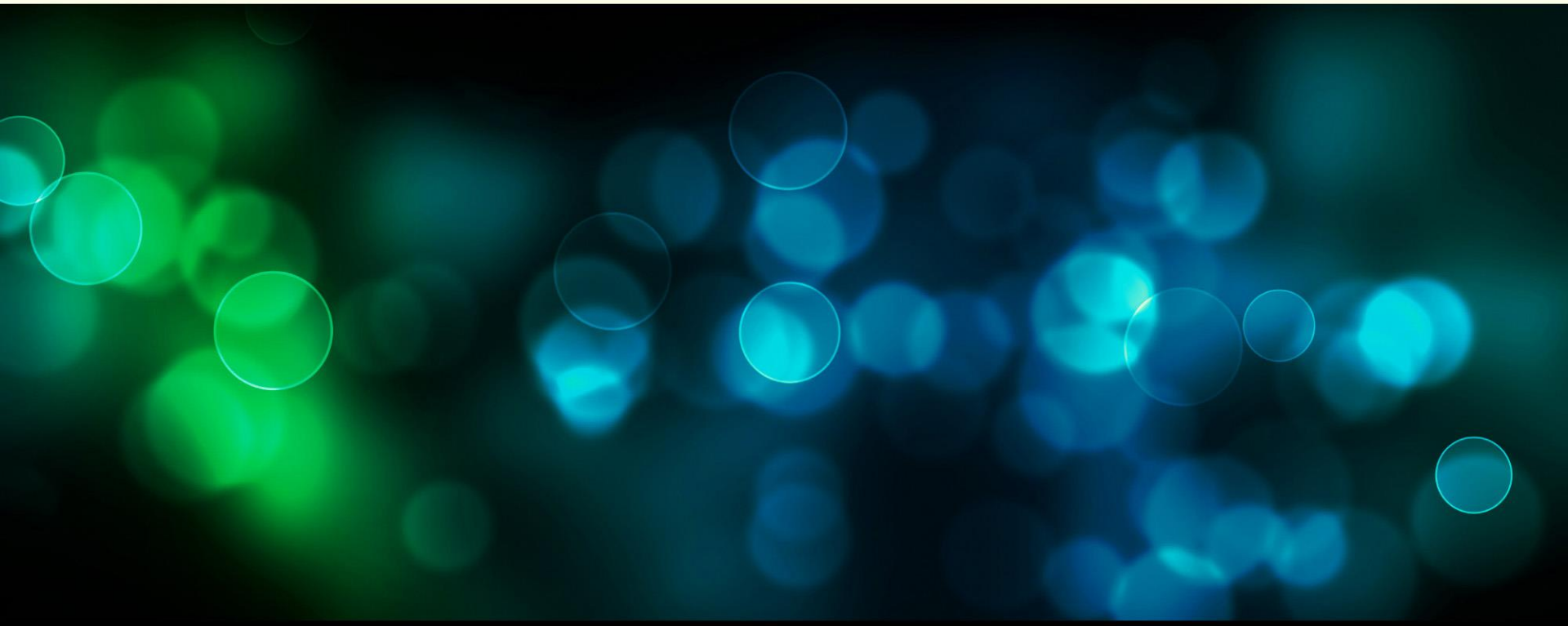
Does the length of the fielding period matter? Examining response scores for early versus late responders



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Acronyms

FEVS = Federal Employee Viewpoint Survey

OPM = U.S. Office of Personnel Management

Disclaimer: The opinions, findings, and conclusions expressed in this article are those of the authors and do not necessarily reflect those of the U.S. Office of Personnel Management.

Outline

- Overview of FEVS

- What if the field period is shortened?
  - Changes in respondents
  - Changes in estimates
  - Relationships between changes and establishment characteristics

FEVS Overview

- Administered by OPM in 2002, 2004, 2006, 2008, 2010 and annually since 2011
- Population:
  - 83 Executive Branch agencies
  - Federal full-time permanent employees
  - Permanent part-time employees added in 2012
- Sampling frame = OPM personnel database (N>2 million)
- Survey objectives:
  - Obtain employees' opinions about their organizations
  - Provide summary data to OPM and agencies for management activities

FEVS Overview (continued)

- 2011 Sample Design:
  - Single-stage disproportionately stratified sample selected each cycle
  - Stratification variables: Sub-agencies and supervisory status
  - 1,114 strata
  - Administered as a census in 13 agencies
  - n=560,084
- Data Collection:
  - Primarily web-based—invitations and weekly reminder by email
  - Less than 5,000 employees provided with paper surveys
  - 2011 governmentwide response rate was 48% (AAPOR RR3)

FEVS Post-Data-Collection Processing

- Calculate weights
  - Calculate base weights to reflect the sample design
  - Use CHAID or SEARCH to develop weighting classes and then adjust the base weights for differential nonresponse
  - Rake adjusted weights to sampling-frame totals for the sampling strata and cells defined by agency, gender, and minority status
- Calculate estimates:
  - Recode 5-point scales to positive/not-positive
  - For each survey item, estimate the percentage of positive responses by agency and governmentwide
  - Calculate indices, which are averages of related percent-positive estimates. (Perfect score = 100)

Examples of FEVS Indices

(Sub)-Index	# items	Example item
Conditions for Employee Engagement	**(15)**	
Leaders Lead	5	**Q61**. I have a high-level of respect for my organization's senior leaders.
Intrinsic Work Experience	5	**Q6.** I know what is expected of me on the job.
Supervisors	5	**Q51**. I have trust and confidence in my supervisor.
Global Satisfaction	**4**	**Q40**. I recommend my organization as a good place to work.

What if shorten the fielding period?

- How short?
  - 2011 FEVS: 3 to 9 weeks (mostly 6 weeks)
  - Shortened to 2 weeks
- Defines *early responders* and *late responders* in the 2011 FEVS
- Proportions of late responders among all responders in 30 large agencies (n=253,285 completes):
  - Governmentwide: 41%
  - Across agencies: 14% - 57%

Governmentwide Early- and Late-Respondent Characteristics (unweighted)

	Early responders	Late responders	Early minus Late
Minority	31%	**39%**	-8%
Male	51%	**54%**	-3%
GS 13-15	43%	**46%**	-3%
Intend to stay	70%	**73%**	-3%
Headquarters	41%	**43%**	-2%
Supervisor/ manager	25%	**26%**	-1%

Agency Respondent Characteristics

- In all 30 agencies, minorities are more likely to be late responders.
- In 26 agencies, employees intending to leave are more likely to be early responders.
- In 17 agencies, males are more likely to be late responders.

Comparison of Weighted Estimates

- Repeated 2011 FEVS weighting procedures for early respondents

$$\bar{x}^{(early)} = \sum_{early} w_i^{(early)} x_i \Big/ \sum_{early} w_i^{(early)}$$

$$\bar{x}^{(all)} = \sum_{all} w_i^{(all)} x_i \Big/ \sum_{all} w_i^{(all)}$$

early-minus-all difference $= \bar{x}^{(early)} - \bar{x}^{(all)}$

Expectation of early-minus-all difference (*E*)

- Deterministic response model:
  - All respondents (N_{all} in population)
    - Early respondents (N_{early} in population)
    - Late respondents (N_{late} in population)
  - Nonrespondents
- Define

$$\bar{X}^{(early)} = \text{expectation of } \bar{x}^{(early)}$$

$$\bar{X}^{(all)} = \text{expectation of } \bar{x}^{(all)}$$

Expectation of early-minus-all difference (*E*) *[continued]*

$$E = r_{late}\left(\bar{X}^{(early)} - \bar{X}^{(late)}\right)$$

$$r_{late} = \frac{N_{late}}{N_{early} + N_{late}}$$

$$= \text{prevalence of late respondents}$$

$$\bar{X}^{(late)} \text{ such that } \bar{X}^{(all)} = \frac{N_{early}\bar{X}^{(early)} + N_{late}\bar{X}^{(late)}}{N_{early} + N_{late}}$$

Governmentwide Early-Minus-All Differences

	Change in governmentwide scores	
	(Sub)-Index	Items
Conditions for Employee Engagement	**-1.39**	
Leaders Lead	-1.76	-1.96 to -1.45
Intrinsic Work Experience	-1.29	-1.68 to -0.51
Supervisors	-1.13	-1.56 to -0.72
Global Satisfaction	**-1.31**	-1.70 to -0.36

Agency Early-Minus-All Differences

	Change in (sub)-index scores		
	Govern-mentwide	Agency median	Agency range
Conditions for Employee Engagement	**-1.39**	**-1.39**	**-3.93 to 0.19**
Leaders Lead	-1.76	-2.00	-4.40 to 0.42
Intrinsic Work Experience	-1.29	-1.13	-3.92 to 0.40
Supervisors	-1.13	-1.12	-3.49 to 1.10
Global Satisfaction	**-1.31**	**-1.28**	-5.92 to 0.30

Agency Early-Minus-All Differences

	Change in (sub)-index scores		
	Govern-mentwide	Agency median	Agency range
Conditions for Employee Engagement	**-1.39**	**-1.39**	**-3.93 to 1.90**
Leaders Lead	-1.76	-2.00	-4.40 to 0.42
Intrinsic Work Experience	-1.29	-1.13	-3.92 to 0.40
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Agency Estimation Effects

	Change in (sub)-index scores		
	Govern-mentwide	Agency median	Agency range
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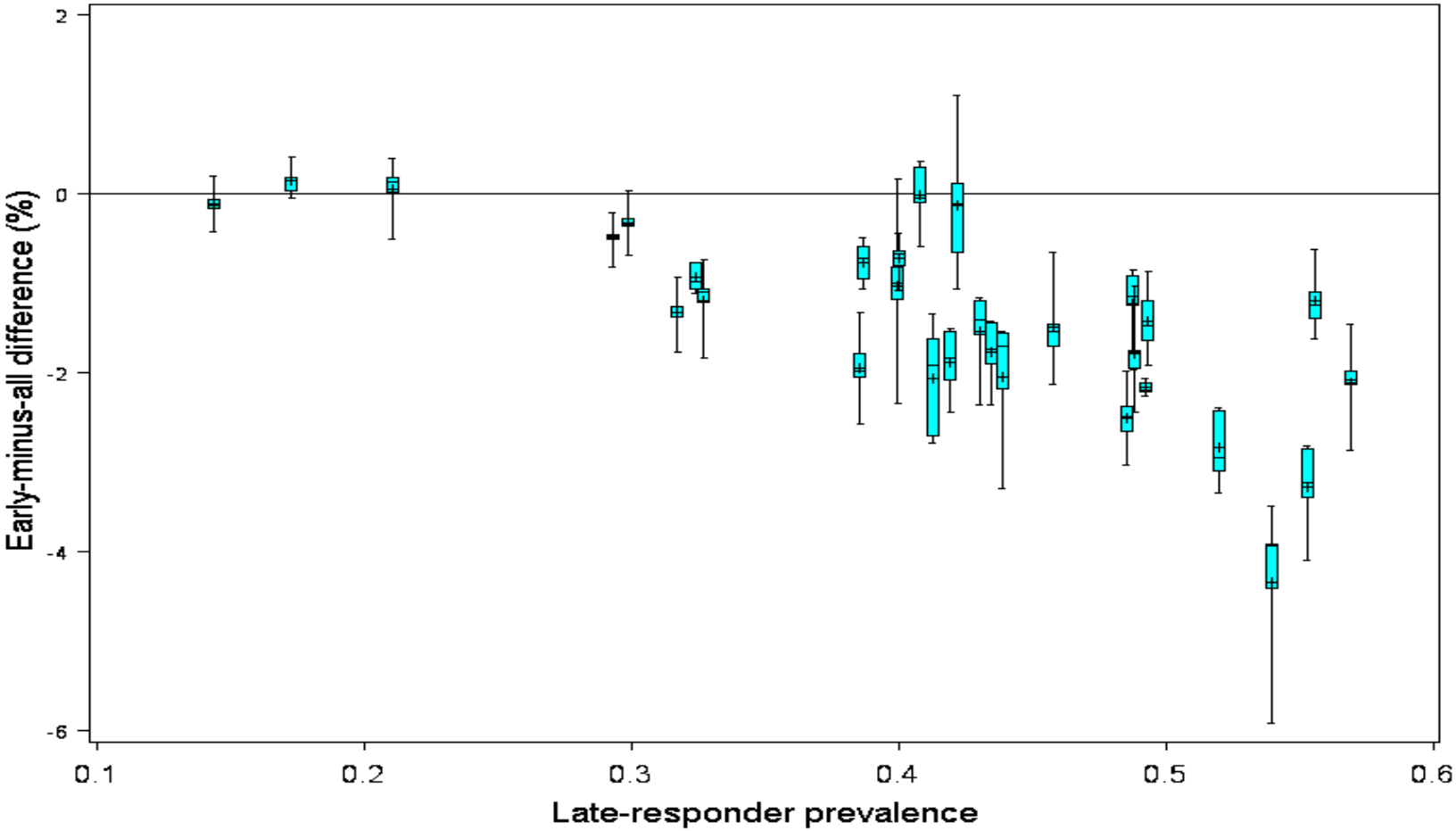
Changes in (Sub)-Index Scores vs r_{late}



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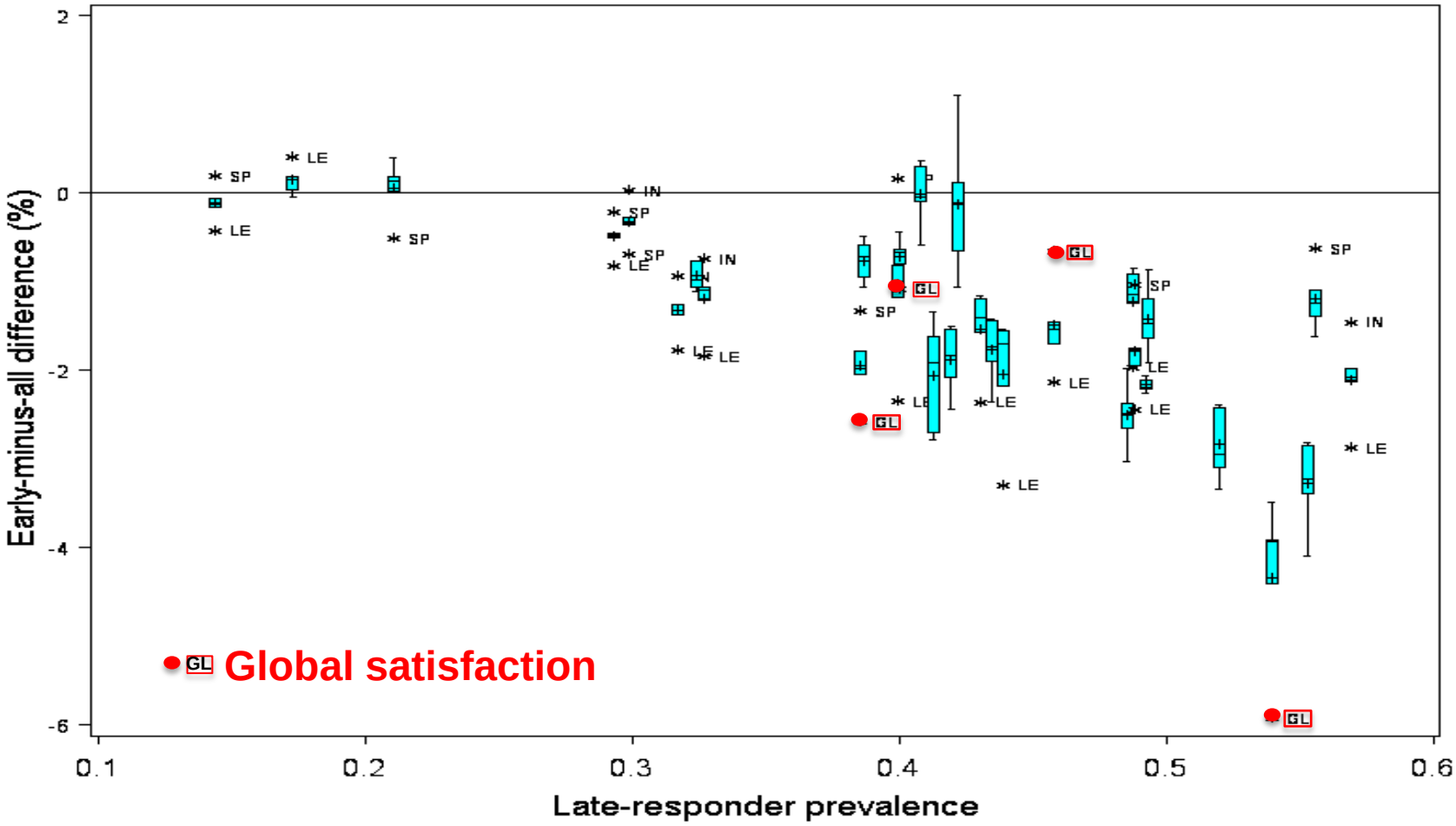


Relationships Between Changes and Agency Characteristics

- Developed prediction models for r_{late} and (sub)-index early-minus-all differences (n=30).
- Agency-level variables available from sampling frame:
  1. Percent minority
  2. Percent male
  3. Percent assigned to field
  4. Percent non-supervisors
  5. Average length of federal service
  6. Average age of employees
- Excluded average-age to avoid multi-collinearity.

Prediction of r_{late}

- Using frame variables as predictors
  - R^2=0.29
  - All coefficients not significantly different from zero, except for percent males (increases r_{late})
- Two additional predictors—all-responder response rate and reciprocal of # weeks in field period
  - R^2=0.80
  - Significant coefficients:
    - Reciprocal of # weeks
    - Percent assigned to field (decreases r_{late})
    - All-responder response rate (decreases r_{late})

Prediction of Agency-Level Early-Minus-All Differences ($\hat{E}_a$)

- Models for (sub)-indices:

$$\hat{\mathbf{E}}_a = \mathbf{r}_{late,a}\, f(r_{late,a}, u_{1a}, u_{2a}, \ldots, u_{5a})$$

$$f(\ldots) = \alpha_0 + \sum_{k=1}^{5} \alpha_k (u_{ka} - \bar{u}_k)$$

$$+ r_{late,a}\left[\beta_0 + \sum_{k=1}^{5} \beta_k (u_{ka} - \bar{u}_k)\right]$$

  - $r_{late,a}$ is observed value, not predicted value.
  - R^2 values from 0.74 to 0.78 (using an intercept)

Prediction of Agency-Level Early-Minus-All Differences ($\hat{E}_a$)

- Models for (sub)-indices:

$$\hat{E}_a = r_{late,a}$$

$$f(r_{late,a}, u_{1a}, u_{2a}, \ldots, u_{5a})$$

Predicts $\left(\bar{X}^{(early)} - \bar{X}^{(late)}\right)$

$$f(\ldots) = \alpha_0 + \sum_{k=1}^{5} \alpha_k \left(u_{ka} - \bar{u}_k\right)$$

$$+ r_{late,a}\left[\beta_0 + \sum_{k=1}^{5} \beta_k \left(u_{ka} - \bar{u}_k\right)\right]$$

$r_{late,a}$ is observed value, not predicted value.

Significant Coefficients for Predicting Early-Minus-All Differences

Independent variable[1]	Engage-ment	Exper-iences	Leaders	Supervi-sors	Satis-faction
r_{late}	*	*		*	
r_{late}[d(%minority)]	*	*			*
r_{late}[d(avg. LOS)]				*	
$(r_{late})^2$	*	*	*	*	*
$(r_{late})^2$ [d(%minority)]		*			*

[1] $d(u) = u - \bar{u}$, LOS= length of service

*p<0.05

Significant coefficients for Predicting Early-M-nus-All Differences

Set $u = \bar{u}$ for "average" agency

Independent variable[1]	Engage-ment	Exper-iences	Leaders	Supervi-sors	Satis-faction
r_{late}	*	*		*	
~~r_{late}[d(%minority)]~~	*	*			*
~~r_{late}[d(avg. LOS)]~~				*	
$(r_{late})^2$	*	*	*	*	*
~~$(r_{late})^2$[d(%minority)]~~		*			*

[1] $d(u) = u - \bar{u}$, LOS= length of service

*p<0.05

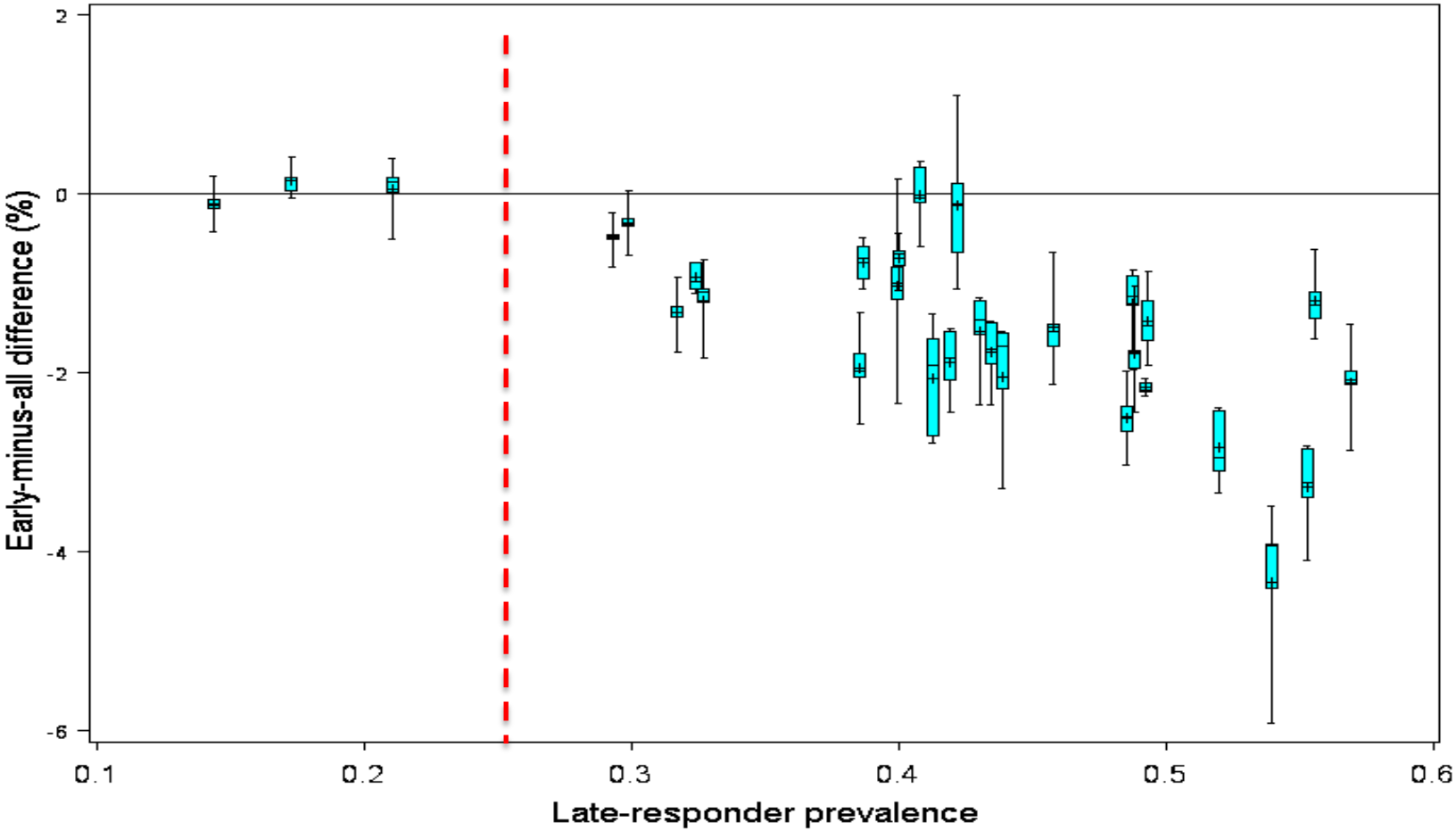
Predicted Score Change for "Average" Agency

Prevalence of late responders	Engage-ment	Exper-iences	Satis-faction
0.10	**0.3**	0.3	0.2
0.20	**0.2**	0.2	0.1
0.30	**-0.3**	-0.2	-0.4
0.40	**-1.1**	-1.0	-1.2
0.50	**-2.4**	-2.1	-2.4
0.60	**-4.0**	-3.6	-3.8

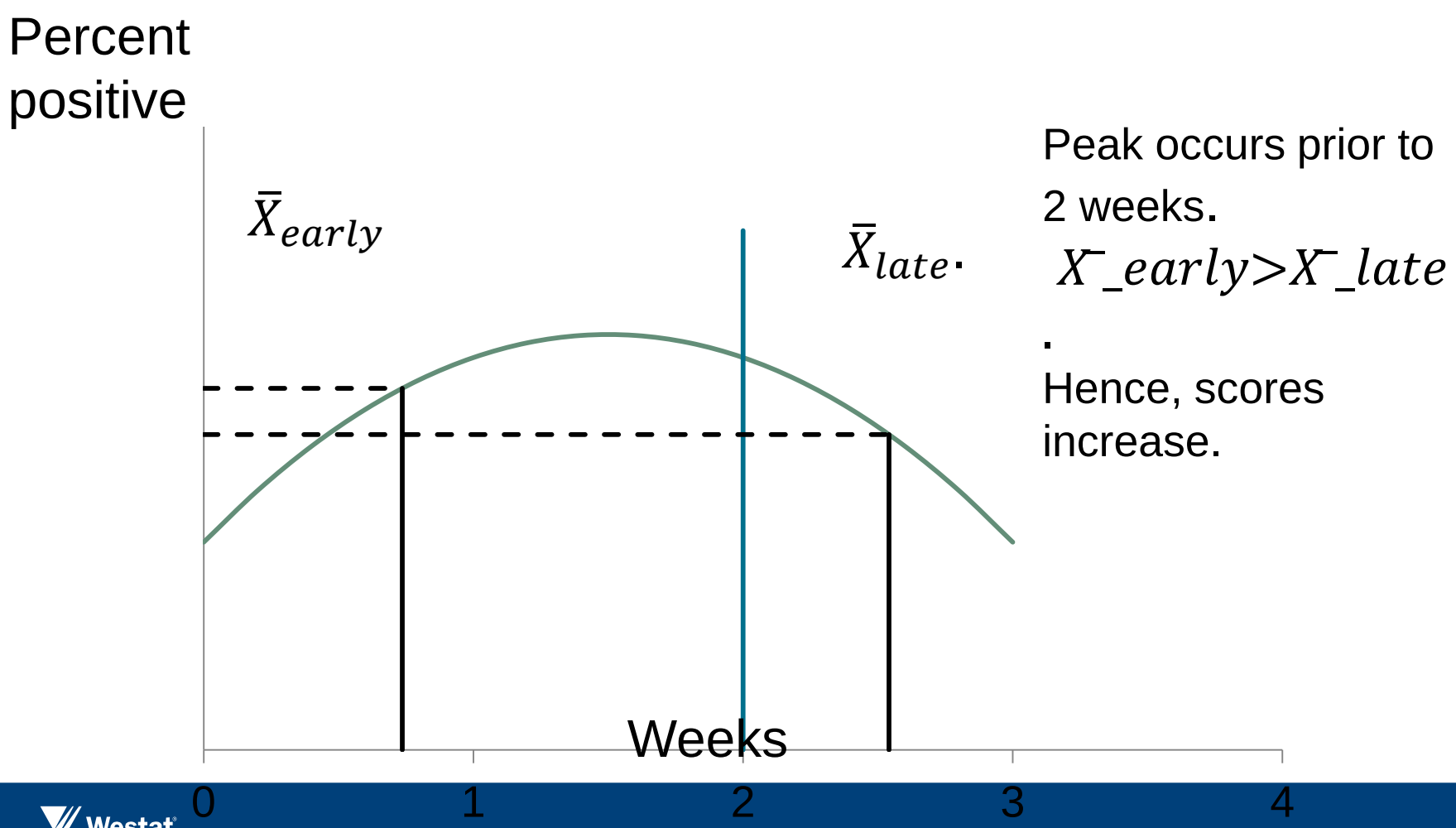
Predicted Score Change for "Average" Agency

Prevalence of late responders	Engage-ment	Exper-iences	Satis-faction
0.10	**0.3**	0.3	**0.2**
0.20	**0.2**	0.2	**0.1**
0.30	**-1.3**	-0.2	**-0.4**
0.40	**-1.1**	-1.0	**-1.2**
0.50	**-2.4**	-2.1	**-2.4**
0.60	**-4.0**	-3.6	**-3.8**

Changes in (sub)-index scores vs $p^{(late)}$



Possible Explanation for "Average" Agency's Score Increase for Low r_{late}



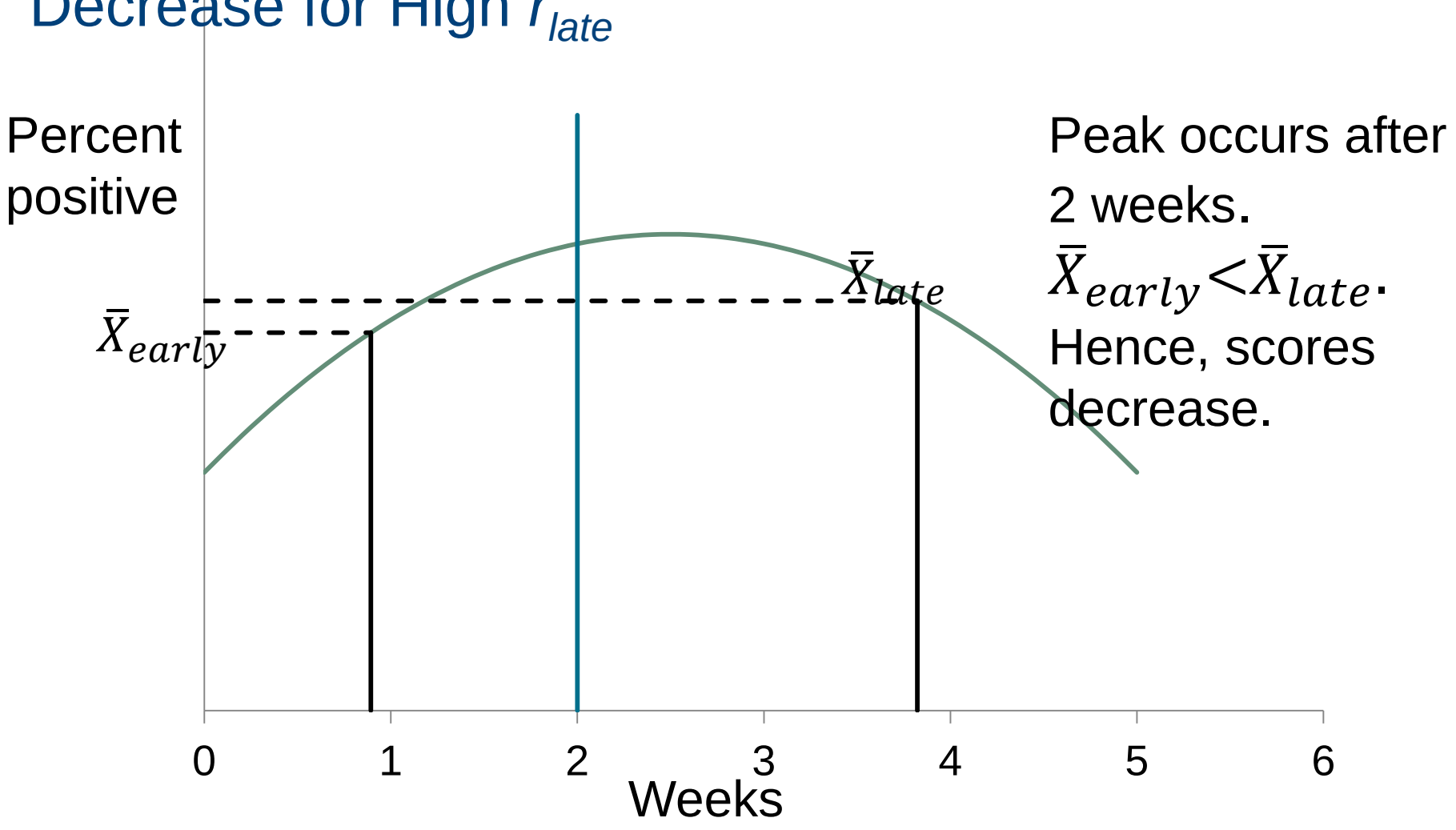
Peak occurs prior to 2 weeks.

$\bar{X}\_early > \bar{X}\_late$

.

Hence, scores increase.

Possible Explanation for Average Agency's Score Decrease for High r_{late}



Peak occurs after 2 weeks.

$\bar{X}_{early} < \bar{X}_{late}$.

Hence, scores decrease.

Conclusions

If the FEVS fielding period were to be shortened to 2 weeks and no other changes made, then

1. Number of completed surveys reduced by approximately 41%.
2. Decrease in proportion of respondents who are minorities, males, GS13-15, intend to stay, work in headquarters, and are supervisors or managers.
3. Governmentwide percent-positive estimates and (sub)-index scores would decrease slightly. Score changes for governmentwide (sub)-indices range from -1.76 to -1.13.

Conclusions (continued)

4. Many, but not all, agency-level percent-positive estimates and (sub)-index scores would decrease. Score changes for agency-level (sub)-indices range from -5.92 to 1.10.

5. The magnitude of an agency's expected (sub)-index score changes depends on its prevalence of late responders and its proportion of minority employees.

6. The magnitude of an agency's expected change in the Supervisors sub-index also depends on the average length of Federal service of the agency's employees.

Area for Further Research

- Our study:
  - Artificially shortened the field period
  - Lacked end-of-survey messaging about a 2 week field period
- What would have been the effect of messaging about a 2 week field period on early-minus-all difference?

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