

Sensory Ergonomics: Designing Inclusive Workspaces for Neurodiversity

Aya Ataya*

Department of Ergonomics, Changshin University, Changwon, Korea

DESCRIPTION

The landscape of workplace design is undergoing a profound transformation, driven by a growing recognition of neurodiversity and the importance of creating environments that accommodate diverse sensory experiences. As an ergonomics researcher passionate about inclusivity, I argue that our design strategies must fundamentally reimagine spatial and sensory interactions. Contemporary scientific research increasingly demonstrates that neurological diversity represents not a challenge to be overcome, but a rich spectrum of human cognitive variation that demands sophisticated, nuanced design approaches. The traditional paradigms of workplace ergonomics have predominantly focused on normative experiences, systematically marginalizing the sensory needs of neurodivergent individuals. Traditional ergonomic approaches have predominantly focused on physical biomechanics, overlooking the critical role of sensory processing in workplace performance. For individuals with neurodivergent conditions such as autism and sensory processing disorders, conventional workspace designs can be overwhelming and counterproductive. Neurological research reveals that sensory processing is not a uniform experience but a complex, individualized phenomenon. Each nervous system interacts with environmental stimuli through unique perceptual filters, creating dramatically different experiential landscapes. Comprehensive studies from leading neuroscience research centers indicate that approximately 15%-20% of the population experiences significant sensory processing differences. This substantial demographic demands a radical reimagining of workplace design principles. Research increasingly demonstrates that sensory-friendly environments can significantly enhance cognitive performance, reduce stress, and promote inclusivity. This requires a nuanced understanding of individual sensory sensitivities and adaptive design strategies.

Advanced neuroimaging techniques have illuminated the intricate neural mechanisms underlying sensory processing. The interaction between sensory input, neural networks, and cognitive interpretation represents a complex, dynamic system far more sophisticated than previously understood. For neurodivergent individuals, environmental stimuli can trigger

significantly different neurological responses compared to neurotypical experiences. What might appear as a minor background noise to one individual can represent a profoundly disruptive sensory assault for another. Sound management represents a crucial aspect of sensory ergonomics. Open-plan offices, while promoting collaboration, often create acoustic challenges for neurodivergent individuals.

Background noise, sudden interruptions, and reverberating sounds can trigger significant cognitive and emotional stress. Acoustic ecology research suggests that sound environments are not merely passive backgrounds but active participants in cognitive and emotional experiences. The complex interplay between acoustic stimuli and neurological processing demands sophisticated, adaptive design strategies. Visual stimuli play an equally significant role in workspace design. Harsh lighting, complex visual patterns, and high-contrast environments can be particularly challenging for individuals with sensory processing differences. Neurological research demonstrates that visual processing is not a passive reception of information but an active, interpretive process. Different neural networks process visual information with remarkable variability, suggesting the need for highly personalized visual environments. Adaptive lighting systems that adjust color temperature, intensity, and distribution based on individual preferences represent a promising approach. Emerging technologies offer unprecedented opportunities for personalized sensory management. AI-driven interfaces can learn individual sensory preferences, automatically adjusting environmental parameters to optimize comfort and performance. Wearable technologies that provide real-time sensory feedback and personalized adaptation strategies represent an exciting frontier in inclusive workspace design. Implementing sensory-inclusive ergonomics requires more than technological solutions. It demands a fundamental cultural shift towards recognizing and celebrating neurodiversity.

CONCLUSION

Sensory ergonomics represents a critical evolution in workplace design. By acknowledging and supporting diverse sensory experiences, we can create environments that not only

Correspondence to: Aya Ataya, Department of Ergonomics, Changshin University, Changwon, Korea, E-mail: aya.ataya333@gmail.com

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accommodate differences but actively celebrate human neurological diversity. The future of workspace design lies in our ability to create flexible, adaptive environments that recognize

the unique sensory profile of each individual transforming workspace from standardized environments to personalized cognitive ecosystems.