Allsteel®

Worker Effectiveness and the Role of Place

THE SCIENCE LINKING THE WORKPLACE TO USER EXPERIENCE AND PERFORMANCE, PART 2

Many people have recognized the power our workplaces hold over our daily actions and interactions, and perceptions about our work. However, it is not broadly understood *how* our workplaces shape our behavior and what these insights might mean for knowledge worker performance. An expansive approach to the workplace is required to go beyond what is physically known, to the science behind the factors that influence our everyday experiences.

By Jan Johnson, VP of Design and Workplace Resources, Allsteel

IN THIS WHITEPAPER:

This paper takes a wide-ranging look at the types of factors that are scientifically known to influence knowledge worker performance, including environmental, cognitive, and organizational management factors. This research review sheds new light on what really matters in workplace-making, and expands on previous research that identified the six *organizational management* factors with the highest correlation to team performance.

WHAT YOU WILL LEARN:

Why we must ground workplace design in evidence-based principles

What is scientifically known about the factors that influence knowledge worker performance, for both individuals and teams

How to differentiate between more context-dependent workplace factors, and less context-dependent factors

Why we must create a shared understanding of the meaning we assign to physical artifacts, or risk them being misinterpreted or counterproductive

We know our workplaces influence us...but do we know *how*?

Every day, we consciously or unconsciously assign meaning to the environments in which we live, work, play, and heal. Imagine walking each day into a well-lit workplace with fresh flowers next to the receptionist who greets you warmly. Just beyond the desk you glimpse your colleagues lounging on soft seating over a warm beverage. While grabbing your own cup of coffee, you stop to chat about their weekends and approaching deadlines.

Now imagine a very different workplace. You arrive in the morning, fumbling for your badge to enter through a set of badge-only-accessible double doors. The empty reception desk is lit by a harsh line of fluorescents. You walk by the company's quality policy posted on the wall (which you no longer notice) and take a silent elevator ride with your colleagues to your floor. You sneak through a back hallway to arrive at your desk before your supervisor catches you arriving to work late.

"Knowledge Workers are people who know more about what they are doing than their boss does."
- PETER DRUCKER

These two scenarios describe very different experiences. One workplace has the potential to nurture social ties, mutual support, and wellbeing; while the other has the potential to increase stress, limit interaction, and lower commitment. But what are the factors that contribute to these two very different examples? We know that it goes beyond the physical layout of the workplace or the colors on the wall, but to what exactly? How might we articulate the powerful ways our workplaces shape our perceptions, daily actions, and behaviors?

With these questions in mind, we embarked on two research reviews to uncover what is known about the human experience of work and place, and how those factors relate to the performance of both individuals and members of teams. What we found is that to cover the breadth of physical, cognitive, and emotional support for workers, and to create positive, relevant user experiences in the workplace, we need to delve deeper than the superficial surface.

The physical workplace is just the tip of the iceberg

Every experience we have is made up of a complicated web of personal perceptions, connections, and meaning we assign. As Andrew Mawson, Founder and Director of Advanced Workplace Associates, and leader of the first research review on Knowledge Worker Productivity states, "Every individual will have a potentially different response to the same 'experience' based on their values, culture, and history."

Similarly, Edgar Schein, Professor Emeritus at the MIT Sloan School of Management and a leader in the field of organizational development, has written extensively about organizational culture and its inherent "layers" or levels. He points out that at the surface, we experience **artifacts**, like logos, architecture, business processes and even what's typically worn by employees. Beneath that are **espoused values** – conscious strategies, stated codes of conduct, goals and philosophies. But most importantly, beneath that are what usually feel like self-evident **basic assumptions** – the meanings we *each* assign, plus the *collective* social norms we organically develop with others; and which are actually quite difficult to discern because they're often unconscious, and yet explain why things happen the way they do[1]. In other words, we are constantly assigning meaning to the things that are readily observable in our environment, informed by our values and beliefs, as well as our (largely unconscious) underlying assumptions. Take, for example, a boss's request for you to sit next to them. In some organizations, this would be an honor because it means the boss values your presence. In another organization, it may be the equivalent of full-time surveillance.

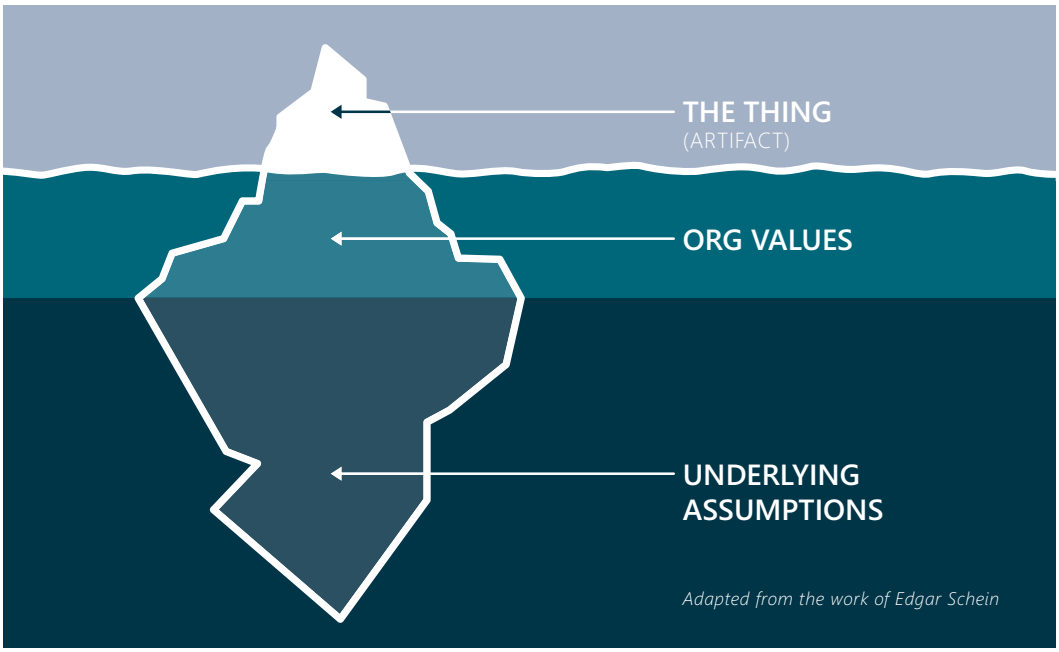
[1] Edgar Schein. 1990. "Organizational Culture." American Psychologist, vol. 45, no. 2, pp. 109-119.

Given this dynamic, we strongly believe that a large part of workplace strategy must be to explore the relationships between aspects of the physical environment and the underlying assumptions that assign them meaning. Especially those aspects that are highly dependent on context – the unique circumstances or conditions, like culture and climate, structure, business model, history etc., of a given organization.

Below we will introduce a model for organizing the breadth of factors we have identified, including noting which are highly context-dependent and which are much less so.

IT'S NEVER JUST ABOUT THE THING

Much like what is known about human experience and organizational culture, the science around workplace performance goes way beyond physical artifacts. It encompasses both the person and the organization, the seen and unseen, and the highly and less-so context-dependent.

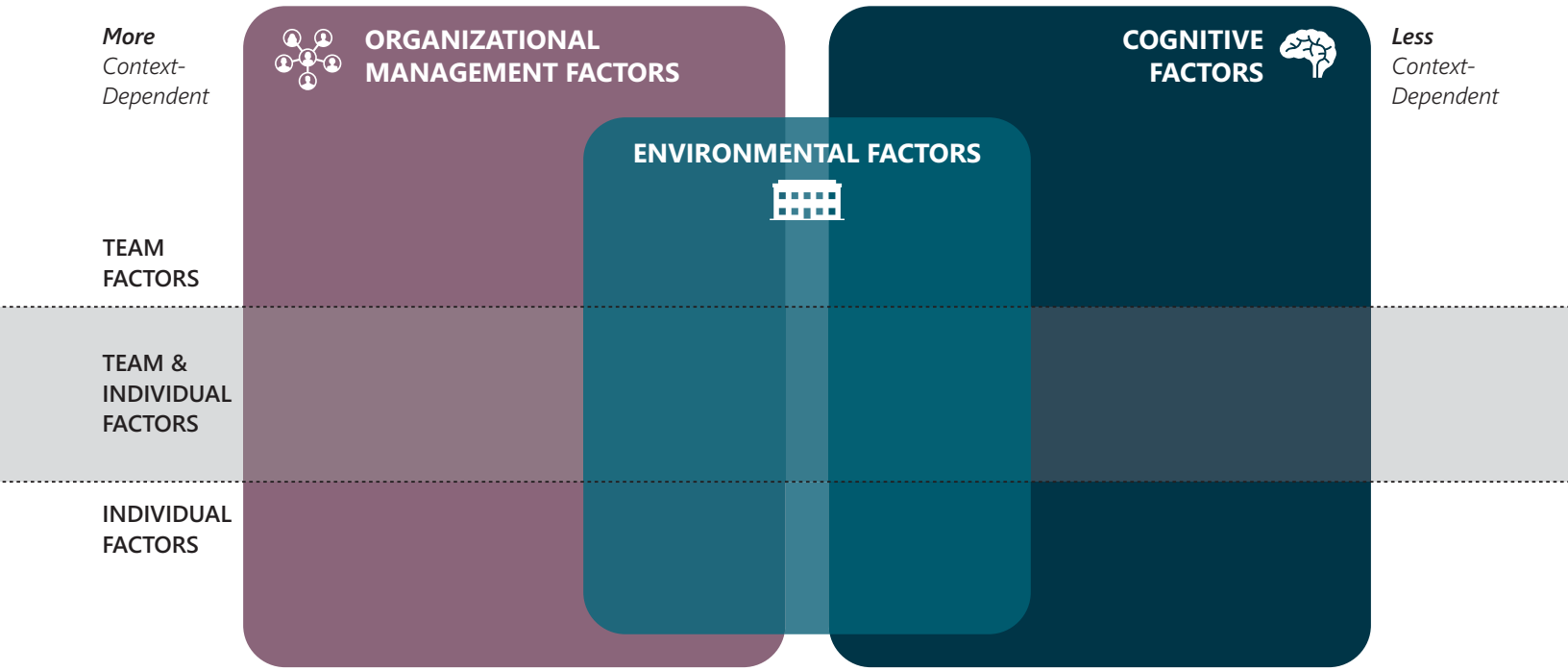


Sorting through the research, three categories emerged from the science on workplace performance: organizational factors, environmental factors, and cognitive factors. While traditional workplace design is often limited to the realm of the physical or environmental, the research reveals that the physical environment is heavily influenced by the ways in which the organization manifests its culture and social norms, and our own choices for cognitive self-care.

The resulting workplace factors framework describes three categories of impact on worker performance: organizational management factors, environmental factors, and cognitive factors; and can be further sorted into individual and team factors. Further organizational management factors are highly context dependent, while cognitive factors are much less so.

This framework provides an opportunity to step back and evaluate the design of workplaces in a more holistic way. As we build on previous research findings that identified the top six organizational management factors that support the performance of knowledge work teams[2], we have now populated the framework with additional research that aids in our understanding of both the individual and team experience of the workplace.

[2] Jan Johnson, Karen Plum, and Andrew Mawson. "What Really Matters for Knowledge Worker Performance."



So, what exactly have we learned about the organizational, environmental, and cognitive factors that influence workplace effectiveness? In what follows, we will further define each category of the framework and give illustrative examples of research related to knowledge worker performance. This list is neither comprehensive nor conclusive, but does include the most significant research findings at the time of writing. We hope to build on this work over time with contributions of experts across disciplines.

Organizational Management Workplace Factors

Organizational management factors reflect the conscious or unconscious ways the organization's culture and climate are manifested, and are inclusive of social dynamics, behavioral norms, and protocols. They are inherently highly context dependent.

Think of this as how an organization or department conducts itself – is it informal and playful or methodical and precise? And how do people treat one another – formally or informally? Competitively or cooperatively? With trust or distrust?

Organizational management factors correlate to both team and individual performance. Let's begin by looking at the research found at the intersection of organizational management and team performance.

TEAM FACTORS

To briefly recap the original research project into Knowledge Worker Productivity[3], the top six factors scientifically proven to have the highest correlations to knowledge worker productivity are listed below. These six factors can act as proxy measures for team performance.

- **Social cohesion:** High levels of social cohesion create a psychologically safe environment in which team members feel free to innovate, explore new ways of doing things, take judicious risks, and even disagree with each other. As a result, mutual support and the free and timely exchange of ideas is more likely.

[3] Jan Johnson, Karen Plum, and Andrew Mawson. "What Really Matters for Knowledge Worker Performance."

"When we tell people to do their jobs, we get workers. When we trust people to get the job done, we get leaders."

- SIMON SINEK

- **Perceived supervisory support:** Team members' perception of their supervisor's support impacts their performance, organizational commitment, job satisfaction, and turnover intentions.
- **Information sharing:** Information sharing is the extent to which teams know of and utilize each member's distinctive knowledge for the team's benefit; and members are willing and happy to share their knowledge with others.
- **Vision and goal clarity:** Clearly stated vision and goals help prioritize team efforts and give work meaning, which in turn, motivates teams to enhance their performance.
- **External outreach:** External outreach encourages teams to operate across boundaries and build bridges between teams, within and beyond the organization; and to keep adding to and updating their knowledge and perspectives.
- **Trust:** Trust in team members further promotes a shared direction and mutual support for common goals over personal interests.

A further review of academic, peer-reviewed literature identified additional team-related factors:

- **Mood:** A positive emotional state shared by group members that is correlated to originality and flexibility, and is closely linked to social cohesion (Knight and Eisenkraft, 2015).
- **Job satisfaction:** A collective, team-level evaluation of how wide the gap is between the actual experiences of working at particular jobs and the team's expectations for those experiences. The smaller that gap, the higher the team's collective job satisfaction. Job satisfaction is not only associated with task performance but also lower counterproductive work behavior (e.g., stealing or gossiping) and increased organizational citizenship behavior (e.g., helping co-workers, assisting supervisors when not asked, etc..). It also predicts fewer work withdrawal behaviors.
- **Organizational alignment:** Covers the nuances of group life beyond how clearly responsibilities are defined and the confidence team members share in their colleagues, as well as what sorts of actions and outcomes are rewarded and punished, for example. Kozlowski and Ilgen (2006) found that what they call "collective climate" can predict performance, member satisfaction, and facets of individual, team and unit effectiveness. Bain, Mann and Pirola-Merlo (2001) studied team climate for innovation and found that when the team had a climate for innovation, they had greater scope for creating novel and innovative ideas.
- **Autonomy and control:** The agency to make decisions about how work gets done, and have those decisions respected by the organization leads to higher goal completion rates, higher levels of experienced meaning (Maddi, 1970), self-determination (Deci & Ryan, 2000), and is one of the two best predictors or job satisfaction (along with social support). Control is related to perceived supervisory support and trust (the second and sixth of the original six factors, respectively), but has wider implications for the design of the physical environment.
- **Stress:** Research suggests that when groups work in stressful situations, they actually do more work, but they do it badly. They focus their collective attention more narrowly, and think more pragmatically, less imaginatively. Stress also diverts mental processing power away from the task at hand, degrading performance.

These five amplify, validate, and expand on the original six factors, and strengthen our belief that an organization's leaders and managers must make conscious choices in how they behave and treat others – encourageing teams to follow their examples and develop appropriate social norms.

INDIVIDUAL FACTORS

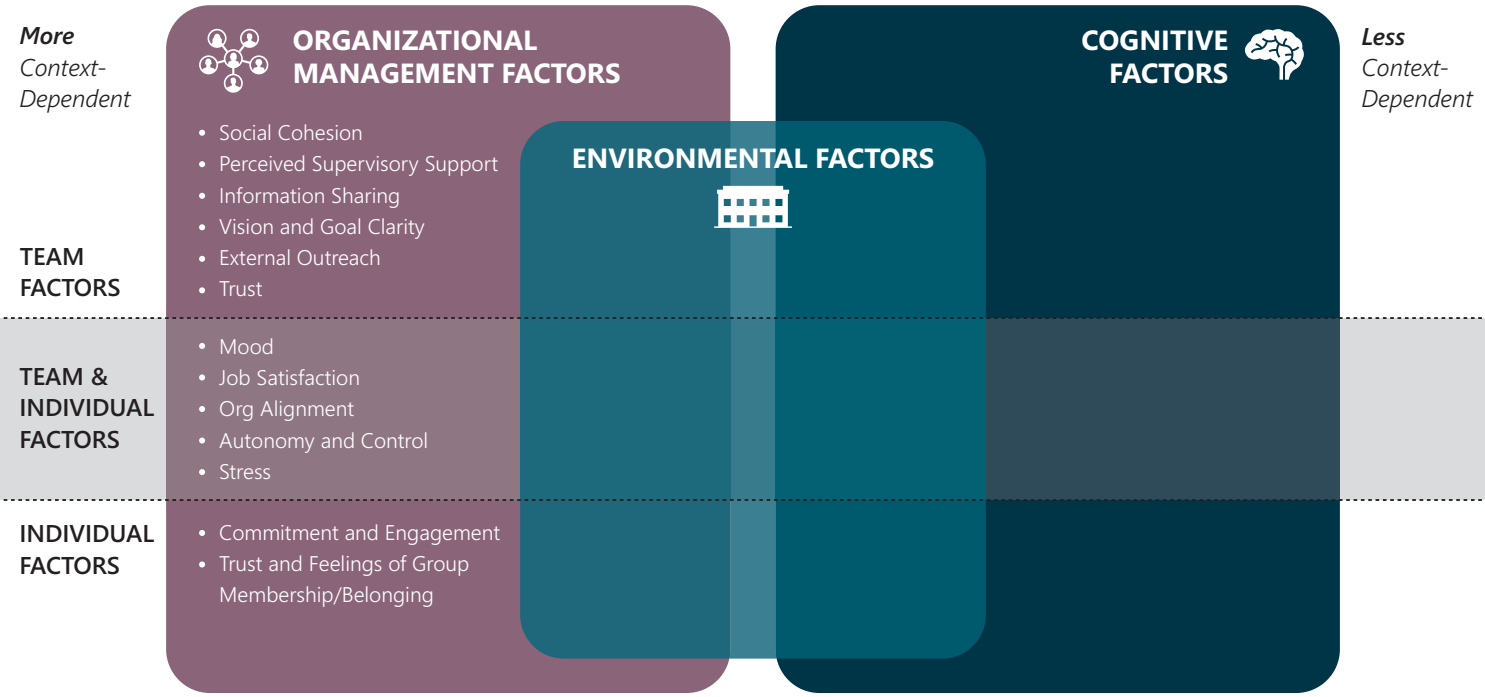
Organizational management factors linked to knowledge worker performance at the individual level are closely tied to employee subjective wellbeing (SWB). Researchers define SWB as "people's overall evaluations of their lives and their emotional experiences" and includes "broad appraisals, such as life and health satisfaction judgments, and specific feelings that reflect how people are reacting to the events and circumstances in their lives" (Diener, Heintzelman, Kushlev, Tay, Wirtz, Lutes and Oishi, in press). Higher levels of SWB are linked to higher levels of positive affect.

Bryson, Forth, and Stokes (2014) report a positive correlation between SWB and employee job performance generally and their problem-solving ability, speed at processing complex information, and creativity, specifically. They also share that there are three potential explanations for this link: "The first is by affecting employees' cognitive abilities and processes – enabling them to think more creatively and to be more effective at problem-solving. The second is by affecting employees' attitudes towards work – raising their propensity to be co-operative and collaborative. The third is by improving employees' physiology and general health – improving their cardiovascular health and immunity, enabling speedier recovery from illness, and securing greater levels of energy and potentially effort."

The same five additional factors we identified above for teams are reflected in SWB, and are also tied to individual knowledge worker performance: mood, job satisfaction, organizational alignment, autonomy and control, and stress.

The research also suggests additional, interrelated factors:

- **Commitment and engagement:** While job satisfaction is generally passive, commitment and engagement are active. "Engaged workers are more open to new information, more productive, and more willing go the extra mile. (And they) proactively change their work environment in order to stay engaged." (Bakker, 2011) Autonomy and social support from co-workers have been linked to engagement, according to Bakker, as have "those physical, social or organizational aspects of the job that may a) reduce job demands and the associated physiological and psychological costs; b) be functional in achieving work goals; or c) stimulate personal growth, learning and development." (Schaufeli and Bakker, 2004)
- **Trust and feelings of group membership:** Team cohesion is also correlated to individual performance. Team cohesion provides social support and the opportunity to learn from others, which can lead to enhanced performance of both the individual as well as the team. Professional performance improves when employees trust each other, and trust can be developed among cohesive teammates. (Ferrin, Bligh and Kohles, 2008)



Environmental Workplace Factors

Our environments include workplace factors that are highly dependent on the context, and those factors that are much less dependent on the context. High context-dependent factors include those where meaning is often aligned with the organization's particular culture and climate, but may also be interpreted by the individual experiencing it, and includes things like visibility, openness, accessibility and control. Low context-dependent factors, on the other hand, often have consistent, known-to-be-optimal ranges, like those for indoor air quality or lighting color and levels.

HIGH CONTEXT-DEPENDENT ENVIRONMENTAL FACTORS

Highly context-dependent factors are open to both personal interpretation and the influence of national cultures, organizational culture and climate, management styles, and the social norms consistent with them.

High context-dependent environmental factors must overlap with organizational management factors. Imagine, for example, an organization that designs and builds a wonderfully inviting social space to foster social cohesion and information sharing, but executives don't use the social spaces and managers maintain a "you-need-to-be-in-your-seat-to-be-seen-as-working" attitude. This misalignment between the environment (the availability of the social space) and the organization's social norms (the discouraged role of social activities in the organization) can lead to unintended results.

Environmental factors correlate to team performance in the following ways:

- **Ownership, personalization, and identity of space:** Both individuals and teams benefit from clear territories they control. Territories include spaces the individuals and teams can claim, and within which establish their identity – often by personalization or through the display of team artifacts, like work-in-progress. One study identified a correlation between personalization and stress reduction (Gifford, 2007), while another called out territorial "marking behaviors are positively associated with (organizational) commitment and (job) satisfaction" (Brown, 2007). Furthermore, since personalization is the expression of one's interests and/or identity, it can also support social cohesion. Personalization invites colleagues to learn more about the person behind the work and build rapport over the things revealed.

  By the same token, standardization can lead to a lack of personal control among employees, which is a risk factor for overload and stress. Besides these risks, if the standardization of the office leads to sterile work environments it may also have negative effects, such as a decline of employees' organizational identification, well-being and productivity." (Danielson, 2013)

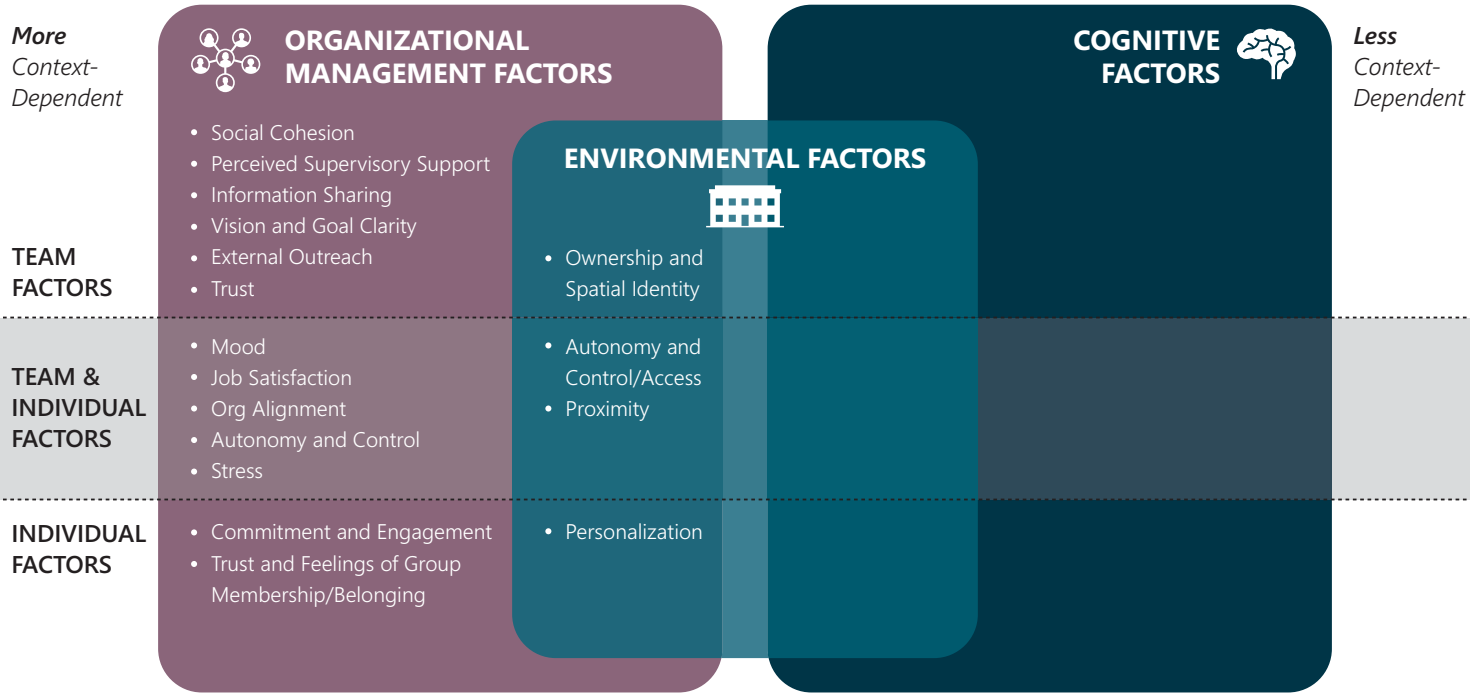
- **Access, control, and autonomy:** Real choice in where, when and how to work – including broader opportunities for independent action – are significantly linked to subjective and objective measures of performance (Humphrey, Nahrgang and Moregeson, 2007). The choice of where to work should also extend to seeking distance, privacy, or at least quiet when needed. Privacy is a fundamental human need: If we don't have the opportunity to isolate ourselves physically and acoustically from others when desired, our cognitive performance is degraded. (Gifford, 2014)

Autonomy and control over aspects of the environment is known to reduce stress, and has been directly linked to enhanced professional performance. But control over what, and to what extent? Some environmental controls are easier to imagine letting workers mess with than others: opening or closing blinds or operable windows, or choosing the location or setting in which they work for the day, for example, aren't nearly so nail-biting as encouraging workers to rearrange groups of furniture. This topic alone likely deserves its own paper, but in the interest of brevity, let us just remind the reader that there are no absolutes: each organization has the opportunity to determine their unique approach to what's appropriate and set guidelines, given their own culture and climate.

- **Proximity:** No one form of communication works for every kind of worker or every situation. Here again, there are insights science provides that make it easier for workers to match the form to a particular situation; and, indeed, understand the value of face-to-face communication and the importance of proximity. Even as distance-shrinking technology accelerates, proximity is becoming more important. Studies show that both face-to-face *and* digital communications follow the Allen Curve, estimating that we are four times as likely to communicate regularly with someone sitting just six feet away from us as with someone 60 feet away, and we will almost never communicate with colleagues on separate floors or in separate buildings. (Waber, Magnolfi and Lindsay, 2014)

  Combining the idea of "ownership" with proximity, team members and people who should be working together need to be seated not only near each other, but also close to shared spaces like team rooms they can use as needed and personalize or customize in ways that they choose.

Shared team spaces support developing a shared knowledge base as well as building camaraderie. Memory is also enhanced when workers complete a project in a single location – returning to the exact same spot again and again, over time, as needed – as opposed to using a different work area each time a project is worked on. Being in the same space helps us remember information previously considered there as well as with recognizing material presented earlier in that location. (Smith, 1985)



LOW CONTEXT-DEPENDENT FACTORS

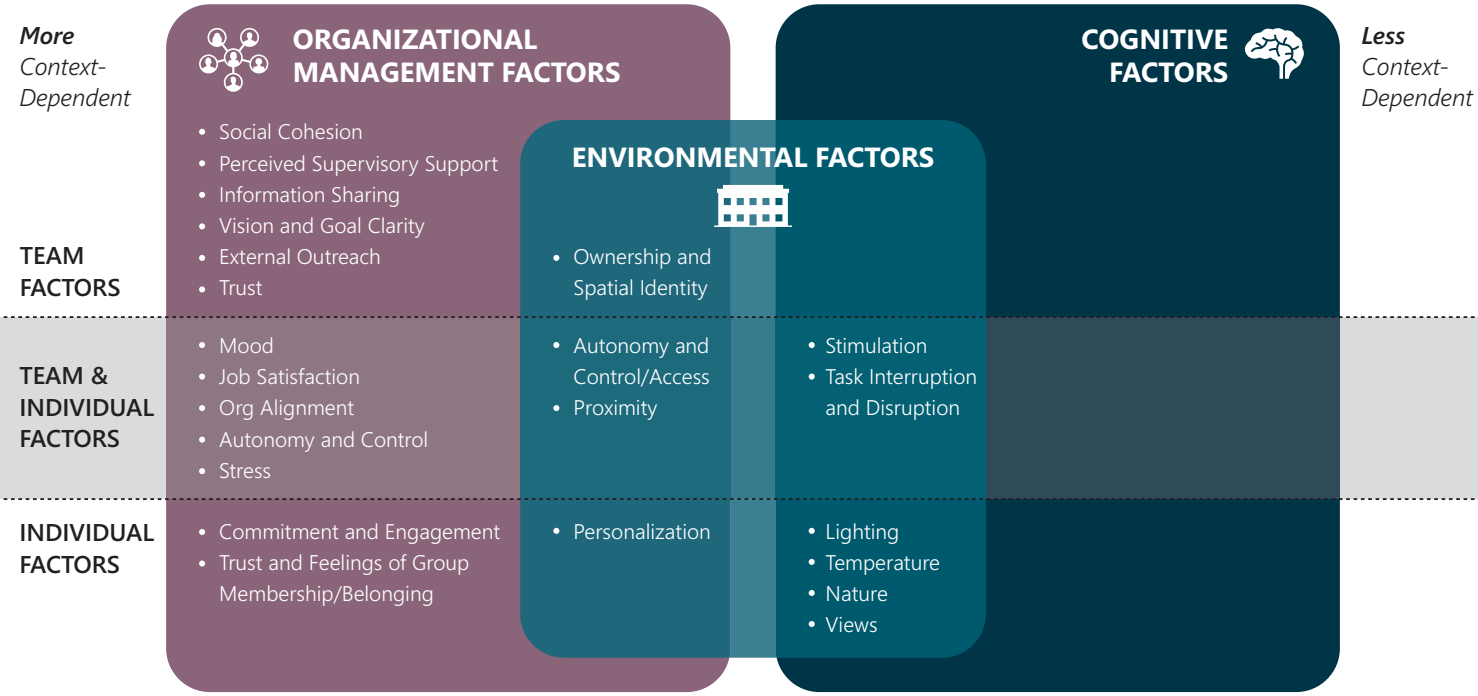
This category includes many of the aspects both LEED and the newer WELL programs seek to calibrate; and include what is known about cognitive and biological health. We won't recap here the factors covered by LEED and WELL, but will include research that supports other more-empirically-measurable environmental factors.

When it comes to workplace performance, we know empirically, for example, that several indoor environmental quality (IEQ) factors influence productivity, including indoor air quality and ventilation, thermal comfort, lighting and daylighting, noise and acoustics, biophilia, and views. See LEED and the WELL Building Standard for more data (and the supporting research) on the impact of indoor environmental quality and other aspects of health and wellbeing on workplace performance.

- **Stimulation:** The right levels of stimulation for performance depend on the type of work one is doing. Complex knowledge work benefits from calmer, less stimulating spaces to balance the cognitive load. Tasks that are less mentally challenging – because they are simply easier or have been done repeatedly – are best accomplished in more stimulating environments (Wohlwill, 1966).

- **Task interruption and distraction:** "Distraction is a part of everyday life and typically leads to both errors and the slowing down of responses...(and) exerts a negative effect on attentional processing even when it is task-irrelevant..." (Marini, Chelasso and Maravita, 2013). Interruptions displace the time required to complete job tasks, thereby increasing the perceptions of workload and negatively impacting an employee's stress level. (Jin, Kain and Fritz, 2013)

- **Nature and views:** People with live plants or window views had higher job satisfaction than those without either. (Dravigne, Aliczek, Lineberger and Zajicek, 2008) One theory, in the case of plants, is that they provide moderate levels of visual complexity.



Cognitive Workplace Factors

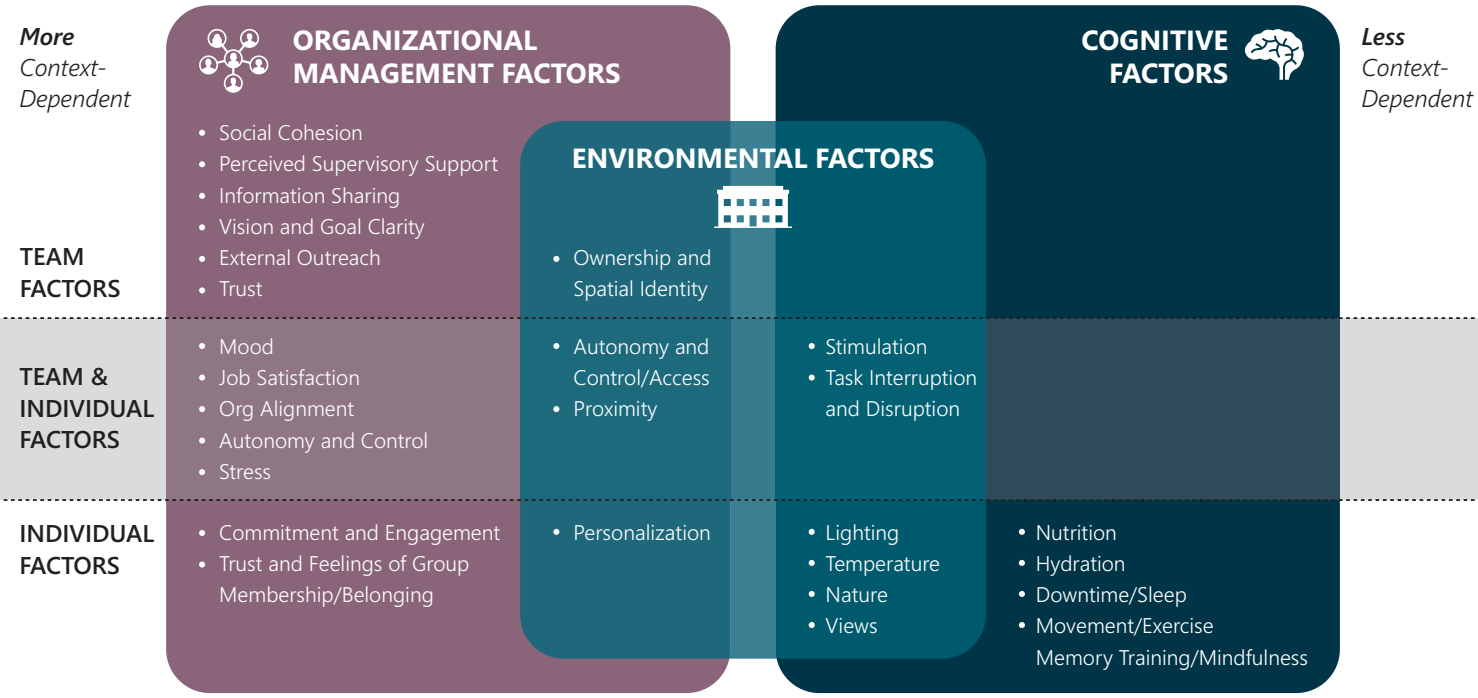
The final category of workplace factors speaks to the things that influence our ability to utilize the mental processes in our brains. While often overlooked in the creation of a workplace, astonishing breakthroughs in the past 20 years of cognitive neuroscience and cognitive neuropsychology hold great promise for the future of design and workplace change. These findings may well be the greatest discoveries of our time, transforming our understanding of the human experience and how we engage with the environments we inhabit. As stated above, the WELL building standard materials do a great job of making the case for the power of nutrition, hydration, and other factors that contribute to wellbeing, so we won't go into detail on these below. Having said that, here is a bit more information on less well known topics specifically regarding their effect on cognitive performance:

- **Belonging:** "While we noted 'belonging' under individual organizational management factors, it has cognitive impact, too. Research indicates that perceived social isolation (i.e., loneliness) is a risk factor for, and may contribute to, poorer overall cognitive performance, faster cognitive decline, poorer executive functioning, more negativity and depressive cognition, heightened sensitivity to social threats, a confirmatory bias in social cognition that is self-protective and paradoxically self-defeating, heightened anthropomorphism, and contagion that threatens social cohesion." (Cacioppo and Hawkley, 2009)

"The fact that a man does not realize the harmfulness of a product or design element in his surroundings does not mean that it is harmless."

- RICHARD NEUTRA
Survival Through Design

- **Movement:** In addition to the cognitive benefits of movement being widely discussed and debated in the popular press, one study suggests another benefit: "walking boosts creative ideation in real time and shortly after." (Oppezzo and Schwartz, 2014) This affect was found whether people walked on or off a treadmill, inside or outside. The researchers concluded that "walking opens up the free flow of ideas, and it is a simple and robust solution to the goals of increasing creativity and physical activity."
- **Rest:** The human brain becomes surprisingly active during downtime. This suggests that periods of rest are critical in allowing the brain to synthesize information and make connections between ideas. Downtime is to the brain, what sleep is to the body. (Baird et al, 2009)



Now we know how our workplaces can influence us...but now what?

While it's apparent that there is a growing body of research that encompasses the environmental, cognitive, and organizational management factors that should inform workplace design, we acknowledge that making the leap from research findings to what this means for workplace strategy and design is a sizeable and relatively abstract challenge. On top of that, no two organizations are the same. There are different missions. Different starting points. Different end goals. Different ways to define performance. Therefore, there is no one-size-fits all approach to translate these insights into action.

"Our built environments will not accommodate people's needs until we integrate what we know and are learning about human experience into their design and composition."

- SARAH WILLIAMS GOLDHAGEN
Welcome to Your World

So, what can we do with this research?

First, use the workplace factors framework to think more expansively about workplace discovery, design, and change.

This requires a shift in the way we have traditionally thought about the workplace – expanding from a laser focus on the environmental factors that contribute to performance, to include what we know about the organization and cognition. It requires that we resist short-cuts in the discovery process and advocate for investing in more robust needs analysis and discovery upfront.

Second, evaluate the relative strength of these factors in your (or your client's) organizations.

The first paper in this series includes question sets designed to help measure the original six factors; and the tool we'll be adding to this paper in the next few weeks will outline other ways to evaluate 'current state.' Then, consider how each factor might be best enhanced and expressed – and reflected in the workplace.

Third, involve as many people as is feasible.

Closely related to both of the above suggestions is the premise that there is much to be gained from involving lots of people from a cross-section of functions, levels, and perspectives. And involving them not only in small sub-sets of decisions, but in the establishment or evolution of organizational management practices. Not only will the participants come away with a sense of ownership and commitment to the decisions made, but also a much greater understanding of the underlying assumptions that align with the artifacts selected and arranged–the rationale for the design decisions and its alignment with the organization's culture and values. Shared understanding isn't developed when only a handful of people shape decisions.

Finally

By doing all of the above, you, and the teams and individuals who make up each organization, will have laid the foundation to actively disrupt old, no-longer-appropriate social norms and replace them with relevant, helpful and aligned new ones.

Workplace Advisory at Allsteel

The Workplace Advisory team listens. We apply research and our extensive workplace experience to assist organizations in the development and implementation of situationally appropriate workplace strategies. Strategies that align with organizational culture and business goals, support the ability to work effectively, utilize real estate assets as efficiently as possible, and adapt to changing business and work practice requirements.

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Our thanks to Sally Augustin for her immense contributions to the content and clarity of this paper.

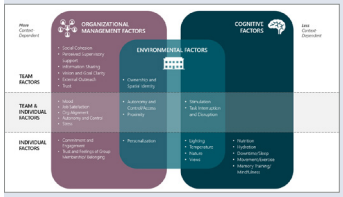
Workplace Factors Slide Summary

Introduction: Factors in Workplace and Performance

These findings expand on a previous paper that identified the six factors with the highest correlation to Knowledge Worker productivity. They cover more ground – including Organizational Management, Environmental and Cognitive Factors.

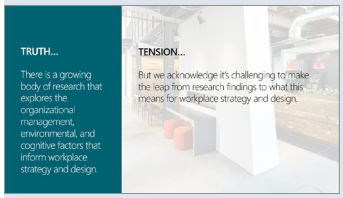
(How) does space matter to performance?

We set out to uncover and share what is known about the relationship between space and performance, including the dynamics at work as occupants experience workplaces



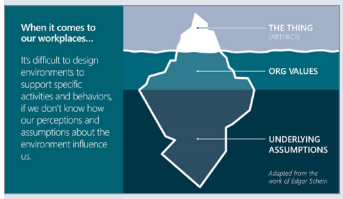
Three overlapping types of factors

The findings to date are organized into three major, overlapping categories: Organizational Management, Environmental and Cognitive factors. Some relate to teams, some to individuals and some to both. Those to the right have "ideal ranges," while those to the left are much more context dependent on an organization's culture and climate and their social norms.



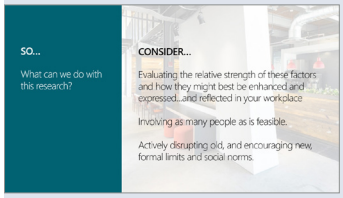
How might you apply these findings?

What's involved in effectively translating an organization's culture and climate (and social norms) into workplaces that support performance?



What we see physically is the proverbial tip of the iceberg

The work of Edgar Schein and Jeff Leitner give us insights into the dynamics at work in organizations as they consciously and unconsciously try to align behaviors – from formal codes of conduct to informal social norms – to their strategy, culture and climate.



The opportunity...

Is to apply both the findings regarding performance and the behavioral dynamics at work to engender performance.

Looking for more?

Here are the references.

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