

PLANNING STRATEGIC SEATING TO MAXIMIZE EMPLOYEE PERFORMANCE

**New Data Uncovers How Seating Distance
Affects Various Performance Measures**



EXECUTIVE SUMMARY

Research performed as a collaboration between Cornerstone OnDemand and researchers at Harvard Business School uncovers how the distance between two employees' desks affects various performance measures.

According to the findings, placing the right type of workers in close proximity to each other has been shown to generate up to a 15% increase in organizational performance. For an organization of 2,000 workers, strategic seating planning could add an estimated \$1 million per annum to profit. For organizations looking to increase their returns on the human capital of their workforce, simply rearranging employee seating may be one of the most cost-effective resources at their disposal.

This study measures the effects of performance Spillover – both positive and negative – on several dimensions, and finds that it is pervasive in the physical distance between workers. The research also finds that workers have different strengths, and that while Spillover is minimal for a worker when it occurs in an area of strength, the same worker can be greatly affected if the Spillover occurs in his/her area of weakness. This suggests a symbiotic pairing of workers in physical space can greatly improve performance. Overall, physical space appears to be an untapped resource that companies can use to enhance organizational performance.



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INTRODUCTION: INCREASING PRODUCTIVITY IN THE WORKPLACE BY OPTIMIZING SEATING PLANS

Human capital is fundamental to organizational performance. Selective hiring and investing in effective education and training are well-known methods for increasing that capital. Similarly, the social structure of an organization – supervisors, co-workers and toxic employees – all strongly influence that capital and have an impact on performance. Until now, not much has been explored on how the physical location of an employee and proximity to others can impact his/her productivity and performance.

Hiring and training are effective, yet costly, methods for maximizing the human capital of an organization. Can

simply rearranging desks be one of the lowest cost ways to affect the returns on human capital?

As part of the study, we analyzed data of more than 2,000 employees over a two-year period provided by a large technology company with several locations in the U.S. and Europe. For every performance measure that we examine, we define a metric for each employee called "Spillover," which provides an aggregate measure of the performance of the employee's surrounding peers. **Based on the analysis, we concluded that who an employee sits next to does have a significant impact on his/her performance, for both positive and negative situations.**

SPATIAL MANAGEMENT

"Spatial management" as described in this paper is the pursuit of how to best physically locate workers within an organization.

To explore Spatial management across physical space and time, we followed the performance of employees within the Technology company to identify how the co-location of workers affects their performance outcomes on several dimensions of performance.

SOURCE OF

SPILOVER EFFECTS



In terms of dynamics, the Spillover effects occur almost immediately and vanish within two months of exposure. This rules out peer-to-peer learning and instead suggests that the source of Spillover effects is a combination of inspiration and peer pressure from being in close physical proximity to high-performing workers.

QUANTIFYING SPILOVER EFFECTS

To measure Spillover, we develop a weighting of workers to measure the potential impact on a focal worker as a function of how close he/she is in terms of physical distance. We then use this "distance weighting" to obtain a measure for the overall Spillover that a focal worker receives on a given performance dimension. For each of the performance measures, we calculate an employee's "Spillover" as an aggregate value of all of the employee's neighbors, weighted by distance. The farther an employee from a focal worker, the less his/her performance contributes to the Spillover faced by that focal worker.

DEFINING & MEASURING PERFORMANCE

In the study, we considered three measures of positive performance:

PRODUCTIVITY

How long does it take the worker to complete a task?

EFFECTIVENESS

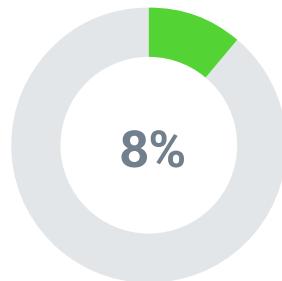
How many times does the worker need to escalate his work to another worker to solve?

QUALITY

How satisfied is recipient of the completed task?

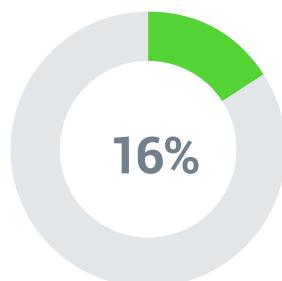
All three measures of positive performance – productivity, effectiveness and quality – exhibit strong positive Spillovers as a function of how closely situated one type of worker is to another. We use the phrase "density of exposure" to mean the level of Spillover a focal worker faces. In terms of magnitudes, increasing the density of exposure of productivity by one standard deviation increases the productivity of the focal worker by roughly 8%. A similar increase in exposure to other effective workers increases effectiveness of the focal worker by some 16%. Finally, a similar increase in the density of exposure to other quality workers increases the focal worker's quality by some 3%.

OVERALL PERFORMANCE SPILLOVER EFFECTS ARE POSITIVE & PERVERSIVE



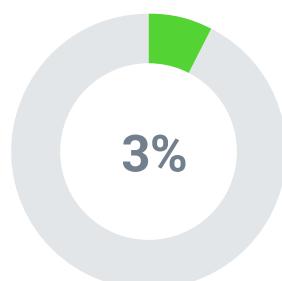
Productivity

One standard deviation increase in density results in 8% increase in the productivity measure



Effectiveness

One standard deviation increase in density results in 16% increase in the effectiveness measure



Quality

One standard deviation increase in density results in 3% increase in the quality measure

WHO IS AFFECTED BY SPILLOVER?

WE FIND THAT SPILLOVER EFFECTS ARE STRONGEST FOR PERFORMANCE MEASURES WHERE THE EMPLOYEE IS WEAKEST.



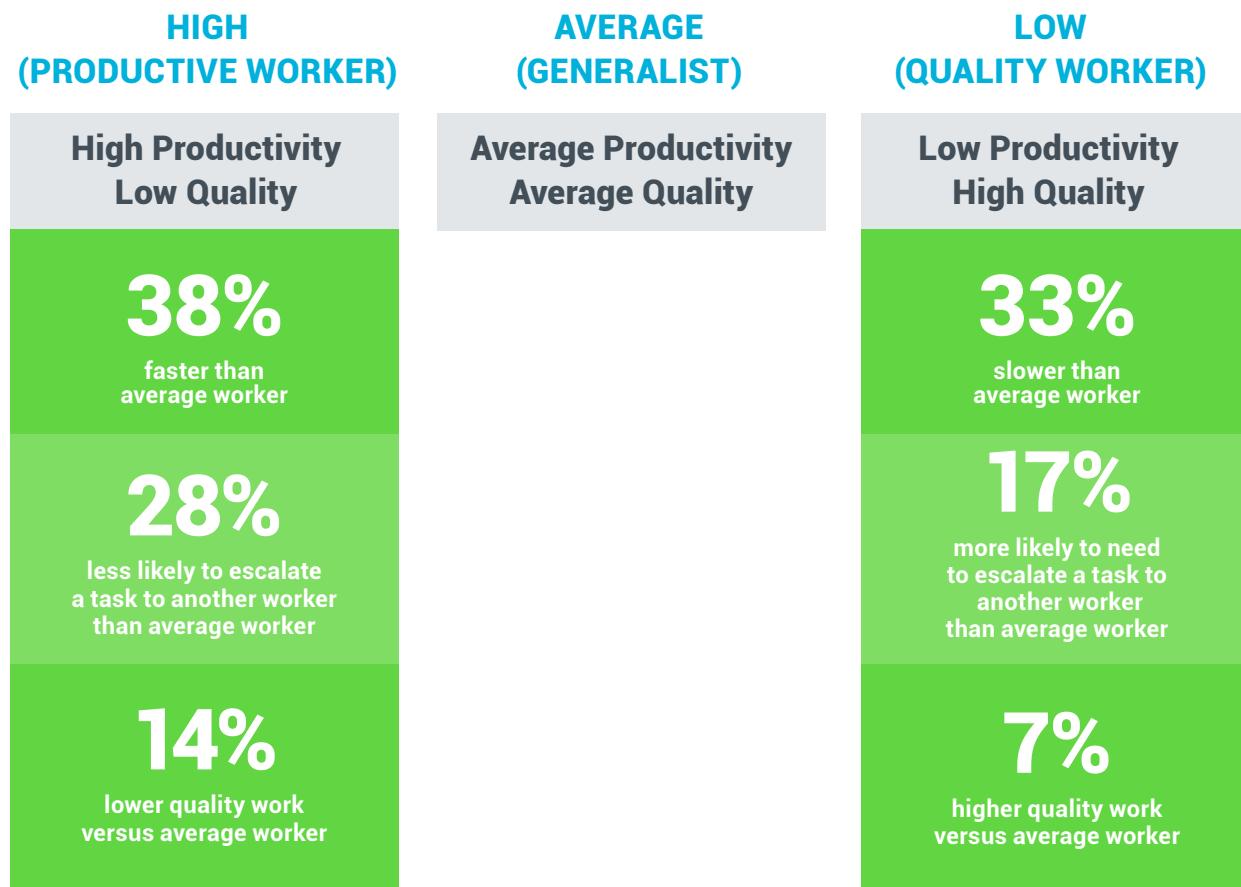
A multi-dimensional defining of performance as more than just productivity tells a richer story. **Through this lens, we uncovered three types of workers:** Productive, Generalists and Quality workers. Productive workers are very productive but lack in quality. In contrast, Quality workers produce superior quality but lack in productivity. All the while, the Generalists are average on both dimensions.

This presents an interesting and important organizational question: which types of workers should be paired together? We found that matching Productive and Quality

workers together and matching Generalists separately generates up to 15% of increased organizational performance. In short, symbiotic relationships are created from pairing those with opposite strengths. It turns out that those strong on one dimension are not very affected by Spillover on that dimension; however, they are very sensitive to Spillover on their weak dimension. In total, based on our empirical estimates, for an organization of 2,000 workers, symbiotic Spatial management could add an estimated \$1 million per annum to profit.

OPTIMAL SEATING ARRANGEMENTS

Different types of workers are affected by Spillover differently, and some workers affect others differently. To explore these dynamics we divided workers into three types based on their productivity levels.



Spillover most strongly improved an employee's weakest areas when exposed to peers stronger on that dimension; however, the effect of Spillover was only marginal when an employee's strength was exposed to colleagues weaker on that dimension. As such, there are clear gains to be made by pairing workers with complementary strengths and weaknesses.

For optimal Spatial management to increase organizational performance:

Productive workers should be paired with Quality Workers

Generalists should be grouped together

This configuration has shown a 13% gain in productivity and a 17% gain in effectiveness



NEGATIVE PERFORMANCE SPILLOVER

Spillover effects can also extend to negative performance through misconduct and unethical behavior Spillovers. In measuring the extent to which a toxic worker¹ influences others, we find that the negative performance of these workers spills over to fellow workers in a process similar to positive Spillover.

The study suggests that one standard deviation in toxic density increases the probability of the focal worker being terminated for toxicity by over 150%. However, once we control for a worker's sense of his/her work environment – how much he/she trusts his/her manager, a sense of worker trust and sense of a positive work environment – an increase of one standard deviation in toxic density results in 27% increase in the chance of a toxic termination. **This suggests that employee engagement surveys that capture how employees feel about their work environment and their managers can be an important first line of defense to rooting out toxicity by providing an early warning to intervene in such a team.** The good news is that, similar to positive Spillover, the effects of being around toxic employees is transient and dissipates over a month. That is, if the toxic worker is removed from a team, within a month his/her adverse effect on the rest of the team has largely dissipated.



CONCLUSION

It is extremely important to consider seating arrangements within your company. These results suggest that companies can develop a framework to maximize organizational performance simply through the physical placement of workers. **Different organizations will have different kinds of tasks and different kinds of Spillover.** However, once an organization identifies which Spillovers exist and how they Spillover to different kinds of workers, management **can plan the space of the organization to produce better outcomes.** In this way, physical space, which all organizations have and can relatively inexpensively manage, can be an important resource. We hope that this research is the first of many future works to help better understand this little understood tool for management.

¹ i.e., a worker that harms a firm's people and/or property

ABOUT THE AUTHORS



DYLAN MINOR

VISITING ASSISTANT PROFESSOR, HARVARD BUSINESS SCHOOL

Dylan Minor has taught at Harvard Business School and the Kellogg School of Management. Professor Minor received his PhD in business administration from UC Berkeley. His research explores the nexus between organizations, performance, and social and ethical issues.



MICHAEL HOUSMAN

WORKFORCE SCIENTIST IN RESIDENCE, HIQ LABS

Michael Housman is the Workforce Scientist in Residence at HiQ Labs, where he mines publicly-available data for insights that allow large employers to identify employees that are potential flight risks and take actions that will help retain them. Prior to HiQ Labs, he was the Chief Analytics Officer at Evolv (acquired by Cornerstone OnDemand), where he applied state-of-the-art statistical methodologies and econometric techniques to databases consisting of hundreds of millions of employee records in order to understand: (1) what keeps people on the job longer; and (2) what enables them to perform better. He has published his work in a variety of peer-reviewed journals, presented his work at dozens of academic and practitioner-oriented conferences, and has had his research profiled by such media outlets as The New York Times, Wall Street Journal, The Economist, and The Atlantic. In fact, he was named a 2014 game changer by Workforce magazine for his groundbreaking research and contributions to the field of workforce science. Dr. Housman received his A.M. and Ph.D. in Applied Economics and Managerial Science from The Wharton School of the University of Pennsylvania and his A.B. from Harvard University.



YITZI GREENBAUM

DATA SCIENTIST, CORNERSTONE ONDEMAND

Isaac "Yitzi" Greenbaum is a data science and engineering leader on Cornerstone OnDemand's Big Data/Machine Learning team, where he spearheads the company's data science and data products initiatives. Following Cornerstone's acquisition of Evolv, Yitzi led the integration of Evolv's machine learning platform team, and he continues to drive the strategic vision for Cornerstone Insights, a set of analytical dashboards that applies sophisticated machine learning to collect and analyze workforce data. Prior to Cornerstone, Yitzi served as the lead Data Scientist at Chartbeat, a real-time web analytics company, and was instrumental in creating a wide range of data science products, including spike-detection alerting and traffic pattern modeling, among others. He also worked as an analyst for Citigroup, where he structured credit derivative products. Yitzi received his M.S. in computer science and his B.S. in Applied Mathematics from Columbia University.

ABOUT CORNERTONE ONDEMAND

The desire to fulfill one's potential isn't merely generational, it's human nature. So imagine if every employee in your company was given the opportunity and the means to contribute their best possible performance. For us at Cornerstone OnDemand (NASDAQ: CSOD), it's more than a compelling idea; it's the very foundation of our company. We help organizations realize the potential of the modern workforce.

Cornerstone was founded on a belief that a lifetime of learning and development is fundamental to growth—for both the employee and the organization. So we created what is today's leading cloud-based learning and talent management software solution. From recruitment, onboarding, training, and collaboration, to performance management, compensation management, succession planning, and analytics, Cornerstone is there, at every phase of the employee life cycle.

Nearly 2,700 clients spanning 25 million users and 191 countries use Cornerstone's software to help their employees excel in their roles. Clients range from multinational enterprises to midsized companies and small businesses, and they extend across all industries. This includes leading organizations such as BMW, Nestlé, Starwood Hotels & Resorts, United Airlines, Microsoft, Amazon, and Box, as well as the U.S. Department of the Treasury, the University of Southern California, and Team Rubicon.

Cornerstone is headquartered in Santa Monica, California, with operations in over 20 countries.

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