Work Better

WB

Special Research Report

Fall 2026



Your Office Is Talking to Your Brain.

Is it saying the right things?

Steelcase

About this Research Report

In the age of AI, it's essential that people can leverage their uniquely human skills of judgment, creativity and complex problem solving. Neuroarchitecture, which studies how built environments affect the brain, offers researchers new methods to better understand how workplaces can shape human behavior. This paper breaks down some of the latest findings that can help organizations design spaces to help people manage their attention, stress and cognition so they can do their best thinking.

Your Office Is Talking to Your Brain.

Is It Saying the Right Things?

Walk into an office with low ceilings, harsh fluorescent lighting, and rows of identical gray cubicles, and something happens in your body before you've consciously registered it. Your heart rate ticks up slightly. Your pupils adjust. Deep in your brain, networks that track whether a space is safe or worth avoiding are already responding, below the level of awareness.

Now walk into a different office with daylight pouring in, curved shapes, wood elements, natural textures, greenery and open views. You probably find yourself breathing more easily and feeling calmer. Your colleagues seem energized and conversations happen organically. Your mood improves and you feel ready to tackle the problems of the day.



Designers have known, intuitively and in practice, how physical spaces affect us. Now, a growing body of neuroscience research is building evidence that the physical environment can shape not only people's behaviors but also how our brains function. By developing new ways to measure how people respond to the spaces where they work and learn, science can guide evidence-based design decisions that help people thrive and do their best work.

For organizations thinking about the future, these findings can unlock potential in their offices that was never fully realized. We've spent years debating where people should work, whether remote work is viable for some jobs or how much hybrid work achieves the right balance. We've talked much less about how offices impact the way we think, learn, create and solve problems.

New research shows that the buildings we occupy are not simply places to provide employees with the tools and technology they need to do their work.

While that's important, **the bigger opportunity is to understand how workplaces can influence how we think and feel, which, in turn, affects how we perform.**

Neuroarchitecture is a growing field that studies just that: how built environments relate to brain, physiological and behavioral responses. It generally focuses on the structural and spatial planning of buildings.

Neurodesign is a closely related area of study that explores sensory details like lighting, color, materials, and acoustics to shape human well-being.

"Humans spend about 90% of their time inside buildings, which impacts our mood, behavior and how we live our lives. But our brains developed for a completely different life and environment than the one we have today. Urbanization is increasing rapidly, which has many benefits, but also stresses the body and the brain in various ways. The positive side is that neurodesign can help minimize stress and build some resilience factors in our environments."

Isabelle Sjövall
Research Director, Research Institutes of Sweden



Fighting for Attention

Most of our work today needs us to use our judgement, learn and solve-problems, especially as AI takes over many routine tasks. This requires a resource that feels increasingly scarce: our attention. Focused, cognitively demanding work draws on what psychologists call “directed attention” — the effortful mental resource we use to stay on task, filter distractions, and make decisions. It’s a finite resource that can become fatigued. When a work environment constantly interrupts that resource without offering any path to recovery, the cumulative effect is cognitive fatigue — and, over time, stress.

Digital tools now intrude on moments that once allowed focus and recovery. Screen-based tools allow work to move faster. But speed comes at a cognitive cost. Research by Dr. Gloria Mark at the University of California shows our ability to pay attention when working on screens (which is most of our day) have shrunk from 2.5 minutes in 2004 to roughly 47 seconds today.

Workers are interrupted roughly every two minutes by emails, meetings, messaging pings and, especially, by our own distractability. This research found that it can take approximately 23 minutes to return to the original task as people switch to other activities, but 23% of the time we don’t go back to it at all. And we interrupt ourselves more than we’re interrupted by others. Constant task-switching increases stress, slows thinking and leaves employees drained. Fragmented attention has real psychological and cognitive costs, stifling deep thinking and adding stress.

Psychologists Rachel and Stephen Kaplan at the University of Michigan identified this dynamic decades ago in their Attention Restoration Theory (ART), which describes how our capacity for directed attention can best be replenished by exposure to natural environments that allow the mind to rest without effort. They proposed that people need to feel immersed in the environment, perceive it is an escape from regular activities and is somewhere they want to be or appreciate. This suggests that simply adding a few plants or changing desks won’t be enough to help.

Your Body Responds to Rooms, As Well As People

As the field of neuroarchitecture has progressed, researchers have learned even more about how our bodies and brains respond to our environments. Our body’s stress response system doesn’t neatly distinguish between “real” threats and environmental ones. Environmental conditions can activate the body's stress response, similar to what you might experience when your boss surprises you with an urgent project.

The Stress Response

Researchers call this the stress response, and it runs through two brain systems *(McEwen 1998 and Ulrich-Lai & Herman 2009):*

- **Sympathetic-Adrenal-Medullary (SAM) axis:** your fast, involuntary “fight or flight” system, releases adrenaline and noradrenaline.
- **Hypothalamic-Pituitary-Adrenal (HPA) axis:** your slower, hormonal system designed to manage sustained or prolonged stress, which eventually releases cortisol.

Both exist for good reason. In short bursts, this response is adaptive — it’s what gets you through a tough presentation or a near-miss in traffic.



Since the physiological response in our brains can be triggered by perceived “threats” in our environment, it becomes a problem when the trigger never really goes away. When you’re exposed to a stressor again and again, for years, in the same building, it could shift your body’s stress system, from sounding the “alarm” to getting stuck. Researchers propose that this type of repeated exposure could contribute to cumulative physiological strain. The scientific term for this cumulative physiological cost is allostatic load — when demand outpaces the body’s capacity to adapt, it enters a state of allostatic overload *(McEwen & Stellar 1993 and McKewen & Wingfield 2003)*. That’s the state where chronic stress starts to reshape how your brain functions.

The brain isn’t static. It’s constantly reorganizing itself, strengthening some connections and pruning others. Neuroplasticity is a term that describes the brain’s ability to rewire existing circuits by forming new connections (synapses) or strengthening existing ones. In certain regions, notably the hippocampus, which is central to memory and learning, evidence suggests the adult brain may continue to generate new neurons, called neurogenesis, which is part of neuroplasticity. It’s how we learn, adapt, and recover from setbacks. The extent to which this occurs in adult humans is still being studied, but it challenges the long-held assumption that the adult brain cannot grow new cells at all.

Neuroplasticity is influenced by chronic stress. Research shows that sustained stress hormone exposure appears to inhibit the generation of new neurons in the hippocampus, and has been associated with structural and functional changes in brain regions involved in emotional regulation and decision-making and may contribute to the kind of dysregulation seen in depression and anxiety disorders.

Much of this evidence comes from animal studies and from people under severe or clinical levels of chronic stress, but it indicates the direction in which sustained stress pushes the system.

And this is where neurodesign can make a difference. If your environment is quietly triggering that stress response multiple times a day, every day, for years, people might not even realize, let alone be able to describe, how their workplace impacts them. Leaders may perceive employees’ attempts to explain this stress as mere complaints or dissatisfaction.

By understanding the science behind why some spaces work better than others, or why some design approaches should be avoided altogether, leaders can collaborate with designers to create spaces that reduce avoidable stressors and create conditions to better support cognitive work.

How Buildings Shape Our Brains

Asking people about their workplace and involving them in potential solutions is critical to designing not only an optimal space but also one that employees embrace. This practice is central to the concept of inclusive design. Steelcase research conducted with workers in 11 countries in 2024 has found that asking people about their space helps them feel that their needs are being considered and is associated with 22% higher wellbeing scores. But there are many aspects of people's workplace experience that they may not be able to explain or even be aware of the impact a space has on them. Using new technologies to measure our physiological responses, combined with quantitative or qualitative research, can help lead to a deeper understanding of how employees are affected by their physical surroundings.

A recent paper by Valentine, Mitcheltree, Sjövall and Khalil at the University of Cambridge and University College London draws on multiple studies using tools such as virtual reality, EEG, fMRI, and biosensors. This technology has enabled researchers to combine physiological measures with behavioral observations and self-reported feedback for a more robust picture of how a space affects us in real time. The paper provides a theoretical framework for understanding how the buildings we work in might be quietly shaping our mental health, one exposure at a time. Much of this evidence comes from short laboratory exposures, and extending it to years of building occupancy is the subject of ongoing research.

Curves calm us.

Across several studies, curved walls, furnishings in rounded shapes or architectural elements that arc were consistently associated with lower stress responses than sharp-edged, rectangular ones. In one virtual reality experiment, people in curved rooms showed lower heart rates, more positive moods, and even performed better on a creativity task than people in rectangular rooms *(Strachan-Regan et al, 2024*). Another study found that curved transitional spaces helped people recover faster from a standardized stress test *(Li et al 2022)*.



Cramped spaces cost us.

Tight, enclosed spaces appear to ramp up the body's stress response. In one virtual reality experiment, participants who underwent a standardized stress test in an enclosed virtual room showed a greater cortisol response than those in an open room *(Fich et al. 2014).*

Other research has linked enclosed spaces to activation in a brain region associated with fear responses. Ceiling height and window size follow a similar pattern — generally, more openness and light correlate with lower stress.

That's not to say that openness is always the right solution. Research published in the Journal of Management & Organization found that exposure to open-plan office noise increased negative mood by 25% and physiological stress, measured by skin conductance, by 34%. The study combined heart rate, skin conductivity, facial expression analysis and self-report measures in a simulated work environment.

Open plan-office noise showed to increase:

↑25% Negative mood

↑34% Physiological stress

The key insight is that **the best workplaces provide people with options for the level of openness they prefer** and the autonomy to choose the spaces that work best for them, based on their personality, the type of work they need to do, or their mood.



Daylight keeps us alert.

Our internal clocks depend on light exposure to manage everything from melatonin production to inflammation levels. Disrupted daylight exposure has been linked to dysregulated stress hormone patterns and even to inflammatory markers associated with depression. Natural light is doing real physiological work for the people in the building – this suggests that access to daylight for everyone is much more than a preferred amenity.



Lighting can energize or drain us.

Certain kinds of lighting, especially some LED and fluorescent fixtures, produce a flicker that's often imperceptible but still registers in the nervous system. Researchers find larger pupil size, increased brain activity, and slower reading speeds among people exposed to these lighting conditions. They estimate this affects somewhere between 10 and 15% of people in any given space *(Wilkens 1995, Wilkens 2016)*. Similarly, highly repetitive geometric patterns, such as certain stair treads, ceiling panels or carpet patterns, can be visually taxing because they deviate from the kinds of patterns our visual systems evolved to process efficiently.

10% –15%

Of people in any space are affected by artificial flickering light conditions.

Nature nurtures our brains.

Multiple studies have found that even brief exposure to green space appears to reduce activity in the amygdala (a small, almond-shaped part of your brain known to control fear, among other emotions) and is associated with positive changes in brain structure over time. One study found that viewing images of a forest, compared to images of an urban setting, led to measurable changes in prefrontal cortex activity and self-reported feelings of calm *(Joung et all 2026)*.

Meanwhile, exposure to "gray space" — the concrete, pavement, steel found in urban environments — has been linked to altered connectivity in brain circuits associated with emotional regulation *(Harris et al, 2023)*, though these studies cannot fully separate the effects of green space from other factors such as income, air quality and noise.

Neurosustainability

Neurosustainability, a term introduced by Mohamed Hesham Khalil and developed with his co-authors, including Valentine and Sjövall *(Valentine et al 2023, Khalil 2024)*, is the idea that certain environments actively support healthy brain function over time.

We know from decades of animal research that environments combining physical activity, cognitive stimulation, and a sense of safety support healthy brain aging and function. How that translates to humans is an ongoing area of research.

"The finding that matters here is not that a single space raises stress. It is that the same space does so repeatedly, for years, to people who cannot leave it and who often have no language for what it is doing to them. That is the condition under which allostatic load accumulates. We are past the question of whether the built environment reaches physiology. The open questions are which features carry the cost, at what dose, and for whom."

Cleo Valentine
Senior Research and Innovation Lead, RISE Research Institutes of Sweden,
Affiliate Lecturer in Architecture, University of Cambridge,
Research Associate, Harvard University.

A Future-of-Work Conversation

Leading organizations have long understood that the physical workplace is a strategic asset with the power to shape behavior and culture. This emerging research helps explain why some design decisions deliver better outcomes, and others don't.

Business leaders care about employee wellbeing, burnout and engagement. They invest in mental health benefits, flexible schedules, manager training and a variety of programs to help employees thrive at work and in life. This research is a reminder that the physical space itself is part of that equation and an active participant. The place where we work for hours every week isn't neutral. It can add to or reduce the sensory, social and cognitive demands we manage.





It can help our nervous systems settle into a state where good thinking can happen, or it's quietly working against that, one low ceiling and flickering light panel at a time.

Chronic, low-grade stressors are easy to dismiss precisely because they're low-grade. No one walks out of a windowless conference room wincing in obvious pain. The effects are cumulative and largely invisible, which makes them easy to ignore when the budget gets tight.

The good news is that these design interventions don't have to be expensive or overly complex. Daylight access, adding more curved rather than angular forms, providing views of nature and giving people options for open and enclosed spaces – these are choices made regularly in every facility. The research demonstrates they are not just aesthetic decisions. They influence the performance of a company's most important and highest cost asset – its people.



The Takeaway

So, the next time you're sitting in a meeting room, in a workstation, or a lobby — pay attention. Not just to whether it looks good or feels comfortable, but to the specifics. Is there daylight? Can you see anything green? Are the walls and ceiling curved or boxy? Is there a faint hum or flicker you can't quite place?

Your brain is already paying attention to all of it. The research is beginning to provide greater clarity about how physical spaces affect us as human beings. It's giving us a genuinely new lens for thinking about what "good design" means, and why it matters.

For leaders, especially as our organizations continue to adopt AI, we are in a new era of work that requires new solutions. AI does not simply live on a computer screen. It is changing the very nature of work. To compete in this new era, it is essential that we focus on bringing together AI capabilities and human strengths.

As new research shows how physical surroundings impact our brains, it provides insights for how to redesign the places where we work and learn to build a cognitive advantage for people and organizations.

"The brain economy represents a new frontier where human intelligence and artificial intelligence work in partnership, allowing for greater productivity and resilience."

The Human Advantage:
Stronger Brains in the age of AI,
World Economic Forum +
MicKinsey Health Institute

Spaces for Healthy Minds

Workplaces should become active participants in helping people do their best thinking. Diverse, flexible spaces allow people to choose what works best for them and support the variety of activities they engage in throughout the day. People need places that foster social connections, which can help improve cognitive health, as well as places to better manage their attention, emotions and critical thinking.

Team Neighborhood

This space gives people a sense of control over their day which can help them manage stress. It offers a variety of areas to work alone or together, in person or virtually, with varying levels of privacy.

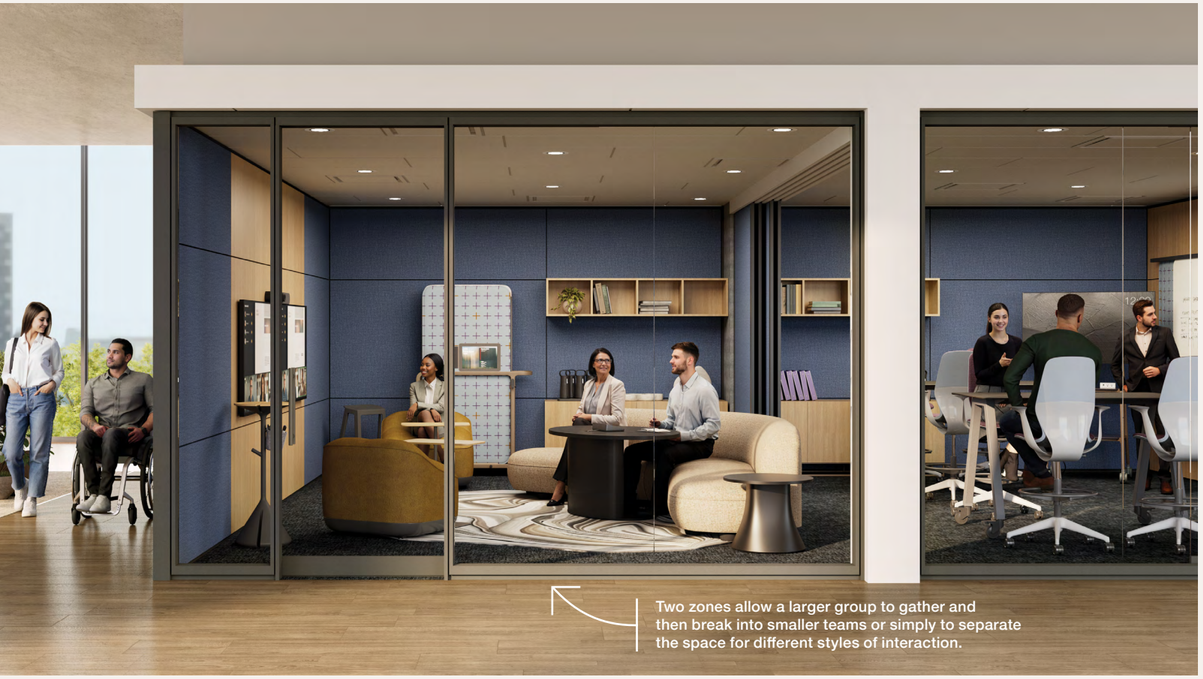


"Exposure to nature and landscapes has significant positive outcomes that can lower stress hormones, heart rate and blood pressure, as well as support overall health and wellbeing."

Sjövall & Spiers 2024

Glass walls and ceiling louvers keep small spaces from feeling cramped or stressful.

The combination of enclosed and open spaces for structured or informal meetings helps people feel psychologically safe and build trust.



Learning & Collaboration Space

This multi-modal space, with integrated technology, can be used for training sessions or collaboration.

The space helps foster positive social connections, which research shows can increase oxytocin and dopamine, and support learning, memory, and emotional regulation. *(Menon & Neumann 2024).*





Reservable Enclaves

Places that enable quiet, uninterrupted focus can help replenish depleted attentional resources and improve cognitive functioning *(Pham & Sanocki 2024).*

A calming sensory experience can foster a positive emotional state, improving people's creativity and problem-solving.

These individual enclosed spaces provide options for different needs.



Collaboration Zone

Creativity is boosted in collaboration spaces that support active participation and movement. Bodily experiences, like shifting from sitting to standing or moving around the room improves our ability to recall information.



An open collaboration zone with curvy chairs that rotate encourages movement, which can help circulate dopamine, and, in turn, improve attention, creativity and problem-solving *(Beilock 2015)*.

Mobile tables and stool-height chairs make it easy to rearrange a collaboration space so everyone can see and be seen, and to move around the room or stand and maintain easy eye contact.

This helps people maintain their attention and fosters a sense of equality among participants.



Library

A quiet library with a range of individual spaces supports focus and reflection and serves as a destination where people can reset, shift pace, and engage in deep work with minimal distractions.





Environments that allow mental recovery can improve working memory, a foundational cognitive capability associated with learning, reasoning, and decision-making *(Van Oordt et al 2022)*.

Biophilic design can also support increased performance, creativity, cognition, mood, and wellbeing *(Sjövall & Spiers 2024)*.

Wood surfaces, warm materials, and natural light can offer positive psychological and physiological outcomes, such as reduced stress levels, improved immune function and memory, lower blood pressure, and better sleep.



People can choose between working side-by-side for more interaction with their teammates or reorienting to reduce visual distractions that make it harder to manage their attention.

Individual Workstations

These reconfigurable workstations give people options to choose the best spaces for their individual work, with movable desks and adjacent focus nooks for privacy when needed.



Rounded screens not only help absorb sound but also offer a calming area to rejuvenate.



Collaborative Private Office

When people are doing work that requires a heavy cognitive load, they need spaces that can help them toggle between individual deep focus and collaboration with others to refine ideas.

This shared, bookable private office is available when people need to shift between multiple work modes, from working alone to working with others.

The rounded desktop allows a person to work individually and then bring in two other people, or more, virtually.

Eighty percent of all meetings include two people, according to data from Steelcase partner VergeSense. Providing small group spaces can help people focus their attention during collaboration.



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