Social Comparison and the Value of Performance Trajectory Information

A Field Experiment in the Workplace

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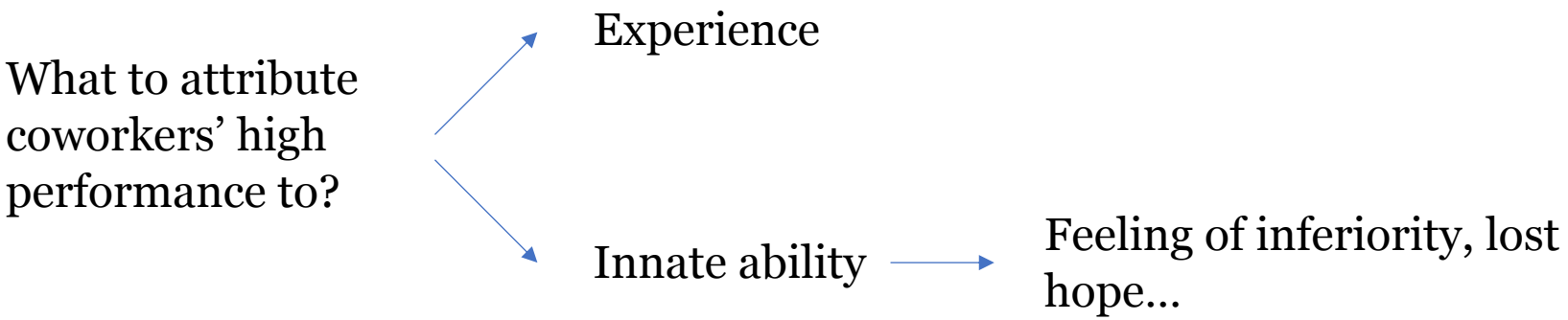
Research Motivation

- Upward social comparison: Workers compare themselves to high-performing coworkers
  - Organizations often highlight their high performers
  - People want to become high performers
- Social comparison can impose substantial costs on firms and workers
  - Stressful environment, distort behaviors…

Research Motivation

- Incomplete information in upward social comparison
  - Easy to know high achievers' current performance, hard to know their past
  - Especially for new workers
- Incomplete info can exacerbate upward social comparison costs



Research Question

- Can firms mitigate the costs of performance comparison by sharing information about the past performance of high-achievers?

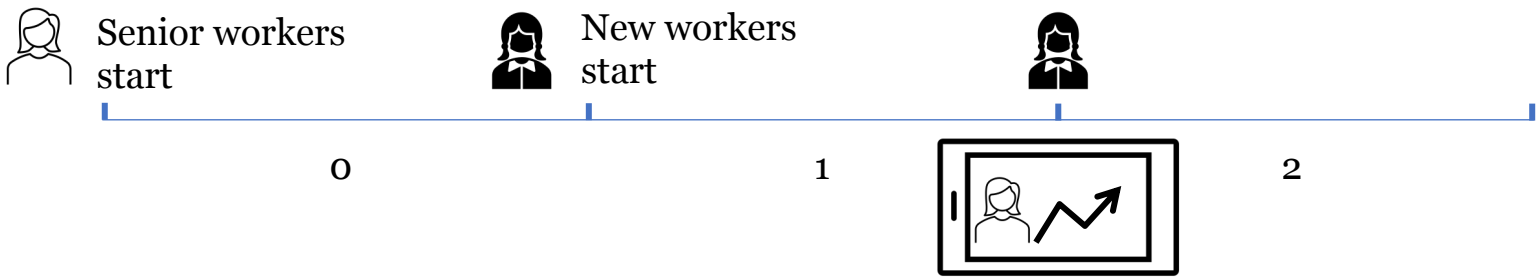
Preview

- 28-week field experiment at a Chinese spa chain
  - 160 stores, 7000 workers
- Main treatment
  - Disclosing the performance trajectories of high-performing senior workers
- Main outcomes
  - Attrition, productivity, well-being
- Mechanisms
  - Social comparison or career concern?

Literature

- Peer effects on performance and performance transparency
  - Mas and Moretti 2009; Bandiera et al. 2010; Blanes i Vidal and Nossol 2011; Breza et al. 2018
- Career concerns and salary dynamics
  - Lazear and Rosen 1981; Harris and Holmstrom 1982; Cullen and Perez-Truglia 2021
- Stress in the workplace
  - Bhagat 1983; Kocher et al. 2012; Cahlíková et al. 2020; Kaur et al. 2021

Theoretical Framework



- $\text{Performance}_{it} = \text{InnateAbility}_i + \text{ReturnsToExp}_i \times \text{Experience}_{it}$
- Information
  - New workers know senior workers' period-1 performance, but not their period-0 performance
  - Fundamental attribution bias
    - New workers overattribute senior workers' performance to their innate ability
- Decision: stay for period 2 or quit
  - $\text{EU(stay)} = \underbrace{\text{InnateAbility}_N + E_N(\text{ReturnsToExp}_N)}_{\text{Expected monetary payoff}} \underbrace{- \lambda E_N(\text{InnateAbility}_S)}_{\text{Social comparison cost}}$

Effect of performance trajectory information

↑ If ReturnsToExp are correlated

↓

Hypotheses

- Effects of performance trajectory information on new workers
  - Belief about senior workers' early-stage performance: ↓
  - Stress: ↓
  - Expectation of own future performance: maybe ↑
  - Attrition: ↓
- No effect of peer performance information on new workers
- No effect of information treatments on senior workers

Field Experiment

Setting: a spa chain in China

- 13 regions, 160 stores, 7000 workers

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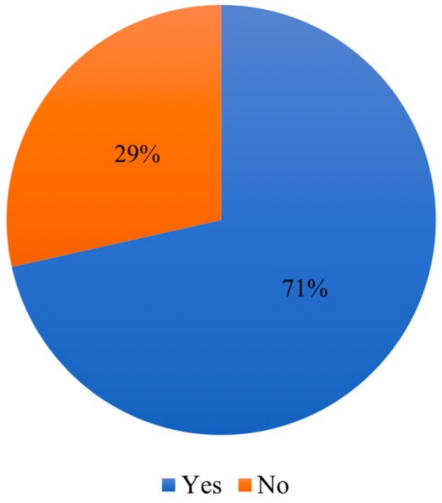
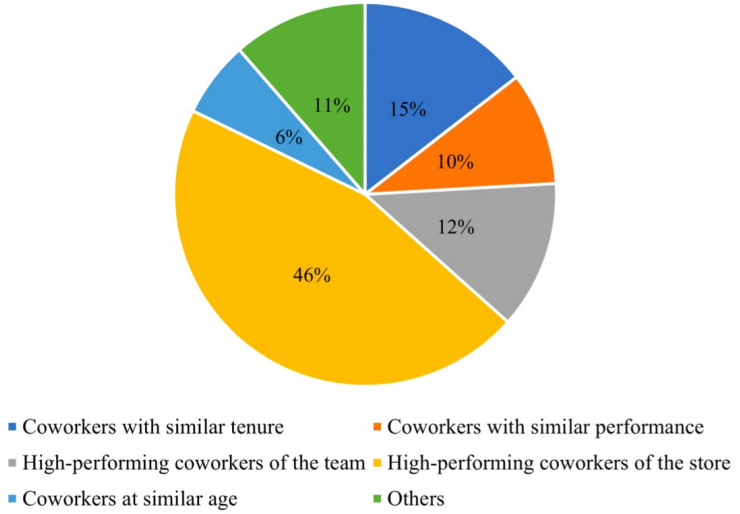
- 13 regions, 160 stores, 7000 workers
- Worker performance
  - Two key measures: sales and customer picks
  - Pay is linear in both measures
  - Mostly reflect individual skills and efforts
- Information environment
  - Workers are organized into teams of 10-20 for administrative reasons
  - Team managers discuss members' performance in team meetings
  - High performers are highlighted

Performance comparison in the company

Do you often compare your performance to your coworkers?



Who do you compare yourself to in terms of performance?



Performance Trajectory Treatment

- Twice-weekly messages sent to workers through company's app
- Message content
  - The performance trajectory of an anonymous high-performing senior worker in the same region
  - "To help you know your coworkers better, today we introduce you to the performance trajectory of Xiaomei (alias).
  - "Xiaomei joined our company in your region in [year and month].
  - For t = 1st, 3rd, 6th, 12th, last:
  - "In [her/his] t month at the company, she had n customer picks, and her sales is ¥y."
- Treatment group
  - All workers from 40 treated stores (randomly chosen, well balanced)
- Treatment period
  - 2019.06-2019.12

An Auxiliary Treatment

- Does the early-stage performance info have to be about senior high-performing workers?
- Peer Performance Treatment
  - 40 stores, same treatment period, same message frequency
- Message content
  - The last-month performance of an anonymous worker in the same region with similar tenure
  - "To help you know your coworkers better, today we introduce you to the recent performance of Xiaomei (alias).
  - "Xiaomei joined our company in your region in [year and month].
  - "Last month, she had n customer picks, and her sales is ¥y."

Summary of Treatments

- Performance trajectory of high-performing senior workers (40 stores)
- Current performance of peers (40 stores)
- No performance information (80 stores)
- Stratified randomization

Outcome Variables

- Attrition
  - Attrition_{it} = 1 if employee i leaves during month t
- Productivity
  - Customer picks, sales, days of attendance, salary
- Store revenue
- Survey measures
  - Subjective well-being and beliefs
- Elicited before, during, and after treatments

Outcome Variables: Subjective Well-being

- Stress
- Mental health
  - Warwick-Edinburgh Mental Wellbeing Scales
- Job satisfaction
  - overall job satisfaction, trust, sense of belonging, willingness to recommend the company as a workplace, willingness to stay
- Evaluation of managers
  - perceived care, skills, helpfulness, fairness, leniency
- Elicitation
  - 5-point likert scale

Outcome Variables: Beliefs

- Forecast on own sales in the next month
- Forecast on own sales in three months
- Belief about senior coworkers' early-stage sales performance
- Belief about peers' recent sales performance
- Elicitation
  - Unincentivized
  - Point estimates
  - Confidence in beliefs
  - Changes in beliefs caused by treatments

Results

Econometric Analysis

Treatment vs. control difference

$$Y_{ijt} = \beta_1 \times T_{1i} + \beta_2 \times T_{2i} + \tau_t + \gamma_j + \varepsilon_{ijt}$$

Y_{ijt} : turnover, productivity, or subjective well-being
T_{1i} : = 1 if in trajectory information group
T_{2i} : = 1 if in peer information group
γ_j : region fixed effect
τ_t : month fixed effect

Treatment effects on attrition

- Performance trajectory information *lowers* new workers attrition

Table 3: Average Treatment Effects on Attrition (Linear Probability Models)

Dependent Variable	Attrition			
Worker Type	New Workers		Senior Workers	
	(1)	(2)	(3)	(4)
Trajectory	-2.429**	-2.200**	0.917	1.009
	(1.110)	(1.114)	(0.805)	(0.700)
Peer	-0.065	-0.326	0.130	0.110
	(1.276)	(1.171)	(0.870)	(0.716)
Month fixed effects		✓		✓
Region fixed effects	✓	✓	✓	✓
Mean DV if Treatment=0	20.31	20.31	9.70	9.70
Number of observations	10171	9579	21799	18448

Treatment effects on attrition

- Performance trajectory information *lowers* new workers attrition (especially for high-performing ones)

Table 5: Do High-performing Employees Stay? (New Workers)

Dependent Variable	Attrition	
Worker Type	Low-performing	High-performing
	(1)	(2)
Trajectory	-1.455	-2.210**
	(2.398)	(0.896)
Peer	-0.877	-0.256
	(2.359)	(1.099)
Month fixed effects	✓	✓
Region fixed effects	✓	✓
Mean DV if Treatment=0	31.97	9.70
Number of observations	3761	5818

Treatment effects on well-being

- Performance trajectory information *lowers stress and improves mental health* of new workers

Table 7: Average Treatment Effects on Individual Survey Outcomes

Dependent Variables	Job Satisfaction		Evaluation of Managers		Low Stress		Mental Health	
Worker Type	New	Senior	New	Senior	New	Senior	New	Senior
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trajectory	-0.040	-0.037	0.016	-0.021	0.180**	-0.004	0.172**	-0.023
	(0.067)	(0.046)	(0.076)	(0.040)	(0.079)	(0.046)	(0.075)	(0.043)
Peer	-0.104	-0.012	-0.053	-0.034	0.006	-0.081*	-0.028	-0.073
	(0.081)	(0.051)	(0.069)	(0.048)	(0.088)	(0.046)	(0.080)	(0.051)
Month fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Region fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Mean DV if Treatment=0	3.93	3.87	3.99	3.89	2.98	3.00	3.69	3.58
Number of observations	36891	69415	35519	73726	37716	73664	35951	71232

Treatment effects on well-being

- Performance trajectory information *lowers stress and improves mental health* of new workers

Table A10: The Effect of Coworkers' Performance Trajectory Information on Stress of New Workers

Dependent Variable	Low Stress
Coworkers' performance in the 1st month	-0.521**
	(0.251)
Coworkers' performance in the last month	0.0886
	(0.134)
lagged (Stress Score)	0.294***
	(0.0197)
Store fixed effects	✓
Number of observations	5576

Association between well-being and attrition

- Low stress and good mental health are negatively associated with attrition

Table 8: The Effect of Stress and Mental Health on Attrition

Dependent Variable	Attrition			
Worker Type	New	Senior	New	Senior
	(1)	(2)	(3)	(4)
Low Stress	-2.047***	-1.240***		
	(0.499)	(0.312)		
Mental Health			-1.411***	-0.460
			(0.484)	(0.299)
Month fixed effects	✓	✓	✓	✓
Region fixed effects	✓	✓	✓	✓
Mean DV if Treatment=0	20.31	9.70	20.31	9.70
Number of observations	8149	15885	8669	16732

Summary

- Effects of performance trajectory information on new workers
  - Lower attrition
  - Improved mental health and stress level
  - The two effects are associated

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- What is the mechanism?
  - Career concern
    - "If she could improve, I can too."
    - Should expect higher future performance (given same effort) or lower effort (required to achieve the same future performance)

Career concern: Treatment effects on own performance forecasts

Table A11: Average Treatment Effects on New Workers' Forecasts on Own Future Performance

Dependent Variables	log (forecast on next month's sales)	log (forecast on sales in three months)
	(1)	(2)
Trajectory	0.153	0.0473
	(0.0976)	(0.0766)
Peer	-0.125	-0.128
	(0.0913)	(0.0806)
log (sales)	0.419***	0.332***
	(0.0289)	(0.0241)
Month fixed effects	✓	✓
Region fixed effects	✓	✓
Number of observations	3023	3088

Performance forecasts are associated with attrition

Table A12: Effects of Individual Performance Forecasts on Attrition

Dependent Variable	Attrition	
Worker Type	New Workers	Senior Workers
log (forecast of next month's sales)	-2.13**	0.156
	(0.909)	(0.582)
log (forecast of sales in three months)	1.13	-0.902*
	(1.17)	(0.536)
log (sales)	-1.74*	-1.26***
	(1.03)	(0.343)
Month fixed effects	✓	✓
Region fixed effects	✓	✓
Number of observations	1508	4583

Career concern: Treatment effects on effort and performance

Table 4: Average Treatment Effects on Individual Labor Supply and Productivity

Dependent Variables	Attendance		Customer Pick		log (sales)		log (compensation)	
Worker Type	New	Senior	New	Senior	New	Senior	New	Senior
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trajectory	0.530	-0.359	-0.033	-0.160	0.010	0.000	-0.011	-0.024
	(0.434)	(0.345)	(1.529)	(2.997)	(0.054)	(0.046)	(0.030)	(0.025)
Peer	-0.456	-0.209	-1.083	-8.094*	-0.008	-0.073	0.009	-0.041
	(0.393)	(0.369)	(1.033)	(4.183)	(0.061)	(0.046)	(0.032)	(0.026)
Month fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Region fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Mean DV if Treatment=0	22.17	25.68	17.27	57.01	9.43	9.91	8.71	9.12
Number of observations	9573	18408	9413	17983	9568	18347	9579	18448

Summary

- Effects of performance trajectory information on new workers
  - Lower attrition
  - Improved mental health and stress level
  - The two effects are associated
- What is the mechanism?
  - Career concern
    - "If she could improve, I can too."
    - Should expect higher future performance (given same effort) or lower effort (required to achieve the same future performance)
  - Social comparison
    - "She also started low. We are not that different!"

Social comparison: excerpt from interview

- *"Senior workers have been like god since I joined the firm, and it was beyond imagination to surpass them. Now that I know many of them accomplished that step by step, they are also ordinary human beings. My current performance is still much lower than the top worker's in my store, but I have a higher tolerance for myself."*

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  - The two effects are associated
- What is the mechanism?
  - Career concern
    - "If she could improve, I can too."
    - Should expect higher future performance (given same effort) or lower effort (required to achieve the same future performance)
  - Social comparison
    - "She also started low. We are not that different!"
  - Other mechanisms
    - No treatment effects on performance uncertainty, perceived performance volatility, and competitiveness

Conclusion

- Information about high-performing senior workers' past performance improves the retention of new workers
  - Social comparison mechanism
- A new aspect of upward social comparison: comparing to the *past* of high-performing senior workers
- Information friction exacerbates social comparison costs

Thank you! Comments or suggestions are welcome:
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