

Peer Pressure and Manager Pressure in Organisations

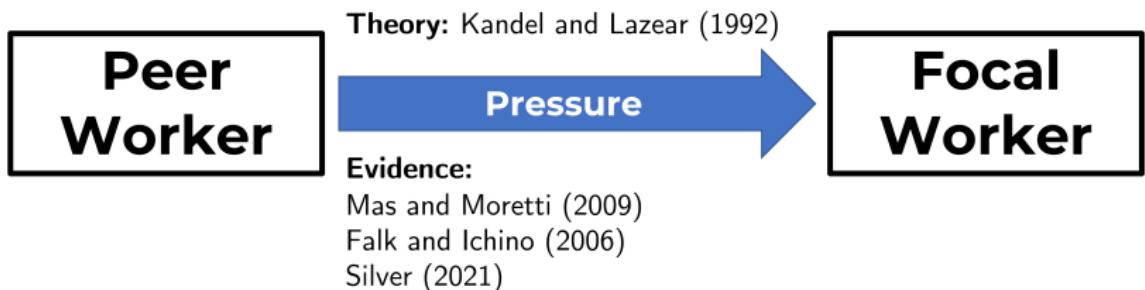
Diego Battiston (University of Edinburgh)

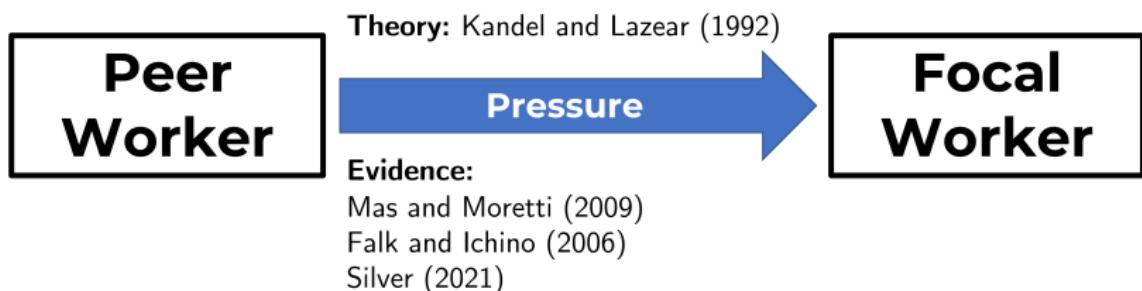
Jordi Blanes i Vidal (LSE)

Tom Kirchmaier (CBS and CEP)

Katalin Szemerédi (Corvinus, Budapest)

October 31, 2023



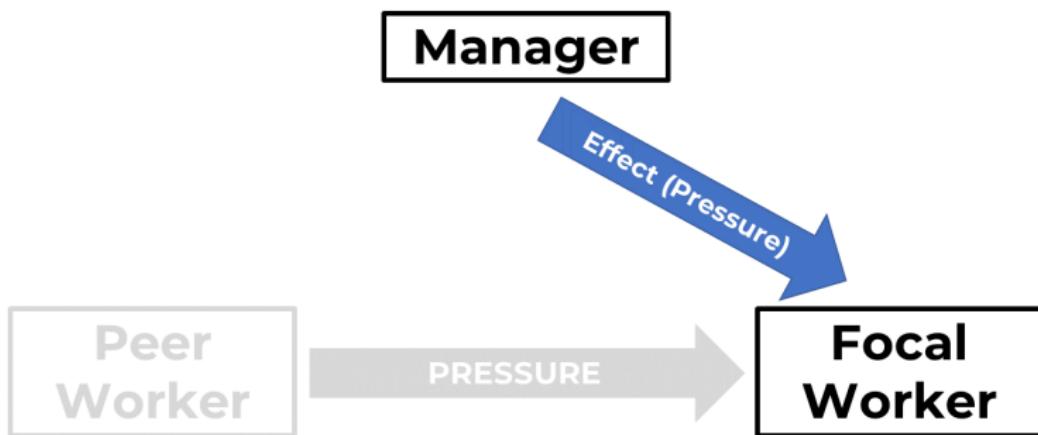


Mechanism?

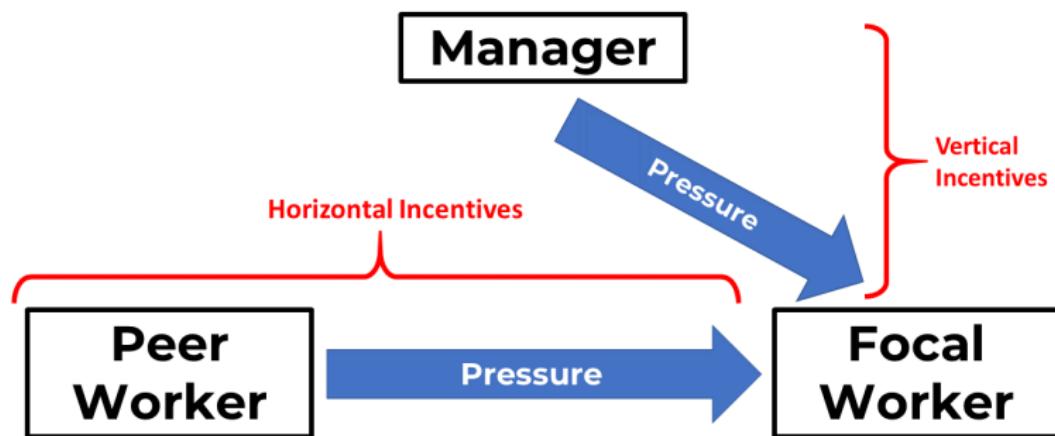
- Kandel and Lazear (1992): guilt, shame, norms...
- Mas and Moretti (2009): "*If a worker is slow, other workers may impose a cost on her, for example, by reporting her to management(...).*"

Managers Matter

Lazear et al. (2015), Hoffman and Tadelis (2020), Frederiksen et al. (2020),
Adhvaryu et al. (2022), Fenizia (2022)



How do Peer Pressure and Manager Pressure Interact?



- Unlikely to be independent mechanisms
- Substitutes, Complements?... not obvious

This Paper:

- Effect of **presence** of nearby peers on worker's productivity
- Mechanism: peer matters because it provides/improves manager's signal about worker's productivity
- Message: managers shape the horizontal incentives between workers

Why do we care?

- Optimal design of working spaces, shifts, teams
 - e.g: we simulate alternative seating arrangements and find large productivity gains
- Working-from-home, hybrid working
 - missing peer-pressure
 - effect may depend on existing vertical incentives
 - important for office based jobs and public sector
- Understanding why does peer pressure arise

999 Call Handling Room - Manchester Police



(Team) Production Technology



▶ details

Team Production Technology

- Handlers take calls from common queue
 - free-riding with all contemporaneous handlers
 - handler sets 'ready status' for taking calls
- Managers imperfectly observe effort
- Peers on adjacent desks observe effort

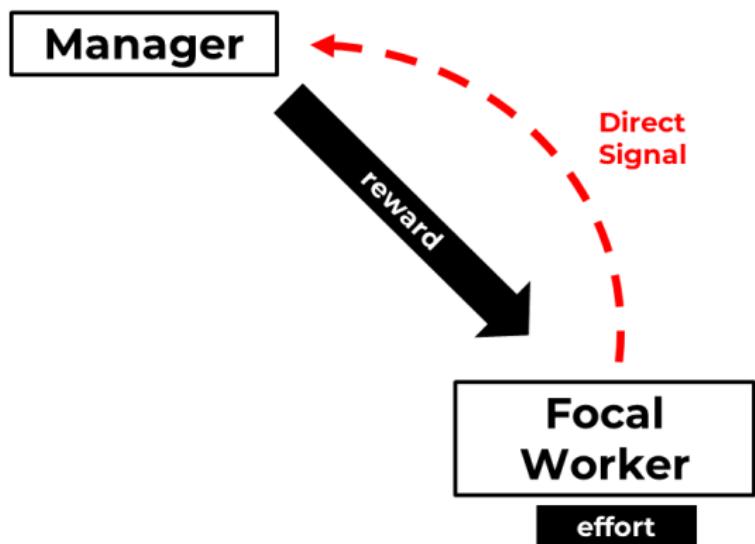
Team Production Technology

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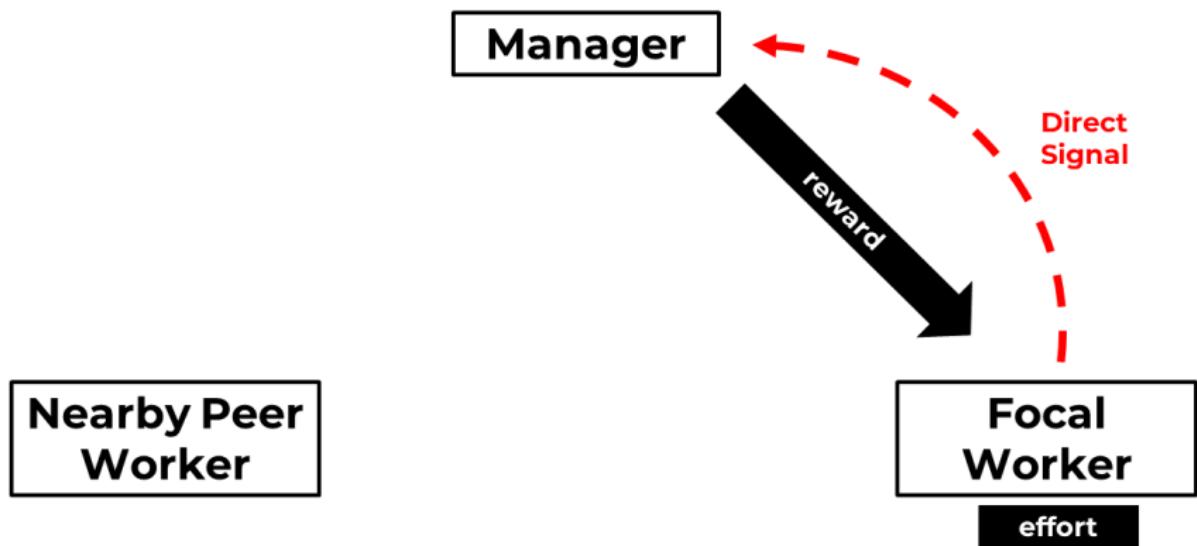
Measures of Performance

- Number of calls answered
- Also:
 - Time on the phone
 - Call 'quality' (e.g. time to arrive to the incident)

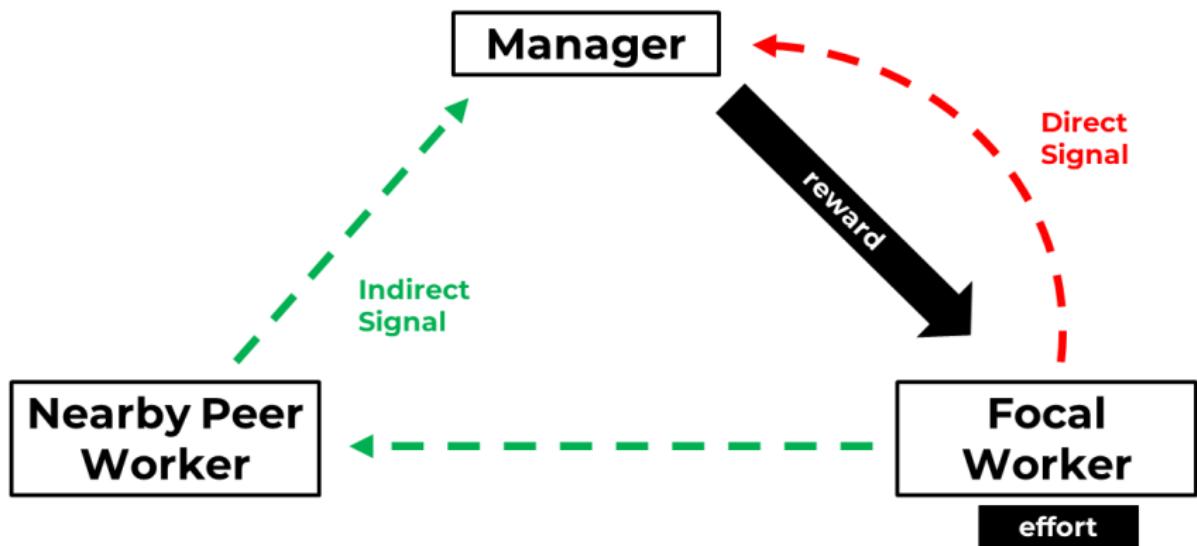
Conceptual Framework (math details in paper)



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Conceptual Framework (math details in paper)

Predictions:

- ① peer presence increases productivity
- ② peer effect stronger when manager's direct signal is weaker
- ③ peer effect stronger when peer/manager information link is stronger

Plan for Today

- ① identify peer effects (i.e. having peers closeby)
 - properly
 - robustness/heterogeneity
 - effects on 'quality'
- ② mechanism/relation with manager pressure (predictions 2 and 3)
- ③ simulations and discussion

Empirical Strategy:

Occupation of Adjacent Seats → Productivity of Worker

Identification:

- Seating is:
 - endogenous (hot-desk)
 - but fixed within a shift

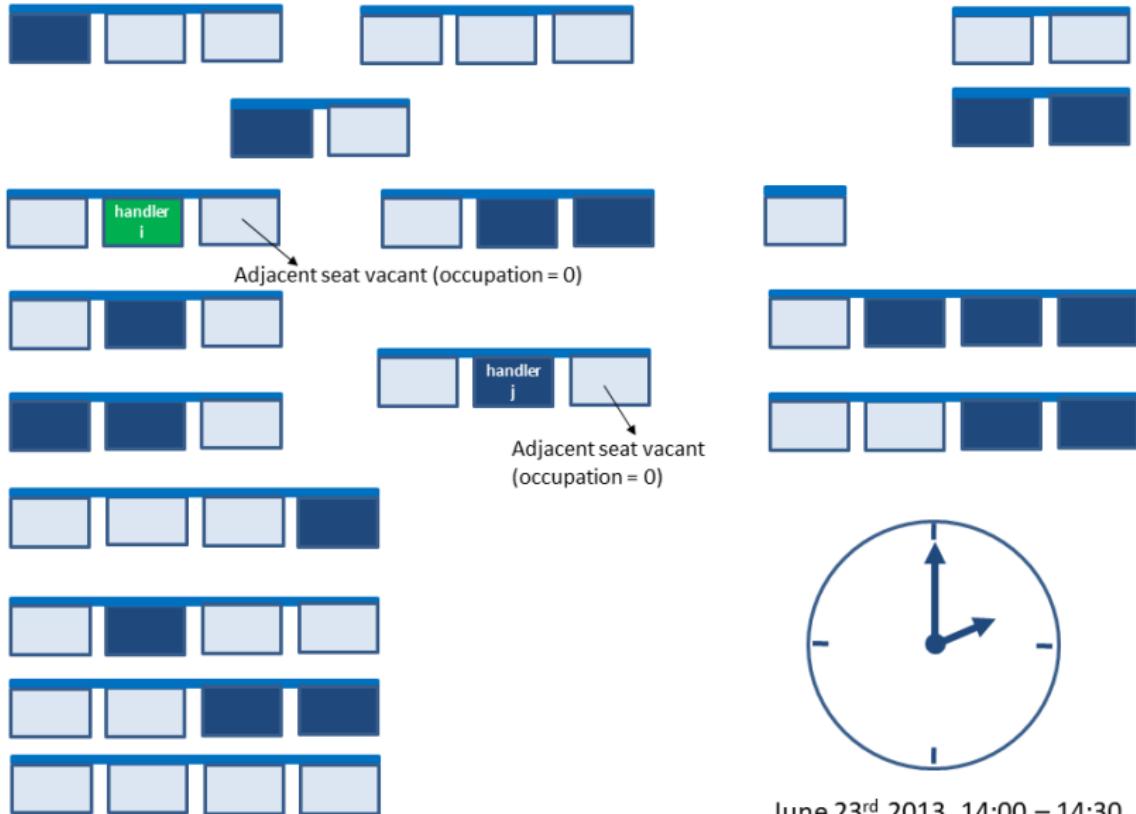
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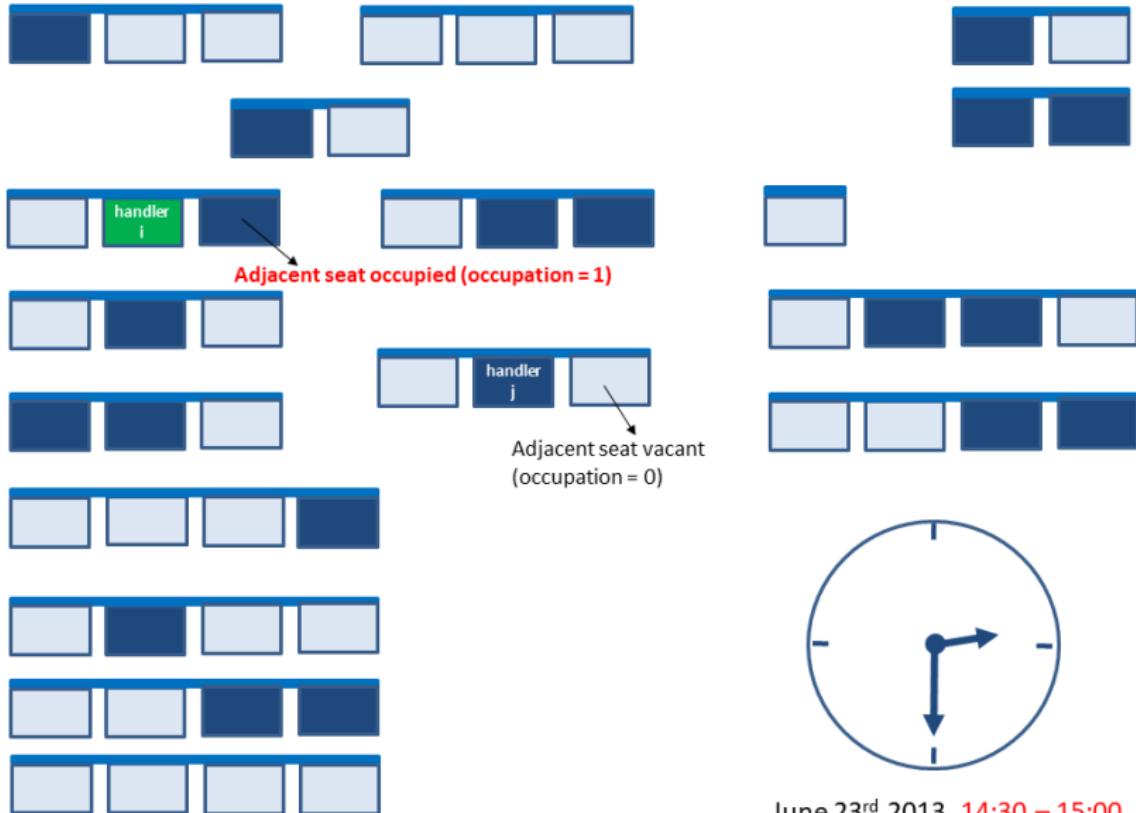
- Seating is:
 - endogenous (hot-desk)
 - but fixed within a shift
- Exploit high-frequency (e.g. 30mins) variation in occupation of adjacent seats
 - within handler-shift variation
 - absorb common shocks at granular time level

The Effect of Having Peers: Occupation of Adjacent Seats



June 23rd 2013, 14:00 – 14:30

The Effect of Having Peers: Occupation of Adjacent Seats



June 23rd 2013, 14:30 – 15:00

Panel of individual $i \times$ shift $s \times$ half-hour r periods:

$$y_{isr} = + \epsilon_{isr}$$

Panel of individual $i \times$ shift $s \times$ half-hour r periods:

$$y_{isr} = \beta Occupied_{isr} + \epsilon_{isr}$$

- $Occupied_{isr} \in [0, 2]$: average occupation of adjacent(s) seat(s)

Panel of individual $i \times$ shift $s \times$ half-hour r periods:

$$y_{isr} = \beta Occupied_{isr} + \gamma_{is} + \epsilon_{isr}$$

- $Occupied_{isr} \in [0, 2]$: average occupation of adjacent(s) seat(s)
- γ_{is} : individual-shift effect

Panel of individual $i \times$ shift $s \times$ half-hour r periods:

$$y_{isr} = \beta Occupied_{isr} + \gamma_{is} + \lambda_{t(isr)} + \epsilon_{isr}$$

- $Occupied_{isr} \in [0, 2]$: average occupation of adjacent(s) seat(s)
- γ_{is} : individual-shift effect
- $\lambda_{t(isr)}$: time (year \times month \times day \times half-hour) effect

Panel of individual $i \times$ shift $s \times$ half-hour r periods:

$$y_{isr} = \beta Occupied_{isr} + \gamma_{is} + \lambda_{t(isr)} + \theta_r + \epsilon_{isr}$$

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- θ_r : half-hour-within-individual-shift effect

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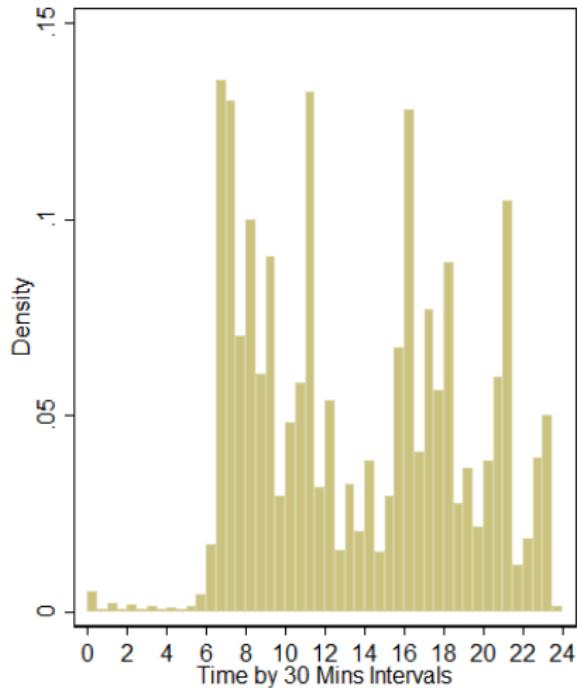
In first differences within individual-shift:

$$\Delta y_{isr} = \beta \Delta Occupied_{isr} + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$

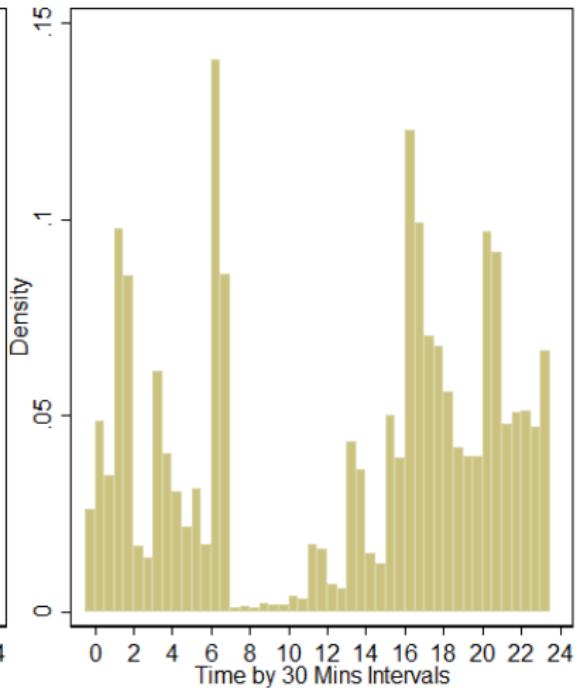
Handlers Start/End their Shifts at all Times of the Day

Distribution of Shift Hours

Starting Time



Ending Time



Identification assumption: Occupation of adjacent seats orthogonal to within-individual-shift/across-half-hour shocks.

E.g: arriving peer doesn't sit next to a handler that is to become more productive at half-hour t

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Supporting Evidence:

- Leads/lags in baseline regression (check pre-trends)
- Leads/lags in calls characteristics (placebo)
- Balance tests

Data:

- Feb2012 - Nov2014
- 71,000 shifts
- 350 handlers
- 2 million calls

Descriptive:

- ▶ Available and Occupied Seats
- ▶ Δ Occupied
- ▶ Outcomes

Baseline Regression:

$$\Delta y_{isr} = \beta \Delta Occupied_{isr} + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$

The Effect of Occupation of Adjacent
Desks on Handler Productivity

VARIABLES	(1) $\Delta \text{ LogCalls}$	(2) $\Delta \text{ LogPhone}$
Δ Occupied	.04*** (.002)	.06*** (.003)
N	1,120,501	1,120,501

Controls = Half-Hour FE, Shift Half-Hour FE, Minutes Worked During Half-Hour

Dataset in first-differences within handler/shift

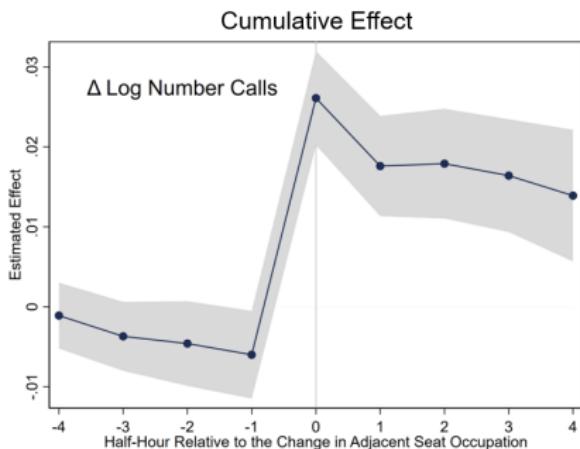
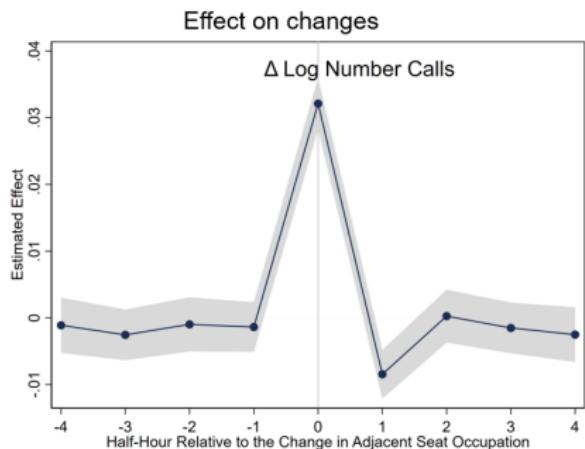
S.E. clustered at handler/shift level

Baseline Regression with Leads and Lags

$$\Delta y_{isr} = \sum_{j=-4}^{j=4} \beta_j \Delta Occupied_{i(r-j)} + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$

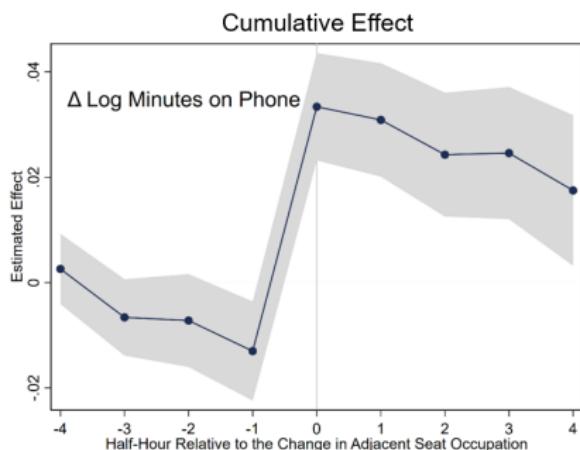
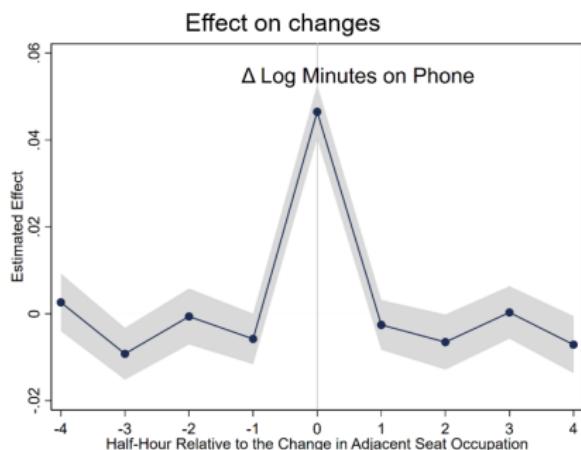
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Baseline Regression with Leads and Lags

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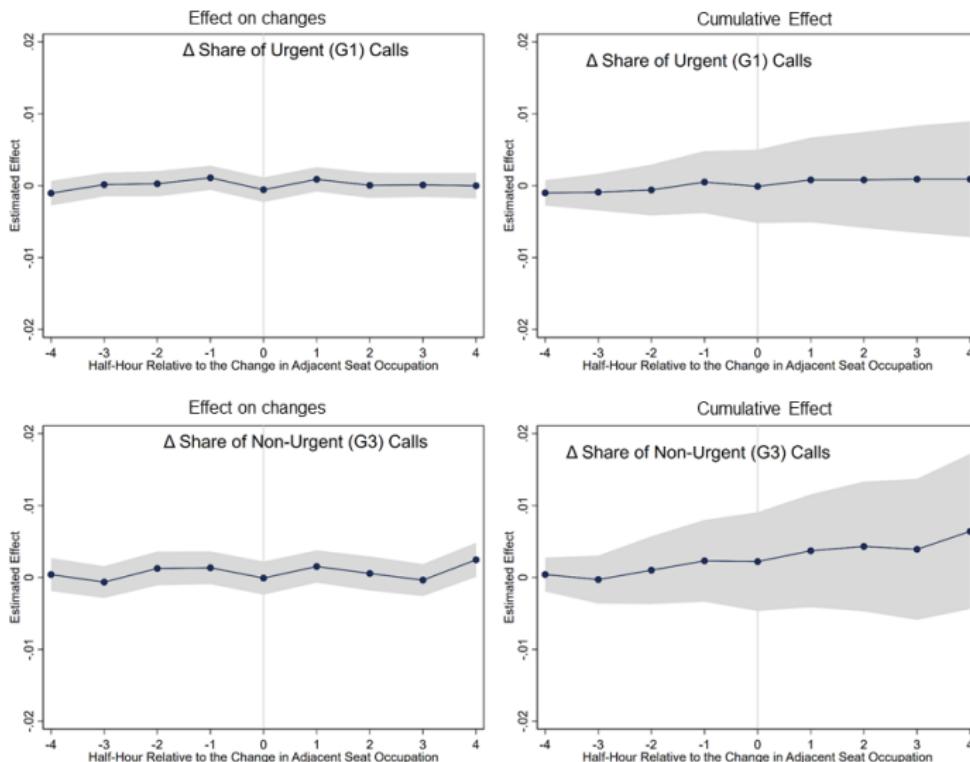


Placebo Test using Characteristics of Calls received

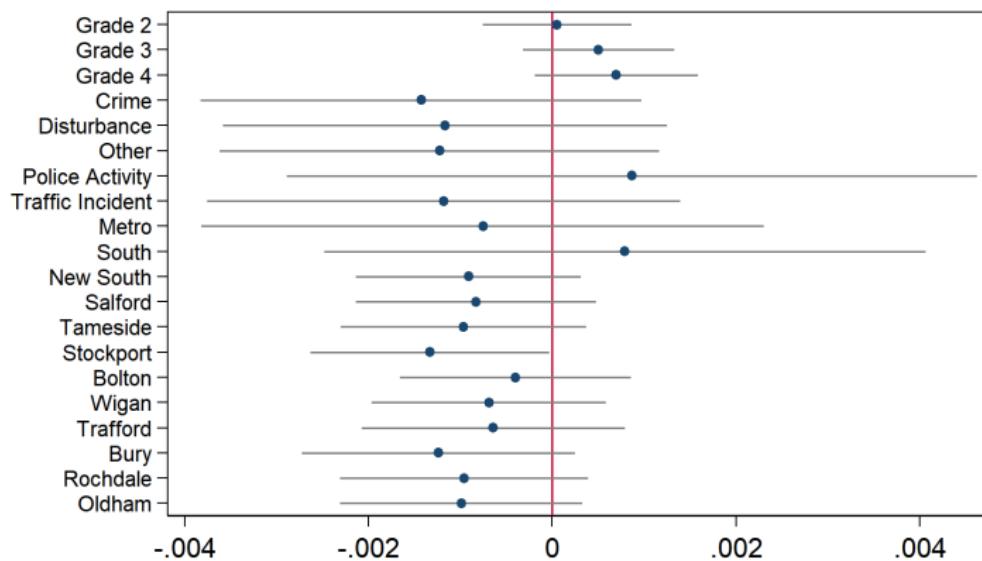
$$\Delta z_{isr} = \sum_{j=-4}^{j=4} \beta_j \Delta Occupied_{i(r-j)} + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$

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$$\Delta z_{isr} = \sum_{j=-4}^{j=4} \beta_j \Delta Occupied_{i(r-j)} + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$



Balance Test: Characteristics of the calls



Regression at the call level. N = 2022385

Dependent variable = change in the number of neighbouring seats occupied in the half-hour

RHS variables are displayed in the vertical axis.

F Joint significance = .66

Summary of heterogeneous results

- ➊ both for increases and decreases in occupation 
- ➋ most individual-level effects are positive 
 - for focus handler
 - spillovers created when arriving/leaving
- ➌ weaker effects for occupation of front/behind row 
- ➍ stronger effects when 
 - similar experience
 - arriving peer high productivity
 - co-located prior to 2012

 additional robustness

Quality

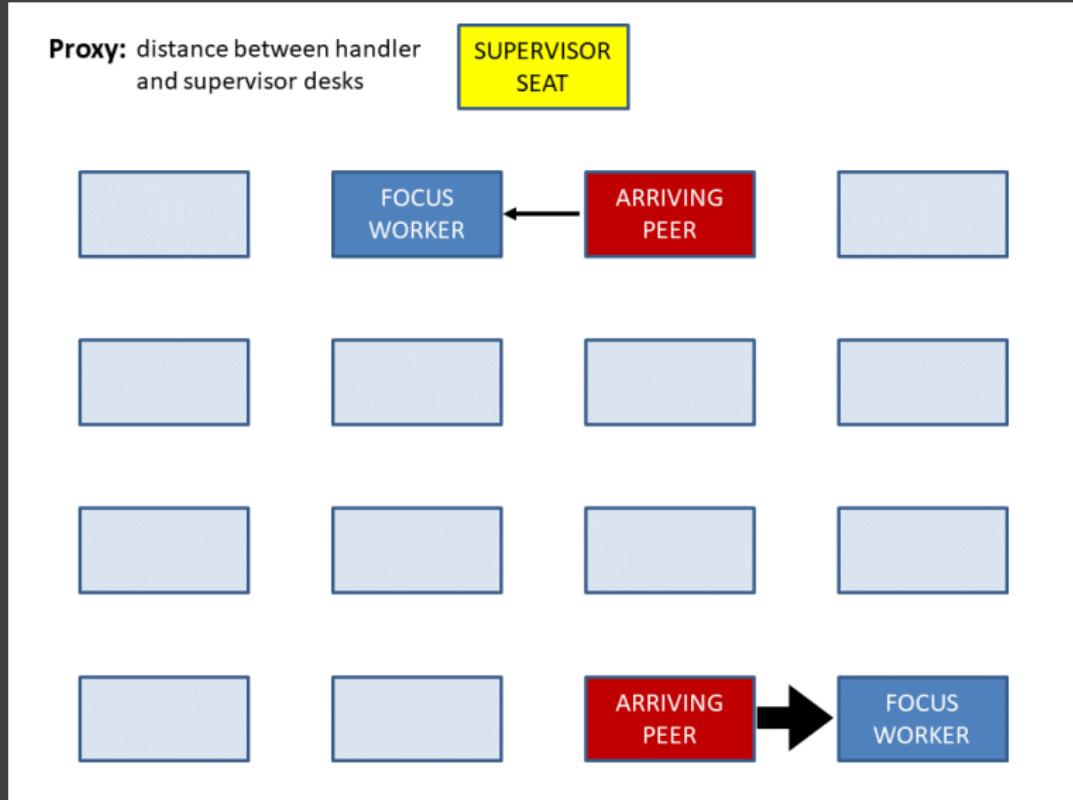
Effects on Quality of Work

Dependent Variable:	(1)	(2)	(3)	(4)
	$\Delta \log$ Average Call Duration	$\Delta \log$ Allocation Time	$\Delta \log$ Response Time	$\Delta \log$ Clearance Dummy
Δ Occupied	.005 (.0029)	.02 (.0165)	.012 (.0124)	-.026 (.0327)
N	908,253	355,363	351,023	9,625

Plan for Today

- ① identify peer effects
 - properly
 - robustness/heterogeneity
 - effects on 'quality'
- ② mechanism/relation with manager pressure (predictions 2 and 3)
- ③ simulations and discussion

Prediction 2: stronger peer effects when manager gets a weaker direct signal



Effect by distance to closest supervisor

$$\Delta y_{isr} = \beta \Delta Occup_{isr} + \alpha (\Delta Occup_{isr} \times Distance_{is}) + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$

Dependent Variable:	(1) Δ Log Phone	(2) Δ Log Calls	(3) Δ Log Phone	(4) Δ Log Calls
Δ Occupied	-.001 (.0134)	-.001 (.0081)		
Δ Occupied × Log Distance to Supervisor	.026*** (.0064)	.016*** (.0038)	.025*** (.0074)	.016*** (.0045)
Δ Occupied × Focus Handler F.E.	No	No	Yes	Yes
Δ Occupied × Time (Half-Hour) F.E.	No	No	Yes	Yes
N	982,861	982,861	982,861	982,861

► Non-Parametric

Controlling for selection:

$$\Delta y_{isr} = \alpha(\Delta Occup_{isr} \times Distance_{is}) + \beta_i(\Delta Occup_{isr} \times \eta_i) \\ + \gamma_i(\Delta Occup_{isr} \times \lambda_t) + \theta_r + \Delta \epsilon_{isr}$$

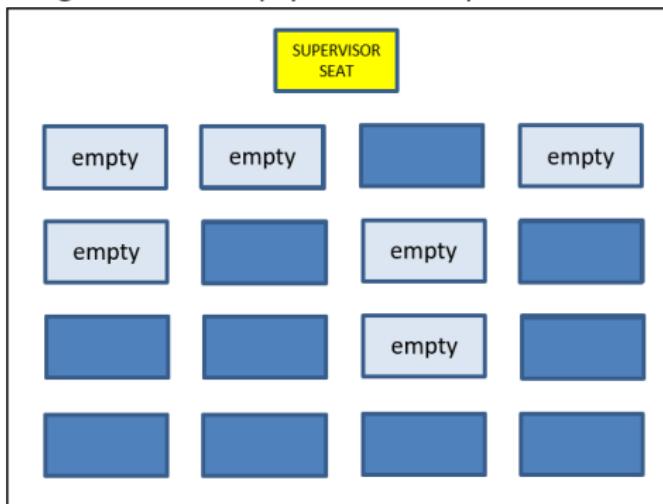
Dependent Variable:	(1) Δ Log Phone	(2) Δ Log Calls	(3) Δ Log Phone	(4) Δ Log Calls
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Δ Occupied × Focus Handler F.E.	No	No	Yes	Yes
Δ Occupied × Time (Half-Hour) F.E.	No	No	Yes	Yes
N	982,861	982,861	982,861	982,861

► Non-Parametric

Instrument for distance:

- avg distance of **free seats** at the time handler starts her shift
- intuition: seat choice constrained by free seats → idiosyncratic

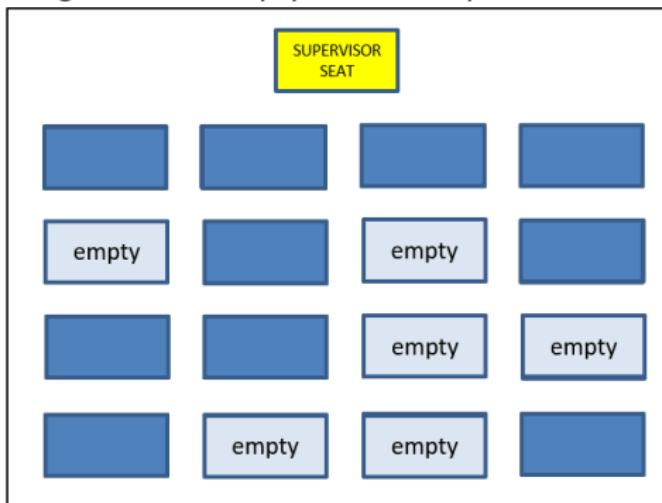
Avg. distance empty desks to supervisor = 2.4



Instrument for distance:

- avg distance of **free seats** at the time handler starts her shift
- intuition: seat choice constrained by free seats → idiosyncratic

Avg. distance empty desks to supervisor = **3.7**



Effect by distance to closest supervisor

2SLS results:

	First Stage (1)	Second Stage (2)	Second Stage (3)
Dependent Variable:	$\Delta \text{ Occupied} \times \text{Log Distance to Supervisor}$	$\Delta \text{ Log Phone}$	$\Delta \text{ Log Calls}$
$\Delta \text{ Occupied} \times \text{Log Av. Distance Free Seats}$	1.572*** (.0478)		
$\Delta \text{ Occupied} \times \text{Log Distance to Supervisor}$.072*** (.0304)	.051*** (.0184)
$\Delta \text{ Occupied} \times \text{Focus Handler F.E.}$	Yes	Yes	Yes
$\Delta \text{ Occupied} \times \text{Time (Half-Hour) F.E.}$	Yes	Yes	Yes
Kleibergen-Paap F	2666.66		

Prediction 3: stronger peer effects if manager/peer link is stronger

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What do Managers do? Two Functions

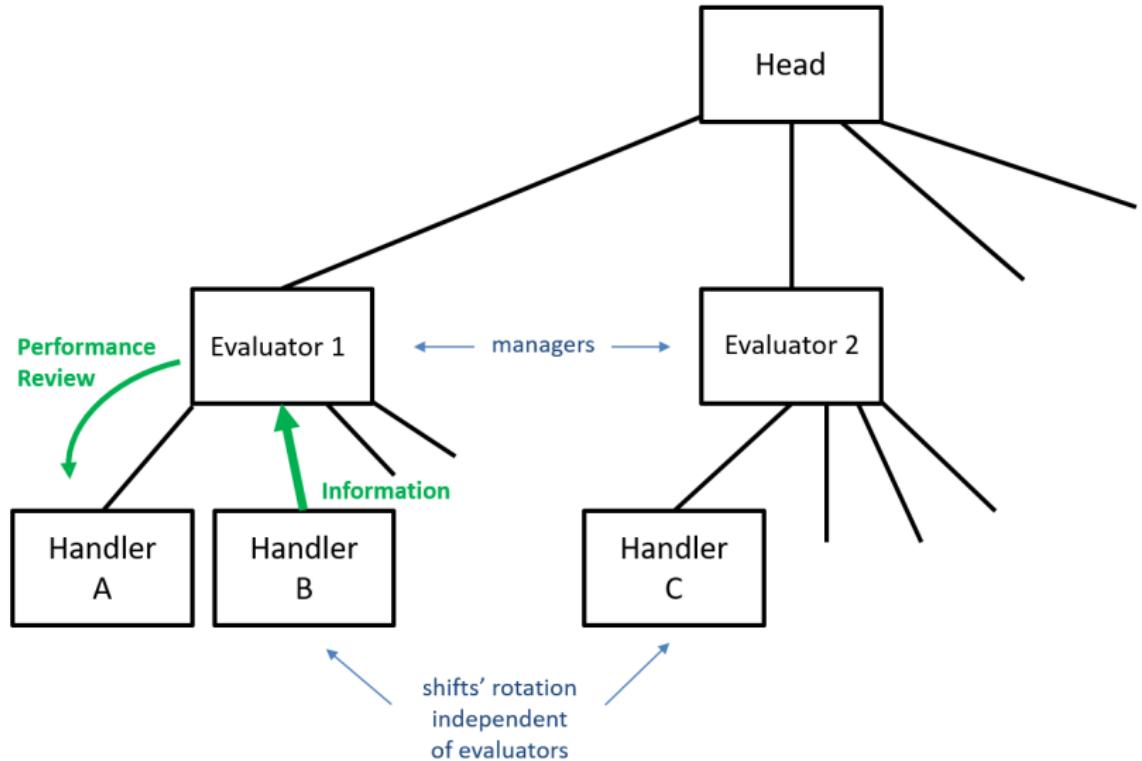
Supervisors:

- in the room
- monitor visually
- solve hard problems

Evaluators:

- undertake performance review (plus mentoring, advice)
- requires 'hard' and 'soft' information
- regular meetings with handlers

Co-evaluated Handlers



Effect by evaluator affiliation of peer

	$\Delta \text{ LogCalls}$				
	(1)	(2)	(3)	(4)	(5)
$\Delta \text{ Occ}$.033*** (.002)			
$\Delta (\text{Occ} \times \text{Co-Evaluated})$.02*** (.006)	.018*** (.006)		

$\Delta \text{ Occ}$ interacted with:

Focus Handler FE	NO	YES
------------------	----	-----

Effect by evaluator affiliation of peer

	$\Delta \text{ LogCalls}$				
	(1)	(2)	(3)	(4)	(5)
$\Delta \text{ Occ}$.033*** (.002)				
$\Delta (\text{Occ} \times \text{Future Co-Evaluated})$			-.006 (.012)		
$\Delta (\text{Occ} \times \text{Current Co-Evaluated})$.02*** (.006)	.018*** (.006)	.017*** (.006)		
$\Delta (\text{Occ} \times \text{Past Co-Evaluated})$				-.009 (.008)	

$\Delta \text{ Occ}$ interacted with:

Focus Handler FE	NO	YES	YES
------------------	----	-----	-----

Effect by evaluator affiliation of peer

	$\Delta \text{ LogCalls}$				
	(1)	(2)	(3)	(4)	(5)
$\Delta \text{ Occ}$.033*** (.002)				
$\Delta (\text{Occ} \times \text{Future Co-Evaluated})$			-.006 (.012)		
$\Delta (\text{Occ} \times \text{Current Co-Evaluated})$.02*** (.006)	.018*** (.006)	.017*** (.006)	.018** (.009)	
$\Delta (\text{Occ} \times \text{Past Co-Evaluated})$			-.009 (.008)	-.011 (.011)	

$\Delta \text{ Occ}$ interacted with:

Focus Handler FE	NO	YES	YES	NO
Focus/Peer Pair FE	NO	NO	NO	YES

For same pair of focus-arriving handlers:
Stronger effects in periods when they share the evaluator

Effect by evaluator affiliation of peer

	$\Delta \text{ LogCalls}$				
	(1)	(2)	(3)	(4)	(5)
$\Delta \text{ Occ}$.033*** (.002)			
$\Delta (\text{Occ} \times \text{Future Co-Evaluated})$			-.006 (.012)		
$\Delta (\text{Occ} \times \text{Current Co-Evaluated})$.02*** (.006)	.018*** (.006)	.017*** (.006)	.018** (.009)	.017** (.01)
$\Delta (\text{Occ} \times \text{Past Co-Evaluated})$			-.009 (.008)	-.011 (.011)	-.014 (.011)
$\Delta (\text{Occ} \times \text{N Past Interactions})$.006*** (.001)
<hr/>					
$\Delta \text{ Occ}$ interacted with:					
Focus Handler FE	NO	YES	YES	NO	NO
Focus/Peer Pair FE	NO	NO	NO	YES	YES

Additional Channel: Effects beyond adjacent desks. It may be easier to evaluate handlers working at the same time

- Exploit variation in the share of co-evaluated peers in the room
- Scheduled weeks in advance
 - i.e. orthogonal to idiosyncratic shocks at handler-30mins level

Share of Co-Evaluated Peers in the Room

	$\Delta \text{ LogCalls}$			
	(1)	(2)	(3)	(4)
Δ Share Current Co-Evaluated in the Room	.115*** (.0305)			
Δ Share Past Co-Evaluated in the Room	.002 (.0272)			
Δ Share Future Co-Evaluated in the Room	.012 (.0271)			

Δ Occ interacted with:

Focus Handler FE	NO
Focus/Peer Pair FE	NO

Share of Co-Evaluated Peers in the Room

	$\Delta \text{ LogCalls}$			
	(1)	(2)	(3)	(4)
Δ Share Current Co-Evaluated in the Room	.115*** (.0305)	.134*** (.0305)	.134*** (.0305)	.125*** (.0317)
Δ Share Past Co-Evaluated in the Room	.002 (.0272)	.001 (.0272)	.002 (.0272)	0 (.0283)
Δ Share Future Co-Evaluated in the Room	.012 (.0271)	.014 (.027)	.013 (.027)	.018 (.0283)
Δ Occupied		.033*** (.0021)		
Δ Occupied \times Current Co-Evaluated		.021*** (.0062)	.018*** (.0064)	.02** (.0091)
<hr/>				
Δ Occ interacted with:				
Focus Handler FE	NO	NO	YES	NO
Focus/Peer Pair FE	NO	NO	NO	YES

orthogonal to the effect of occupation of adjacent desk by co-evaluated

Plan for Today

- ① identify peer effects
 - properly
 - robustness/heterogeneity
 - effects on 'quality'
- ② mechanism/relation with manager pressure
- ③ simulations and discussion

Simulating Alternative Seating/Shift Arrangements

Use estimated peer effects to simulate:

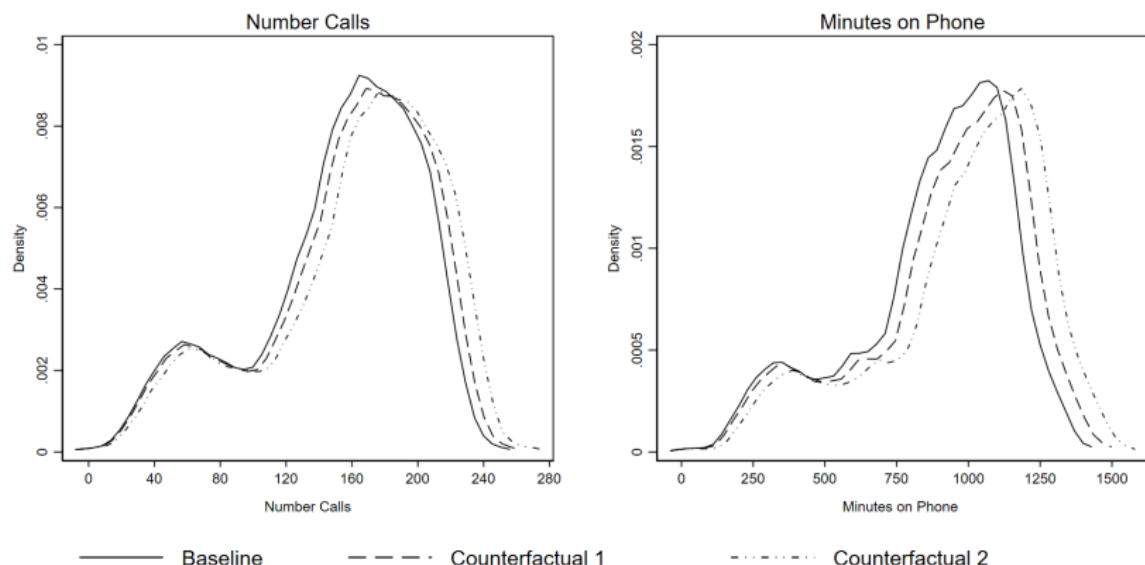
- ① Maximize occupation of adjacent seats
- ② Change shifts to maximize overlap in co-evaluated peers

Mixed-integer programming problem: Approximate solution with heuristic algorithms

Simulating Alternative Seating/Shift Arrangements

Simulated Average Productivity Changes		
	Counterfactual 1:	Counterfactual 2:
Hourly change (%) in:	Increasing Horizontal Incentives	+ Leveraging Vertical Relations
Minutes on Phone	4.84*** (0.31)	11.98*** (2.98)
Number of Calls	2.88*** (0.17)	7.64*** (1.94)

Simulating Alternative Seating and Shifts Arrangements

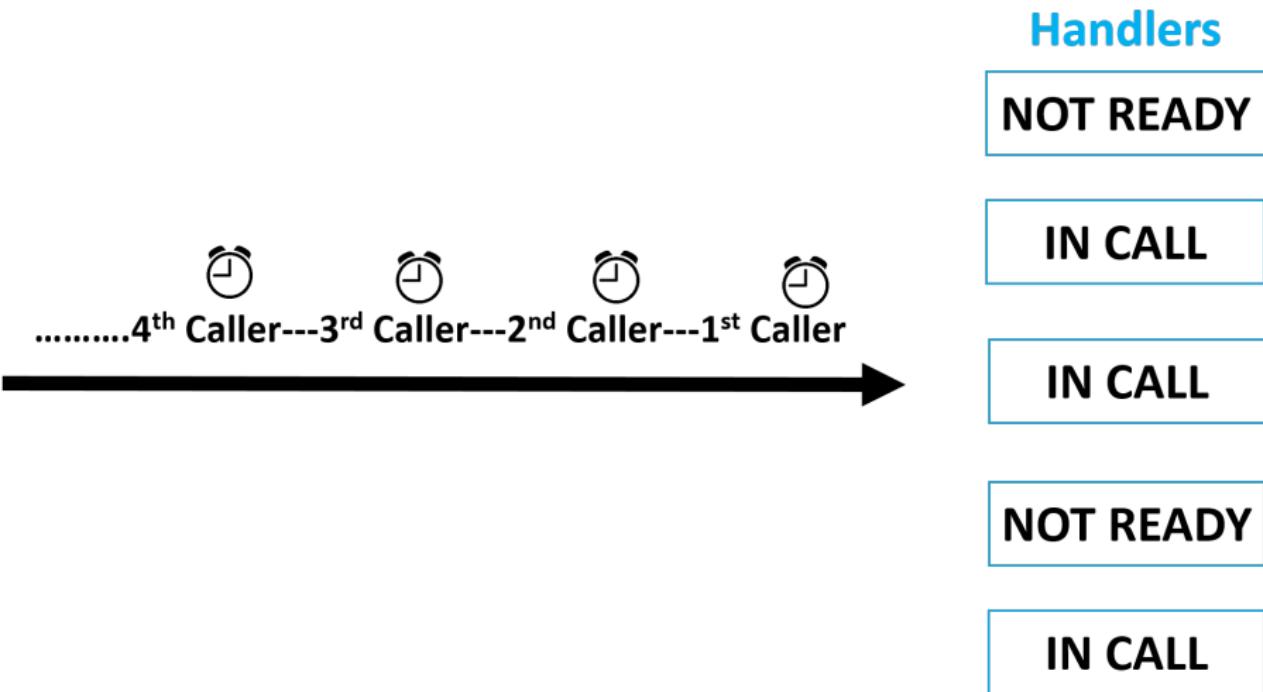


Final Remarks:

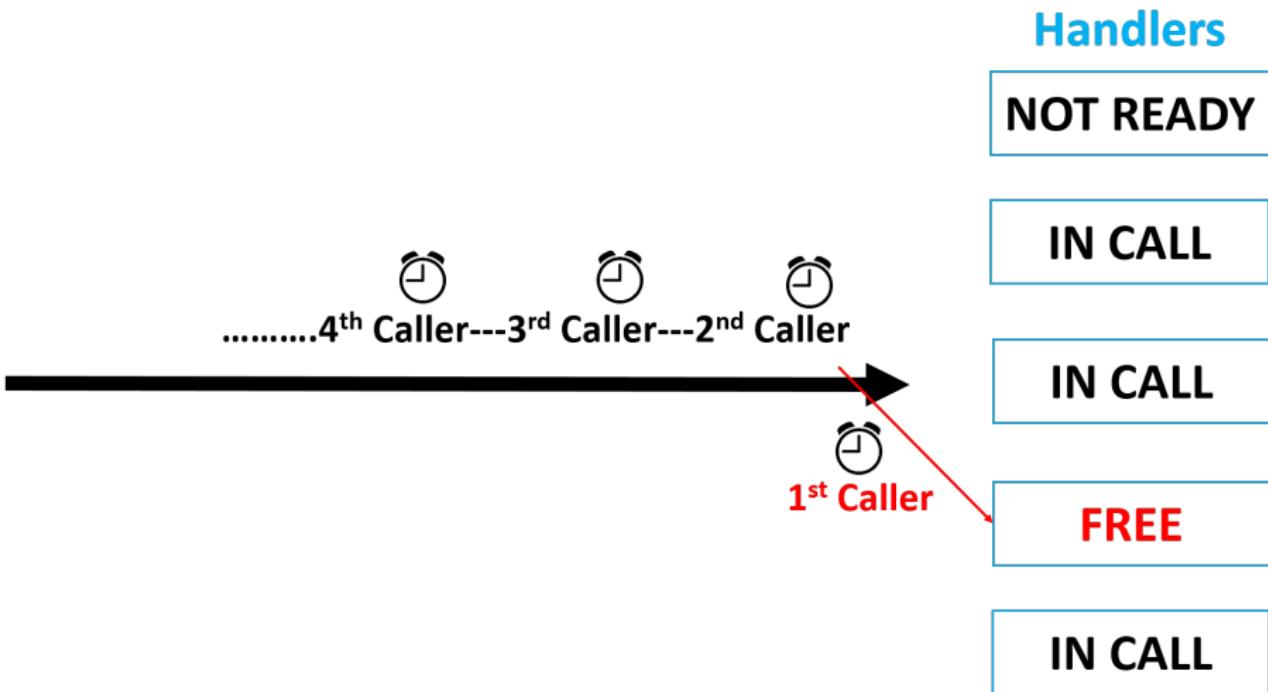
- Working with peers closeby:
 - positive effects despite potential for distraction/noise
- Peer pressure is related to manager pressure
 - substitute for direct monitoring
 - driven (at least partly) by manager pressure
- Policy implications
 - workplace design and hierarchical structure matters for productivity
 - e.g. potential productivity gains by changing seat arrangement
 - working from home?
- Caution: paper is silent about e.g. workers' satisfaction

Additional Slides

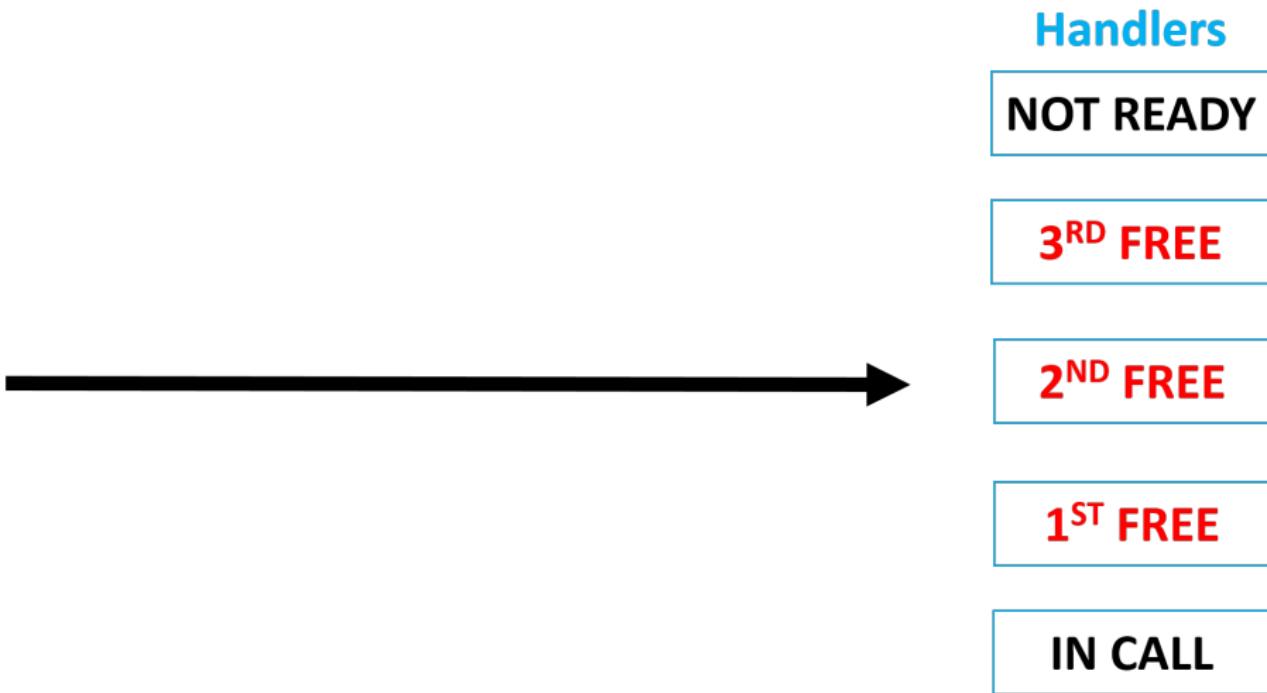
Team Production (Free-Riding)



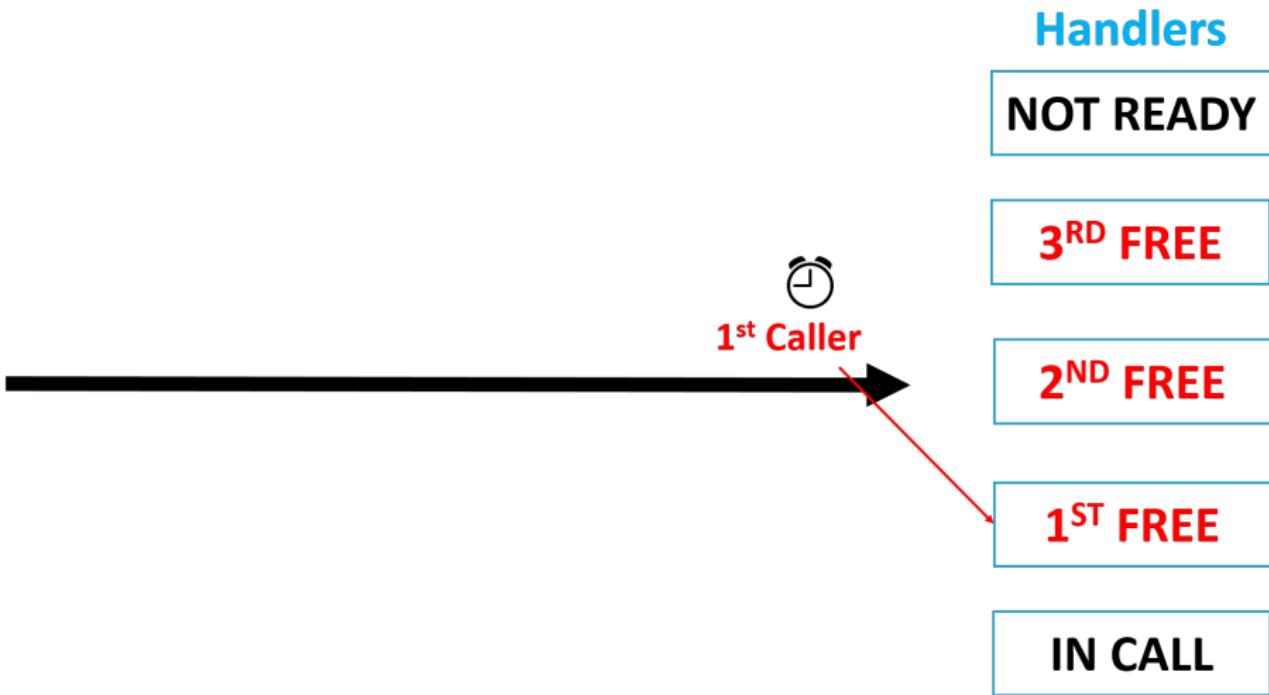
Team Production (Free-Riding)



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Team Production (Free-Riding)

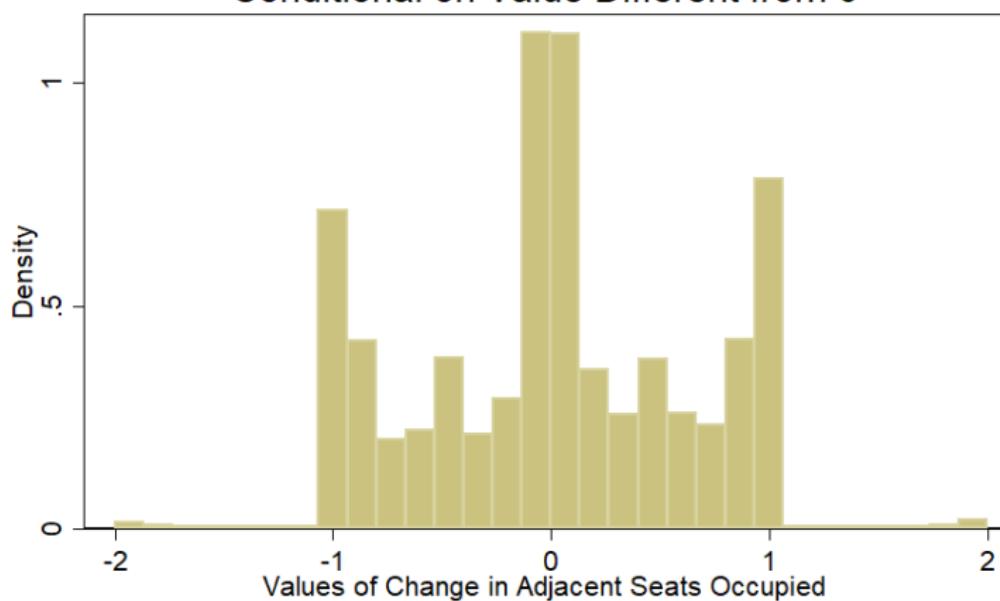


Observations by Existing/Occupied Adjacent Seats

Number of Occupied Seats	Number of Adjacent Seats				Total
	0	1	2		
0	7,646	230,145	39,410		277,201
1	0	610,825	137,732		748,557
2	0	0	143,166		143,166
Total	7,646	840,970	320,308		1,168,924

▶ Back

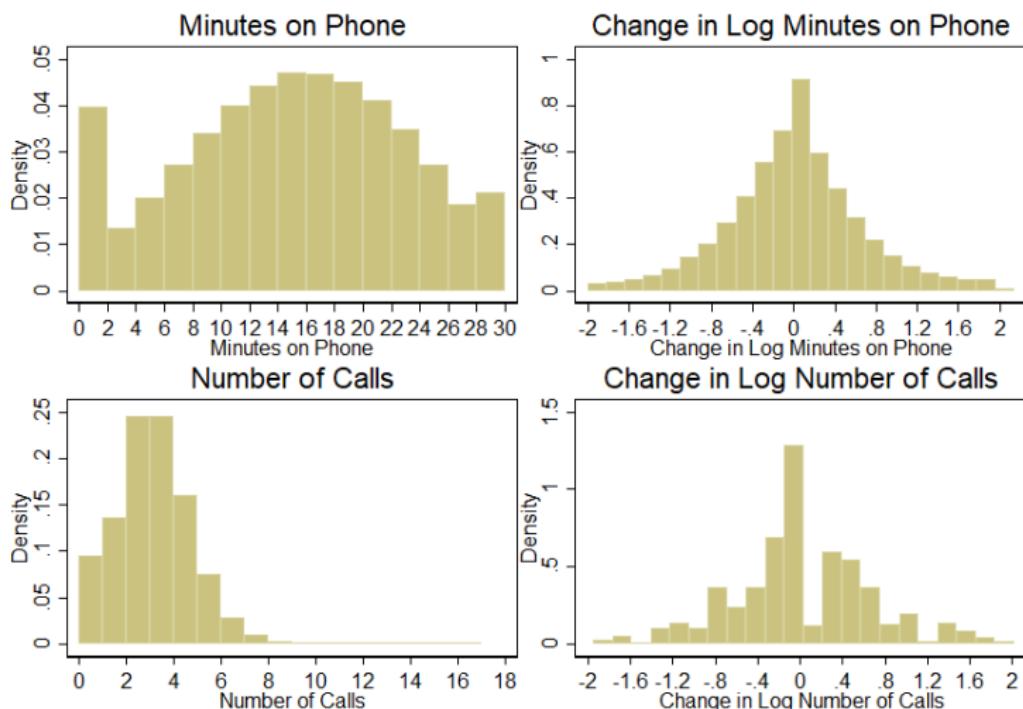
Distribution of Change in Adjacent Seats Occupied Conditional on Value Different from 0



88% of observations have a value of 0.

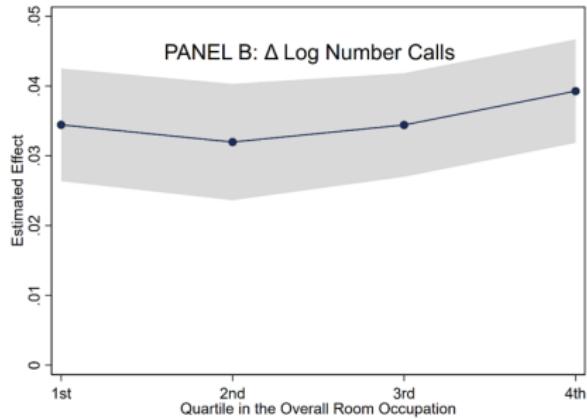
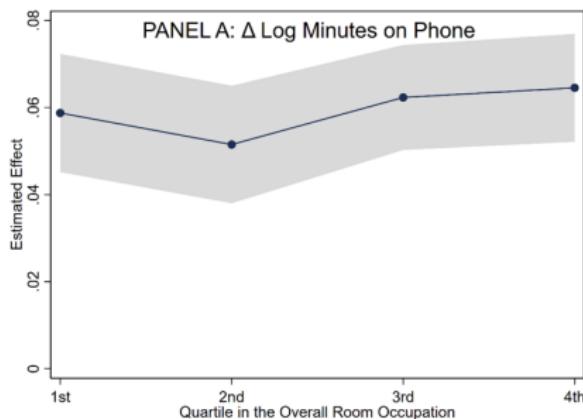
The histogram displays the distribution of the variable for the remaining observations.

Distribution of Outcome Variables



Additional Test: Similar results when handlers have less seat choices

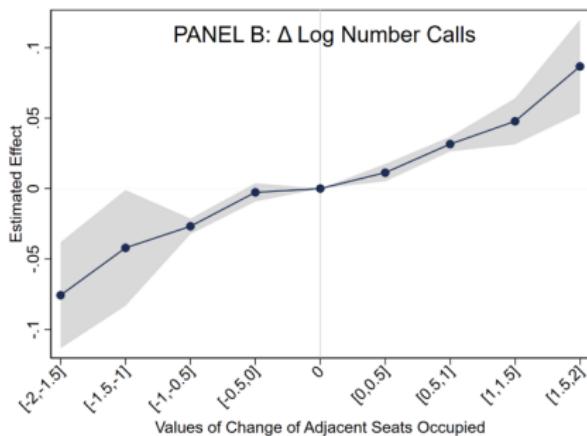
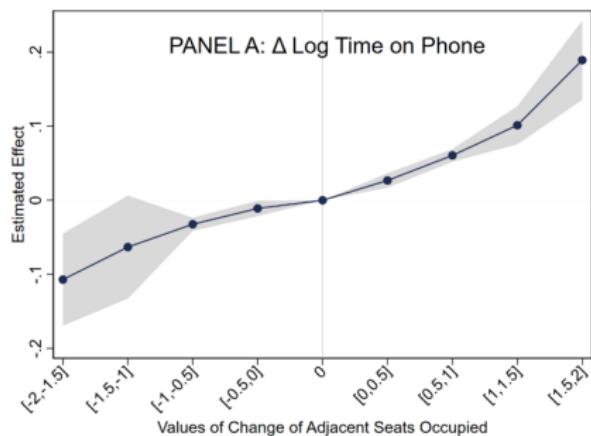
Effects by Room Occupation



Baseline Regression with Asymmetric Effects (Non-Parametric)

$$\Delta y_{isr} = \sum_{j=1}^9 \beta_j \Delta Occupied Dummy J_{isr} + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$

Increases vs. Decreases in Occupation



▶ Positive vs Negative

▶ back

Baseline Regression with Asymmetric Effects

Seats Becoming Free vs Becoming Occupied

VARIABLES	(1) Δ LogPhone	(2) Δ LogCalls
Δ Occupied × (Δ Occupied > 0)	.078*** (.004)	.04*** (.003)
Δ Occupied × (Δ Occupied < 0)	.04*** (.005)	.03*** (.003)
p-value ($\Delta < 0 = \Delta > 0$)	.000	.007
r2	.34	.27
N	1120501	1120501

Controls = Half-Hour FE, Shift Half-Hour FE, Minutes Worked During Half-Hour

Dataset in first-differences within handler/shift

S.E. clustered at handler/shift level

▶ back

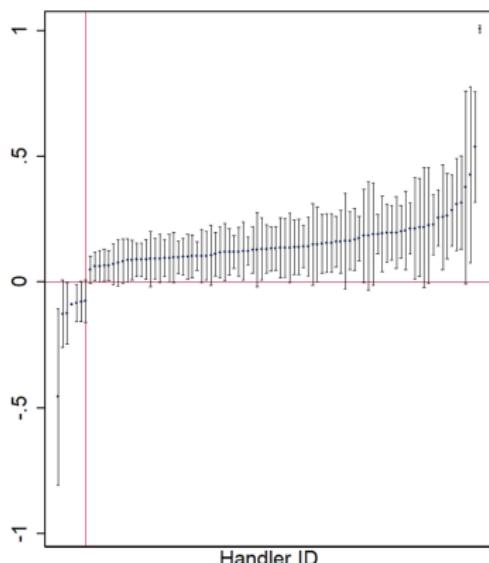
Calculating Individual i (Focus Worker) Effects

$$\Delta y_{isr} = \beta_i (\Delta Occupied_{isr} \times \eta_i) + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$

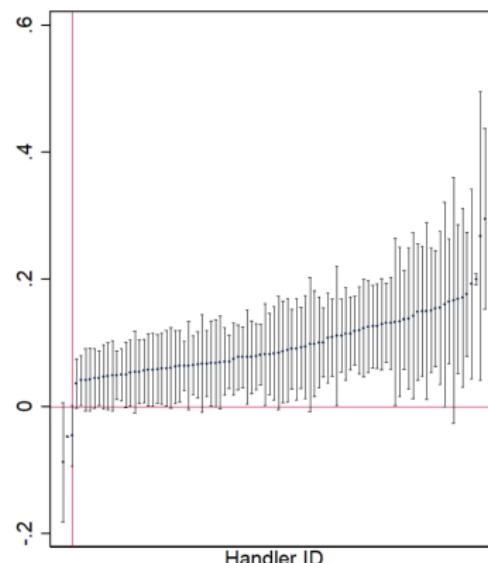
Estimated Individual-Level Effects

Only β_i significant at 10%

$\Delta LogPhone$



$\Delta LogCalls$



Calculating Individual j (Peer Spillover) Effects

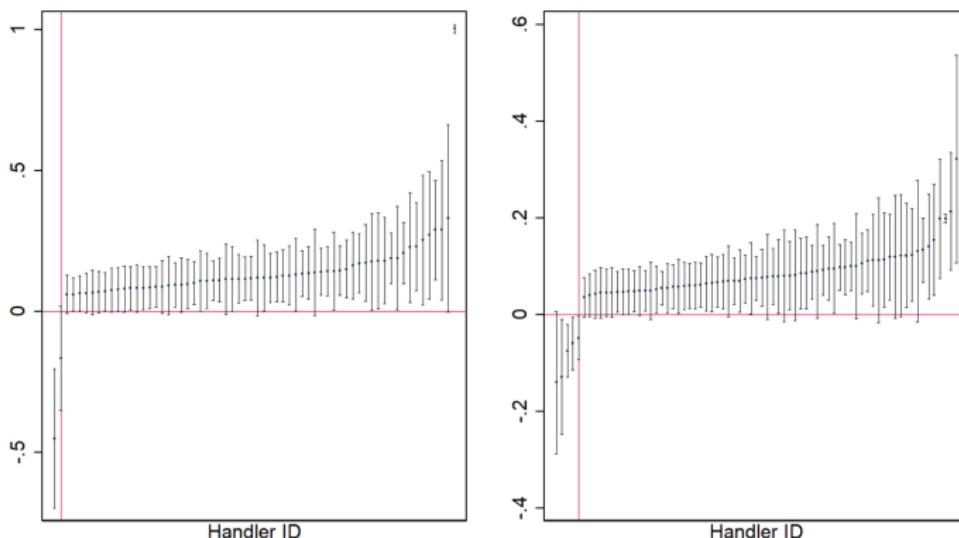
$$\Delta y_{isr} = \beta_j (\Delta Occupied_{isr} \times \eta_{j(isr)}) + \lambda_{t(isr)} + \theta_r + \Delta \epsilon_{isr}$$

Estimated Average Spillover on Co-Workers

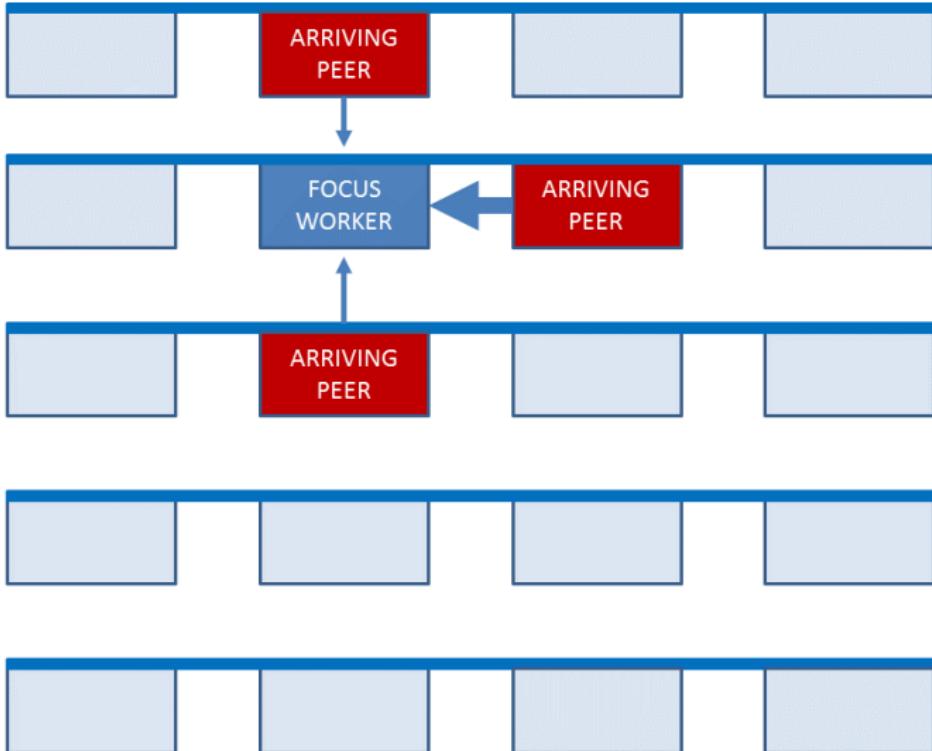
Only β_j significant at 10%

$\Delta LogPhone$

$\Delta LogCalls$



Sanity Check: Visibility of Peer Matters



Effect of Occupation of Adjacent vs Non-Adjacent Seats

VARIABLES	(1) Δ LogCalls	(2) Δ LogPhone
Δ Adjacent	.035*** (.002)	.06*** (.0034)
Δ Behind Row	.009*** (.002)	.016*** (.0033)
Δ Front Row	.004 (.0028)	.012*** (.0047)
p-value ($\Delta \text{ Adj} = \Delta \text{ Vic}$)	.000	.000
p-value ($\Delta \text{ Vic} = \Delta \text{ Fro}$)	.152	.452
r ²	.27	.34
N	1120501	1120501

▶ back

Heterogenous Effects By Focus Handler Characteristics

VARIABLES	(1) Δ LogPhone	(2) Δ LogCalls	(3) Δ LogPhone	(4) Δ LogCalls
ΔOccupied	.028** (.012)	.012* (.007)		
ΔOcc x Female	.001 (.007)	-.003 (.004)		
ΔOcc x AvgProductivity	.007 (.007)	-.002 (.004)		
ΔOcc x LogExperience	-.017*** (.004)	-.007*** (.002)	-.008 (.022)	.001 (.013)
ΔOcc x LogIncomingCalls	.034*** (.006)	.024*** (.003)	.029*** (.006)	.02*** (.003)
IndivFE X ΔOccupied	NO	NO	YES	YES
r ²	.34	.34	.34	.34
N	1113720	1113720	1113720	1113720

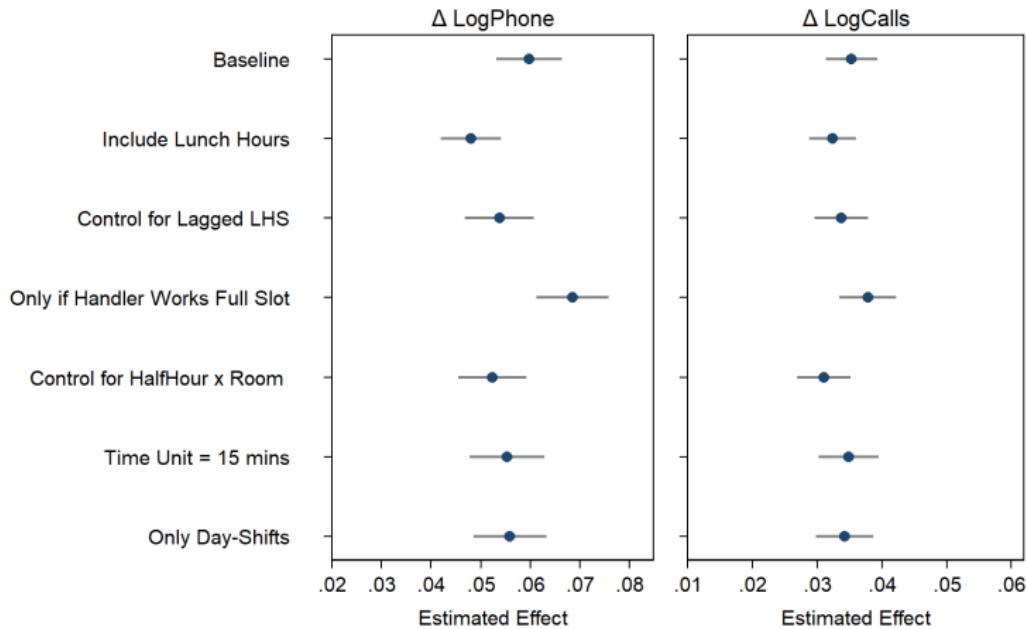
▶ back

Heterogenous Effects
By Peer Handler Characteristics

VARIABLES	(1) Δ LogPhone	(2) Δ LogCalls	(3) Δ LogPhone	(4) Δ LogCalls
Δ Occupied	.055*** (.008)	.036*** (.005)		
Δ Occ x High Experience	.004 (.015)	.008 (.009)	.006 (.015)	.01 (.009)
Δ Occ x High Productivity	-.005 (.009)	-.01 (.006)	-.007 (.01)	-.005 (.007)
Δ Occ x Experience Diffs	-.003*** (.001)	-.002*** (.001)	-.004*** (.001)	-.002*** (.001)
Δ Occ x Productivity Diffs	.03 (.019)	.046*** (.018)	.029 (.024)	.022 (.024)
Δ Occ x Same Gender	.008 (.008)	0 (.005)	.009 (.009)	.005 (.005)
Δ Occ x Co-located in 2011	.037* (.021)	.017 (.013)	.062*** (.024)	.024* (.014)
IndivFE X Δ Occupied	NO	NO	YES	YES
r2	.32	.32	.32	.32
N	1043114	1043114	1043114	1043114

Robustness

Effect of Change in Adjacent Seats Occupied

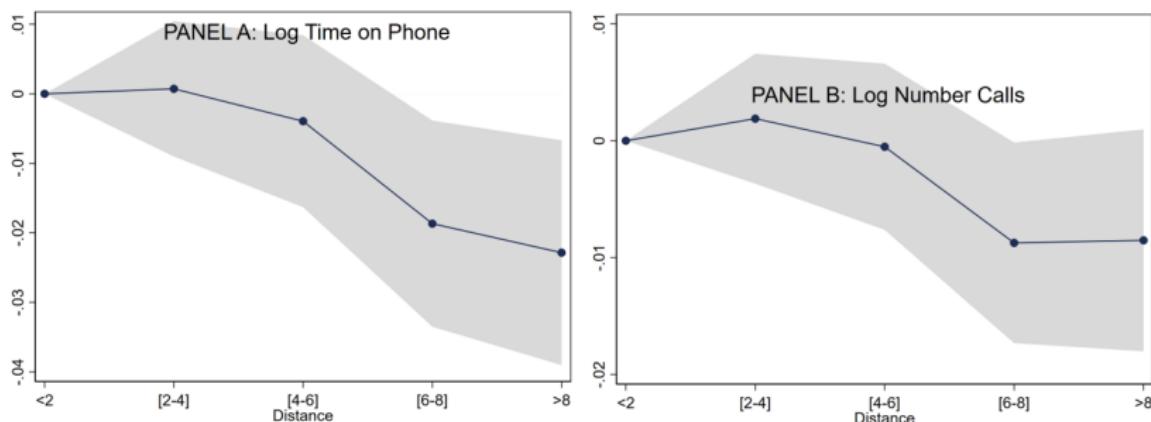


Prediction 2: stronger peer effects when manager gets a weaker direct signal

- **proxy:** distance handler-supervisor desks
- **validation:** a handler is less productive when sits far from supervisors

$$y_{isr} = \alpha Distance_{is} + \eta_i + \lambda_{t(isr)} + \theta_r + \epsilon_{isr}$$

Productivity vs. Distance to Supervisors

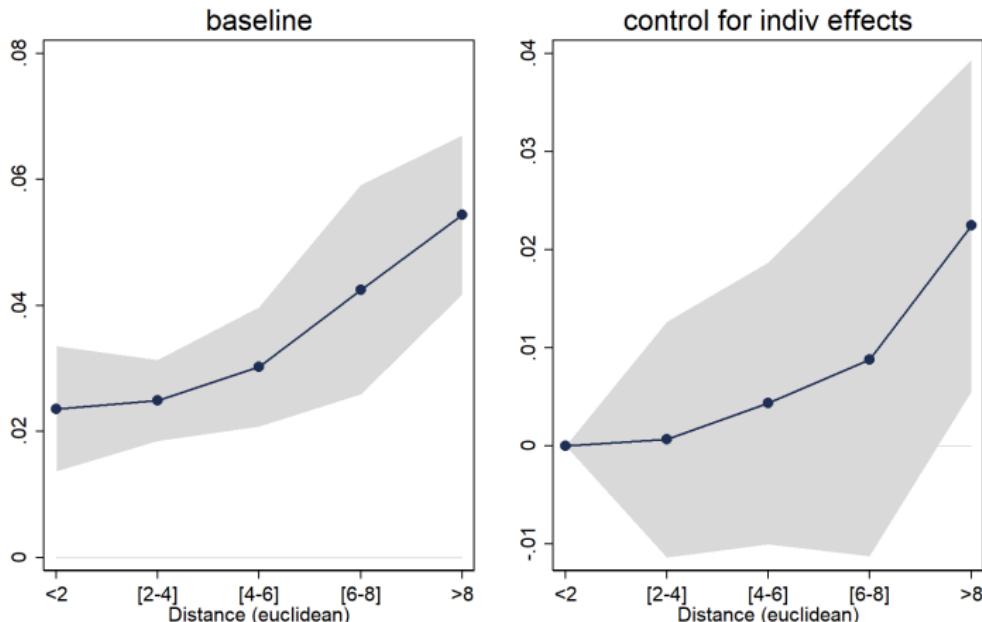


Effect of Distance to Closest Supervisor Position

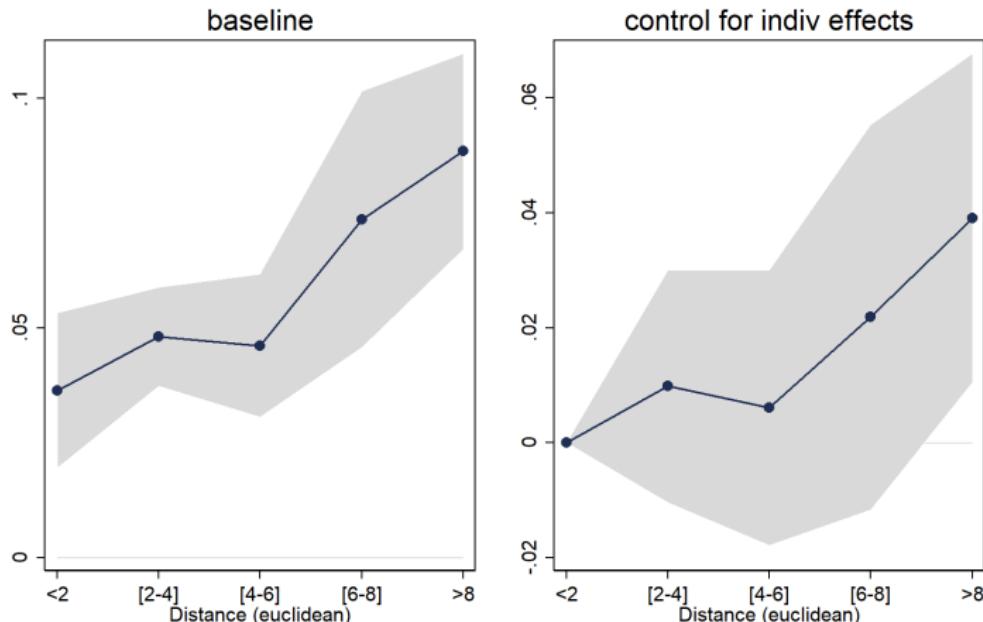
VARIABLES	(1)	(2)	(3)
	$\Delta \text{ LogPhone}$	$\Delta \text{ LogPhone}$	$\Delta \text{ LogPhone}$
$\Delta \text{ Occ}$	-.006 (.0154)		
$\Delta \text{ Occ} \times (\log) \text{ Distance to Supervisor}$.025*** (.0065)	.018*** (.0069)	.021*** (.0076)
$\Delta \text{ Occ} \times \text{Indiv FE}$	NO	YES	YES
$\Delta \text{ Occ} \times \text{HalfHour FE}$	NO	NO	YES
r2	.34	.34	.37
N	982777	982777	982777

▶ back

Estimated Effect by Distance to Closest Supervision Position $\Delta \text{LogCalls}$



Estimated Effect by Distance to Closest Supervision Position $\Delta \text{LogPhone}$



Allocation of handlers to evaluators

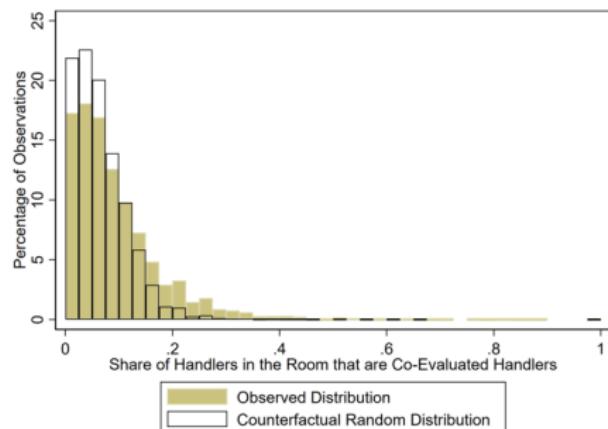
Balance of Co-Evaluated vs. Non Co-Evaluated Pairs

$$Charack_{ijt} = \psi CoEvaluated_{ijt} + \theta_i + \lambda_j + \pi_t + \epsilon_{ijt}$$

	(1)	(2)
Same Gender	-.011 (.019)	-.001 (.002)
Difference in Age	-.026 (.017)	-.002 (.002)
Difference in Experience	-.037* (.021)	-.004 (.003)
Average Distance Within Room	-.004 (.012)	0 (.001)
Overlap in the Night Shifts	-.017 (.011)	-.003 (.002)
Overlap in the Morning Shifts	-.005 (.009)	0 (.001)
Difference in Share of Urgent Calls	-.013 (.011)	-.001 (.001)
Difference in Number of Hours Worked	-.02 (.013)	-.001 (.001)
Difference in Share of Time with Adjacent Seats Occupied	.003 (.008)	.001 (.001)
First Handler Fixed Effects	Yes	Yes
Second Handler Fixed Effects	Yes	Yes
Year/Semester Fixed Effects	Yes	Yes
F-Statistic Coefficients Jointly Equal to Zero	1.16	

(2) is a single regression of a co-evaluated dummy on pair's characteristics

Co-Evaluated shift overlapping



Effect by evaluator affiliation of peer - Time on the Phone

	$\Delta \text{ LogPhone}$				
	(1)	(2)	(3)	(4)	(5)
$\Delta \text{ Occ}$.057*** (.0036)			
$\Delta (\text{Occ} \times \text{Future Co-Evaluated})$			-.013 (.0207)		
$\Delta (\text{Occ} \times \text{Current Co-Evaluated})$.027*** (.0103)	.029*** (.0106)	.027*** (.0107)	.029* (.0153)	.029* (.0153)
$\Delta (\text{Occ} \times \text{Past Co-Evaluated})$			-.023* (.0124)	-.017 (.0185)	-.022 (.0185)
$\Delta (\text{Occ} \times \text{N Past Interactions})$.011*** (.0015)

$\Delta \text{ Occ}$ interacted with:

Focus Handler FE	NO	YES	YES	YES	YES
Focus/Peer Pair FE	NO	NO	NO	YES	YES

Share of Co-Evaluated Peers in the Room - Time on the Phone

	$\Delta \text{LogPhone}$			
	(1)	(2)	(3)	(4)
Δ Share Current Co-Evaluated in the Room	.183*** (.0493)	.215*** (.0492)	.215*** (.0492)	.215*** (.0512)
Δ Share Past Co-Evaluated in the Room	-.008 (.0422)	-.009 (.0422)	-.007 (.0422)	.001 (.044)
Δ Share Future Co-Evaluated in the Room	-.028 (.0425)	-.025 (.0425)	-.026 (.0425)	-.023 (.0447)
Δ Occupied		.057*** (.0036)		
Δ Occupied \times Current Co-Evaluated		.028*** (.0103)	.03*** (.0106)	.033** (.0153)
<hr/>				
Δ Occ interacted with:				
Focus Handler FE	NO	NO	YES	NO
Focus/Peer Pair FE	NO	NO	NO	YES

▶ back

Summary of Findings:

- F1 Positive effect (for almost all handlers) of occupation of adjacent seat
- F2 Stronger effects when far from supervisors
- F3 Stronger effects for pairs with same evaluator

Discuss alternative mechanisms:

Mech 1: Relative Evaluation

- conceptually very similar mechanism (signal "passively" transmitted, but handler cares about the signal)
- Does not explain F2 (overlap of evaluators-evaluatees very small. Can't be visual comparison.)

Mech 2: Pro-social preferences. Motivation if friends around.

- F1: effects very similar even when few available seats (i.e. when can't sit next to friends)
- Does not explain F2
- Does not explain F3
 - co-evaluated \perp friends
 - effect within the same focus-peer pair
 - unchanged when controlling for $\Delta Occ \times NInteractions$

Mech 3: Adjacent Peers are Reference Points

- many handlers should adjust effort downwards
- Does not explain F2

Mech 4: Knowledge Spillovers

- makes no sense with 30 minutes variation

Mech 5: Adjacent Peers can Help

- tasks are parallel, little scope for help
- odds are the peer is busy

Mech 6: Conformity to Norm - Collusion

- predicts a reduction in effort

Mech 7: F2 predicted by convex cost of effort

- model assumes this, still predicts F2
- not true if we interact with proxies of baseline effort (e.g. calls per handler, occupation of room, etc.)

