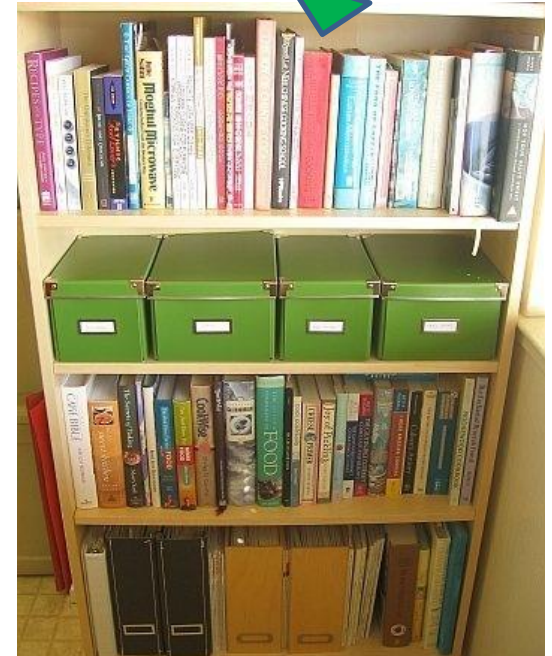
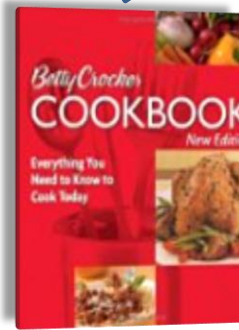
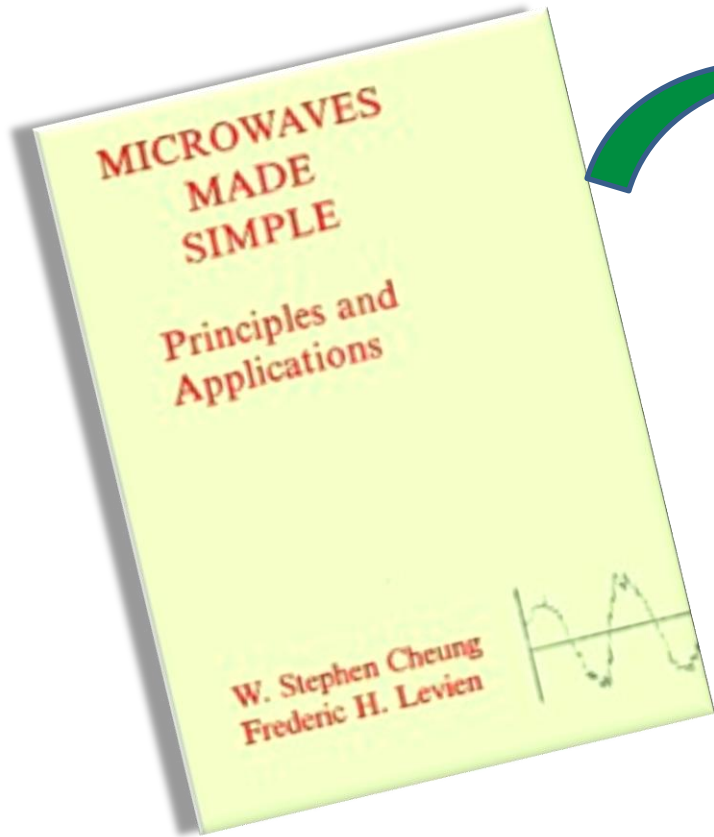


**Women, Science and  
Entrepreneurship:  
A Career in the Federal Government**

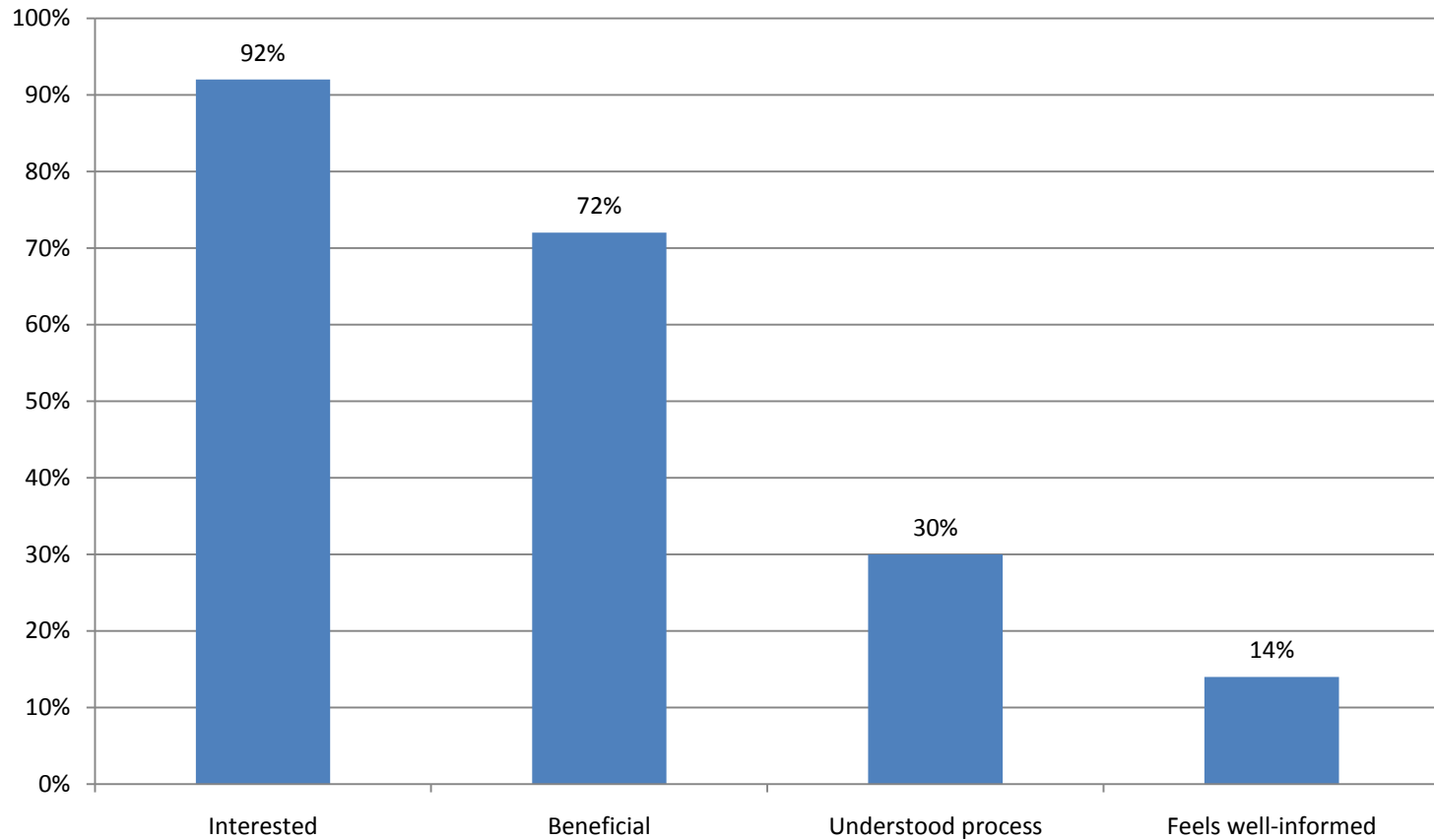
***7th KIEC and 16th EPSCoR Joint Annual Conference  
Galt House Hotel  
Louisville, KY***

Elissa I. Sobolewski  
DHS SBIR Program Director  
Science and Technology (S&T) Directorate  
May 26, 2011

Mom, did you see my “*microwaves*” book?  
(Circa 1987)



# What Americans Say About Science



# Women and Undergraduate Degrees

- The share of bachelor's degrees awarded to women **increased** in many major S&E fields from 1993 to 2007.
- Women have earned 58% of all bachelor's degrees since 2002;
  - Women have earned about half of all S&E bachelor's degrees since 2000, but major variations persist among fields.
- In 2007, men earned a majority of bachelor's degrees awarded in engineering (81%), computer sciences (81%), and physics (79%).
  - Women earned half or more of bachelor's degrees in psychology (77%), biological sciences (60%), social sciences (54%), agricultural sciences (50%), and chemistry (50%).
- Among fields with notable increases in the proportion of bachelor's degrees awarded to women are: earth, atmospheric, and ocean sciences (from 30% to 41%); agricultural sciences (from 37% to 50%); and chemistry (from 41% to 50%).
- Women's share of bachelor's degrees in computer sciences, mathematics, and engineering has declined in recent years.

# Women and Graduate Degrees

- Master's degrees awarded in S&E fields increased from 86,400 in 1993 to 121,000 in 2006 but declined in 2007.
- Increases occurred in most major science fields,
  - However the number of master's degrees awarded in engineering and computer sciences has dropped since 2004.
- The number and percentage of master's degrees awarded to women in most major S&E fields have increased since 1993.
- The number of S&E master's degrees awarded increased for all racial/ethnic groups from 1995 to 2007
  - The percentage awarded to Asians/Pacific Islanders, blacks, Hispanics, and American Indians/Alaska Natives has also increased during that time period.

# Women and Doctoral Degrees

- In 2006, the United States awarded the largest number of S&E doctoral degrees of any individual country,
  - Followed by China, Russia, Germany, and the United Kingdom.
- The numbers of S&E doctoral degrees awarded in China, Italy, and the United States have risen substantially in recent years.
  - The numbers of S&E doctoral degrees in India, Japan, South Korea, and many European countries have risen more modestly.
- Women earned 40% of S&E doctoral degrees awarded in the United States in 2006:
  - About the same as the percentages earned by women in Australia, Canada, the European Union, and Mexico.
  - The percentage of S&E doctoral degrees earned by women ranged from less than 20% in some countries to 50% or more in others.

# Distribution of Women-Owned Firms by Industry Sector 2002 and 2011

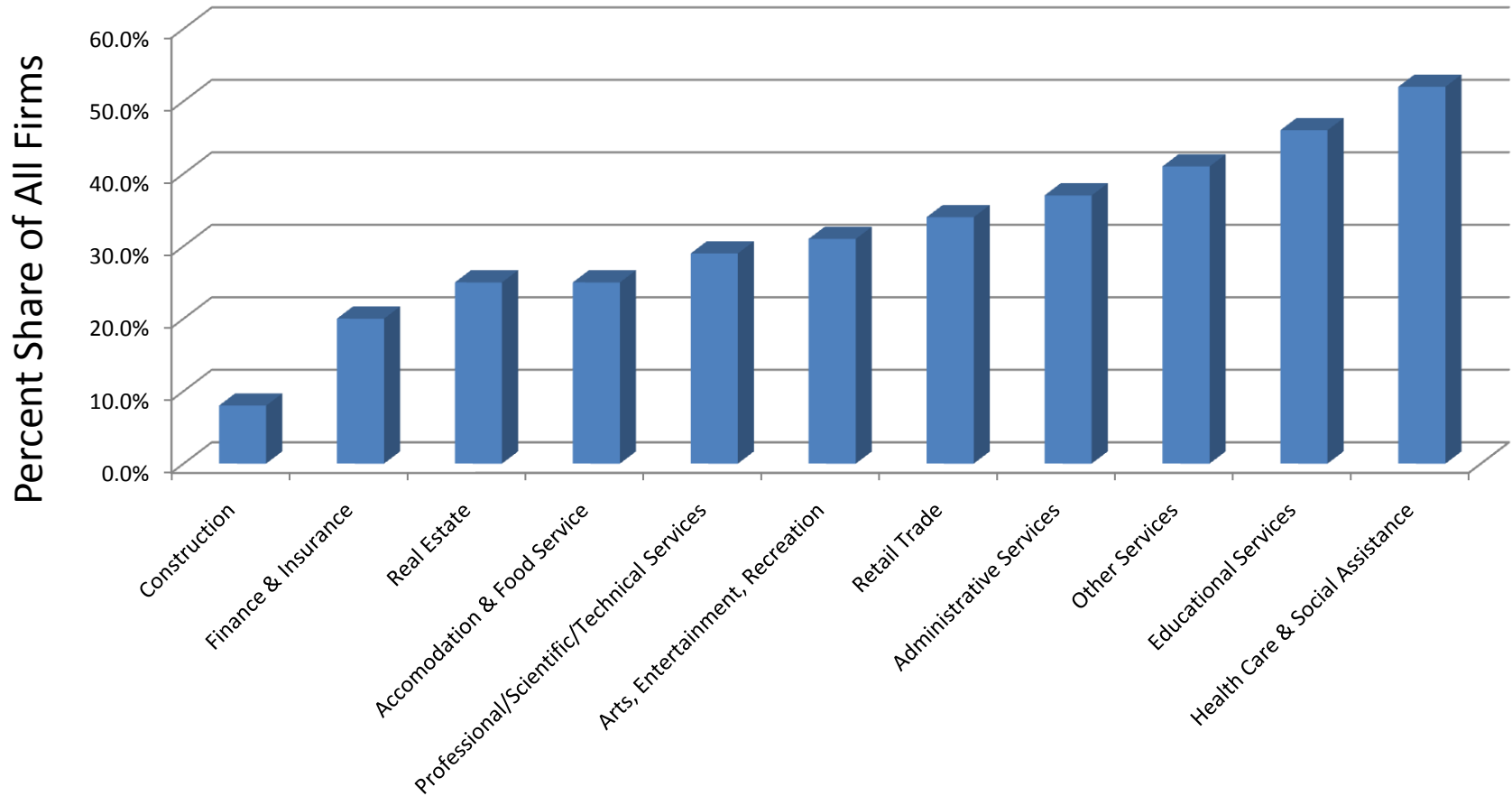
Industry Sector (with 2% + women-owned firms)	2002 Share	2011 Share
Construction	3.1%	3.5%
Retail Trade	14.6%	11.2%
Finance & Insurance	2.6%	2.6%
Real Estate	7.8%	8.5%
Professional/Scientific/Technical Services	14.4%	14.0%
Administrative Service	8.8%	10.3%
Educational Services	3.0%	3.6%
Health Care & Social Assistance	16.0%	15.7%
Arts, Entertainment, Recreation	4.5%	4.9%
Accommodation & Food Service	2.6%	2.4%
Other Services	15.7%	16.1%
All Other Industries (with < 2%)	6.1%	4.3%

Source:

The American Express OPEN State of Women-Owned Business Report  
A Summary of Important Trends, 1997 - 2011

# Trend in Women-Owned Firms by Industry

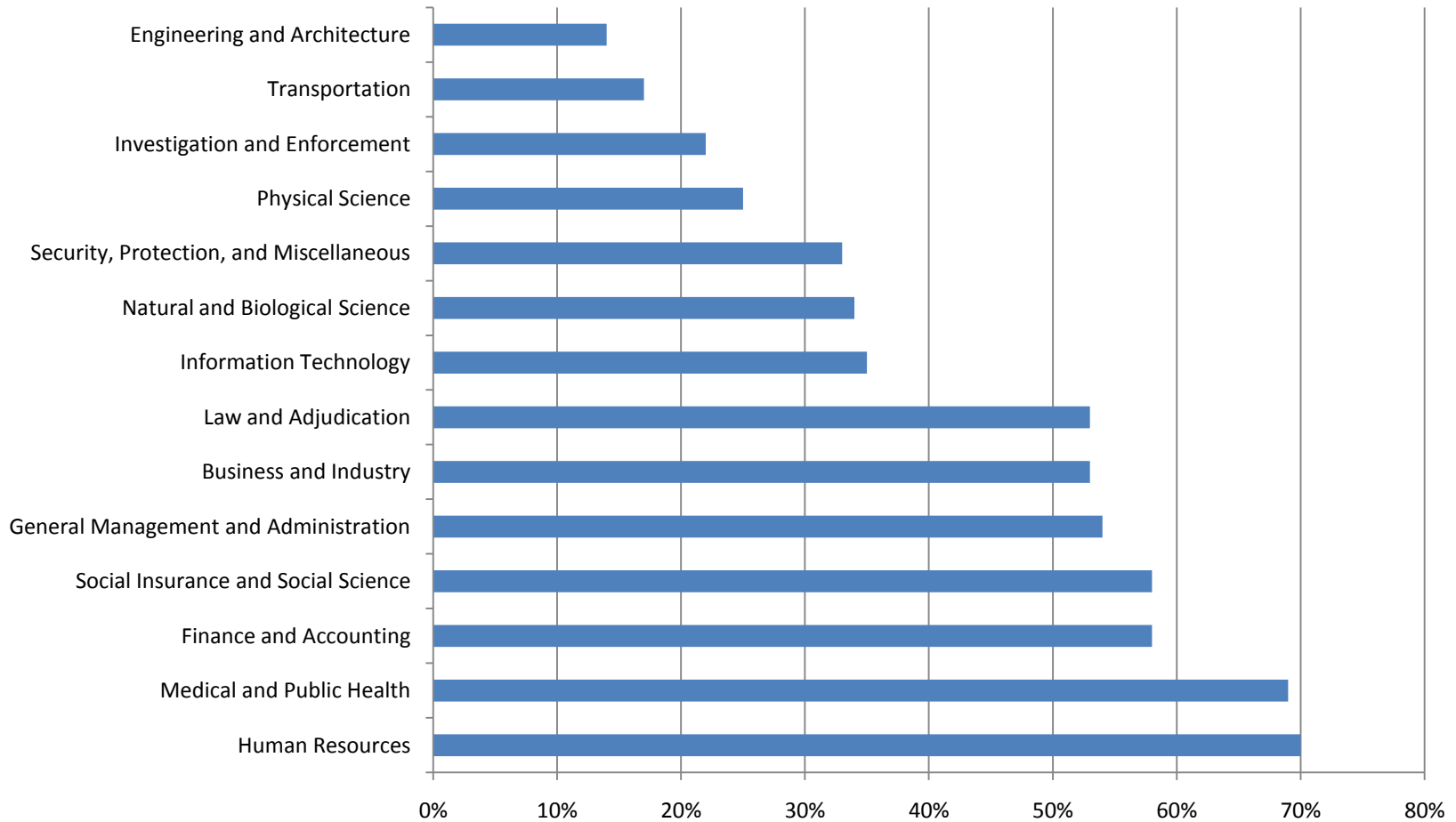
## 2011



Source:

The American Express OPEN State of Women-Owned Business Report  
A Summary of Important Trends, 1997 - 2011

# Percentage of Federal Government Professional and Administrative Positions Held by Women in Selected Occupational Families (2009)



Source:

Women in the Federal Government: Ambitions and Achievements  
A Report to the President and the Congress of the United States by  
the U.S. Merit Systems Protection Board, May 2011

# Employment Status of Women in the Federal Government

- Women have made substantial progress in the Federal Government since 1992
- Increased representation of women in professional and administrative occupations
  - hold ~44% of positions in both professional and administrative occupations (pipeline for positions at the highest grade and pay levels)
- Increased representation of women in high-level and supervisory positions
  - account for ~30% of the Senior Executive Service

Source:

Women in the Federal Government: Ambitions and Achievements  
A Report to the President and the Congress of the United States by  
the U.S. Merit Systems Protection Board, May 2011

# Employment Status of Women in the Federal Government (continued)

- Differences in pay have narrowed
  - In administrative occupations, median salary for women is now ~ 83% of that for men
  - However convergence is not yet complete
    - Difference is not necessarily due to discrimination
    - Differences are position-based (skill requirements and grade level) and individual-based (experience, tenure, education, and performance)

Source:

Women in the Federal Government: Ambitions and Achievements  
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U.S. Merit Systems Protection Board, May 2011

# Employment Status of Women in the Federal Government (continued)

- Women are increasingly successful in competing for employment
  - Now more women in the Federal workforce have both extensive experience and formal educational credentials

Source:

Women in the Federal Government: Ambitions and Achievements  
A Report to the President and the Congress of the United States by  
the U.S. Merit Systems Protection Board, May 2011

# Employment Status of Women in the Federal Government (continued)

- The glass ceiling has been fractured, but it has not been shattered
  - women remain less likely than men to be employed in the highest-paying occupations
  - Women often have lower salaries than men, even when they are in the same occupation
    - Salary differences due to job classification (supervisory) and other factors (experience and education)
  - Glass ceiling persists for reasons other than discrimination
    - occupation held, education level, supervisory experience
    - Geographic mobility, work/life responsibilities, or interest in supervisory and managerial roles

Source:

Women in the Federal Government: Ambitions and Achievements  
A Report to the President and the Congress of the United States by  
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# Career Accelerators and Categories from the 2007 Career Advancement Survey (CAS)

Category	Factors
Education and Skills	<ul style="list-style-type: none"><li>• Formal educational qualifications</li><li>• Specialized or technical training</li><li>• Leadership or managerial training</li></ul>
Experience	<ul style="list-style-type: none"><li>• Developmental assignments</li><li>• Lateral move – within the agency</li><li>• Lateral move – to another agency</li><li>• Extensive work experience</li><li>• Acting in a position</li></ul>
Performance	<ul style="list-style-type: none"><li>• High quality past performance</li><li>• Willingness to take on challenging assignments</li></ul>
Relationships	<ul style="list-style-type: none"><li>• Contacts who knew selecting official</li><li>• Supportive supervisor</li><li>• Mentor (other than supervisor)</li><li>• Professional networking</li></ul>
Availability	<ul style="list-style-type: none"><li>• Willingness to work long hours</li><li>• Willingness to travel</li><li>• Willingness to relocate</li></ul>

# Prevalence of Career Accelerators among Upper-Level Respondents, 2007 Career Advancement Survey (CAS)

Prevalence	Career Factor
Universal (90% or more)	<ul style="list-style-type: none"> <li>• Willingness to take on challenging assignments</li> <li>• Willingness to work long hours</li> <li>• Willingness to travel</li> <li>• High quality of past performance</li> </ul>
Very High (80% to 89%)	<ul style="list-style-type: none"> <li>• Formal educational qualifications</li> <li>• Specialized or technical training</li> <li>• Extensive work experience</li> </ul>
High (60% to 70%)	<ul style="list-style-type: none"> <li>• Supportive supervisor</li> <li>• Leadership or managerial training</li> <li>• Developmental assignments</li> </ul>
Moderate (40% to 59%)	<ul style="list-style-type: none"> <li>• Lateral move – within agency</li> <li>• Acting in a position</li> <li>• Contacts who knew selecting official</li> <li>• Willingness to relocate</li> <li>• Mentor (other than supervisor)</li> <li>• Professional networking</li> </ul>
Low (Fewer than 40%)	<ul style="list-style-type: none"> <li>• Lateral move -- to another agency</li> </ul>

# Perceived Importance of Career Accelerators among Upper-Level Respondents, 2007 Career Advancement Survey (CAS)

Importance	Factors
<p><b>Essential</b> Among upper-level employees, these factors are universal or nearly so; employees indicate the factor's effect is strong (positive if present, negative if absent, or both); and the factor will be relevant to any upper-level hiring or promotion decision. An employee lacking the factor is almost certain to be at a serious disadvantage when competing for advancement.</p>	<ul style="list-style-type: none"> <li>• Willingness to take on challenging assignment</li> <li>• High quality of past performance</li> <li>• Willingness to work long hours</li> </ul>
<p><b>Important</b> These factors are important. They fall short of "essential" because many employees have obtained an upper-level position without the factor. However, employees indicate that the factor contributed positively to advancement, and the factor is relevant to performance or promotability in most organizations or occupations. In some situations, a particular factor may be essential for entry or advancement.</p>	<ul style="list-style-type: none"> <li>• Developmental assignments</li> <li>• Supportive supervisor</li> <li>• Mentor (other than supervisor)</li> <li>• Formal educational qualifications</li> <li>• Specialized or technical training</li> <li>• Willingness to travel</li> </ul>
<p><b>Potentially Valuable or Important</b> These factors are potentially valuable. Employees indicate that their presence is typically positive and their absence may be negative. However, the importance and effect of the factor may be contingent on the employee's career field, agency requirements, the employee's skills, experience, or work situation, or other considerations.</p>	<ul style="list-style-type: none"> <li>• Leadership training</li> <li>• Extensive work experience</li> <li>• Acting in a position</li> <li>• Contacts who knew selecting official</li> <li>• Willingness to relocate</li> <li>• Lateral move – within the agency</li> <li>• Lateral move – to another agency</li> <li>• Professional networking</li> </ul>

# Differences in Career Factors between Women and Men

<b>Prevalence</b>	For the following factors, there was a difference of six or more percentage points between the percentages of women and men indicating that they had the career factor	
	<p><i>More women than men had these factors:</i></p> <ul style="list-style-type: none"> <li>• Mentor (other than supervisor)</li> <li>• Developmental assignments</li> <li>• Lateral move – within agency</li> <li>• Lateral move – to another agency</li> </ul>	<p><i>Fewer women had these factors:</i></p> <ul style="list-style-type: none"> <li>• Formal educational qualifications</li> <li>• Willingness to relocate</li> </ul>
<b>Effect</b>	<p>Women reported a stronger effect than men for the following factors:</p> <ul style="list-style-type: none"> <li>• High quality of past performance</li> <li>• Supportive supervisor</li> <li>• Developmental assignments</li> <li>• Lateral move – within agency</li> <li>• Lateral move – to another agency</li> </ul>	

Source:

Women in the Federal Government: Ambitions and Achievements  
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# Summary

- No single route to career success
- Importance of a particular career accelerator will depend on the employee's goals, previous education and accomplishments, and the unique requirements and demands of an employee's organization, occupation, and position
- Clearly, though, any employee seeking advancement should demonstrate – through performance, expressions of interest, and personal development – readiness for higher-level responsibilities
- Any employee seeking advancement should identify the specific requirements for success in her/his chosen field and strive to meet them!

Source:

Women in the Federal Government: Ambitions and Achievements  
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U.S. Merit Systems Protection Board, May 2011