

# **Attenuation of Anchoring Bias in Performance Appraisal : An Experimental Study**

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# Introduction

## ❖ Cognitive Biases and Anchoring Bias

$$\begin{array}{r}
 8 \times 7 \times 6 \times 5 \\
 4 \times 3 \times 2 \times 1 \\
 \hline
 \end{array}$$

1,000?

2,000?

2,250 ?



**Anchoring Bias**

$$\begin{array}{r}
 1 \times 2 \times 3 \times 4 \\
 5 \times 6 \times 7 \times 8 \\
 \hline
 \end{array}$$

512 ?

$$\begin{array}{r}
 8 \times 7 \times 6 \times 5 \times 4 \dots\dots \\
 \boxed{\quad} \boxed{\quad} \\
 56 \quad 336 \\
 \text{⚓}
 \end{array}$$

= 2,250 ?



$$\begin{array}{r}
 1 \times 2 \times 3 \times 4 \times 5 \dots\dots \\
 \boxed{\quad} \boxed{\quad} \\
 2 \quad 6 \\
 \text{⚓}
 \end{array}$$

= 512?

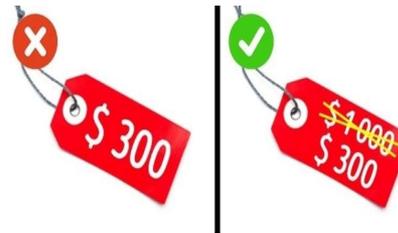
# Introduction

## ❖ What is Anchoring Bias?

**Anchoring Bias** is the cognitive tendency to estimate unknown quantities by making adjustments from an initial value (Tversky and Kahneman 1974).



Shopping



Sale Negotiation



Salary Negotiations



Promotion / Hiring

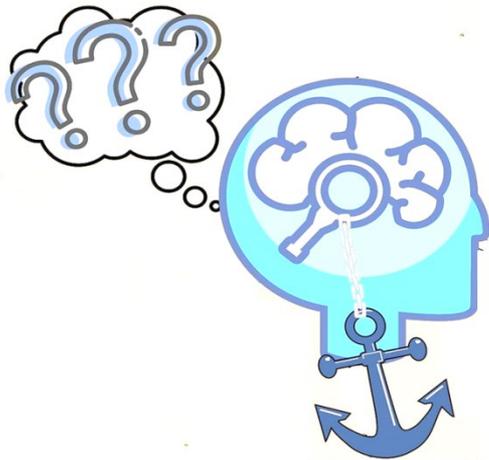


**Anchoring Bias plays a “significant” role in our “everyday” decision-making.**

# Research Framework



The paper aims to 1) test the anchoring biases in employee performance appraisals and 2) suggest a debiasing strategy.



**ANCHORING BIASES**



**PERFORMANCE APPRAISALS**

*Does Anchoring Bias affect employee performance appraisals in the public sector?*

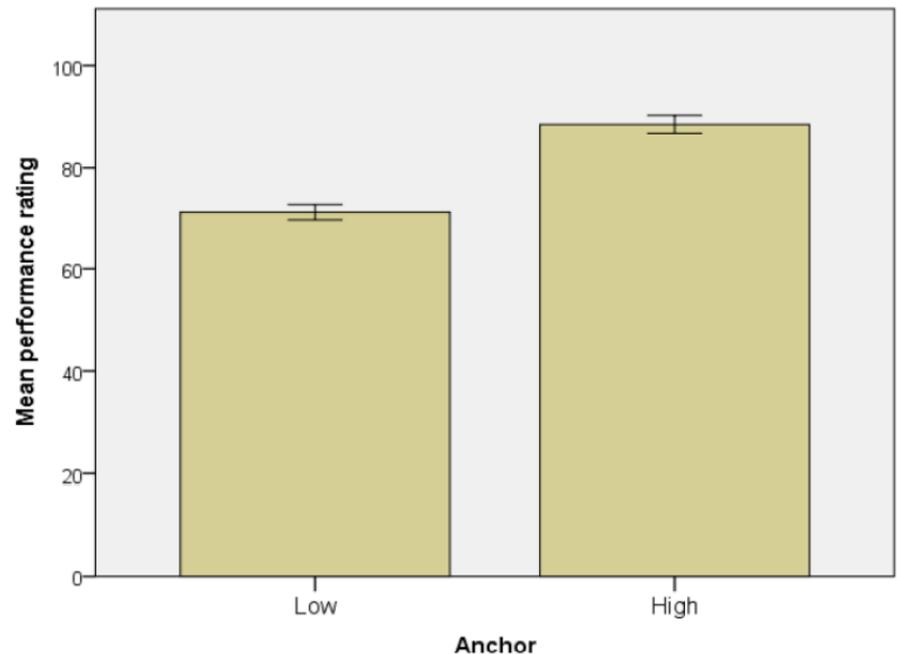
*Can a single training intervention be an effective debiasing strategy?*

# Literature Review

## ❖ Anchoring Biases in Performance Appraisals

- Individual performance appraisal is biased toward the previous year's performance scores (e.g., Bellé, Cantarelli, and Belardinelli 2017; 2018; Nagtegaal et al. 2020)

Anchoring Bias	
Performance	<ul style="list-style-type: none"><li>• Employee's previous year's performance ratings influence new ratings of actual performance (Bellé et al. 2017; 2018; Grimmelikhuisen and Porumbescu 2017; Nagtegaal et al. 2020)</li></ul> <p><b>To Whom? When?</b></p>
De biasing Strategy	<ul style="list-style-type: none"><li>• Consider - the - Opposite Strategies (Nagtegaal et al. 2020)</li><li>• Educational debiasing intervention (Cantarelli et al. 2018)</li></ul> <p><b>How to avoid it?</b></p>



(Bellé, Cantarelli, and Belardinelli 2017)

**One limitation is the lack of contextual consideration yet.**

# Hypothesis Development

## ❖ Anchoring Bias in Performance Appraisals

- Anchoring effect in quantitative evaluation of employees' performance (e.g., Bellé, Cantarelli, and Belardinelli 2017; 2018; Cantarelli, Bellé, and Belardinelli 2020; Grimmelhuijsen and Porumbescu 2017; Nagtegaal et al. 2020)
- The effect of cognitive biases in performance appraisals can be dependent on the level of employee performance (Farris and Lim, 1969)

**Whose Performance Appraisals are more influenced by Anchoring Bias?**



*High Performer*



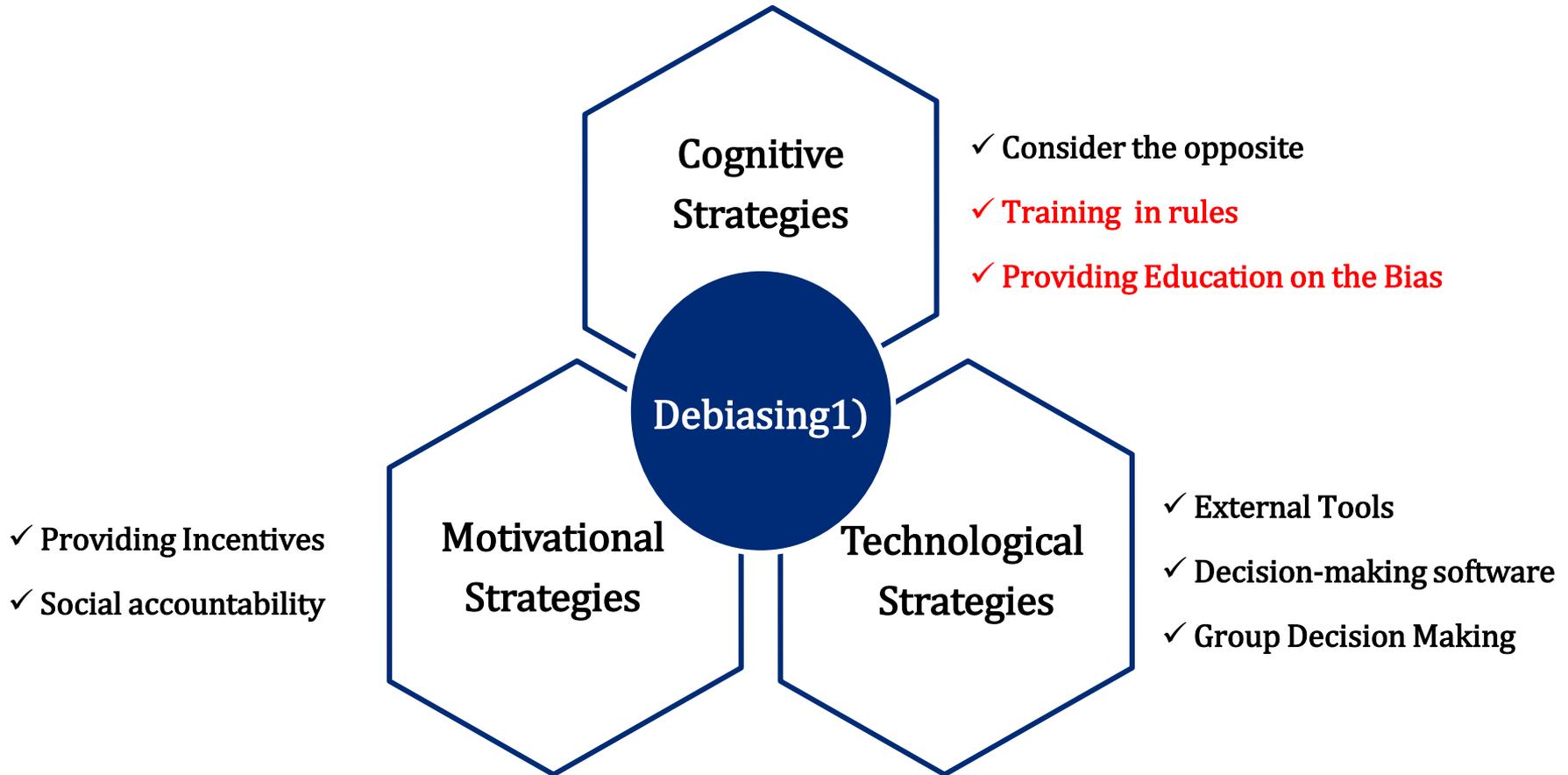
*Low Performer*

***H1: Participants in the high-anchor replication groups will report evaluation scores that are significantly higher than those from participants in low-anchor replication groups.***

***H1-1: Anchoring bias will have different effects on performance appraisals based on the level of performance of the employee.***

# Hypothesis Development

## ❖ Debiasing Strategies



# Hypothesis Development

## ❖ Debiasing Strategies: A Single Training Intervention

- Evidence that training is an effective debiasing strategy is inconclusive



- Cantarelli, Bellé, and Belardinelli (2020)'s Debiasing message

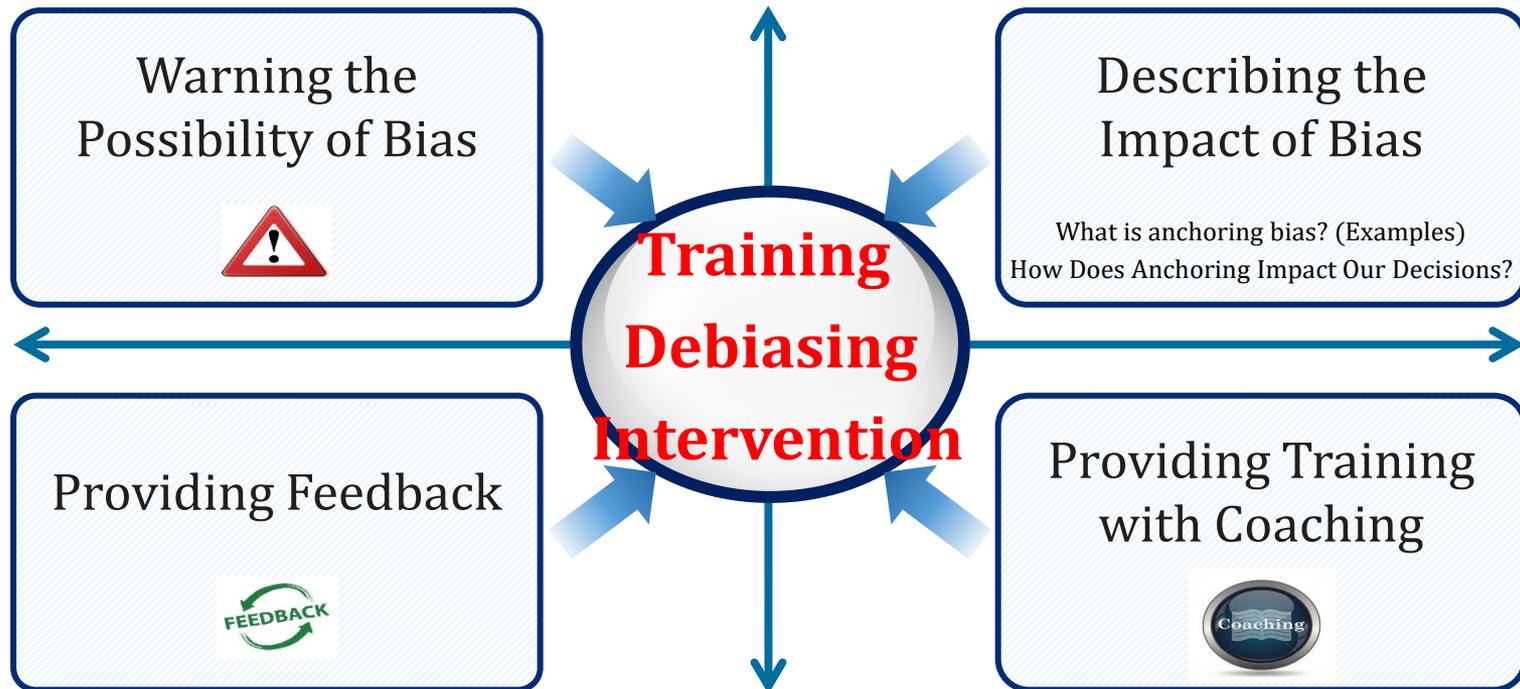
“last year’s performance score should not influence the performance score for this year”



Warning the Possibility of Bias

# Hypothesis Development

## Four Training Debiasing Intervention Strategies (Fischhoff 1982)



*H2: Participants in the low-anchor education group (i.e. informed and warned) will rate and warned) will give higher evaluation than those who do not receive the education*

*H2-1: For the high-anchor replication group, participants who receive the education (i.e., informed and warned) will give lower evaluation than those who do not receive the education*



## ❖ Data

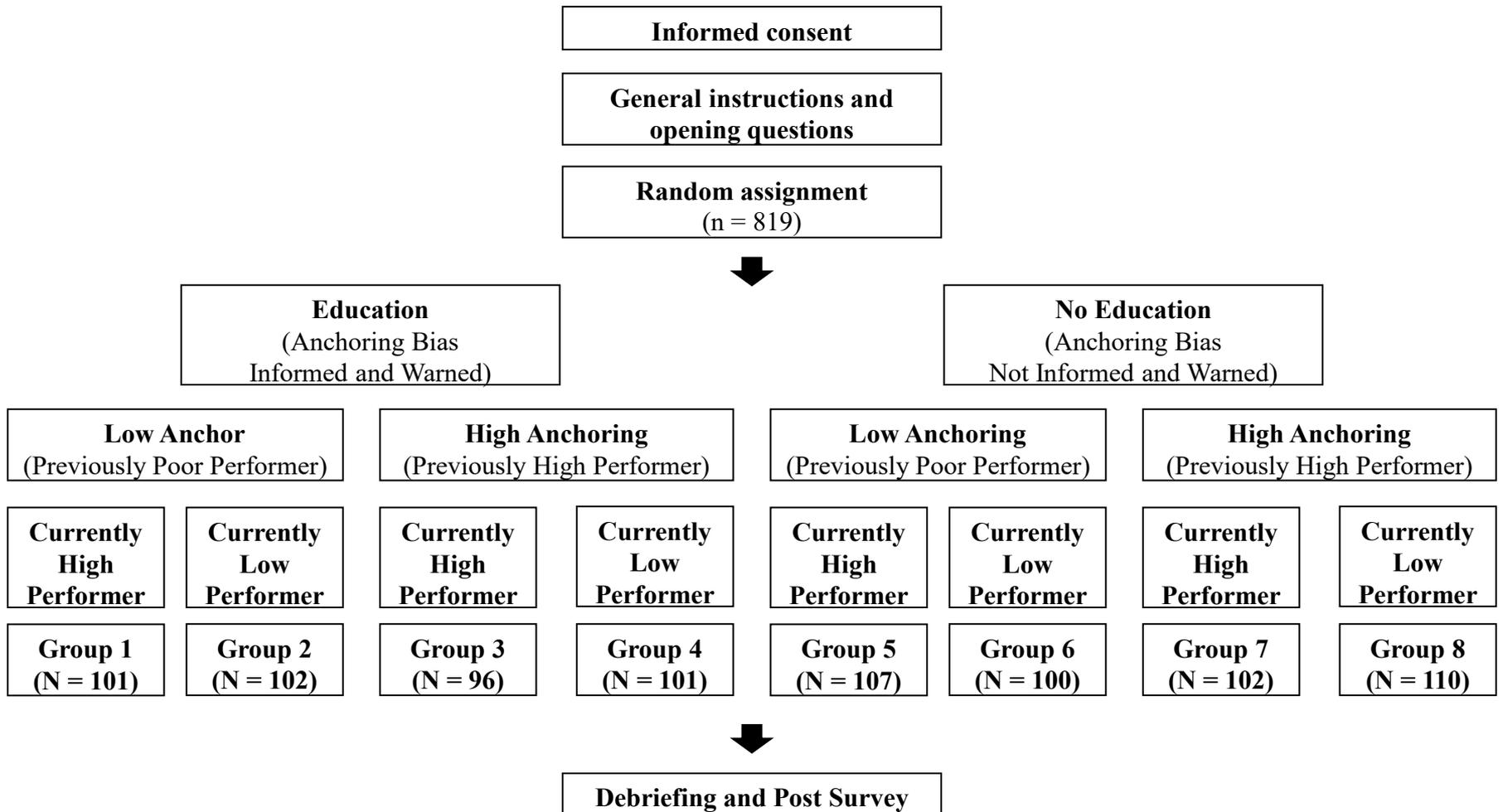
- Participants were recruited through Gallup Korea in April 2023
- 6,000 survey invitations were sent and 1,032 public employees responded (Response Rate: 17.2%)
- After excluding careless participants, the experiment includes **819 Korean public employees**

## ❖ Analytic Method

- Vignette Survey Experiment (2x2x2 = 8 vignettes)  
Mean Comparison T-Test

# Method

## ❖ Experimental Design and Flow



# Method

<b>Group 1</b> <ul style="list-style-type: none"> <li>• Low Anchor</li> <li>• Currently High Performer</li> <li>• Education</li> </ul>	<b>Group 2</b> <ul style="list-style-type: none"> <li>• Low Anchor</li> <li>• Currently Low Performer</li> <li>• Education</li> </ul>	<b>Group 3</b> <ul style="list-style-type: none"> <li>• High Anchor</li> <li>• Currently High Performer</li> <li>• Education</li> </ul>	<b>Group 4</b> <ul style="list-style-type: none"> <li>• High Anchor</li> <li>• Currently Low Performer</li> <li>• Education</li> </ul>	<b>Group 5</b> <ul style="list-style-type: none"> <li>• Low Anchor</li> <li>• Currently High Performer</li> <li>• Education</li> </ul>	<b>Group 6</b> <ul style="list-style-type: none"> <li>• Low Anchor</li> <li>• Currently Low Performer</li> <li>• Education</li> </ul>	<b>Group 7</b> <ul style="list-style-type: none"> <li>• High Anchor</li> <li>• Currently High Performer</li> <li>• Education</li> </ul>	<b>Group 8</b> <ul style="list-style-type: none"> <li>• High Anchor</li> <li>• Currently Low Performer</li> <li>• Education</li> </ul>
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<b>Group 1</b> (Low Anchor, <b>Currently High Performer</b> , Education)	<b>Group 2</b> (Low Anchor, <b>Currently Low Performer</b> , Education)
<p>Imagine that you have to assess this year second quarter's performance of a subordinate of yours. During this year second quarter, your subordinate met majority of goals on time, had very good interpersonal skills with colleagues, and showed high creativity in proposing new ideas for the improvement of the services. [<b>Currently High Performer</b>]</p> <p>This year first quarter, you assigned your subordinate a performance grade lower than C and assigned a rating lower than 51. [<b>Low Anchor</b>]</p> <p>Be aware of Anchoring Bias when you are assessing the performance. [<b>Education</b>] [Please Click the Button]</p> <div data-bbox="112 915 933 1229" style="background-color: #FFD700; padding: 10px; border: 1px solid black;"> <p style="text-align: center;">What is the anchoring effect?</p> <p>Anchoring bias is a cognitive bias that causes people to favor information they receive early in the decision-making process. People hold on to this information, called an anchor, as a reference point and fail to adjust their initial impression correctly.</p> <p>Anchoring bias can happen in performance appraisal. In performance reviews, anchoring bias can occur when managers use employees' past performance reviews to evaluate their work. The first impression of an employee or an employee's past performance can distort current personnel evaluation and cause biased performance assessment.</p> </div> <p style="text-align: center;">Now indicate how would you assess your subordinate on a scale from 0 – 100</p>	<p>Imagine that you have to assess this year second quarter's performance of a subordinate of yours. During this year second quarter, your subordinate did not meet majority of goals on time, had bad interpersonal skills with colleagues, and showed low creativity in proposing new ideas for the improvement of the services. [<b>Currently Low Performer</b>]</p> <p>This year first quarter, you assigned your subordinate a performance grade lower than C and assigned a rating lower than 51. [<b>Low Anchor</b>]</p> <p>Be aware of Anchoring Bias when you are assessing the performance. [<b>Education</b>] [Please Click the Button]</p> <div data-bbox="1000 915 1821 1229" style="background-color: #FFD700; padding: 10px; border: 1px solid black;"> <p style="text-align: center;">What is the anchoring effect?</p> <p>Anchoring bias is a cognitive bias that causes people to favor information they receive early in the decision-making process. People hold on to this information, called an anchor, as a reference point and fail to adjust their initial impression correctly.</p> <p>Anchoring bias can happen in performance appraisal. In performance reviews, anchoring bias can occur when managers use employees' past performance reviews to evaluate their work. The first impression of an employee or an employee's past performance can distort current personnel evaluation and cause biased performance assessment.</p> </div> <p style="text-align: center;">Now indicate how would you assess your subordinate on a scale from 0 – 100</p>

# Method

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
<ul style="list-style-type: none"> <li>• Low Anchor</li> <li>• Currently High Performer</li> <li>• Education</li> </ul>	<ul style="list-style-type: none"> <li>• Low Anchor</li> <li>• Currently Low Performer</li> <li>• Education</li> </ul>	<ul style="list-style-type: none"> <li>• High Anchor</li> <li>• Currently High Performer</li> <li>• Education</li> </ul>	<ul style="list-style-type: none"> <li>• High Anchor</li> <li>• Currently Low Performer</li> <li>• Education</li> </ul>	<ul style="list-style-type: none"> <li>• Low Anchor</li> <li>• Currently High Performer</li> <li>• No Education</li> </ul>	<ul style="list-style-type: none"> <li>• Low Anchor</li> <li>• Currently Low Performer</li> <li>• No Education</li> </ul>	<ul style="list-style-type: none"> <li>• High Anchor</li> <li>• Currently High Performer</li> <li>• No Education</li> </ul>	<ul style="list-style-type: none"> <li>• High Anchor</li> <li>• Currently Low Performer</li> <li>• No Education</li> </ul>

Group 3 (High Anchor, Currently High Performer, Education)	Group 8 (High Anchor, Currently Low Performer, Education)
<p>Imagine that you have to assess this year second quarter's performance of a subordinate of yours. During this year second quarter, your subordinate met majority of goals on time, had very good interpersonal skills with colleagues, and showed high creativity in proposing new ideas for the improvement of the services. [<i>Currently High Performer</i>]</p> <p>This year first quarter, you assigned your subordinate a performance grade higher than A and assigned a rating higher than 91. [<i>High Anchor</i>]</p> <p>Be aware of Anchoring Bias when you are assessing the performance. [<i>Education</i>] [Please Click the Button]</p> <div style="background-color: #FFD700; padding: 10px; border: 1px solid black; margin: 10px 0;"> <p style="text-align: center;">What is the anchoring effect?</p> <p>Anchoring bias is a cognitive bias that causes people to favor information they receive early in the decision-making process. People hold on to this information, called an anchor, as a reference point and fail to adjust their initial impression correctly.</p> <p>Anchoring bias can happen in performance appraisal. In performance reviews, anchoring bias can occur when managers use employees' past performance reviews to evaluate their work. The first impression of an employee or an employee's past performance can distort current personnel evaluation and cause biased performance assessment.</p> </div> <p style="text-align: center;">Now indicate how would you assess your subordinate on a scale from 0 – 100</p>	<p>Imagine that you have to assess this year second quarter's performance of a subordinate of yours. During this year second quarter, your subordinate did not meet majority of goals on time, had bad interpersonal skills with colleagues, and showed low creativity in proposing new ideas for the improvement of the services. [<i>Currently Low Performer</i>]</p> <p>This year first quarter, you assigned your subordinate a performance grade higher than A and assigned a rating higher than 91. [<i>High Anchor</i>]</p> <p style="text-align: center;">Now indicate how would you assess your subordinate on a scale from 0 – 100</p>

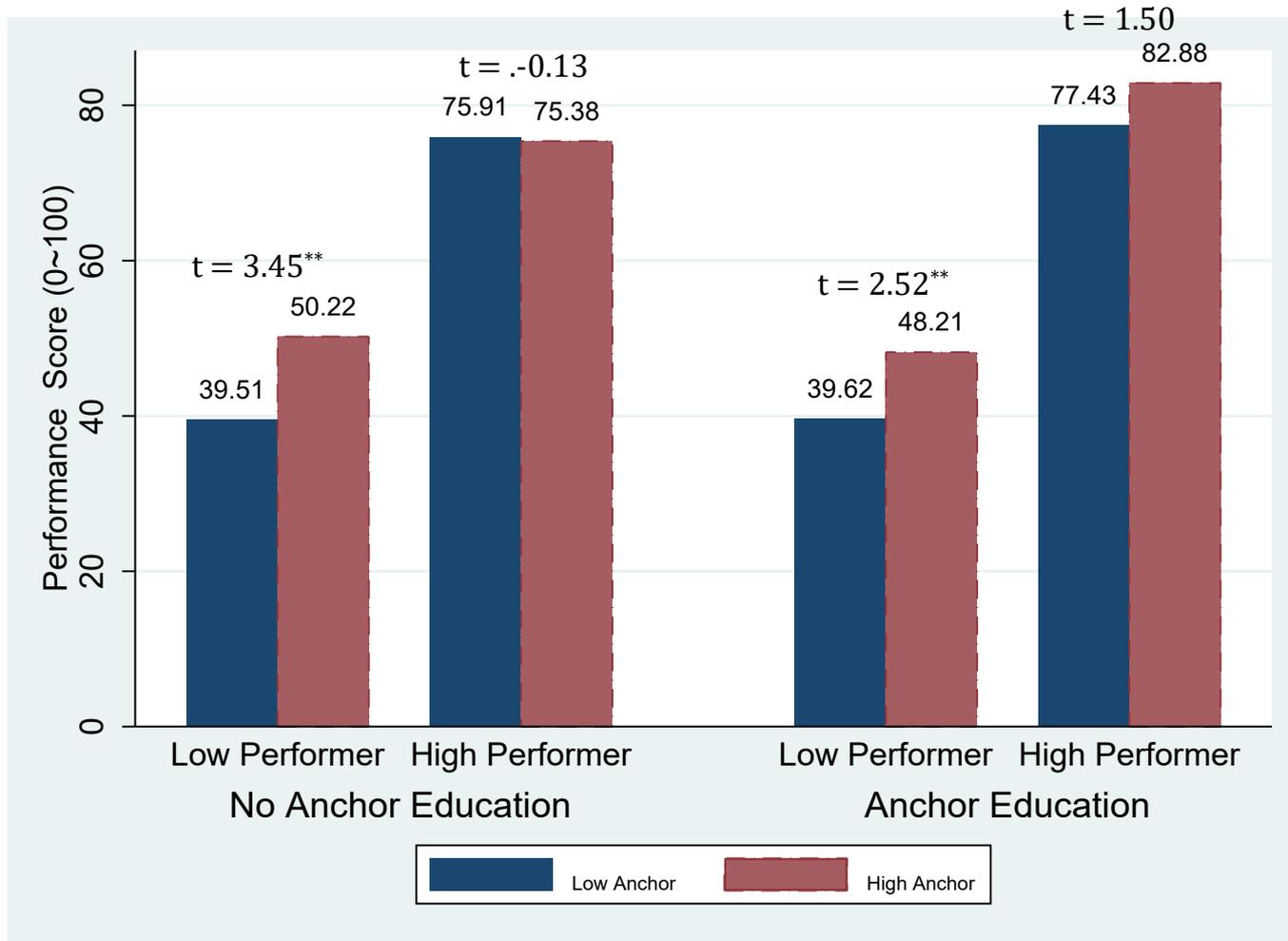
# Method

## ❖ Randomization Checks

Variables	Group 1 (n = 101)	Group 2 (n = 102)	Group 3 (n = 96)	Group 4 (n = 101)	Group 5 (n = 107)	Group 6 (n = 100)	Group 7 (n = 102)	Group 8 (n = 110)
<b>Gender</b>								
Female	42.35	48.31	41.38	37.68	35.71	39.13	47.92	54.88
Male	57.65	51.69	58.62	62.32	64.29	60.87	52.08	45.12
<b>Age</b>								
20s	15.29	10.11	12.64	7.25	11.9	10.87	8.33	14.63
30s	41.18	38.20	25.29	28.99	35.71	38.04	47.92	45.12
40s	28.24	37.08	43.68	42.03	26.19	30.43	22.92	20.73
50s or older	15.29	14.61	18.39	21.74	26.19	20.65	20.83	19.51
<b>Education</b>								
High school	3.53	3.37	8.05	4.35	4.76	1.09	5.21	7.32
Junior college	4.71	2.25	6.9	10.14	9.52	6.52	3.13	6.1
Undergraduate	71.76	73.03	64.37	62.32	67.86	69.57	67.71	63.41
Master degree	14.12	15.73	14.94	20.29	9.52	13.04	19.79	14.63
Phd degree	5.88	5.62	5.75	2.9	8.33	9.78	4.17	8.54
<b>Length of Service</b>								
Less than 2 yrs	11.76	12.36	13.79	10.14	11.9	13.04	13.54	20.73
3 - 5 yrs	28.24	25.84	13.79	14.49	21.43	17.39	25	18.29
6 - 10 yrs	22.35	20.22	24.14	24.64	22.62	21.74	22.92	26.83
11 - 20 yrs	27.06	30.34	34.48	27.54	22.62	29.35	20.83	15.85
21 - 30 yrs	8.24	8.99	12.64	18.84	19.05	15.22	11.46	13.41
31 yrs +	2.35	2.25	1.15	4.35	2.38	3.26	6.25	4.88
<b>Hierarchical Rank</b>								
Grade 3 or higher	2.44	4.76	0	0	2.5	2.33	1.75	0
Grade 4	0	2.38	0	3.03	5	0	3.51	5.13
Grade 5	9.76	4.76	5.26	6.06	10	11.63	10.53	5.13
Grade 6	4.88	21.43	13.16	21.21	10	18.6	10.53	25.64
Grade 7	29.27	40.48	47.37	36.36	35	34.88	31.58	33.33
Grade 8 or lower	53.66	26.19	34.21	33.33	37.5	32.56	42.11	30.77
<b>Types of Job</b>								
Administration Services	43.9	59.52	47.37	48.48	50	51.16	64.91	61.54
Technical Services	17.07	14.29	10.53	18.18	25	9.3	15.79	12.82
Security Services	24.39	11.9	26.32	12.12	12.5	13.95	8.77	5.13
Research Services	4.88	4.76	5.26	6.06	7.5	6.98	1.75	10.26
Other Services	9.76	9.52	10.53	15.15	5	18.6	8.77	10.26
<b>Supervisor Status</b>								
Non-Supervisor	72.94	70.79	75.86	71.01	71.43	66.3	72.92	69.51
Supervisor	27.06	29.21	24.14	28.99	28.57	33.7	27.08	30.49
<b>Marital Status</b>								
Not-Married	35.29	30.34	39.08	29.41	37.8	38	41.05	42.5
Married	64.71	69.66	60.92	70.59	62.2	54	58.95	57.5

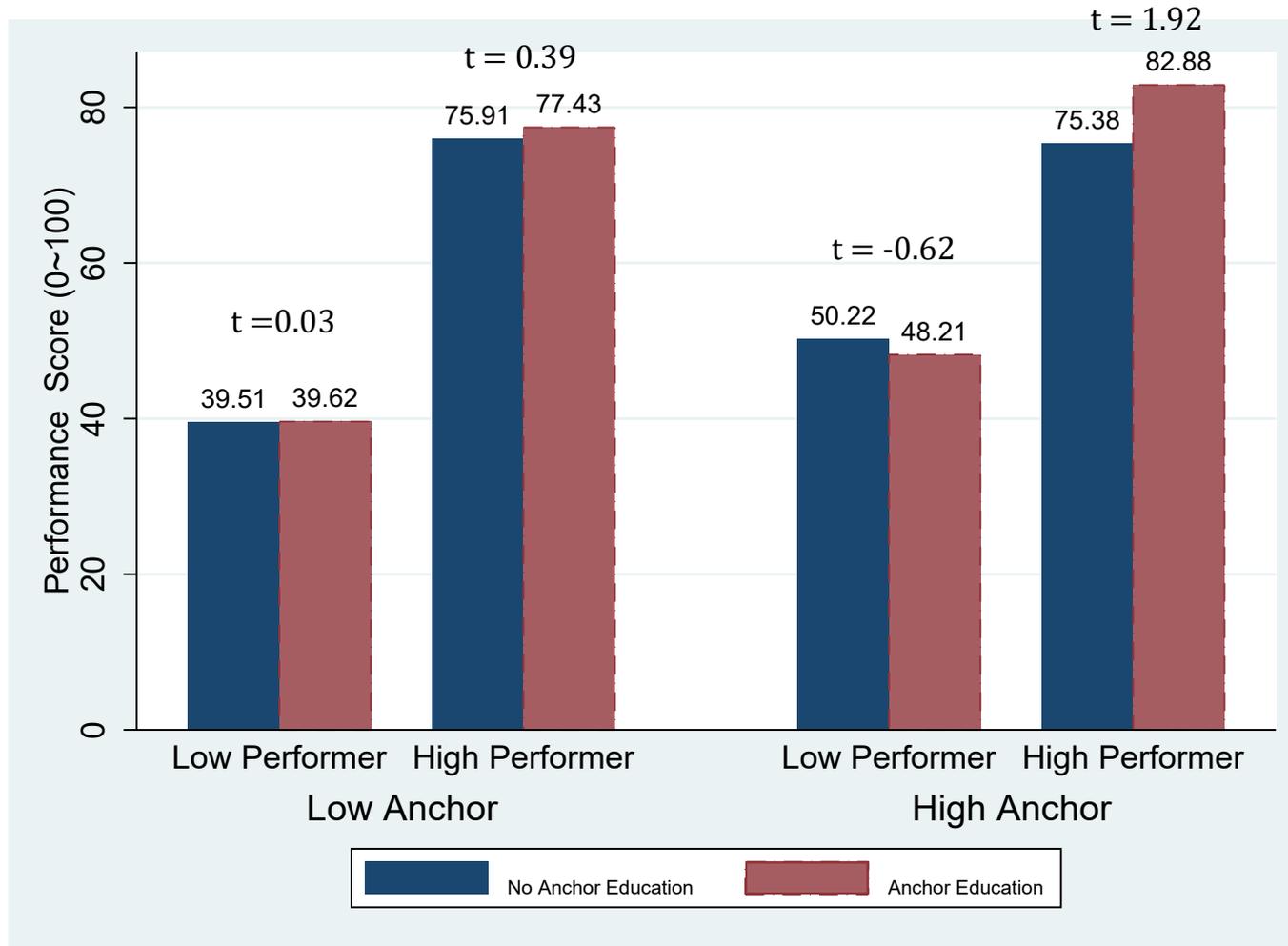
# Results

## ❖ Means of Performance Score



# Results

## ❖ Means of Performance Score



# Conclusion



## ❖ Anchoring Bias in Performance Evaluation

- Employees' previous year's performance ratings influence new ratings irrespective of actual performance.
- Public managers' decision are affected by cognitive biases.

## ❖ Anchoring Bias: To Whom

- Anchoring bias in performance appraisal exists only when evaluating the low performers in the public sector.

## ❖ Relieving Anchoring bias by information provision

- We found a single training intervention to be not effective at reducing anchoring bias.
- Behavioral PA researchers investigate the effect of training debiasing intervention that entail four practice.

# Conclusion

## Four Training Debiasing Intervention Strategies (Fischhoff 1982)



Warning



Coaching



Read Descriptions



Providing Training and Feedback

**Thank you for listening!**

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## ❖ Limitations

- **Internal Validity**

Real-world scenarios might differ and involve more information or more complexity.

- **Sample size may not be sufficient**

Replication need a highly powered sample to confirm that the effect of the original study is significant.

- **External validity**

The subject of the research is public employees in South Korea. More empirical research in diverse contexts is required to validate this research finding.

# Method



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Group 5 (Low Anchor, Currently High Performer, Education)	Group 6 (Low Anchor, Currently Low Performer, Education)
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