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the USA

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Enhancing Women's Inclusion in Firefighting in the USA

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Abstract: Of paid firefighters in the USA, 3.7% are women, compared to an expected representation of at least 17.0%. Although low female employment in this attractive career is often attributed to the job's physical demands, its fundamental cause is an occupational culture excluding many race and gender groups. This culture is the underlying problem, of which women's under-hiring, "glass ceiling," occupational segregation, lack of accommodation, social isolation, and sexual harassment are symptoms. Our surveys of firefighters and fire departments identify best practices for addressing such issues. However, for permanent change, these practices must be encompassed within development of an inclusive workplace culture.

Keywords: Gender Discrimination, Non-traditional Occupations, Workforce Diversity, Systemic Barriers to Inclusion, Stereotypes

Introduction

FIREFIGHTING CAN BE physically demanding, dangerous, and stressful.¹ However, compared to other occupations in the USA accessible with only a secondary school diploma, it offers superior wages, fringe benefits, job security, time off, pensions, excitement, camaraderie and prestige. Together, these elements create a very desirable career.

As in many desirable careers, firefighting has long been overwhelmingly male. This paper examines women's entry into the occupation in recent decades in the USA, their workplace experiences, and best practices by which employers can enhance women's inclusion in the field. We define inclusion to mean more than hiring in numbers proportionate to women's availability, a goal which itself remains far from being achieved. It also means that, throughout their careers, women are treated equally to men in how they are welcomed, trained, assigned, retained, promoted, and otherwise given the opportunity to thrive. Inclusion is an ambitious goal but essential

if increases in women's employment are to be meaningful and self-sustaining.

This paper first describes the firefighting occupation in the USA and women's employment within it. The paper then uses a structured survey of 675 male and female firefighters to document barriers to inclusion women continue to encounter. We then draw on that survey, a structured survey of 114 fire departments, and several hundred interviews² to identify best practices by employers to reduce these barriers. The final section of the paper summarizes our findings concerning how to enhance the inclusion of women among "America's heroes."

Key Characteristics of the Firefighting Occupation³

About 350,000 persons in the USA currently work as paid firefighters, and their number is expected to grow more than 18% over the next decade. About 90% are employed by municipal governments, from urban departments with several thousand uniformed

¹ This research was funded by the Ford Foundation. We appreciate contributions to data collection and analysis by Mary Lou Egan, John Miller, the Association for Advancing Women's Equality, and the International Association of Women in Fire and Emergency Services. However, the authors alone bear responsibility for all findings and conclusions.

² During 2004 and 2005, we mailed confidential structured questionnaires to the 972 departments across the USA with at least 100 paid employees. We received 114 usable replies, a response rate of 11.7%, from departments in 39 states, ranging in size from 103 paid firefighters to more than 3,000, and together employing 51,281 paid firefighters.

Between 2004 and 2006, non-random, confidential, semi-structured individual interviews were conducted with 175 women firefighters from a range of departments nationwide. Additionally, 13 focus groups were conducted with women firefighters, typically in race/ethnically homogeneous groups of about nine. The authors also conducted week-long "case studies" in which they observed operations, reviewed data and documents, and interviewed employees and officials in five departments (Kansas City, Los Angeles City, Minneapolis, Prince William County (VA), and Seattle).

³ This description is based on US Department of Labor (2006), Berkman, Floren and Willing (1999), Chetkovich (1997), Paul (1998), and the sources described in footnote 2.



officers to suburban and rural ones where a handful of paid employees are supplemented by volunteers.⁴

As the occupation's title signals, a principal duty is fire suppression. This activity requires strength, stamina and agility in dragging heavy hoses, hoisting and climbing ladders, making forcible entries with chain saws and axes, moving injured victims, and conducting salvage operations. It also requires physical courage to participate in crash-prone, high-speed drives to emergency scenes and enter burning buildings presenting unpredictable hazards from smoke, flames, explosions and structural collapse. Firefighting's line-of-duty death rate is nearly four times the average occupation in the US labor force.⁵

Other job duties related to fire suppression include maintenance of fire-fighting equipment, rescue work on land and water, fire safety inspections, fire investigations, fire prevention education, hazardous materials management, and homeland security response. However, all duties together typically leave firefighters with unoccupied paid hours at the firehouse awaiting call-outs when they engage in personal activities or simply fight boredom.

Administration of first aid to victims of fires, car crashes, drownings, cardiac emergencies, violence, or out-of-hospital childbirths, and assisting "load and go" ambulances, have long been additional firefighter duties. Paid firefighters typically have basic training as "first responder" emergency medical technicians. However, in recent years, their emergency medical duties have increased substantially. Among the departments responding to our survey, an average of 67.9% of emergency calls was for medical assistance, not fire suppression.

In response to these medical demands, about 65% of fire departments operate their locality's emergency ambulance services. Many departments increasingly seek uniformed employees certified as paramedics -- emergency medical technicians whose two years of advanced training entitles them to administer intravenous drugs, interpret electrocardiograms, and implement other treatments under medical supervision by radio. These individuals may be employed as firefighter-paramedics or as paramedics stationed in firehouses.

The need for rapid response to emergency calls 24 hours a day generates perhaps the most unique aspect of firefighters' work lives, their living arrangements. In the most common schedule in the USA, paid firefighters remain in their fire houses through-

out 24 hours of continuous duty, followed by 48 hours off duty. Extended periods of continuous close proximity, working, living, cooking, eating, lounging and sleeping as a team tend to build occupational camaraderie and strong personal ties among co-workers.

Firefighting work is traditionally conducted along para-military lines. Employees wear uniforms, are trained in "academies," and carry hierarchical ranks such as lieutenant, captain, battalion chief, and assistant chief. Tasks are typically governed by written rules, standard procedures, and orders issued through a chain of command with limited explanations.

To be hired as an entry-level firefighter typically requires a secondary school diploma but no post-secondary education or work experience. These limited prerequisites open opportunities to a large fraction of the US labor force, for whom the occupation offers attractive compensation compared to likely alternative jobs. Among firefighters nationwide in 2005, the average hourly wage was US\$19.42, 22.4% higher than the average blue collar occupation (US Department of Labor, no date).

Three circumstances further enrich the occupation's financial rewards. First, as public employees and deliverers of essential public services, firefighters enjoy low risk of layoffs and unemployment. Second, as public employees, firefighters typically receive generous fringe benefits; in 2006, service workers in US state and local government received an average of US\$.64 in fringe benefits for every US\$1 of wages, compared to US\$.34 per \$1 among service workers in the private sector (US Department of Labor, 2007). For firefighters, these fringe benefits typically include generous pensions, often half-pay for their lifetime after 25 years of service. Third, taking advantage of their unusually large number of off-duty hours, such as 48 hours off after every 24 hour shift, firefighters commonly "moonlight" at paid second jobs. In the most recent national survey, 28.1% of firefighters reported holding second jobs, the highest proportion of any occupation (Amirault, 1995, 11), and informal estimates suggest that the rate is often as high as 90%. Taking all these factors into account, one study estimated that entry-level firefighter employment in the Chicago Fire Department is worth at least 31.3% more than the average employment alternative for persons with the same qualifications (Bendick, 2002, 20).

⁴ As of 2005, 24,147 fire departments were registered with the National Fire Census, but only 3,140 (13.0%) were staffed primarily or exclusively by paid employees (U.S. Fire Administration, 2005).

⁵ While quadruple the average occupation and one-fifth higher than police officers, the death rate for firefighters is well below other occupations, such as logger and commercial fishers (both 27 times the average occupation), as well as farmers, truck drivers, and construction laborers (Clark and Zak, 1999, 7). This ranking reflects the fact that firefighters engage in highly dangerous activities -- answering emergency calls and suppressing large fires, where the majority of the 50 work-related deaths nationwide each year occur -- less than 10% of their duty time (Berkman, Floren and Willing, 1999, 17). We return to this point below in discussing disparities between the occupation's self image and the realities of daily work life.

In addition to financial rewards, firefighting has long enjoyed occupational prestige, ranking in opinion polls near the top among blue collar occupations and often outranking even highly-educated professions such as doctors and scientists (Harris, 2006). Following the heroism of New York City firefighters as first responders to the terrorist attacks of September 11, 2001, public admiration in the USA rose even higher. In part because of such admiration, firefighters generally express great pride in serving their communities and high job satisfaction.

Reflecting all these circumstances, firefighting must certainly be considered a very desirable occupation for many US workers. Consistent with this conclusion, job seekers typically apply in large numbers when vacancies are announced, despite often small probabilities of being hired. For example, when Chicago offered an entry-level firefighter examination in 1995, 26,048 applicants sat for the examination, from which only 4.6% were eventually hired (Bendick, 2002, 4).

Women's Gradually Increasing Employment

As in many attractive occupations, firefighting has long been male-dominated. The first female paid firefighter in the USA was hired around 1973, and women did not appear in more than scattered numbers until the 1980s.⁶ The USA's most recent national census, in 2000, reported slightly more than 11,000 paid women firefighters nationwide, 3.7% of all persons in the occupation.⁷ This representation places firefighting in the lowest 11th percentile of occupations in the proportion of women employees (US Department of Labor, 2002).

These women disproportionately work in a relatively limited number of fire departments, with no women firefighters having ever worked in more than half the nation's departments with paid employees. Among the 291 Metropolitan Statistical Areas reported in the USA's 2000 Census, 51.2% had 0.0% paid women firefighters in the entire metropolitan area, typically encompassing multiple fire departments. As of 2005, departments in jurisdictions as large as Garden Grove, CA, population 165,000, remained entirely male (Women in the Fire Service, 2005, 5). The USA's largest city, New York, counts less than

one-quarter of one percent women among its uniformed employees, and its second largest city, Los Angeles, employs 2.5%.

We developed a benchmark for the expected female representation among firefighters by computing from the 2000 US Census the proportion of women in the nation-wide labor force of typical firefighter age (20–49) and educational background (secondary school graduate but no four-year post-secondary degree) employed at least 35 hours per week in one of 184 occupations resembling firefighting in requiring strength, stamina, and dexterity, and/or involving outdoor, dirty or dangerous work. These comparison occupations include: bus mechanics, drywall installers, enlisted military personnel, highway maintenance workers, loggers, professional athletes, refuse collectors, roofers, septic tank servicers, tire builders, and welders. The proportion of women among these persons in the USA's labor force nationwide is 17.0%.

Current employment of women in selected fire departments can be used to check the plausibility of this 17.0% benchmark. Women now approach, equal, or exceed 17.0% of uniformed fire officers in a number of jurisdictions. Large departments with the highest proportion of women include: Minneapolis, MN (17%); Madison, WI (15%); San Francisco, CA (15%); Boulder, CO (14%); and Miami-Dade, FL (13%) (Women in the Fire Service, 2005, 5). Among departments responding to our survey, 20 (16.4%) reported having 10.0% or more women among their uniformed officers, including two over 17.0%.

To examine a more systematic sample of jurisdictions, we computed the average representation of women among firefighters in the 291 large metropolitan areas reported in the 2000 US Census. Particularly because of common requirements that firefighters reside within the jurisdiction which employs them, firefighters living in a metropolitan area often approximate the firefighters employed by the largest department in that area. Among the 29 (10.0%) of metropolitan areas with the highest proportion of women firefighters, the average is 14.5%, including such diverse locations as Allentown-Bethlehem-Easton, Pa (12.2%); Anchorage, AK (14.1%); Jacksonville, FL (11.2%); Kalamazoo, MI (23.7%); Racine, WI (18.6%); Redding, CA (17.1%); Sarasota, FL

⁶ Passage of the USA's national Civil Rights Act of 1964 entitled both women and race/ethnic minorities to equal employment opportunities. However, many departments which were both all white and all male began to hire persons of color during the early 1970s but women only in the late 1980s. Among departments responding to our survey, their first women was hired an average of 14 years after their first race/ethnic minority.

⁷ Consistent with this figure, Women in the Fire Service (2005, 5) estimates there were 6,140 suppression-trained women in career, paid, structural firefighting in 2005, as well as 30,000 women among the volunteer and paid on-call firefighters in smaller suburban or rural jurisdictions.

(12.3%); Springfield, IL (19.0%); and Tuscaloosa, AL (24.0%).⁸

In 2000, if women nationwide had been employed at the 17.0% rate, there would have been 39,742 additional women firefighters, or 50,577 total women, more than quadruple their actual number of 11,135. In that year, if women of color had been employed at an expected rate computed by the same method as for all women, then 13,552 (34.1%) of the additional women firefighters would have been women of color.

The Work Life of Women Firefighters

To understand the circumstances underlying these numbers, between 2003 and 2005 we collected confidential written questionnaires from 675 male and female firefighters in 48 of the 50 states. In the absence of a comprehensive sampling frame to enable random sampling, survey respondents were recruited

via “convenience sampling.” In this case, that procedure meant that women respondents were recruited via professional organizations,⁹ personal contacts, and word of mouth. We then asked each woman respondent to recruit a counterpart male firefighter to complete a separate, identical questionnaire. Table 1 reports that, on eight of 11 personal and professional characteristics, our male and female respondents did not differ to a statistically significant extent.

In Table 2, the second and third columns compare rates of gender-related discrimination or exclusion reported by survey respondents. On all 26 questions examined, women reported a higher rate of gender-based problems than their male counterparts, with statistically-significant differences on 23 of the 26. In response to the broadest question -- “I have experienced different treatment because of my gender”-- a pandemic 84.7% of women agreed, compared to 12.4% of men.

Table 1: Characteristics of Survey Respondents (% of Gender)

Characteristic	Women	Men
	(n=457)	(n=218)
Current position		
firefighter	38.1	39.6
firefighter-paramedic	21.4	17.4
officer other than chief	29.1	32.6
chief officer	6.8	11.0
Employing department		
has > 500 staff	26.9	24.4
works on 24 hour shifts	88.0	87.5
has < 1% females	28.3	20.6 *
Personal characteristics		
plans to seek promotion in the future	71.5	71.0
under age 40	49.2	47.5
> 12 years in fire service	46.5	61.8 **
speaks a non-English language	19.3	18.3
race-ethnic minority (person of color)	12.3	26.7 **

* Difference is statistically significant at $p < .05$

** Difference is statistically significant at $p < .01$

Source: authors' survey of 675 firefighters nationwide, 2003-2005

⁸ In one sense, efforts to increase the representation of women would seem to have their clearest targets in departments with zero women. However, more women's employment is likely to result from increasing representation in a few large departments already at least slightly above zero. Compared to the 17.0% benchmark, the 10 metropolitan areas with under-representation of more than 500 women are: Chicago (1,690 shortfall), New York (1,535), Boston (866), Nassau-Suffolk, NY (703), Detroit (629), Los Angeles (617), Philadelphia (562), Riverside-San Bernardino, CA (556), Orange County, CA (554), and Cleveland (514).

⁹ Women firefighters can obtain professional development and personal support from two national associations – the International Association of Women in Fire and Emergency Services (www.i-women.org) and Black Women in the Fire Service (www.iabpff.org/bwfs/bwfs.htm), as well as state- and department-specific associations (e.g., United Women Firefighters of the Fire Department of New York or the Alabama Women Firefighters Network).

Women are not alone in being traditionally excluded or discriminated against in firefighting. How does the prevalence of gender-based problems compare to those based on race and ethnicity, such as for African Americans and Hispanics? Our data addresses this question in three ways:

The actual employment of racial/ethnic minorities (synonymously, persons of color) can be compared to their expected representation computed as we did for women -- that is, based on their representation in the 2000 US Census among persons of typical firefighting age and education employed full-time in one of 184

“demanding, dirty or dangerous” comparison occupations. According to this analysis, in 2000, race/ethnic minorities accounted for 16.7% of paid firefighters but 30.1% of the benchmark occupations. Dividing the former figure by the latter reveals that persons of color were employed at 55.5% of their expected representation.

The parallel computation for¹⁰women -- 3.7% divided by 17.0% -- shows them employed at 21.8% of their expected representation, a gap more than twice as large as for persons of color.

Table 2: Discrimination or Exclusion Experienced by Firefighters (% of Respondents)

Survey Question	Women	Men	Women of Color	White Women	Women < 40	Women ≥ 40
I have experienced different treatment because of my gender	84.7	12.4 **	87.5	84.3	83.0	86.2
I have encountered problems with ill-fitting equipment	79.7	20.9 **	66.1	81.6	75.7	84.0
My dept. has no procedure for addressing discrimination complaints	65.0	42.7 **	41.1	68.3 *	69.2	60.8
I have seen supervisors' authority challenged because of gender	49.9	21.0 **	59.3	48.7	43.4	55.8
My gender has created barriers to my career advancement	36.5	7.4 **	36.4	36.3	35.2	37.5
Males and females are not treated the same during fire college and/or probation	33.9	17.8 **	26.8	35.0	30.5	37.4
Promotions are not decided upon fairly	33.9	30.6	32.7	34.1	30.3	37.6
Staff in my department are treated differently because of their sexual orientation	30.6	14.4 **	29.1	30.6	30.5	30.8
The hiring process in my department does not fairly select and hire applicants	30.3	22.6 *	32.7	29.8	29.2	31.6
I have not received coaching/mentoring from senior people in my department	25.4	20.4	27.3	24.9	23.0	27.4
My supervisor does not address complaints concerning gender-related incidents	23.4	5.6 **	21.8	23.4	22.0	24.8
Men and women are not treated the same during physical ability testing	13.3	10.5 *	15.4	12.9	8.2	18.0 **
I have experienced incidents involving:						
shunning/isolation	50.8	2.3 **	41.1	52.3	45.5	56.0 *
privacy in showers, dormitory, or when changing clothes	46.2	2.8 **	46.4	46.3	40.1	51.7 *
verbal harassment	42.9	2.8 **	32.1	44.3	38.4	47.4
pornography	31.9	1.4 **	21.4	33.5	26.3	37.5 *
sexual advances	30.2	0.5 **	25.0	31.0	29.5	31.0

¹⁰ In the survey, questions were worded as neutrally as possible. In this and other tables, some responses are reworded so that higher numbers consistently correspond to more discrimination or exclusion.

dormitory accommodations	28.4	2.3 **	30.4	28.3	23.7	33.2 *
training denial or differences	24.3	4.1 **	28.6	23.8	21.0	27.2
other	21.2	5.5	16.1	21.8	25.0	17.7
station assignments	20.4	0.9 **	16.1	21.0	20.5	19.8
hazing	18.6	1.4 **	19.6	18.5	10.3	26.7 **
hostile notes, cartoons, or written material	18.2	0.9 **	16.1	18.5	10.7	25.4 **
mealtime-related difficulties	13.1	0.9 **	14.3	12.8	11.2	15.1
assault	6.3	0.0 **	7.1	6.3	4.9	7.8
These Incidents continue in the present	30.6	6.0 **	28.6	30.8	35.7	25.9 *
Average	34.2	18.8 **	31.5	33.2	31.7	37.8
* Difference is statistically significant at $p < .05$. ** Difference is statistically significant at $p < .01$ <i>Source: authors' survey of 675 firefighters nationwide, 2003-2005.</i>						

- Table 3 reports five questions in which survey respondents were asked in parallel about problems based on gender and on race/ethnicity. On all five topics, women (of all race/ethnicities) reported gender-based problems at a higher rate than persons of color (both men and women) with respect to the same problem based on race/ethnicity.
- Survey respondents were asked to rate firefighting as if they were advising a young person considering the career. According to Table 4, respondents of all gender, race/ethnicity, and ages rated the career higher for white males than for either race/ethnic minorities or women, implicitly recognizing problems faced by both groups. However, the rating was lower for advisees who were women (3.7 to 4.0 on a scale with a top score of 5.0) than for advisees who were person of color (3.9 to 4.1).

Together, these analyses suggest that, while both women and race/ethnic minorities currently face significant discrimination and exclusion in firefighting, the impacts are greater for women based on their gender than for persons of color based on their race/ethnicity.

Women of color, of course, face both gender and race/ethnicity problems simultaneously. A common hypothesis in prior research is that they face even greater discrimination in the labor market than do either white women or males of color -- a "double disadvantage" or "intersectionality." Empirical studies in the USA support this hypothesis in some employment circumstances but not others (e.g., Greenman and Xie, 2006; Browne and Misra, 2003; Xu and Leffler, 1992; American Bar Association, 2006).

Table 3: Prevalence within Fire Careers of Gender-Based Problems Compared to Race/Ethnicity-Based Problems (% of the Adversely-Affected Group)*

Survey Question	Women (All Races)	Persons of Color (Both Genders)
I have experienced different treatment because of my gender	84.7%	
I have experienced different treatment because of my race/ethnicity		44.7%
Gender incidents continue into the present	30.6%	
Race/ethnic incidents continue into the present		15.7%
My supervisor does not take steps to address gender complaints	23.4%	
My supervisor does not take steps to address race complaints		13.0%
My gender is a barrier to my career development	36.5%	
My race/ethnicity is a barrier to my career development		29.8%
I have seen supervisors' authority challenged because of gender	49.9%	
I have seen supervisors' authority challenged because of race/ethnicity		40.2%
* Computation of statistical significance of differences is not appropriate because both respondents and questions differ between the groups. Source: authors' survey of 675 firefighters nationwide, 2003-2005.		

Does this “double disadvantage” apply in firefighting?¹¹ Comparisons between white women and women of color offer some indications that it does. Our Census analysis documents that women of color totaled 2,444 persons in firefighting, 0.8% of all persons in the field, compared to an expected representation of 5.9% -- that is, current representation 13.6% of expected representation. The comparable figure for white women is 26.0% (2.9% divided by 11.1%). Thus, the rate of under-representation is

about double among women of color than among white women.

On the other hand, in the 4th and 5th columns in Table 2, women of color and white women reported gender-based problems at almost identical rates. Responses for women of color on the 26 questions examined in the table averaged 31.5%, not statistically significantly different from the 33.2% for white women. Women of color reported problems at a higher rate than the other group on 12 questions, while white women did so on 14.

Table 4: If I were Advising a Young Person Aspiring to a Fire Career, I would Rate the Career (Average Score on a Scale of 5 = the Best of All Careers and 1 = the Worst of All Careers)*

Race and Gender of the Person being Advised	Race and Gender of Person Offering the Advice					
	Women	Men	Women of Color	White Women	Women < 40	Women ≥ 40
White Male	4.3	4.2	4.5	4.3	4.4	4.3
Race-Ethnic Minority	3.9	4.1	4.0	3.9	4.0	3.9
Female	3.8	4.0	4.0	3.7	3.8	3.7
* Within the first column of data, 4.3, 3.8, and 3.9 are all significantly different from each other at $p < .01$. In comparisons between types of advisors (male-female, women of color-white women, and women < 40-women > 40) advising the same type of person, no differences were statistically significant except for the difference between female and male advisors in advice to females (the difference between 3.8 and 4.0 is statistically significant at $p < .05$). Source: authors' survey of 675 firefighters nationwide, 2003-2005						

Based on this evidence, we might conclude that women of color experience somewhat greater problems

than white females in being hired, but few differences after being hired. We might moderate the second

¹¹ According to Yoder and Aniakudo (1996, 266), African American women firefighters tend not to attribute their treatment separately to race or gender because they view these facets of their lives and personal identities as inextricably intertwined. This analysis therefore incorporates a conceptual structure which might not be accepted by our survey respondents.

part of that conclusion to reflect that, in interviews, women of color almost universally expressed particularly strong feelings of isolation and not being supported by either women’s or minority employee organizations. It would seem judicious to conclude only that, whatever the differences among women of different race/ethnicities, they are more limited than the women’s shared experience of major disadvantage compared to men.

Are women’s experiences in firefighting improving over time? Table 2 examines this question in two ways. First, the sixth and seventh columns in the table compare the experiences of women 40 and over to their younger counterparts, assuming that the latter responses reflect more recent experience than the former. The average rate of reported problems is 6.1 percentage points lower among younger women than their older colleagues -- 31.7% versus 37.8%.

On the other hand, responding to the 26th question in Table 2, 34.0% of all women reported that gender-based problems continue into the present. This figure is strikingly similar to their 34.2% average response to the previous 25 questions, asked without specifying a time period. These data offer little support for characterizing gender discrimination and exclusion as problems of the past or rapidly disappearing. Consistent with this slow rate of change, in moving from approximately 0.0% in 1980 to 3.7% in 2000, the female proportion of firefighters has increased

an average of less than 0.2 percentage points per year. At that rate, females will not constitute 17.0% of firefighters in the USA for another 72 years.

Male-Female Treatment on Six Operational Issues

Guidance concerning how to accelerate this process can be gleaned from our surveys.

Recruiting

When fire department managers are challenged about the absence of women firefighters, they traditionally respond that women do not want and cannot handle the job. These assertions are contradicted by the experience of departments, discussed earlier, where substantial numbers of women are employed. How can departments recruit more such women?

The first section of Table 5 compares women and men survey respondents in terms of their circumstances preceding entry into their firefighting careers. Four points concerning effective recruitment are suggested by their responses.

First, recruiting initiatives targeting women are perceived as more widespread than they actually are. According to the first line of the table, 69.3% of male respondents believed that their departments made such

Table 5: Selected Issues in Firefighter Recruitment and Hiring (% of Gender)

Operation	Survey Question	Women	Men
Recruitment	My department makes special effort to recruit women	35.6%	69.3% **
	I was actively recruited to become a firefighter	8.8%	4.6%
	I read about firefighter job opening in newspaper or flyer	14.2%	12.8%
	Growing up, I wanted to be a firefighter	20.9%	40.1% **
	Growing up, I had firefighter family members or friends	47.5%	48.6%
	I was introduced to firefighting by a family member or friend	60.6%	67.4%
	At the time I applied, I knew the requirements for the job	68.9%	73.4%
	Prior to my first paid fire job,		
	I was an EMT, medical technician, nurse, or other medical	46.6%	34.4% **
	I was active in gym/athletic/sports	35.0%	15.6% **
	I had fire fighting experience	11.4%	15.6%
	I had construction background	5.9%	23.8% **
	I had a fire degree	5.0%	8.2%
	I had military experience	4.2%	18.4% **
I am a college graduate	65.2%	47.0% **	

Hiring	My department's hiring process included a written exam	85.8%	87.2%
	This written exam measured my ability to perform the job	29.5%	33.1%
	My department's hiring includes an oral board	81.6%	85.3%
	My department hiring includes a physical abilities test	91.0%	89.3%
	Of those taking a physical test, % who trained to prepare	78.4%	55.2% **
	Of those taking the test, % passed the first time	85.8%	97.9% **
	This physical test measured my ability to perform the job	42.8%	52.9% **
* Difference is statistically significant at $p < .05$. ** Difference is statistically significant at $p < .01$ <i>Source: authors' survey of 675 firefighters nationwide, 2003-2005</i>			

efforts, but women themselves reported only half that rate. Only 8.8% of women reported being actively recruited, and only 14.2% had encountered recruitment advertising. Low rates of being actively recruited were also reported by our male respondents, suggesting that, without regard to the gender of intended recruits, many departments are not making extensive recruiting efforts or are doing so ineffectively. Departments seeking to increase female firefighters might start by investing in more, and more effective, active recruitment. They should not be deterred by the fact that they already have more applicants than they can hire, because current applicants typically do not include the expected number of women.

Second, personal relationships are very important in recruiting. According to Table 5, 47.5% of female firefighters grew up with a family member or friend who was a firefighter, and 60.5% were introduced to the occupation by such a person. Tellingly, these rates are about the same as for males. Thus, the same person-to-person approaches which are traditional and successful in recruiting men -- proverbially, fathers passing down the occupation to their sons -- can also work with daughters. In interviews, many women firefighters reported hearing about firefighter hiring through family members and friends, and some reported being inadvertently recruited when their husbands or brothers were recruited. Particularly until a critical mass of women firefighters exists to generate its own stream of referrals, departments seeking more women should mobilize personal networks of current employees, retirees, and others toward that goal.

Third, men and women typically come to firefighting with different prior experience. According to Table 5, construction and the military are not as likely recruiting arenas for women as for men, while medical employment, active sports, and high school and community college campuses provide more likely recruiting venues for women than for men. In interviews, women particularly recalled being recruited at fire department-sponsored activities at gyms and sports events. Most medium and large departments assign recruiting staff to attend job fairs,

host open houses, and speak to community and school groups. To increase female applications, departments can target such outreach efforts where recruitment-relevant women are disproportionately to be found.

Fourth, Table 5 reports that women firefighters were somewhat less likely than men to have pictured themselves as future firefighters when they were very young. That pattern can be changed by making women firefighter increasingly visible as role models, as well having persons actively suggest the career to girls and young women. Vocational aspirations of both men and women are strongly influenced by such actions, which expand young persons' sense of what occupations are feasible for them (Phillips and Imhoff, 1997). However, these processes must start years before individuals apply for jobs; among survey respondents who reported wanting to be firefighters since they were a child, both males and females first formed that ambition at about age 11.

As they move closer to recruiting age, young women are less likely than young men to acquire firefighting experience prior to seeking career employment, leaving them less exposed to this career option and less prepared for job-based selection processes. In Table 5, this pattern is reflected in women's lower rates of firefighting experience and fire science degrees. To increase the representation of women, departments can encourage young women's participation in pre-career experiences such as volunteer firefighting, "fire cadet" programs for students and scouts, and summer jobs as seasonal forest firefighters (Berkman, Floren and Willing, 1999, 4). Adult and high school cadet programs are particularly useful in urban areas which lack the volunteer firefighting opportunities found in many rural locations.

Testing for Physical Abilities

To perform fire suppression and rescue duties safely and effectively, firefighters need strength, stamina and agility. Hence, it is appropriate that job candidates face rigorous screening for job-related physical abilities. According to Table 5, about 90% of respondents to our firefighter survey report that their depart-

ment requires a physical abilities test during hiring, as did 92.9% of the departments responding to our departmental survey. For example, the Candidate Physical Ability Test (CPAT), discussed below, requires that job applicants complete eight strenuous tasks (stair climb, ladder raise, hose drag, equipment carry, forcible entry, crawling search, rescue drag, and ceiling pull) in a limited time while wearing a 50 pound weighted vest (IAFF, 1999).

Among departments responding to our survey which require a physical abilities test, the average pass rate for women was 47.3%, about half the 83.9% rate for men. Reducing this "adverse impact" on women could therefore substantially increase female firefighter hiring.

A widely-held stereotype is that women are inherently not strong enough to meet the job's physical requirements, and, consequently, that departments employing women must be endangering public safety by lowering physical standards. This assumption misapplies generalizations about the general population of women to the unusually fit subset of women who are typical firefighting applicants. Among recruits to the Milwaukee Fire Department, for example, Berry (2002) found that, prior to participation in the department's training, the average female recruit was in the 85th percentile among women of the same age in physical fitness. Table 5 reports that 35.0% of women survey respondents were active in gyms or sports before they became firefighters, approximately double the male rate.

Furthermore, pass rates for both men and women on physical abilities tests are strongly influenced by whether job candidates train prior to being tested. In Milwaukee, where recruits undergo 14 weeks of physical training prior to the examination, Berry (2002) found that females' strength increased an average of 21% and fitness by 29%, and that by the end of training, the females' combined size, strength and fitness averaged 96% of their male counterparts'. Among departments responding to our survey which require a physical abilities test, 45.9% provide physical training prior to the examination, lasting an average of 5.1 weeks. Departments with pre-training reported a 52.6% pass rate for women, a statistically significant ($p < .01$) increase over the 34.6% reported by departments not providing training. Accordingly, departments seeking to increase the representation of women typically make physical training part of their recruitment and screening process.

One model for doing so involves integrating physical training into the fire academy and placing physical abilities screening late enough in the academy program for the training to have been effective. For example, the Kansas City, MO, department does not administer its test, the CPAT, until job applicants have been in the fire academy for eight

weeks. Trainees are first given the test for practice on their second day at the academy, after which a personal trainer develops individualized exercise programs. Thereafter, trainees spend one hour a day on physical development and can check their progress by re-taking the CPAT every Saturday (author interviews, 2006).

Other departments' physical training takes place prior to the fire academy itself. These programs frequently begin with a fitness evaluation, with those not passing required to do so before entering the academy. Candidates then participate in several weeks of training, the most effective of which uses equipment replicating the test itself. During the 1990s, however, some departments discontinued such classes, despite their success. The reasons given included statewide initiatives banning affirmative action, budget cuts, pressure from the local firefighters' union, and perceptions of unfairness (i.e. recruits participating in "the women's program" were alleged to have an unfair advantage due to familiarity with equipment). To replicate these programs, some women started programs outside their departments, in gyms and backyards, often attended by recruits of both genders.

Another factor influencing pass rates for men and women is the physical abilities tests themselves, which vary widely in their validity, reliability, job-relatedness, and power to predict on-the-job performance. Among departments which require a physical abilities test responding to our survey, 21.5% use the CPAT, which was developed by the International Association of Fire Fighters union in collaboration with the International Association of Fire Chiefs. Another 24.3% use tests developed by consultants or their state's civil service commission. The remaining 54.2% use "home grown" tests, many of which are *ad-hoc* and reflect little attention to professional standards for test development and validation. For example, some tests reject trainees for slowness in sprinting when many departments forbid sprinting as fatiguing and exacerbating smoke inhalation. Others impose extreme requirements for strength in isolated muscle groups (e.g., an 85 pound bicep curl performed while standing flat against a wall), rather than testing the whole body strength which firefighting involves. Still others test upper body strength, where men typically out-perform women, without measuring stamina and agility, which are also necessary for firefighting and where women often outscore men (Chetkovich, 1997, 217; Hough, Oswald, and Ployhart, 2001, 165).

Among respondents to our departmental survey using a physical abilities test, the average pass rate for women on the CPAT is 68.0%, statistically-significantly higher ($p < .01$) than the 49.0% rate in departments using other tests. Furthermore, CPAT's

ratio of pass rates for women compared to men -- 77.4% -- is statistically significantly higher ($p < .01$) than the 61.7% ratio for all other departments' tests. These outcomes contradict the assumption that the only way to increase the proportion of women passing physical abilities test is to lower standards, because the CPAT requires very high levels of physical performance.

In fact, the level of performance required to pass the CPAT is at the center of widespread criticism of that test. The job relatedness of the test has not been validated using the standard statistical method -- "criterion-based validation," which analyzes whether the test predicts on-the-job performance. The weak analyses to which the test has been subjected -- "content-based validation," which focuses on whether the test tasks parallel actual job duties -- clearly demonstrated that women pass at a statistically-significantly lower rate than men (IAFF, 1999, appendices 6-3 through 6-14). Key aspects of the test appear directly related to this adverse impact on female job candidates and remain without evidence that they contribute to on-the-job performance. These include the high level of the test's strength requirements; its emphasis on strength over aerobic capacity; its requirement that all eight tasks be completed in a continuous, timed sequence; its applicability in climates and altitudes different from where the test was developed; and its tendency to test coaching on "tricks of the trade" more than physical abilities *per se*.

A final factor influencing pass rates is the circumstances under which tests are administered. Within the firefighting community, anecdotes abound concerning ways in which tests have been implemented to assist men to succeed and women to fail. Examples include timed trials in which women are required to drag wet hoses over wet pavement while men drag dry hoses over dry pavement; pre-test training in which men are given tips on how to perform well and women are not provided the same information; men tested in properly-fitting clothing and equipment while women struggle with ill-fitting gear; and men tested in front of peers who cheer them on while women are tested in silence. According to our interviews, even the CPAT, which provides detailed instructions concerning how each test task is to be administered and trains and certifies test monitors, is not immune to such inconsistencies.

It is clear that departments seeking to increase women's pass rates on physical abilities screening without sacrificing their workforce's ability to perform their jobs safely and efficiently have many opportunities to do so. Departments would be well advised to review their physical abilities test, its validity and job-relatedness, its placement in the hiring sequence, the availability of pre-test training, and how tests are conducted. Departments should seek altern-

atives to any test -- including the CPAT -- which has substantial adverse impact on women job candidates without validation that the test is related to actual on-the-job performance.

Uniforms and Equipment

In firefighting, properly-fitted uniforms and equipment are not merely a matter of appearance or comfort. Bunker coats which do not fit result in burns, breathing masks which do not seal lead to smoke inhalation, and helmets which slip can block vision during an emergency.

Among adults, the average woman has a body size 93% of the average man's, and the 50th percentile woman corresponds in size to a 5th percentile man (Stirling, no date, 8). Thus, to equip women, at a minimum a department must order a higher proportion of smaller uniforms and personal equipment than for an all-male staff. However, women are simply smaller versions of men only for overall height and weight. For other dimensions, such as neck circumference, hip breadth, or finger length, women and men are shaped sufficiently differently that gear needs to be designed differently.

According to Table Two, 79.7% of women survey respondents reported problems with ill-fitting equipment, four times the 20.9% reported by males. These problems involved gloves (for 57.8% of female respondents), boots (46.8%), turnout/bunker coats (38.9%), helmets (28.4%), and breathing masks (25.6%). In interviews, one particular complaint from all but the tallest women involved breathing apparatus hitting helmets, tipping them forward to impair vision.

Among departments responding to our survey which had women employees, 39.8% reported not having purchased size-adapted clothing and personal equipment. This rate does not appear to reflect short-term constraints, such as the current year's budget or schedules for gradual equipment replacement, because the proportion of departments reporting no such investments is similar -- 37.9% -- in departments with at least 10 women and women for at least 10 years. Nor does the problem reflect unavailability of suitably-sized gear, which manufacturers have been offering since at least 1995 (WFSI, no date, 2).

Instead, the issue is simple lack of employer responsiveness. This pattern is illustrated in comments by women firefighters to a survey in 1995. There, 51% of respondents reported current problems with gear fit. But more tellingly, among the 42% reporting no current problems, a number appended comments such as: "But only after ten years of problems, memos, and letters," "only because we made such an issue," or "because I bought it myself" (WFSI, no date, 2).

Firehouse Living

Days and nights spent in the fire station, idle time while on duty, and on-duty domestic activities such as cooking, eating, showering, and sleeping raise issues of privacy and harassment to particular prominence. Over decades operating with an all-male staff, many fire stations developed a “fraternity house” atmosphere in which sexually-oriented conversation, pornography, and homophobia were common and unopposed.

While in some US departments, that atmosphere has been replaced by a more “professional” approach, it persists in many other departments (Berkman, Floren and Willing, 1999, p. 2). In Table 2, 46.2% of female survey respondents reported incidents involving privacy in showers, dormitory, or when changing clothes, compared to 2.8% of men; 28.4% of women reported incidents related to dormitory accommodations, compared to 2.3% of men; and 13.1% reported problems related to meal times, compared to 0.9% of men.

In our department survey, 55.0% of departments reported major construction or renovation in firehouses or other facilities to accommodate women - for example, installing separate bathrooms or dormitories.¹² An additional 32.4% reported minor changes, such as signs on bathroom doors or privacy curtains; and 12.6% of departments reported having done nothing. As with clothing and equipment, lack of action here does not reflect short-term considerations such as waiting for scheduled construction and maintenance; among departments with at least 10 women where women have been employed at least 10 years, 41.5% reported no major construction responding to this issue.

In any case, the issue typically involves women having not only physical space in the firehouse but also psychological space -- acknowledgement that they are full, permanent members of the work team by accommodating their needs and preferences. This interpretation makes particular sense of women’s reports, in Table 2, of “mealtime difficulties.” According to Table 6 later in this paper, mealtime issues by themselves reduces women’s satisfaction with firefighting more than 12%, the largest reduction for any gender-related issue. In firehouses, firefighters take turns shopping and cooking meals, which are eaten family style. In that context, mealtime difficulties refer to choice of food as well as table conversation and social interaction. Our interviews produced many stories of mealtime harassment, including refusal to cook for or serve an unwelcome firefighter, refusal to take account of dietary restrictions

or preferences, and, in extreme cases, food contamination or threats of contamination.

Sexual Harassment

The close living relationships discussed in the previous section, as well as the importance of teamwork when firefighters’ lives literally depend on each other, give particular importance to mutual support among firefighters. In addition, camaraderie among peers is often cited as a benefit of a firefighting career (Berkman, Floren and Willing, 1999, 3; Paul, 1998; Chetkovich, 1997). Emotional closeness is forged in many hours living together and the shared experience of danger.

It is also commonly developed and expressed through pranks and practical jokes in the firehouse (Hibbard, no date) and hazing of new firefighters in ways reminiscent of college fraternities. Some observers characterize this behavior as traditional, harmless fun which enhances teamwork, relieves boredom, and attracts volunteers. Others emphasize instances in which pranks and hazing turns nasty, especially with sexist, racist, and homophobic content, and represents harassment and intimidation intended to test and drive out unwelcome individuals (Yoder and Aniakudo, 1996). Women we interviewed reported “pranks” involving human feces in boots and on bathroom walls, hard-core pornography, derogatory messages left in lockers, contamination of food, shunning, and dangerous conduct at fires, such as cutting off water supply. They complained about sexual harassment including vulgar statements, unwanted attention, and “locker-room” pranks involving gross and juvenile sexually-related “humor.” Some reported a male expectation that women would date their fellow firefighters and stations where the only women previously present serviced on-duty male firefighters (“getting laid and getting paid”). Many women reported that even now, “hardly a day goes by” without some sort of harassment, although most agreed that it was generally less blatant and crude than in the past. A small number of women enumerated physical assaults, mostly unreported for fear of retaliation.

Our interviews produced an almost universal consensus that departmental internal procedures for addressing complaints of harassment or discrimination were weak and carried great risk of ostracism and retaliation against complainers. Unless they faced particularly egregious behavior, women typically attempted to handle situations themselves or with the support of a mentor. When facing a severe problem, they trusted outside agencies, such as the federal

¹² In our interviews, many women firefighter opposed separate male and female dormitories as destructive of team spirit and information sharing. They suggested instead that the situation be addressed by appropriate respect and common sense in shared sleeping areas (Berkman, Floren, and Willing, 1999, 62-63).

Equal Employment Opportunity Commission, more than the department's processes.

Departments seeking to increase the representation of women among firefighters must exercise constant vigilance and control on these issues. Departments can convey distinctions between appropriate and inappropriate behavior through explicit anti-harassment policies, mandatory training communicating these policies to all staff, and enforcement of the policies through proactive monitoring, prompt responses to complaints, and serious punishment -- including termination, if necessary -- for violators. Our interviews confirmed a direct relationship between the level of harassment in a department and the tolerance for such activity by the department's senior managers. In the few departments that have instituted and seriously enforced a "zero tolerance" policy, it was reported that incidents decreased.

Despite the relatively straightforward nature of these remedies, women's survey responses make clear that such vigilance and control is often not maintained. Table 2 reports that 50.8% of women have experienced shunning or isolation; 42.9%, verbal harassment; 31.9%, pornography; 30.2%, sexual advances; 18.6%, hazing; 18.2%, hostile cartoons or written material; and 6.3%, assaults.¹³ Such incidents were reported by 2.8% or fewer male respondents. Furthermore, 65.0% of women reported that their department has no procedures of which they were aware for addressing such complaints, and 23.4% reported that their supervisors failed to address problems reported to them.

Promotions

After acquiring on-the-job experience, entry-level firefighters can apply for promotions which offer greater responsibility and authority and increased pay and prestige. Advanced ranks typically carry such titles as engineer (who drive fire engines and operate their water pumps), sergeant, lieutenant, captain, battalion chief, deputy chief, and department chief.

Employment of women in these ranks has lagged behind even their limited representation in entry-level firefighting. Although only three to five years' experience is typically required before entry-level firefighters can begin to apply for promotions, among the departments responding to our survey which have had woman at above-entry level, an average of 10 years elapsed between the first women at the entry-level and at the higher rank. The number of women nationwide in senior positions is so limited that the primary source of information on them is lists of names maintained by professional associations. The

contact network of Women in the Fire Service includes about 150 women battalion chiefs or deputy chiefs and 31 department chiefs (Women in the Fire Service, 2005, 1).

Thus, firefighting exhibits a typical "glass ceiling" pattern, with the representation of women diminishing at each stage up the managerial hierarchy. Among departments responding to our survey, employment which averages 5.7% at entry level falls to 4.5% among intermediate supervisors (company officer or battalion, assistant, or deputy chief) and 2.6% among department chiefs. In the 2000 US Census, women represent 3.7% of first-level firefighters and 2.9% of their first line supervisors (US Census, 2007).

Firefighting also exhibits "glass walls," or gender occupational segregation in roles and assignments at the same rank. Among the departments responding to our department survey, females average 4.8% among persons in fire suppression, in contrast to 16.6% in such roles as fire inspection and investigation. In our firefighter survey, among respondents in entry-level positions, 36.0% of women were firefighter paramedics rather than firefighters, compared to 30.5% of men. In some cases, these differences reflect individuals' preferences, while in other cases they are involuntary. In either circumstance, they are likely to limit perceptions of women as full members of the working team, as well as prospects for promotions.

In interviews, women firefighters also discussed disparities in training and assignments which affected their promotional opportunities. Denial of access to classes and equipment to train for certification and promotional exams was a common theme. Women also reported constant and inequitable drilling, having to prove themselves beyond what was expected of their male counterparts. For example, one woman reported that an officer repeatedly required her to perform single-person ladder raises, when the department had long before stopped using that maneuver. Others reported frequent station changes, so that they reported to a different officer every shift throughout their probationary period. Race/ethnic minority women reported retaliatory transfers to all-white, all-male stations in neighborhoods where they were particularly unwelcome. Only occasionally did women report making it through the early stages of their careers because a male officer took them "under their wing" to buffer the firehouse culture and aid in acquiring skills.

How can departments become even-handed in terms of assigning and advancing women? One key is suggested by the fact that women and men survey respondents characterized the promotional processes

¹³ Two other surveys have estimated even higher rates of sexual harassment for women firefighters -- 88% (WFSI, no date) and 58-75% (Rossell, Miller & Barber, 1995).

in their department as unfair at almost the same rate -- 33.9% and 30.6%, respectively. This consensus suggests that considerable progress for women can be achieved by ensuring that the promotional processes are professionally designed and conducted to control personal favoritism and stereotype-prone subjective decision-making. The well-known means for doing so involve replacing informal, “tap on the shoulder” promotional selections with public posting of job vacancies; establishment of explicit selection criteria which have been validated as job-related and predictive of on-the-job performance; and training of selecting officials about the potential role of unconscious bias and stereotypes (Bielby, 2000). Such “cleaning up their act” in promotional decisions need not be gender-specific and would typically improve opportunities not only for females but also for males not in the “buddy network” which tends to be favored in many departments.

Which Problems are most Important?

The previous sections demonstrate that women encounter discrimination and exclusion in many different aspects of firefighting. Which of these issues are the most important in determining women’s satisfaction with firefighting? We examined this question by applying stepwise regression analysis to women’s responses to our firefighter survey. In this analysis, we measure women’s career satisfaction using the question examined in the bottom row of Table 4 -- how they would rate firefighting if advising a young woman considering it as a career. As variables potentially increasing or reducing women’s ratings, we

include the respondents’ personal characteristics, career experiences, and departmental policies summarized in Tables 1, 2, and 5.

This analysis, reported in Table 6, identified 2 clusters of issues which bother our female respondents the most. The first, labeled “incidents in the workplace,” refers to respondents’ encounters with discrimination, harassment, or exclusion in their daily work life, combined with lack of response to these incidents by their supervisors. The second, labeled “Fairness in Employment Practices,” refers to respondents’ perceptions that they and their peers are not treated equally in hiring, assignments, and promotions. Departments seeking to make current women firefighters more satisfied with their employment and encourage other women to become firefighters should devote their highest priority attention to these two concerns.¹⁴

It is noteworthy that neither cluster of issues involves special treatment for women or lower standards for physical performance. They do not call for “affirmative action,” whether that term is misinterpreted to mean “quotas” in hiring and promotion or more correctly interpreted to mean seeking, encouraging, and supporting qualified employees of all backgrounds. Instead, they merely require US fire departments to ensure equal employment opportunity. In most fire departments, the first step toward that goal would be to recognize that the “playing field” is not level between the genders today. The departments then need to enforce standards of non-harassment and equal treatment which have been required by law in the USA, as well as widely held as societal norms, for at least four decades.

Table 6: The 11 Departmental Actions and Circumstances Which Most Affect Women Firefighters’ Rating of Firefighting as a Career for Women

Category	Explanatory Variable	Impact on Rating
Incidents in the Workplace	I have experienced gender-based mealtime-related incidents in the workplace	-12.2% **
	I have experienced race-based incidents in the workplace	- 8.2% **
	I have experienced other incidents in the workplace	- 7.6% **
	My supervisor does not address gender complaints	- 7.4% *
	I have experienced verbal harassment in the workplace	- 6.3% *
	Gender-based incidents in the workplace continue into the present	- 6.1% *

¹⁴ The only high-impact variable identified by stepwise regression not falling within these two clusters is use of paid child care. Among our survey respondents, 39.3% of women and 68.4% of men reported having had young children at some time during their firefighting careers. About 84% of both groups reported that these children were cared for by a family member. Among the women analyzed in Table 6, the combination of having young children and relying on paid care providers reduced the average respondent’s assessment of firefighting as a career by 6.3%.

Fairness in Employment Practices	The hiring process in my department is not fair	- 5.8% *
	My gender is a barrier to my career advancement	- 5.5% *
	I have experienced gender-based discrimination in work assignments	- 5.3% *
	The promotion process in my department is not fair	- 5.0% *
Other	For child care, I have used a paid provider, not family	- 6.3% *

*Source: Stepwise regression analysis with 56 candidate variables, using a minimum inclusion criterion of $p < .10$. The same variables were selected under both forward and backward stepwise procedures. Data = 441 women respondents to authors' survey of 675 firefighters nationwide, 2003-2005. Intercept = 4.35**. $R^2 = .31$. The regression included nine additional variables forced in as controls for respondent characteristics (person of color; age > 40; < 12 years' experience; college graduate; in an entry-level rank; paramedic; in a department with > 500 employees; in a department with < 1% females; and have or has had young children). In the absence of being forced in, none of these variables would have met the inclusion criterion. The dependent variable is advice to a young woman considering a firefighting career, on a scale of 1=worst career, 5=best career. Entries in this table are the change in the rating associated with agreement with the statement listed as the explanatory variable, divided by women's respondent's average rating of the career for women, 3.8.*

The Workplace Culture Underlying these Operational Issues

This paper has presented evidence that women's employment among firefighters in the USA remains far below its expected level and that even obvious steps to enhance their representation have not been undertaken by most fire departments. Such findings are readily recognizable as symptoms of workplaces whose culture resents the presence of women and, consciously or unconsciously, *intends* to exclude them.

Formally defined, a workplace's "corporate culture" is the interdependent system of beliefs, values, and ways of behaving common to a workplace. Less formally, it is simply "the way things are done around here" (Greenberg and Baron, 1993, 622). These cultures tend to evolve slowly and resist change both actively and passively. Resistance tends to be particularly strong where employees remain for long careers, personal relationships are strong, traditions are maintained with pride, and employment is well rewarded (Bendick and Egan, 2000). Convergence of all these circumstances in firefighting creates a "perfect storm" supporting continued occupational exclusion. In that sense, women's experience in this occupation parallels other occupations, from plumbers to surgeons, where women's presence is "non-traditional" (Padavic and Reskin, 2002; Conley, 1998; Moccio, 2006), although often more intensely.

Firefighting's culture has been described as proud and noble, with shared perceptions that the occupation is dangerous and difficult; the key performance requirements are strength and courage; only an elite subset of individuals are capable of performing its

duties; and generous compensation and prestige reflect these circumstances (Chetkovich, 1997).

Ironically, these beliefs continue to be cited to justify absence of women firefighters as the evolving occupation continues to erode their relevance.¹⁵ Suppression of large fires undeniably remains a dangerous, difficult task. However, it represents only a small proportion of firefighters' responsibilities today. Fire-resistant construction and smoke detectors are gradually reducing the number of fire calls. In addition (Berkman, Floren and Willing, 18):

Only 1 in 10-20 fire calls will involve actual flames. The majority...will be alarm and sprinkler system malfunctions, odor of smoke or gas with no actual fire, overheated fluorescent light ballasts or furnace blower motors, burned food on a stove....Of those fire calls that do involve actual fires, some will be small fires out on arrival, others will be leaf or brush fires, dumpster fires, or car fires.

Concurrently, as was discussed earlier, fire calls both large and small are typically outnumbered two to one or more by medical calls. Many medical calls do not involve major emergencies but instead involve assisting homeless persons, reassuring frail individuals, or transporting individuals to non-emergency medical treatment. Here, firefighters need care-giving skills and aptitudes often associated with nurses or social workers. Even when firefighters provide life-saving emergency treatment, such as in treating heart attacks or assisting victims of major motor vehicle accidents, the activity typically requires medical skills more than strength or courage (Tracey and Scott, 2006).

¹⁵ Under the label "self affirmation theory," social psychologists explain such behavior as unconscious attempts to maintain or restore feeling of self worth when these feelings are challenged by evidence to the contrary (Steele, 1988; Lord, Ross, and Lepper, 1979).

Whatever its actual relevance, “it is the mystique of interior structural firefighting that lures most recruits to city fire departments, and it remains the psychological focus of the urban firefighter’s job...” (Berkman, Floren and Willing, 18). It equally remains the focus of resistance to women. To their male peers, women firefighters represent more than competitors for job vacancies they may seek and constraints on the free-wheeling aspects of firehouse life. They also silently challenge the self-esteem male firefighters derive from perceiving themselves as doing a job for which only a select few have the “right stuff.” In these circumstances, opposition such as is documented in Table 2 and throughout this paper is perhaps not surprising.

Such dynamics are not unique to the USA or to women in firefighting but tend to occur whenever non-traditional, unwelcome individuals enter an occupation where they formerly were absent or rare. Research in a range of occupations demonstrates that, when the demographic diversity of a workforce increases, inter-group relations tend initially to worsen rather than improve (Kochan et al., 2003). Accordingly, fire departments cannot simply hire women and allow them to “sink or swim” but instead need proactive strategies for ensuring inclusion. These strategies must address specific issues in daily work life and career development -- from physical abilities tests to dormitory privacy -- examined in this paper. But more importantly, they must address the underlying exclusionary workplace culture of which these issues are symptoms. Doing the former without the latter will result in no employment increases, only token increases, or increases which are only temporary as newly-hired women are driven out.

How can fundamental, permanent changes in the underlying culture be achieved? Orchestrating strategies appropriate for individual fire departments remains an art beyond the reach of any simple formula. However, research and experience suggest five key elements of such strategies.

The first is *commitment by top leadership* -- in the case of fire departments, mayors, fire chiefs and other senior appointed or elected officials.¹⁶ These leaders must be visible in articulating the goal of enhanced female employment, the reasons for it, and their expectation that those who report to them will join the effort. They must send this message persistently and insistently, in actions as well as words.

The second element is *monitoring and accountability* translating the broad goal into immediate person-

al consequences for mid-level managers, first level supervisors, and others. Contributions toward the goal need to be rewarded in performance appraisals, raises, and promotions. Behavior inconsistent with the goal needs to be sanctioned promptly and visibly.

The third element is establishing *human resource management procedures* embodying principles of transparency, objectivity, and performance-relatedness. These procedures need to replace more traditional procedures which allow gender stereotypes, individual favoritism, in-group bias, and other processes to generate inequality of opportunity (Bielby, 2000).

The fourth element is activities to *change individuals’ behavior* at all levels in the workforce to control hostile behavior. Several approaches are often required. One is establishment of a zero tolerance policy for symbolic words or acts which open the door to more serious biased or aggressive behavior. Another is training to increase employees’ awareness of pervasive tendencies toward bias, both conscious and unconscious, and the cumulative significance of even small slights. The most effective training uses real-life examples drawn from the specific workplace and provides tools for dealing with practical situations, such as “scripts” for alternative behavior (Bendick and Egan, 2000, Appendix B).

This training needs to be provided to staff at all levels in the department, since workplace culture is a “360 degree” process which all employees help to shape. In addition, special training is usually needed for first level supervisors, who are the daily face of the department for individual employees. In Table 2, 25.4% of women (compared to 20.4% of men) report that they do not receive mentoring/coaching from senior people in their departments, and 23.4% of women (compared to 5.6% of men) report that their supervisor does not address gender-related complaints.

The fifth element is *sustained effort*. Significant culture change in a large, long-established workplace may require deliberate effort over 3 to 5 years, if not longer (Bendick, Egan, and Lofhjelm, 2001).

In fire departments in the USA where such culture change initiatives have been successful, the initiatives has sometimes come from enlightened senior elected or appointed officials, such as mayors or fire chief, who have decided that it is the right thing to do. In other cases, the primary motivator has been anti-discrimination litigation. The first major case was *Berkman v. City and County of New York*, 705 F.2d 584 (discriminatory hiring practices). Other notable

¹⁶ Logic might suggest that unions would also champion such changes, which could benefit many of their male members as well as women. However, in a number of lawsuits in the USA, local chapters of the International Association of Firefighters have joined in opposing women’s challenges to hiring and promotional procedures. They have also opposed charges of discrimination, defending white firefighters against charges brought by African American firefighters who also belonged to the union. In turn, mayors and other elected officials who received political support from the union have often been reluctant to implement policies the union opposes.

cases include *Davis v. City and County of San Francisco*, 656 F.Supp. 276 (N.D.Cal. 1987) (discriminatory hiring practices); *Kathleen Kline v. City of Kansas City, Missouri Fire Department*, 245 F.3d 707 (8th Cir. 2001) (discriminatory availability of equipment); *Howley v. Town of Stratford and W. Holdsworth*, 217 F.3d 141 (discriminatory promotion practices and hostile work environment); and *Anne Wedow, Kathleen Kline v. City of Kansas City, Missouri Fire Department*, 442 F.3d 661 (8th Cir. 2006) (discriminatory promotion practices). Women continue to resort to litigation to address sexual harassment and other discriminatory employment practices today.

Summary and Conclusions

As recently as four decades ago, it was widely considered “obvious” that women are neither capable of, nor interested in, firefighting. To be sure, a smaller proportion of women than men are likely to seek this career. That is why we estimate the expected representation of women among firefighters in the USA at 17.0%, about one-third their 46.6% representation in the overall US civilian labor force. But lack of ability to meet physical requirements is not characteristic of *all* women, as is demonstrated by

the substantial numbers of women currently employed in some departments. And lack of interest is rebutted in Table 4, where female firefighters join their male colleagues in rating the occupation well above average as a career.

This paper has discussed ways in which such “obvious” but incorrect stereotypes have served, consciously or unconsciously, to justify administrative, organizational, interpersonal and technological barriers to women’s employment. These barriers to women’s inclusion, and the workplace culture underlying them, remain in place today, in varying degrees, in the majority of departments across the USA. However, as pioneering departments with substantial women employees demonstrate, these barriers are not inevitable or necessary for the safe and efficient firefighting.

To reduce these barriers and bring women’s employment to its potential will require more universal application of best practices adopted by these pioneering departments. In particular, it will require changing the underlying workplace culture from one of exclusion to one of gender inclusiveness. Inclusion is a substantially more ambitious goal than merely increasing the number of women employees. However, it is essential if increases in those numbers are to be meaningful and self-sustaining.

References

- Amirault, T. (1997) Characteristics of multiple jobholders, 1995, *Monthly Labor Review*, March, 9-15.
- American Bar Association (2006) *Visible invisibility, Women of color in law firms*. Chicago: American Bar Association Commission on Women in the Profession.
- Bendick, Jr., M. (2002) *Economic damages for African American applicants not hired by the Chicago Fire Department*. Washington, DC: Bendick and Egan Economic Consultants, Inc.
- Bendick, Jr., M. and Egan, M. (2000) *Changing workplace cultures to reduce employment discrimination*. Presentation to Urban Institute Conference Low Wage Workers in the New Economy, Washington, DC.
- Bendick, Jr., M, Egan, M, and Lofhjelm, S. (2001) Diversity training: From legal compliance to organizational development. *Human Resource Planning*, 24, 10-25.
- Berkman, B., Floren, T., and Willing, L. (1999) *Many women strong, A handbook for women firefighters*. Washington, DC: Federal Emergency Management Agency.
- Berry, M (2000) *Physical characteristics of elite female firefighters*, at <http://www.strengthcats.com/elitefemale.htm> .
- Bielby, W. (2000) Minimizing workplace gender and racial bias. *Contemporary Sociology*, 29, 120-129.
- Browne, I., and Joya, M. (2003) The intersection of gender and race in the labor market. *Annual Review of Sociology*, 29, 487-513.
- Chetkovich, C. (1997) *Real heat: Gender and race in the urban fire service*. New Brunswick, NJ: Rutgers University Press.
- Clarke, C., and Zak, M. (1999) Fatalities to law enforcement officers and firefighters, 1992-97. *Compensation and Working Conditions*, summer, 3-7.
- Conley, F. (1998) *Walking out on the boys*. New York: Farrar, Strauss and Giroux.
- Craig, J. and Jacobs, R. (1985) The effect of working with women on male attitudes toward female firefighters. *Basic and Applied Social Psychology*, 6, 1, 61-74.
- Dobbin, F., Kalev, A., and Kelly, E. (2006) Best practices or best guesses? Assessing the efficacy of corporate affirmative action and diversity policies. *American Sociological Review* 71, 4, 589-617.
- Greenberg, J., and Baron, R (1993) *Behavior in Organizations*. Boston: Allyn and Bacon.
- Greenman, E., and Xie, Y. (2006) *Double jeopardy or compensating disadvantage? The interaction of gender and race on earnings in the U.S.* Ann Arbor, MI : Population Studies Center, University of Michigan.
- Harris (2006) *How prestigious is your business card?* Harris Poll Center for Media Research Issue Brief (August 8), at http://www.media-post.com/research/cfmr_briefArchive.cfm?s=46439 .
- Hibbard, J. (no date) *Little red book of firehouse pranks*. Frazier Park, CA, Jeff Hibbard.

- Hough, L., Oswald, F., and Ployhart, R. (2001) Determinants, detection, and amelioration of adverse impact in personnel selection procedures: Issues, evidence, and lessons learned. *International Journal of Selection and Assessment*, 9, 152-194.
- IAFF (1999) *The fire service joint labor management wellness/fitness initiative, Candidate Physical Abilities Test*. Washington, DC: International Association of Fire Fighters.
- Kochan, T., Bezrukova, K., Ely, R., Jackson, S., Joshi, A., Jehn, K., Leonard, D., Levine, D., and Thomas, D. (2003) The effect of diversity on business performance: Report of a feasibility study of the Diversity Research Network. *Human Resource Management Journal*, 42, 3-21.
- Lord, C., Ross, L., and Lepper, M. (1979). Biased assimilation and attitude polarization: The effect of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, 37, 2098-2109.
- Moccio, F. (2006) "Pioneers, Settlers or Passers-by? Addressing female gender inequality in nontraditional jobs. *New York State Legislative Hearings on the Equal Rights Amendment to the New York State Constitution*.
- Padavic, I., and Reskin, B. (2002). *Women and men at Work*. Thousand Oaks, CA: Sage Publications Pine Forge Press.
- Paul, C. (1998). *Fighting fire*. New York: St. Martins Press.
- Phillips, S., and Imhoff, A. (1997). Women and career development: A decade of research. *Annual Review of Psychology* 48, 31-59.
- Rosell, E., Miller, K., and Barber, K. (1995) Firefighting women and sexual harassment *Public Personnel Management* 24, 3, 339-350.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (ed.), *Advances in Experimental Social Psychology*, Vol. 21, 261-302. New York: Academic Press.
- Stirling, M. (no date) *National antropometry survey of female firefighters*, at <http://www.humanics-es.com/FireFighterAnthropometry.pdf>.
- Tracy, S and Scott, C. (2006) Sexuality, masculinity, and taint management among firefighters and correctional officers. *Management Communication Quarterly*, 202, 1, 6-38.
- US Bureau of the Census (no date) *2000 EEO data tool*, at <http://www.census.gov/hhes/www/eeoindex/eeoindex.html>.
- US Department of Labor (2002), *Nontraditional occupations for women in 2002*, at <http://www.dol.gov/wb/factsheets/nontra2002.htm>.
- US Department of Labor (2006) Fire fighting occupations. In *Occupational outlook handbook, 2006-2007 Edition*, at <http://www.bls.gov/oco/ocos158.htm>.
- US Department of Labor (2007) *Employer costs for employee compensation summary, March 29, 2007*, at <http://www.bls.gov/news/ecec.n0.htm>.
- US Department of Labor (no date). *National compensation survey*, at <http://www.bls.gov/ncs/#data>.
- US Fire Administration (2005) *National fire department census summary data*, at <http://www.usfa.fema.gov/applciations/census/summary.cfm>.
- Valian, V. (1999) *Why so slow? The advancement of women*. Cambridge, MA: MIT Press.
- Women in the Fire Service (2005) *Status report 2005*, at http://www.wfsi.org/women_and_firefighting/status_report.php.
- Women in the Fire Service (no date) *Women firefighter & protective gear: Data from 1995 WFS survey*, at http://www.wfsi.org/women_and_firefighting/issues.php?issue=12.
- Xu, W., and Leffler, A. (1992) Gender and race effects on occupational prestige, segregation, and earnings. *Gender and Society*, 6,3, 376-392.
- Yoder, J., and Aniakudo, P. (1996). When pranks become harassment: The case of African American women firefighters. *Sex Roles* 35, 5-6, 253-270.
- Yoder, J. and Berendsen, L. (2001) Outsider within the firehouse: African American and white women firefighters. *Psychology of Women Quarterly*, 25, 27-36.
- Yoder, J., and McDonald, T. (1998). Measuring sexist discrimination in the workplace. *Psychology of Women Quarterly*, 22, 487-491.

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