

Survival Analysis Modeling of Promotions in the State Department's Workforce

2022 FCSM Research and Policy Conference
U.S. Government Accountability Office
Moon Parks

Agenda

- Explore some aspects of workforce data
- Discuss methodological limitations of various approaches that have been used
- Introduce GAO's methodology used to answer the research question
- Key results from GAO's analysis

State Workforce Data

- Personnel datasets of employees at State
 - Covered the agencies' Civil and Foreign Service employees
- Unique opportunity to get such detailed personnel data
 - Contained demographic characteristics and SF-50 actions
 - 17 years of data from fiscal year 2002 through fiscal year 2018



1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??
Ann DY 1	Ann DY 4 Exit										

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??
Ann DY 1	Ann DY 4 Exit										
			Mike DY 1 Seoul	Mike DY 2 Kabul	Mike DY 3 Pro_C3		Mike DY 8 Exit				

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??
Ann DY 1	Ann DY 4 Exit										
			Mike DY 1 Seoul	Mike DY 2 Kabul	Mike DY 3 Pro_C3		Mike DY 8 Exit				
			Susan DY 1 Caracas	Susan DY 2 Pro_C3	Susan DY 1	Susan Maternity leave	Susan DY 6	Susan DY 7 Pro_C2		Susan DY 5	Susan Pro??

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??
Ann DY 1	Ann DY 4 Exit										
			Mike DY 1 Seoul	Mike DY 2 Kabul	Mike DY 3 Pro_C3		Mike DY 8 Exit				
			Susan DY 1 Caracas	Susan DY 2 Pro_C3	Susan DY 1	Susan Maternity leave	Susan DY 6	Susan DY 7 Pro_C2		Susan DY 5	Susan Pro??
								Jose DY 1 Caracas		Jose DY 6 Pro_C3	Jose

Search for the Methodology

- **Calculating Promotion Rates for Each Year**

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??
Ann DY 1	Ann DY 4 Exit										
			Mike DY 1 Seoul	Mike DY 2 Kabul	Mike DY 3 Pro_C3		Mike DY 8 Exit				
			Susan DY 1 Caracas	Susan DY 2 Pro_C3	Susan DY 1	Susan Maternity leave	Susan DY 6	Susan DY 7 Pro_C2		Susan DY 5	Susan Pro??
								Jose DY 1 Caracas		Jose DY 6 Pro_C3	Jose

Search for the Methodology

- **Calculating Promotion Rates for Each Year**
 - Does not capture time delay in promotion
 - Each year's promotion pools are relatively small
- **Aggregating Promotion Rates across Multiple Years**

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??
Ann DY 1	Ann DY 4 Exit										
			Mike DY 1 Seoul	Mike DY 2 Kabul	Mike DY 3 Pro_C3		Mike DY 8 Exit				
			Susan DY 1 Caracas	Susan DY 2 Pro_C3	Susan DY 1	Susan Maternity leave	Susan DY 6	Susan DY 7 Pro_C2		Susan DY 5	Susan Pro??
								Jose DY 1 Caracas		Jose DY 6 Pro_C3	Jose

Search for the Methodology

- **Aggregating Promotion Rates across Multiple Years**
 - Does not account for censoring

- **Cohort Analysis**

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??
Ann DY 1	Ann DY 4 Exit										
			Mike DY 1 Seoul	Mike DY 2 Kabul	Mike DY 3 Pro_C3		Mike DY 8 Exit				
			Susan DY 1 Caracas	Susan DY 2 Pro_C3	Susan DY 1	Susan Maternity leave	Susan DY 6	Susan DY 7 Pro_C2		Susan DY 5	Susan Pro??
								Jose DY 1 Caracas		Jose DY 6 Pro_C3	Jose

Search for the Methodology

- **Cohort Analysis**
 - Sample size could be an issue
 - Cohort analysis cannot be generalized

- **Standard Regression Model**

1995	1998	***	2002	2003	2004	***	2012	2013	***	2018	2020
John DY 1	John DY 4		John DY 4 Pro_C3	John DY 1	John DY 2 Baghdad		John DY 6 Pro_C1	John DY 1		John DY 6	John Pro??
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								Jose DY 1 Caracas		Jose DY 6 Pro_C3	Jose

Discrete Duration Analysis

- A type of Survival analysis or other equivalent names include:
 - Event history analyses
 - Duration analysis
 - Failure time analysis
 - Reliability analyses
- Regression analysis w/ multiple observations of same people
- Accounts for the time it took for a promotion to occur

What this Methodology can Do

- Analyzes time duration
- Combines multiple years' promotion cycles
- Combines multiple “cohorts”
- Addresses censoring problem
- Accounts for factors other than racial or ethnic minority status that could influence promotion

Regression Equation

$$\log \left[\frac{P_{it}}{1 - P_{it}} \right] = \sum_{z=0}^4 \alpha_z \cdot t^z + \phi \cdot female_i + \mu \cdot minority_i + \beta_1 x_{it1} + \dots + \beta_k x_{itk} + \varepsilon_{it}$$

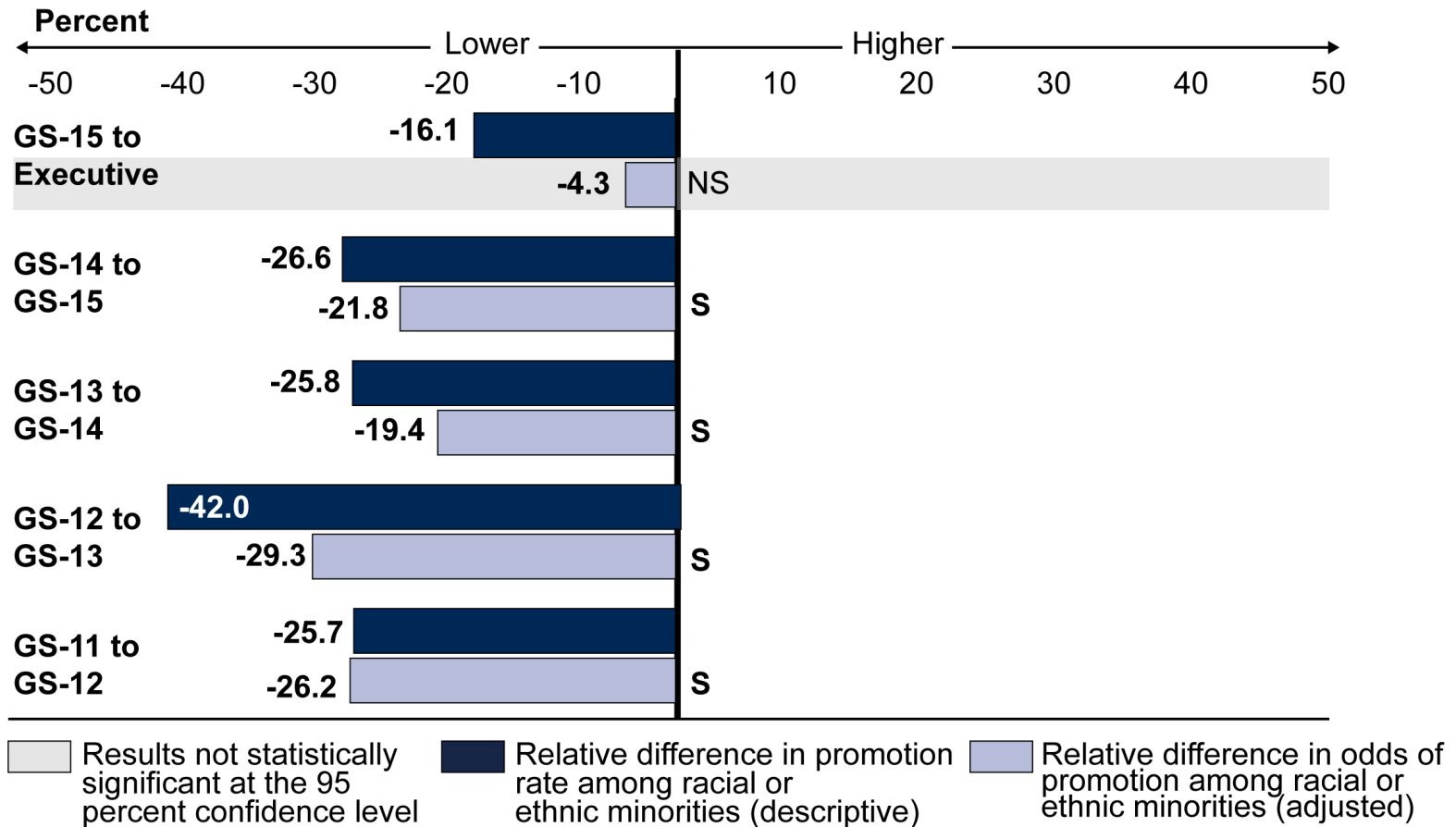
Accounted for Other Factors Associated with Promotion

- Years of prior federal government experience
- Age at the time of entering agency
- Veterans' preference status
- Long-term leave in the prior year
- Transferring between Civil and Foreign Services
- Occupation
- Overseas or high hardship work in the prior year (FS only)
- Language skills (FS only)
- Fiscal years
- Ivy League or school located in DC, VA, or MD (State FS only)

What this Analysis Cannot Say

- Unobservable factors → cannot establish causality
- Occupation segmentation/Occupation Segregation
- We do not model the promotion process

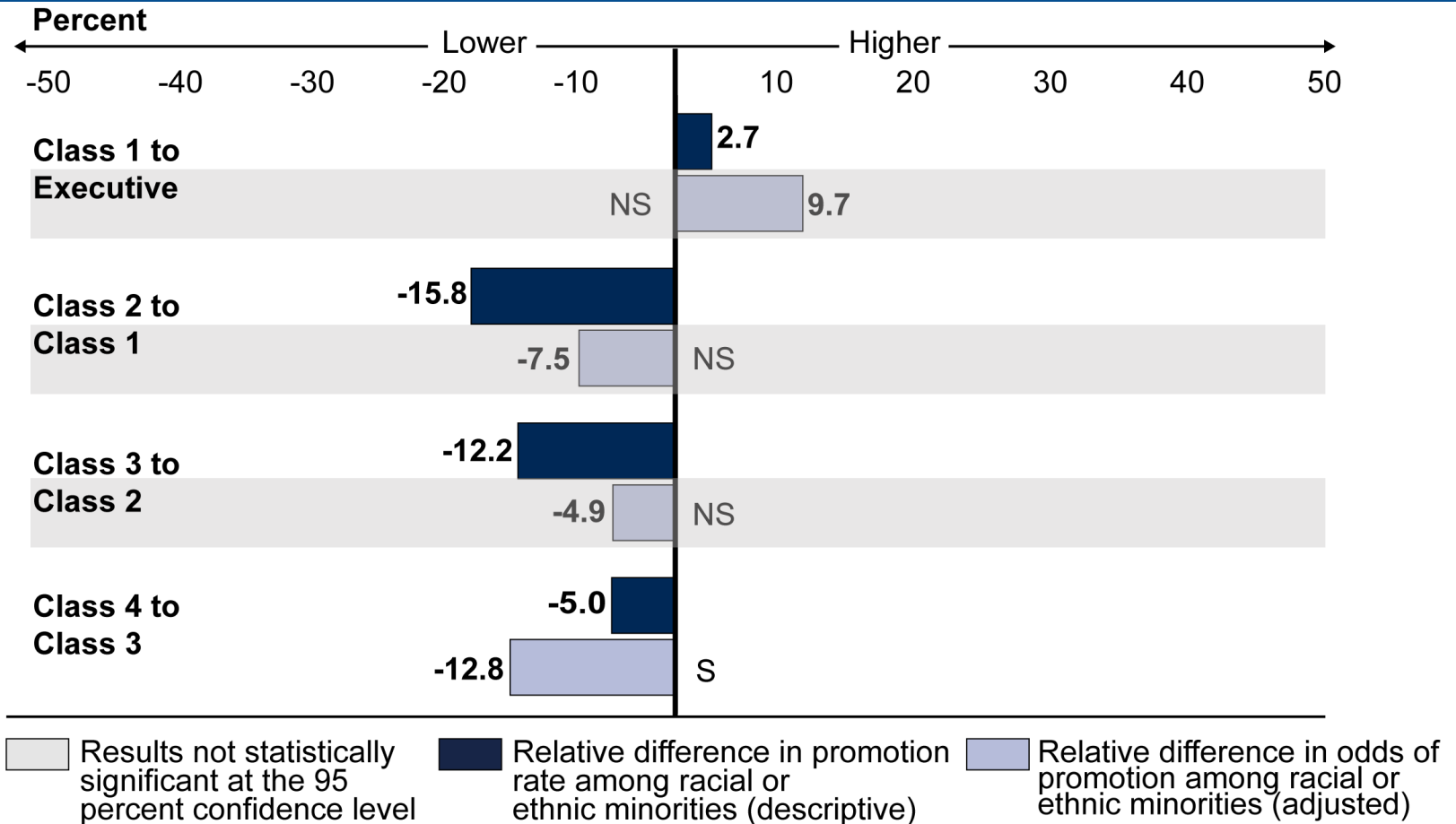
Promotion Outcomes for Racial or Ethnic Minorities in the State's Civil Service



Legend: NS = not statistically significant at the 95 percent confidence level, S = statistically significant

Source: GAO analysis of Department of State data. | GAO-20-237

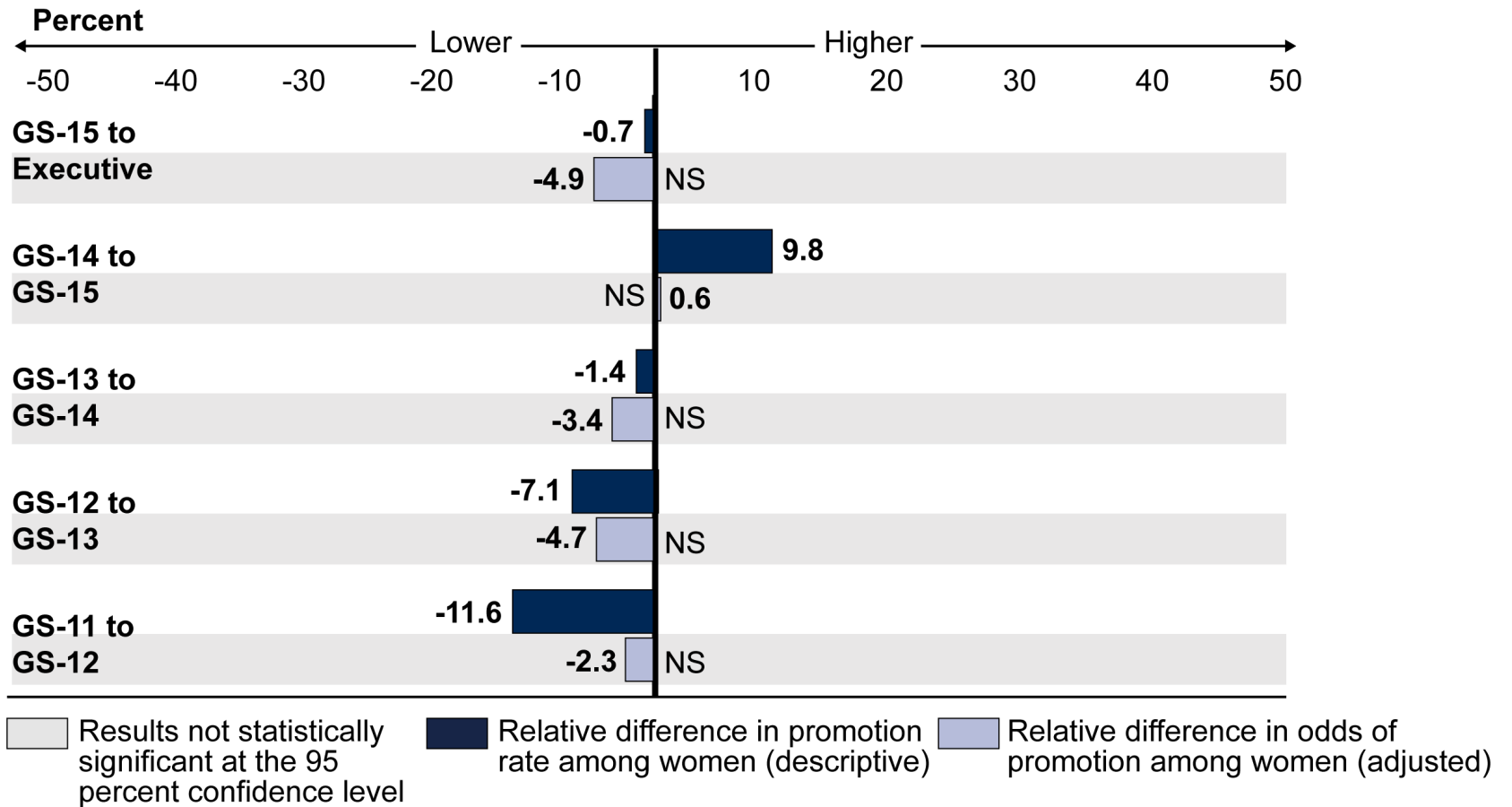
Promotion Outcomes for Racial or Ethnic Minorities in the State's Foreign Service



Legend: NS = not statistically significant at the 95 percent confidence level, S = statistically significant

Source: GAO analysis of Department of State data. | GAO-20-237

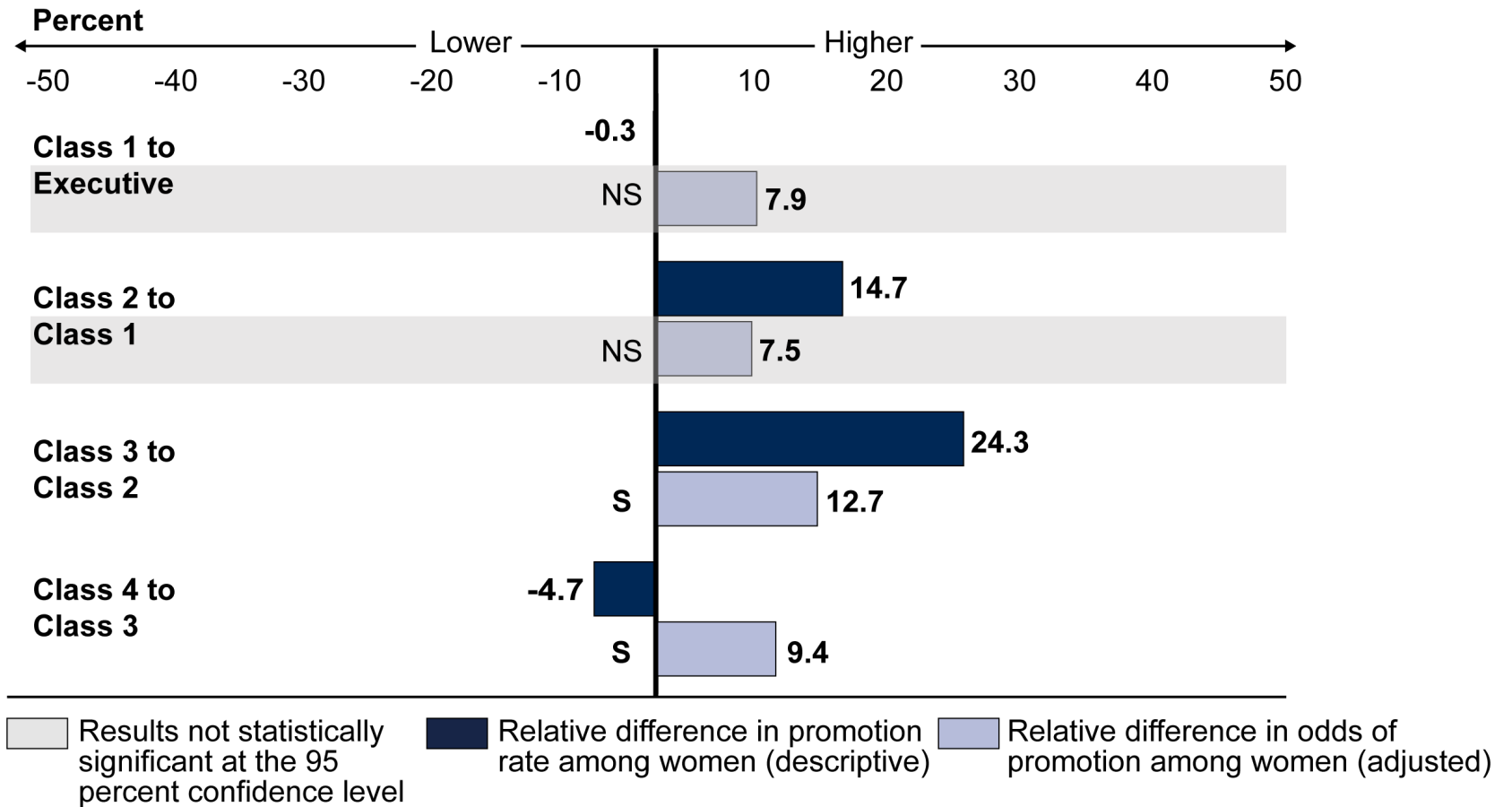
Promotion Outcomes for Women in the State's Civil Service



Legend: NS = not statistically significant at the 95 percent confidence level, S = statistically significant

Source: GAO analysis of Department of State data. | GAO-20-237

Promotion Outcomes for Women in the State's Foreign Service



Legend: NS = not statistically significant at the 95 percent confidence level, S = statistically significant

Source: GAO analysis of Department of State data. | GAO-20-237

Moving forward

- Recommendations
 - GAO recommended that State take additional steps to identify diversity issues that could indicate potential barriers to equal opportunity in its workforce.
- Testimonies
 - June 17, 2020, to the Subcommittee on Oversight and Investigations, Committee on Foreign Affairs, House of Representatives: *State Department: Additional Steps Are Needed to Identify Barriers to Workforce Diversity* ([GAO-20-515T](#))
- Other Outcomes
 - Secretary of State mentioned our report in announcing a Chief Diversity and Inclusion Officer; House included requirement for report on workforce data statistics in 2022 appropriations bill; press including the NYT, The Hill, and Foreign Policy

Acknowledgement

- **Key contributors to this report**

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More Information in GAO-20-237 and Follow up report GAO-22-105182

 United States Government Accountability Office
Report to congressional requesters
January 2020

State Department

Additional Steps Are Needed to Identify Potential Barriers to Diversity

GAO-20-237

www.gao.gov

 United States Government Accountability Office
Report to the Chairman, Committee on Foreign Relations, U.S. Senate

July 2022

STATE DEPARTMENT

Additional Actions Needed to Improve Workplace Diversity and Inclusion