Association between leadership commitment and professional development at NASA (2020): sex-adjusted stratified analysis

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Document version

Version	Alterations
01	Initial version

1 ABBREVIATIONS

- CI: confidence interval
- FEVS: Federal Employee Viewpoint Survey
- OPM: U.S. Office of Personnel Management

2 CONTEXT

The Federal Employee Viewpoint Survey (FEVS) addressed leadership commitment, professional development, and telework satisfaction while accounting for gender (OPM, 2020). This analysis addresses a subset of the FEVS survey reflecting NASA employees.

2.1 Objectives

Test if there is an association between leadership commitment and telework employee satisfaction at NASA from the 2020 Federal Employee Viewpoint Survey.

2.2 Data reception and cleaning

All variables in the analytical set were labeled according to the raw data provided and values were labeled according to the data dictionary for the preparation of production-quality results tables and figures.

After the cleaning process 5 variables were included in the analysis with 9633 observations.

Raw data was collected as a census of the eligible population (OPM, 2020), and statistical weighting was applied at the data collection to adjust for non-responses in in the census attempt. These survey weights allow for the estimation of the association under study in the source population. The raw data is expected to reflect a total employee population at NASA at 16809 employees but after cleaning procedures the observations in the analytical data represents a total of 15283 NASA employees.

3 METHODS

3.1 Variables

3.1.1 Primary and secondary outcomes

Specification of outcome measures (Zarin, 2011):

1. (Domain) telework employee satisfaction
2. (Specific measurement) N/A
3. (Specific metric) N/A
4. (Method of aggregation) N/A

Primary outcome

This analysis does not evaluate an outcome variable, but instead tests whether or not the distributions of answers from two questions are independent from one another.

3.1.2 Covariates

The association will be stratified by the sex of survey respondents.

3.2 Statistical analyses

The epidemiological profile of the study participants will be described. Demographic (sex, age and BMI) will be described as mean (SD) or as counts and proportions (%), as appropriate.

All comparisons between groups will be performed as univariate analyses. Differences in distribution of categorical variables will be assessed with the chi-square test with the Rao correction for weighted survey data.

This analysis was performed using statistical software R version 4.1.2.

4 RESULTS

4.1 Study population and follow up

Table 1 *caption*

Characteristic	N = 15,283
Sex	
Male	10,154 (66)
Female	5,129 (34)
I am given a real opportunity to improve my skills in my organization.	
1	183 (1.2)
2	477 (3.1)
3	1,104 (7.2)
4	6,137 (40)
5	7,382 (48)
Supervisors in my work unit support employee development.	
1	152 (1.0)
2	232 (1.5)
3	678 (4.4)
4	4,640 (30)
5	9,581 (63)

4.2 Inferential analysis

Table 2 *caption*

Characteristic	Overall, N = 15,283[1]	I am given a real opportunity to improve my skills in my organization, n (%)					p-value[2]
		1, N = 183[1]	**2**, N = 477[1]	**3**, N = 1,104[1]	**4**, N = 6,137[1]	**5**, N = 7,382[1]	
Supervisors in my work unit support employee development, n (%)							<0.001
1	152 (1.0)	81 (44)	45 (9.4)	10 (0.9)	11 (0.2)	5 (<0.1)	
2	232 (1.5)	39 (21)	97 (20)	46 (4.2)	42 (0.7)	8 (0.1)	
3	678 (4.4)	21 (11)	119 (25)	264 (24)	238 (3.9)	37 (0.5)	
4	4,640 (30)	15 (8.1)	161 (34)	534 (48)	3,127 (51)	803 (11)	
5	9,581 (63)	27 (15)	56 (12)	250 (23)	2,719 (44)	6,529 (88)	

[1]n (%) [2]chi-squared test with Rao & Scott's second-order correction

5 OBSERVATIONS AND LIMITATIONS

6 CONCLUSIONS

7 REFERENCES

- **SAP-2022-008-GJ-v01** – Analytical Plan for Association between leadership commitment and professional development at NASA (2020): sex-adjusted stratified analysis

8 APPENDIX

8.1 Exploratory data analysis

8.2 Availability

Both this document and the corresponding analytical plan (**SAP-2022-008-GJ-v01**) can be downloaded in the following address:

https://philsf-biostat.github.io/SAR-2022-008-GJ/

8.3 Analytical dataset

Due to confidentiality the data-set used in this analysis cannot be shared online in the public version of this report.

Table A1 *Analytical dataset structure*

id	dsex	q1	q21	postwt
1				
2				
3				
…				
9633				