employees outnumber both whites and minorities.

RESULTS

The means and standard deviations of Level 1 and Level 2 employees are listed in Tables 1-4. In Level 1, the majority of employees are white males who are U.S. citizens while Level 2 is composed primarily of Asian males who are non-U.S. citizens. Looking at both levels, male employees have more experience at the company and less experience outside the company than female employees while both male employees and female employees have received equal performance ratings. White Level 1 employees have more

organizational tenure and slightly higher performance ratings than non-white employees. In Level 2, white employees have more experience outside the company and more organizational tenure than non-white employees. Overall, as expected, Level 2 employees have more experience outside the company and more tenure within the company than Level 1 employees.

To test the hypothesis that female employees are not advancing as far up the corporate hierarchy as are male employees, chi square statistics were computed using gender and number of promotions in the company. To control for the effects of education and level of entry into the company, separate chi square statistics were calculated for Level 1 and Level 2 employees. For Level 1 employees, it was determined that male employees receive a greater number of promotions than female employees, [$\chi^2 (3) = 12.85, p < .01$] (see Table 5). Specifically, Table 5 shows 32.1% of female employees have received no promotions and 26.7% of male employees have received no promotions. In addition, 23.4% of male employees have received 3+ promotions, while only 14.3% of female employees have received 3+ promotions.

Looking at Level 2, it was determined that male employees have received slightly more promotions than female employees, but this difference in promotions received was not significant [$\chi^2 (3) = 7.33, p = .06$] (see Table 6).

Table 5

Number of Promotions, Level 1 Employees, by Gender

Number of Promotions in Company	Gender of Employee		
	Male	Female	Total
	No Promotions	279 (26.7%)	99 (32.1%) 378 27.9%
	1 Promotion	306 (29.3%)	101 (32.8%) 407 30.1%
	2 Promotions	216 (20.7%)	64 (20.8%) 280 20.7%
	3+ Promotions	245 (23.4%)	44 (14.3%) 289 21.3%
Total	1046 100.0%	308 100.0%	1354 100.0%

$$\chi^2 = 12.85$$

$$df = 3$$

$$sig = .005$$

Table 6

Number of Promotions, Level 2 Employees, by Gender

	Gender of Employee		
	Male	Female	Total
No Promotions	454 (44.2%)	66 (51.6%)	520 45.1%
1 Promotion	271 (26.4%)	39 (30.5%)	310 46.9%
2 Promotions	152 (14.8%)	11 (8.6%)	163 14.1%
3+ Promotions	149 (14.5%)	12 (9.4%)	161 14.0%
Total	1026 100.0%	128 100.0%	1154 100.0%

Number of
Promotions in
Company

$$\chi^2 = 7.33 \quad df = 3 \quad sig = .06$$

However, 29.3% of male employees who entered the company at Level 2 have received at least 2 promotions while only 18.0% of female employees have received 2 or more promotions. Although this was not statistically significant, it does show that male Level 2 employees have received more promotions, on average, than female Level 2 employees.

In order to test the second hypothesis, that minority employees are not advancing as far up the corporate hierarchy as are white employees, chi square statistics were computed using race and number of promotions in the company. To again control for the effects of education and level of entry into the company, separate chi square statistics were calculated for Level 1 and Level 2 employees. The chi square for Level 1 employees was significant, showing that white employees receive more promotions than non-white employees [$\chi^2 (6) = 24.32, p < .001$] (see Table 7). Specifically, 26.2% of white employees have received no promotions, while 34.9% of Asian and 46.9% of minority employees have received no promotions. In contrast, 23.0% of white employees have received 3 or more promotions but only 11.8% of Asian employees and 12.2% of minority employees have received at least 3 promotions.

For Level 2 employees the chi square statistic was also significant, showing that white employees receive more promotions than non-white

Table 7

Number of Promotions, Level 1 Employees, by Race

Number of Promotions in Company	Race of Employee				
		White	Asian	Minority	Total
	No Promotions	302 (26.2%)	53 (34.9%)	23 (46.9%)	378 27.9%
	1 Promotion	339 (29.4%)	54 (35.5%)	14 (28.6%)	407 30.1%
	2 Promotions	247 (21.4%)	27 (17.8%)	6 (12.2%)	280 20.7%
	3+ Promotions	265 (23.0%)	18 (11.8%)	6 (12.2%)	289 21.3%
	Total	1153 100.0%	152 100.0%	49 100.0%	1354 100.0%

$$\chi^2 = 24.32 \quad df = 6 \quad sig = .0005$$

employees [$\chi^2(6) = 19.69, p < .01$] (see Table 8). Here, almost 60% of minority employees have not received a promotion while 39.6% of white employees and 49.0% of Asian employees have received no promotions. Also, 16.3% of white employees and 12.3% of Asian employees have received 3+ promotions but only 6.3% of minority employees have received 3+ promotions.

The above calculations support the existence of a glass ceiling for female employees and minority employees in both Level 1 and Level 2. In order to determine if any factors, besides gender and race, contribute to this glass ceiling, an hierarchical multiple regression analysis was conducted. Specifically, the author wanted to determine if, after the work experience of an employee and his/her performance in the company are taken into account, do gender and race still add significant predictive value when predicting current level in the company? To control for the effects of education and level of entry into the company, separate hierarchical regression analyses were conducted for Level 1 and Level 2 employees. Also, for both of the regressions the demographic variables were entered in all possible combinations and the results of the regressions remained consistent.

For Level 1 employees, the experience variables (experience outside company, length of service at company, and average performance rating) were entered first into the regression analysis [$F(3, 1350) = 1137.22, p < .001$,

Table 8

Number of Promotions, Level 2 Employees, by Race

	Race of Employee			
	White	Asian	Minority	Total
No Promotions	206 (39.6%)	295 (49.0%)	19 (59.4%)	520 45.1%
1 Promotion	139 (26.7%)	165 (27.4%)	6 (18.8%)	310 26.9%
2 Promotions	90 (17.3%)	68 (11.3%)	5 (15.6%)	163 14.1%
3+ Promotions	85 (16.3%)	74 (12.3%)	2 (6.3%)	161 14.0%
Total	520 100.0%	602 100.0%	32 100.0%	1154 100.0%

Number of
Promotions in
Company

$$\chi^2 = 19.69 \quad df = 6 \quad sig = .003$$

$R^2 = .7165$] (see Table 9). It was determined that 71.7% of the variability associated with current level can be accounted for by the experience variables. In the second step, gender was entered into the regression. Gender contributed only .037% of unique variability and was not a significant predictor of current level after experience was taken into account. In the third step, marital status was entered. Marital status was entered separately because it is the only demographic variable not concerned with race or gender. This variable contributed only .028% of unique variability and was not a significant predictor of current level after experience was taken into account. In the fourth and final step, the race variables (minority status, Asian status, and citizenship status) were entered as a set into the regression. After the experience variables were entered, the race variables added .332% of unique variability to the prediction of the current level of Level 1 employees. Thus, the race variables add a significant amount of predictive ability when predicting current level in the company, even after work experience and performance at the company are taken into account. This supports the existence of a glass ceiling for Level 1 non-white employees.

A second hierarchical multiple regression was performed using Level 2 employees (see Table 10). Again, the experience variables were entered first [$F(3, 1150) = 1082.33, p < .001, R^2 = .7385$]. It was determined that 73.9%

Table 9

Hierarchical Multiple Regression Predicting Present Level of Level 1 Employees

Step	Variables Entered	Multiple R	R Square	R Square Change
1	Average Rating Experience (not in company) Experience (at company)	.8465	.7165**	
2	Gender (0 = Male, 1 = Female)	.8467	.7169**	.0004
3	Marital Status (0 = Single, 1 = Married)	.8468	.7171**	.0003
4	Minority Status (0 = Non-minority, 1 = Minority) Asian Status (0 = Non-Asian, 1 = Asian) Citizenship Status (0 = Non-citizen, 1 = Citizen)	.8489	.7205**	.0033*

**p<.001
*p<.005

Table 10

Hierarchical Multiple Regression Predicting Present Level of Level 2 Employees

Step	Variables Entered	Multiple R	R Square	R Square Change
1	Average Rating Experience (not in company) Experience (at company)	.8593	.7385**	
2	Minority Status (0 = Non-minority, 1 = Minority) Asian Status (0 = Non-Asian, 1 = Asian) Citizenship Status (0 = Non-citizen, 1 = Citizen)	.8597	.7391**	.0006
3	Gender (0 = Male, 1 = Female)	.8598	.7393**	.0002
4	Marital Status (0 = Single, 1 = Married)	.8606	.7406**	.0013*

**p<.001

*p<.005

of the variability associated with current level can be accounted for by the experience variables. In the second step, the race variables were entered. For Level 2 employees, race did not add significant predictive ability after taking experience and job performance into account. In Step 3, gender was entered into the regression. Gender contributed only .019% of unique variability and was not a significant predictor of current level after experience was taken into account. In the fourth and final step, marital status was entered into the regression. After the experience variables were entered, marital status added significant predictive value when predicting the current level of employees who entered the company at Level 2. Specifically, marital status added .129% of unique variability to the prediction of current level, meaning that employees who entered the company at Level 2 and are married are at a slightly higher current level than employees who entered the company at Level 2 and are single (see Table 11). This supports the existence of a glass ceiling for Level 2 single employees.

DISCUSSION

Is There a Glass Ceiling?

The first hypothesis, that female employees will not be advancing as far up the corporate hierarchy as are male employees, was supported for Level 1 employees. Specifically, it was determined that female employees who entered

Table 11

Number of Promotions, Level 2 Employees, by Marital Status

		Marital Status of Employee		
		Single	Married	Total
Number of Promotions in Company	No Promotions	361 (49.7%)	159 (37.1%)	520 45.1%
	1 Promotion	194 (26.7%)	116 (27.1%)	310 26.9%
	2 Promotions	88 (12.1%)	75 (17.5%)	163 14.1%
	3+ Promotions	83 (11.4%)	78 (18.2%)	161 14.0%
	Total	726 100.0%	428 100.0%	1154 100.0%

$$\chi^2 = 23.93$$

$$df = 3$$

$$sig = .00003$$

the company at Level 1 did not receive as many promotions, on average, as did male Level 1 employees. This supports the existence of a glass ceiling for Level 1 female employees.

Looking at Level 2 employees, however, the results are more difficult to interpret. Although an examination of the numbers indicates that female Level 2 employees averaged fewer promotions than male Level 2 employees, the difference in number of promotions was not statistically significant.

One possible reason for this lack of a statistically supported glass ceiling for Level 2 employees was noted by Beverley Wadsworth in her January, 1990, speech to female risk managers (Calise, 1990). Ms. Wadsworth stated that for a female employee to advance in a company she must excel. "Where a man would just have to be a satisfactory employee,... a woman would have to be outstanding in order to get the recognition for advancement" (cited in Calise, 1990). Perhaps female employees who have earned a masters degree in a technical discipline and are presently employed in this competitive field are those women who could be described as "outstanding". Another possibility is that these women, who have established themselves in a male-dominated environment and who constitute only 11.1% of Level 2 employees, are viewed by the company as having excelled and therefore receive the same number of promotions as male employees.

The second hypothesis, that minority employees will not be advancing as far up the corporate hierarchy as are white employees, was supported for both Level 1 and Level 2 employees. Specifically, it was found that in both Level 1 and Level 2, Asian employees and minority employees did not receive as many promotions as did white employees. This finding is especially notable for Level 2 employees, where Asian employees and minority employees make up almost 55% of the population. The fact that Asians and minorities constitute the clear majority of employees in Level 2 and are still not receiving the same number of promotions as white employees is potentially alarming. This finding that a glass ceiling exists for Asian employees and minority employees should be looked at more closely. It is possible that other factors besides discrimination may be contributing to this glass ceiling, such as a lack of fluency in the English language or a limited tenure at the company due to an international visa. This does not necessarily justify a glass ceiling, but may help explain it.

Why Is There a Glass Ceiling?

After the results of the chi square statistics supported the existence of a glass ceiling for Level 1 female employees and for both Level 1 and Level 2 non-white employees, hierarchical multiple regression analyses were conducted to determine if any factors, besides gender and race, help explain this glass ceiling. The experience variables (experience outside the company,

length of service at the company, and average performance rating) were entered into the regression first, followed by the demographic variables. This was done to determine if the gender, race, and marital status of an employee adds significant predictive value when predicting present level after an employee's work experience and performance on the job are taken into account.

The first regression analysis, using Level 1 employees, showed that over 71% of the variability associated with current level of an employee can be accounted for by the experience variables. The second variable entered, gender, added only .037% of unique variability to the prediction of present level. This result indicates that once work experience and job performance are taken into account gender is not a significant predictor of current level. The third variable entered, marital status, accounted for .028% of the variability associated with current level, but this was also not statistically significant. The fourth and final set of variables entered, the race variables, accounted for .332% of unique variability associated with current level in the company, which was significant. Thus, even after work experience, job performance, gender, and marital status are taken into account, the race and citizenship status of an employee adds significant predictive ability when determining his/her present level. Specifically, when work experience and on-the-job performance are

comparable, an employee who is a minority or Asian or is not a U.S. citizen will receive less promotions than a white employee who is a U.S. citizen. This significance of the race variables adds strength to the earlier finding of a glass ceiling for minority employees who entered the company at Level 1.

An hierarchical regression analysis, conducted to predict the current level of employees who entered the company at Level 2, indicated that almost 74% of the variability associated with current level can be accounted for by work experience and on-the-job performance. The second set of variables entered, the race variables, added .064% of unique variability to the prediction of present level, which was not significant. The third variable entered, gender, accounted for .019% of the variability associated with current level, but again, this was not significant. These findings indicate that once work experience and job performance are taken into account, neither race nor gender is a significant predictor of current level. Differences in promotion rates between male and female employees and white and non-white employees can be explained by differences in work experience and organizational tenure. Therefore, since male employees and white employees have been at the company longer, they have received more promotions.

An unexpected finding was that the fourth and final variable entered, marital status, accounted for .129% of unique variability associated with current

level in the company, which was significant. Thus, even after work experience, job performance, race, and gender are taken into account, the marital status of an employee adds significant predictive ability when determining his/her present level. Specifically, Level 2 employees who are married can expect to be at a slightly higher current level in the company than Level 2 employees who are single.

Several possible reasons that married employees can expect to be at a higher current level than single employees have been proposed in the literature. One possible reason is termed the spouse-as-resource argument and presumes that married employees have additional resources to invest in their careers (Pfeffer & Ross, 1982). Specifically, it has been proposed that spouses make four types of contributions to their mates' careers: 1) direct substitution - the spouse performs work that could be done by a paid employee; 2) indirect support - the spouse builds relationships with important others; 3) consultation - the spouse gives advice and discusses job matters with the employee; and 4) emotional aid - the spouse gives encouragement and emotional support which increases the confidence and motivation of the employee (Kanter, cited in Pfeffer & Ross, 1982). Taken as a whole, these four contributions are theorized to make an employee more productive at work and in turn, receive more promotions.

A second proposed theory why married employees receive more promotions than single employees is called the "financial need" theory (Pfeffer & Ross, 1982). This theory simply states that having a spouse, and perhaps a family, indicates greater financial need and therefore a married employee will earn more than a single employee. The principle behind this theory is that an employee's salary will be at least partly determined by his/her needs; a married employee will be perceived to have greater financial need and will therefore have a higher salary than a single employee.

A third explanation why married employees receive more promotions than single employees is that an employee who is married is thought to have fundamental properties important to being a successful employee (Spence, cited in Pfeffer & Ross, 1982). Specifically, a married employee is thought to be more stable and more responsible than a single employee and therefore will be more likely to receive a promotion.

Strengths and Limitations

The above research, showing that female employees and non-white employees receive fewer promotions than male employees and white employees, respectively, supports previous research on the existence of a glass ceiling. Unlike previous glass ceiling studies, however, this study relied on objective personnel data, eliminating the bias inherent in anecdotal and

opinion-based studies. In this study, it was statistically determined that non-white employees receive less promotions than white employees even after work experience and performance on the job are taken into account.

Although the results of this research can be seen as discouraging to female employees and minority employees, there were two limitations to this study that must be discussed. First, although education completed before entering the company was carefully controlled for, some employees may have completed an additional college degree after entering the company. For example, a Level 1 employee with a bachelors degree may have earned a masters degree after entering the company. This would increase the employee's promotability and, as a result, he/she could expect to receive more promotions or to receive the same promotions more quickly than an employee who has not earned an additional degree. Along the same lines, an employee who has taken an extended leave of absence for medical or other reasons would have less promotability than an employee with no breaks in his/her tenure at the company.

The second limitation to this study was that it was confined to variables that the company includes in its personnel records. Although the experience variables are arguably the most important when predicting current level, there are other variables the author would have liked to include in the regressions.

For example, the number of children an employee has at home and whether or not he/she is a single parent could have a big impact on his/her productivity at work. If an employee has many responsibilities at home, he/she may not spend as many hours at the office as his/her peers and may have less energy to devote to work.

A second example of a variable that might have added predictability to the regressions are the English and communications skills of an employee. An employee who speaks or writes less than fluent English or has poor communications skills would have less promotability than an employee who speaks and writes perfect English or an employee who has excellent communications skills. Unfortunately, neither variable mentioned above is included in the company's personnel records. In addition, the second set of variables, English and communications skills, would have to be measured in a subjective manner, such as questionnaires or interviews.

Implications of Study

The finding of a glass ceiling for non-white employees that is not due to unequal qualifications suggests that organizations must do something to foster equal promotion rates for white males, females, Asians, and minorities. Several methods to reduce the glass ceiling have been proposed (Dominguez, 1991-92). One suggestion involves the use of mentoring to facilitate the

advancement of female employees and minority employees. Managers who provide career support and advice can strongly benefit the career advancement of their subordinates. Those who practice mentoring, however, should keep in mind that "the mentor and potential manager must identify with each other and connect emotionally" (Dominguez, 1991-92) in order for the mentoring to be beneficial.

A second suggestion to reduce the glass ceiling is to ensure that female employees and minority employees have the same access as white male employees to all formal and informal development and training programs. This includes all training programs offered by the company as well as committee and task force assignments. Also, care must be taken to ensure that female employees and minority employees have equal access to job assignments that may enhance their careers (Dominguez, 1991-92).

A third suggestion to reduce the glass ceiling is the use of sensitivity training to help managers and their employees successfully manage the cultural diversity of today's workforce (Dominguez, 1991-92). The purpose of sensitivity training is to increase employees' awareness of culture and cultural differences as well as to reduce stereotypes and to promote harmonious relationships among employees.

Future Research

Regarding future research, the author suggests that a study be conducted comparing minority female employees to white male employees. Unfortunately, due to the small number of minority female employees in the company studied, in this case a meaningful study comparing white male employees to minority female employees could not be conducted.

A second recommendation for future research involves looking more closely at top-level female and minority employees. Specifically, since this study did not find a statistically significant glass ceiling for female employees with masters degrees, it would be interesting to examine the career paths of highly-educated women in other companies. Since the present study examined the advancement of employees who entered the company at entry levels, it would also be interesting to trace the career progression of female employees and minority employees who entered the company at a higher than entry level and should therefore be represented in the ranks of middle and top-level management.

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To: Tracy Graham, Psychology
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From: Serena W. Stanford
AAVP, Graduate Studies and Research

Date: June 4, 1992

The Human Subjects-Institutional Review Board has reviewed and approved your request for exemption from Human Subjects Review for the proposed study entitled:

"Does the Glass Ceiling Really Exist: An Empirical
Test of an Organization"

You may proceed with this study without further review by the Human Subjects-Institutional Review Board.

I do caution you, however, that Federal and State statutes and University policy require investigators conducting research under exempt categories to be knowledgeable of and comply with Federal and State regulations for the protection of human subjects in research. This includes providing necessary information to enable people to make an informed decision regarding participation in your study. Further, whenever people participate in your research as human subjects, they should be appropriately protected from risk. This includes the protection of the confidentiality of all data that may be collected from the subjects. If at any time a subject becomes injured or complains of injury, you must notify Dr. Serena Stanford immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised when people participate in your research as human subjects, each subject needs to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have questions, please contact me at 408-924-2480.

CC: Howard Tokunaga, Ph.D.