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The Silent Workforce Revolution: Are Workers Engaging in Stealth Use of Generative Artificial Intelligence and Reaping Career Gains?

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A B S T R A C T

Generative Artificial Intelligence (GenAI) is reshaping workplace dynamics, often informally and without explicit employer endorsement. Using data from 576 professionals in Recife's Metropolitan Region, Brazil, we study the implications of GenAI use in organizations through the lenses of Cognitive Mediation Networks Theory (CMNT) and Actor-Network Theory (ANT). Specifically, we investigate the associations of the internalization of AI-mediated reasoning (Sophotechnia) with sociodemographic factors, psychological traits, and career success. Findings indicated that Sophotechnia is primarily a cognitive trait developed through experience with GenAIs. This trait is particularly fostered by an exploration-oriented personality. Organizationally, while 81.0% of the workers had interacted with GenAI, only 22.6% were employed in organizations that had formally adopted AI tools. Of those that had engaged with the technology, the vast majority used it for knowledge acquisition or construction (92.2%), and writing, interpreting or manipulating texts (83.4%). Those with higher levels of Sophotechnia exhibited not only greater confidence in the positive impacts of GenAIs (62.9% of users believed in a personal positive impact versus 15.2% of the non-users), but also superior job performance (81.3% chance of exceeding work requirements among those with high Sophotechnia versus only 27.6% for those in the lower range). Additionally, Sophotechnia showed a positive association to the speed of career growth (Rho=.37), plus greater satisfaction with job rewards (Rho=.29) and workplace relationships (Rho=.15). There was yet a positive correlation with the time spent working from home (Rho=.26), but not to the overall time spent working (Rho=.03). These findings highlight a disconnect between individual and corporate AI strategies. Workers seem to independently use GenAIs at home to improve their performance and obtain benefits, often without their employers' awareness. This poses a managerial challenge for organizations to strategically integrate GenAI and maximize its benefits while addressing ethical and regulatory challenges.

Keywords: *Generative AI, Cognitive Mediation Networks Theory, Sophotechnia, Organizational Behavior.*

1. Introduction

Generative AI (GenAI) has rapidly evolved from early neural network research of the 1960s to sophisticated large-scale models such as GPT-4 (Brown et al., 2020; Chen et al., 2023; Goodfellow et al., 2014; Kumar et al., 2024). Key advancements include Generative Adversarial Networks (GANs), the Transformer architecture, and specialized hardware, all of which underpin current successes in language comprehension, image generation, and emergent cognitive abilities (NITI, 2023; Vaswani et al., 2017). With growing applications in healthcare, finance, and creative industries, GenAI's societal impact is evident; yet concerns over ethical governance, workforce disruption, and responsible alignment remain paramount (Leslie & Meng, 2024; Ouyang et al., 2022; West & Allen, 2023). Recent advancements in AI governance, such as the European Union's AI Act (2024) and discussions within the United Nations on global AI regulation, emphasize the need for structured oversight in AI integration (European Parliament and Council of the European Union, 2024; Sloat, 2025).

According to Latour's Actor-Network Theory, society, science, and technology are co-constructed through networks of human and non-human actors (i.e., technology). Thus, by internalizing GenAI-driven reasoning processes, workers can potentially elevate task performance and reshape professional routines, reflecting both individual and collective transformations (Latour, 2005).

The Cognitive Mediation Networks Theory (CMNT) proposes that human cognition is not solely the result of neural processes confined to the brain, but rather emerges from distributed interactions with external systems—such as tools, symbols, technologies, and sociocultural structures—which serve as External Mechanisms. Through repeated and meaningful engagement, individuals internalize functional patterns of these mechanisms as Internal Mechanisms, which act analogously to software drivers by enabling new forms of information processing and interaction with the environment. Over time, successive technological and cultural transformations give rise to distinct modes of cognitive mediation (Souza et al., 2024; Souza et al., 2012).

Under the CMNT, Hyperculture is the name given to the cognitive changes that emerged from the widespread adoption of digital technologies during the late 20th and early 21st centuries. It is an adaptation to the basic digital tools and environments involving computers, the Internet, and portable devices such as laptops, smartphones and tablets. This form of mediation involves the mastery of information and communication technologies, multitasking, fragmented knowledge recombination, transcontextual reasoning, different forms of massive collaboration and interaction (social computing), and more (Souza et al., 2012).

The CMNT suggests that the recent GenAI revolution is driving humanity toward another significant change. This new cognitive mode is termed Sophotechnic Mediation or simply Sophotechnia. It is a new mode of cognitive functioning arising from the rapid integration of such new technology into work, education, and daily life. Unlike previous digital tools, these novel systems possess natural language interfaces and emergent capabilities—such as abstraction, inference, and creative generation—that afford users not just functional enhancement, but also the development of new epistemological and cognitive structures. Sophotechnia involves internalizing these capabilities. It includes skills such as prompt engineering, conceptual understanding of AI operations, recognizing algorithmic limitations and biases, and active participation in AI-related sociotechnical ecosystems. (Souza et al., 2024).

In organizations, GenAI is associated with increased productivity, job transformation, and changing skill demands. These effects have sparked debates about whether AI will displace workers or enhance their capabilities (Brynjolfsson et al., 2023; McKinsey & Company, 2023). While Brazil's labor market shows optimism about AI-driven opportunities, disparities in digital infrastructure could limit widespread gains, with policy shifts indicating an increasing emphasis on regulatory oversight (Agência Brasil, 2025; Cetic, 2024; Ipsos Global, 2024). Also, while the country is experiencing growing confidence in AI, international policy shifts indicate an increasing emphasis on regulatory oversight. France's AI Action Summit (2025) highlights a shift towards ethical AI development beyond existential risks, proposing frameworks for AI's environmental and labor impacts (Sloat, 2025).

Building on these insights, the present study investigated the adoption and effects of GenAI in the workplace, with a focus on Sophotechnia as a novel cognitive mode. It aimed to test the predictions of the CMNT, explore demographic and psychological factors shaping AI-mediated cognition, and assess the levels of GenAI adoption in Recife's

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Metropolitan Region. These findings clarify how organizations and individuals might navigate an era of increasing co-creation between human and AI systems. This perspective aligns with the Actor-Network Theory (ANT).

2. Understanding the Technology

2.1. The Emergence of Generative AI

Generative AI (GenAI) emerged from 1960s neural network research aimed at emulating human cognition (Chen et al., 2023). A key leap occurred with Generative Adversarial Networks (GANs), which pit generators and discriminators against each other to refine outputs (Goodfellow et al., 2014). The Transformer architecture (Vaswani et al., 2017) further transformed the field by enabling parallel processing of sequential data, as seen in OpenAI's GPT series (Radford et al., 2018), culminating in large models like GPT-3 and GPT-4 (Brown et al., 2020).

These architectures, along with specialized hardware (NITI, 2023) and massive datasets, propelled GenAI to tackle tasks once considered uniquely human (Arthur, 2023). Rapid evolution in the last five years brought advanced language models and sophisticated image generators (Karras et al., 2019; Song et al., 2021), demonstrating wide applicability in areas ranging from digital art to medical imaging.

As GenAI reshapes multiple productive sectors, ethical considerations and potential labor market disruptions have surfaced (Leslie & Meng, 2024). Reinforcement learning with human feedback offers pathways to align large models with human objectives (Ouyang et al., 2022). Meanwhile, public adoption of applications such as ChatGPT (Prahl, 2023) underscores broad societal impact and a need for responsible governance.

2.2. Impressive Performance

GenAI models show notable cognitive capabilities across diverse tests, often rivaling or surpassing human performance. Benchmarking on the WAIS-IV revealed mixed outcomes in areas such as verbal comprehension and working memory (Hernández-Orallo et al., 2024). Studies by Zhai et al. (2024) further demonstrated that ChatGPT and GPT-4 outperform most students on science assessments, indicating GenAI's capacity to manage high cognitive loads (Zhai et al., 2024). Other investigations found advanced language understanding and reasoning in GPT-4, with strong performance on CommonsenseQA and SuperGLUE benchmarks (Dhingra et al., 2023). Across summarization, inference, and language-based exams, GenAI consistently meets or exceeds median human abilities (Arthur, 2023), supporting educational initiatives and personalized learning (Al-Smadi, 2023).

GenAI's metacognitive functions are also emerging. Pavlovic et al. (2024) reported that Large Language Models (LLMs) exhibit heightened self-monitoring skills and lower overconfidence than humans (Pavlovic et al., 2024). Notably, the integration of Theory of Mind (ToM) frameworks allows AI to dynamically track conversational partners' beliefs and desires, hinting at more refined social interactions (Yang et al., 2025). This ToM-like functionality may mark a significant leap toward truly interpersonal AI systems.

2.3. Challenges

GenAI stands at the forefront of artificial intelligence, evolving from its early neural network origins to the sophisticated models seen today. These systems have been enabled by breakthroughs in adversarial training, Transformer-based architectures, and specialized hardware. They exhibit notable problem-solving skills, robust language comprehension, and emerging metacognitive and social abilities. As GenAI increasingly integrates into various industries and sectors, its implications—both beneficial and disruptive—underscore the need for ongoing research, responsible regulation, and ethical oversight.

3. Implications for Work

3.1. Employment and Job Market Dynamics

GenAI's integration into the workplace has elicited diverse perspectives regarding its effect on employment. Some analyses suggest that GenAI could disrupt over 30% of all workers, with at least half of their tasks being affected by automation (West & Allen, 2023). Notably, this disruption is anticipated to impact middle- to higher-paid professions, diverging from previous automation trends that primarily affected routine, blue-collar jobs (McKinsey & Company, 2023). Conversely, other reports indicate that GenAI serves as a supportive tool, augmenting human work rather than replacing it, thereby allowing employees to focus on higher-value tasks (Business Insider, 2025). The actual employment impact depends on how organizations implement GenAI. It also hinges on their

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level of investment in workforce training and adaptation. (Deloitte, 2025).

To address such disruptions, policymakers are increasingly focusing on AI governance frameworks. The European AI Act (2024) mandates transparency and risk classification, while the United States is implementing state-level AI legislation, such as Utah's AI Policy Act, which holds companies accountable for AI-related workforce impacts (European Parliament and Council of the European Union, 2024; Wodecki, 2024).

3.2. *Productivity Enhancements*

The adoption of GenAI has been linked to notable productivity gains. McKinsey & Company (2023) projects that GenAI could increase U.S. labor productivity by 0.5 to 0.9 percentage points annually through 2030 (McKinsey & Company, 2023). Similarly, research from MIT indicates that highly skilled workers utilizing GenAI tools can experience performance improvements of nearly 40% compared to their counterparts who do not use such tools (Brynjolfsson et al., 2023). These enhancements are attributed to GenAI's ability to automate routine tasks, provide real-time data analysis, and support complex decision-making processes.

3.3. *Quality of Working Life*

The influence of GenAI on the quality of working life is multifaceted. On one hand, GenAI automates routine tasks. This allows employees to engage in more meaningful and intellectually stimulating work, potentially enhancing job satisfaction (North Carolina Department of Commerce, 2024). On the other hand, the rapid integration of GenAI has led to concerns such as the "fear of becoming obsolete" (FOBO) among workers, highlighting the necessity for continuous investment in training and upskilling to ensure that employees can effectively collaborate with AI systems (Business Insider, 2025).

3.4. *Organizational Adoption of GenAI*

Organizations are increasingly recognizing the strategic importance of GenAI. Recent surveys indicate that 65% of respondents report their organizations are regularly using GenAI, nearly doubling the percentage from ten months prior (PricewaterhouseCoopers, 2024). This surge in adoption reflects a growing confidence in GenAI's potential to enhance productivity and work quality. However, successful integration requires addressing challenges such as ethical governance, data privacy, and the need for robust training programs to prepare the workforce for AI-enhanced roles (Deloitte, 2025). Companies that proactively implement structured upskilling initiatives and foster a culture of continuous learning are better positioned to harness the benefits of GenAI while mitigating potential risks (West & Allen, 2023).

3.5. *Perspective for the Future*

The integration of generative AI into the workplace presents both opportunities and challenges. While it offers avenues for enhanced productivity and the enrichment of work tasks, it also necessitates careful consideration of its impact on employment and the quality of working life. Organizations must adopt a balanced approach, investing in employee development and ethical AI practices to fully realize the benefits of GenAI.

4. The Brazilian Context of AI in Organizations

4.1. *Trends in the Labor Market*

A notable trend in Brazil is the perception of GenAI as a catalyst for job creation. A survey conducted by Ipsos for Google revealed that 60% of Brazilians believe AI will generate more employment opportunities, a sentiment that has grown from 62% to 68% between 2023 and 2024 (Ipsos Global, 2024). Furthermore, the percentage of workers anticipating the need for new jobs due to AI decreased from 20% in 2023 to 15% in 2024, indicating a growing confidence in AI's role in the labor market (Ipsos Global, 2024). However, this optimism must be tempered with caution, as the formal labor market showed signs of deceleration with fewer jobs being created than expected (Agência Brasil, 2025).

The impact of GenAI on employment is not uniform across sectors. Research indicates that while high-skilled occupations may benefit from AI augmentation, routine jobs are at risk of obsolescence due to automation (Comunale & Manera, 2024). The Brazilian labor market is experiencing a polarization effect, where middle-skilled jobs are declining while both low- and high-skilled positions are seeing growth (Comunale & Manera, 2024). This trend aligns with global observations that suggest GenAI will affect nearly all job functions but with varying degrees of impact based on sector and skill level.

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4.2. *Impacts in the Workplace*

GenAI has the potential to enhance productivity by automating repetitive tasks and allowing workers to focus on more complex activities. The Tony Blair Institute (2024) posits that AI can improve job quality by reducing mundane tasks and increasing workplace accessibility for diverse worker groups. Additionally, studies indicate that workers report improved performance and enjoyment at work due to AI integration, which also positively influences their physical and mental health (Tony Blair Institute, 2024).

However, disparities in access to digital infrastructure may hinder some workers from reaping these benefits. A study highlighted that significant portion of the workforce, particularly in lower-income brackets, may not fully benefit from GenAI due to existing digital divides (Cetic, 2024). This issue is particularly pertinent in Brazil, where economic conditions can limit technological adoption.

4.3. *Use in Brazilian Organizations*

Organizations in Brazil are increasingly adopting GenAI technologies as part of their operational strategies. The growing confidence among Brazilian workers regarding AI's impact suggests a conducive environment for technological integration within workplaces. Companies are recognizing the necessity to build workforce capabilities that align with these advancements (EY-Parthenon, 2024). The EY-Parthenon report emphasizes that GenAI will likely transform various functions across organizations, demanding new skills and adaptability from employees.

Although the outlook is positive, organizations still face challenges. They must address workforce displacement issues and the need for reskilling employees. As routine tasks become automated, there is an urgent need for training programs that equip workers with skills relevant to higher cognitive demands (EY-Parthenon, 2024).

5. A Theoretical Framework of Human-AI Interaction

5.1. *The Cognitive Mediation Networks Theory*

The Cognitive Mediation Networks Theory (CMNT) views human cognition not just as processes occurring inside the brain, but as activities that extend to interactions with tools, language, technology, and the broader social environment. CMNT proposes that our cognitive abilities, including thinking, remembering, and problem-solving, are strongly influenced by everyday technological and social tools. For example, using smartphones for memory tasks (like reminders and calendars) changes how we internally organize and retrieve information (Souza et al., 2024; Souza et al., 2012).

Initially, CMNT introduced the concept of Hypercultural Mediation (Souza et al., 2012), describing how digital technologies like the internet and social media have shaped new ways of thinking and interacting. This cognitive mode involves skills such as quickly finding online information (e.g., Google searches), multitasking (such as switching rapidly between chat apps, emails, and documents), and working collaboratively through digital platforms (like virtual meetings on Zoom or document sharing via Google Docs, or yet through social media).

Recently, with the growing popularity of generative artificial intelligence (GenAI), researchers have identified a new cognitive mode called Sophotechnic Mediation (Sophotechnia). This refers to integrating AI tools into our reasoning and decision-making processes. A practical example of Sophotechnia would be using AI assistants like ChatGPT to brainstorm ideas, clarify complex topics, or even write drafts for reports. It requires users not only to operate these AI tools effectively but also to understand their strengths and limitations—for instance, recognizing when an AI-generated answer needs verification or further refinement (Souza et al., 2024; Souza et al., 2012).

Research based on CMNT has found that individuals who effectively incorporate Hypercultural Mediation into their cognitive processes tend to be better at recognizing patterns, thinking abstractly, and adapting to digital environments. These abilities often lead to improved academic results, better problem-solving skills, and greater social competence. For example, students accustomed to digital research methods tend to outperform peers who rely solely on traditional learning resources (Souza et al., 2012).

Similarly, the adoption of Sophotechnia—the integration of AI into cognitive tasks—is assessed using the Sophotechnic Mediation Scale, a tool specifically designed to measure how well individuals have internalized AI-assisted thinking. Early studies show that younger people and those who are already comfortable with digital technologies (hypercultural users) are more likely to quickly adopt and effectively use AI tools (Souza et al., 2024).

Overall, both Hypercultural and Sophotechnic Mediation highlight the profound impact of digital

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technologies and artificial intelligence on human cognition. As society increasingly integrates AI into everyday activities, it becomes critical to promote digital literacy and effective AI usage to ensure individuals can fully benefit from these new cognitive tools and adapt successfully to our rapidly evolving technological world.

5.2. *CMNT and Other Perspectives*

From the perspective of Actor-Network Theory (ANT), as formulated by Bruno Latour (Latour, 2005), Sophotechnia explains how generative artificial intelligence (GenAI) integrates and stabilizes within social and technological networks. ANT emphasizes that human and non-human actors, such as technologies, interact to form complex networks where they mutually influence each other (Gutiérrez & Calderón, 2024; Zeng & Zhang, 2023). Sophotechnia shows how AI tools like ChatGPT evolve from external aids—similar to calculators or reference manuals—into integral cognitive partners. They become essential in human thinking, problem-solving, and decision-making processes (Souza et al., 2024). In practical terms, it involves individuals increasingly delegating complex cognitive tasks to AI, developing critical strategies to produce, evaluate and refine AI-generated information. For example, researchers use AI to quickly analyze large datasets, but do so through carefully drafting prompts or instructions and, then, verifying and interpreting the generated results. This collaboration exemplifies Latour's concept of hybrid networks, where technological and human capacities evolve in tandem.

As GenAI continues to shape knowledge production, decision-making, and creativity, the degree of Sophotechnic internalization within individuals and institutions will significantly influence their competitive advantage and cognitive adaptability in an AI-driven society (Souza et al., 2024).

The Cognitive Mediation Networks Theory (CMNT) complements ANT by emphasizing how external tools, particularly AI, actively enhance human cognitive abilities by facilitating interactions between humans and technologies. Sophotechnic Mediation specifically explores how generative AI transforms cognitive processes through adaptive learning and digital skills (Souza et al., 2024). This aligns with the concept of augmented intelligence, where AI complements human decision-making by providing detailed analysis and data-driven insights, thus boosting productivity and innovation (Dave & Mandvikar, 2023).

In workplace automation, AI applications typically automate repetitive tasks—such as scheduling meetings, data entry, or basic customer support—enabling human workers to engage in more complex and creative activities, thus improving job satisfaction and organizational efficiency (Huang, 2023). The human-AI teaming paradigm highlights a synergistic partnership combining human intuition and AI's computational strengths. For instance, medical professionals collaborating with AI diagnostic systems benefit from accurate AI-generated suggestions while applying their clinical judgment for informed decision-making (Johnson et al., 2023). Collectively, these frameworks emphasize designing AI systems that effectively augment and collaborate with human capabilities.

5.3. *Implication for the Workplace*

It would appear that, within organizations and the workplace, Sophotechnia must play a crucial role in determining how GenAIs are adopted, normalized, and institutionalized. Employees who develop Sophotechnic capabilities become better at integrating AI into workflows. They optimize task execution and effectively leverage AI-driven decision-making processes. Organizations with highly Sophotechnic workforces will likely adopt AI more efficiently and effectively. This can enhance productivity, innovation, and adaptive capacity. Furthermore, Latour's framework implies that as AI becomes more entrenched within workplace actor-networks, organizational hierarchies, power dynamics, and the very definition of expertise may undergo significant transformations, with AI-mediated cognition playing a growing role in structuring work environments.

5.4. *The Roles of Intelligence and Personality*

IQ, or intelligence quotient, is a standardized measure of cognitive ability that quantifies an individual's capacity for reasoning, problem-solving, and learning. This construct is of paramount importance in psychology because extensive empirical research has shown that IQ reliably predicts academic achievement, career success, and various life outcomes. Moreover, studies have demonstrated that IQ scores exhibit robust heritability and stability over time, which underscores their utility as a fundamental indicator of cognitive potential (Plomin & von Stumm, 2018).

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The Big Five personality model is a comprehensive framework that categorizes human personality into five broad dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each trait encapsulates distinct behavioral tendencies and affective patterns—ranging from creativity and curiosity (openness) to discipline and dependability (conscientiousness), sociability (extraversion), cooperativeness (agreeableness), and emotional instability (neuroticism). This model's cross-cultural replicability and its ability to predict various life outcomes, including job performance and mental health, have cemented its status as one of the most influential constructs in personality psychology (DeYoung, 2015).

IQ and the Big Five personality model have emerged as exceptionally robust constructs within psychology—demonstrating consistent replicability and predictive validity even as numerous other areas have faltered amid the replication crisis (Open Science, 2015). Decades of research have confirmed that IQ reliably forecasts a broad array of life outcomes and is strongly underpinned by genetic factors (Plomin & von Stumm, 2018), while the Big Five model continues to provide a stable and universally applicable framework for capturing the fundamental dimensions of human personality (DeYoung, 2015). Together, these constructs not only exemplify rigorous empirical validation but also highlight the enduring capacity of well-founded theoretical models to withstand the methodological challenges that have recently unsettled much of psychological science.

Based on the CMNT framework and the emergence of Sophotechnic Mediation (Souza et al., 2024), IQ and the Big Five personality traits likely play a crucial role. They significantly influence the development and internalization of this cognitive adaptation. IQ, as a measure of cognitive processing efficiency, problem-solving ability, and abstraction, is likely to influence an individual's capacity to effectively interact with AI-based tools, grasp their functionalities, and integrate them into their cognitive repertoire. Meanwhile, the Big Five traits are also relevant: Openness to experience should facilitate curiosity and exploration of AI systems, Conscientiousness may determine structured learning and responsible AI usage, Extraversion could relate to engagement with AI-oriented communities, Agreeableness might influence attitudes toward AI collaboration, and Neuroticism could shape the anxieties or resistance some individuals exhibit toward these technologies. As Sophotechnic Mediation is an extension of prior forms of digital adaptation, it is reasonable to expect that IQ and personality factors will significantly modulate the ease and extent of internalizing this novel mode of thinking and acting.

STUDY GOALS

This study aims to examine the adoption of Generative Artificial Intelligence (GenAI) in organizations and its impact on work life, with a particular focus on "Sophotechnia"—the internalization of cognitive patterns mediated by GenAI. It aims to test predictions from the Cognitive Mediation Networks Theory and Actor-Network Theory regarding the integration of this technology in the workplace. Additionally, it explores how key sociodemographic factors (sex, age, education, and per capita income) and psychological traits (intelligence, measured by IQ, and personality, assessed via the Big Five model) influence the development of Sophotechnia. Finally, the study assesses the current state of GenAI adoption and Sophotechnia among workers and organizations in the Metropolitan Region of Recife, Pernambuco, Brazil.

6. Method

6.1. Sample

A total of 576 adults from the Metropolitan Region of Recife who were employed in a public or private organization in 2024 participated in the study. The sample included 274 men (52.1%) and 252 women (47.9%), with a mean age of 37.4 years (SD = 11.40), ranging from 18.0 to 74.6 years. Regarding educational attainment, 47.0% had up to a high school education, 25.9% had a college degree, and 27.2% had a postgraduate degree. The average per capita income was R$3,614.75 (SD = R$3,321.74), ranging from R$100 to R$33,000.

Approximately 53.8% were employed in the private sector, while 46.2% worked in the public sector. In terms of occupational sectors, 44.7% worked in services, 14.6% in production, 13.5% in commerce, 17.9% in education, and 9.3% in healthcare. About 10.3% held positions at the elementary level, 42.0% at the secondary level, 22.6% at the higher education level, and 25.1% held managerial positions. The average individual income was R$5,653.99 (SD = R$5,370.65), ranging from R$0.00 to R$37,000.00.

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6.2. *Instruments*

- Sociodemographic and Work Life Questionnaire: A set of objective questions regarding sex, age, education level, marital status, socioeconomic status, and various aspects of work, including job position, type of organization, performance, workload, quality of work life, training & development, compensation, and more.
- Pernambuco Adult Mini IQ Test (PAIMT): A very brief intelligence test, administered orally, validated and normalized for the state of Pernambuco, capable of measuring scores between 62 and 137 (Souza et al., 2023).
- Ten-Item Personality Inventory (TIPI): A very brief assessment of the Big Five personality dimensions (Gosling et al., 2003), adapted for Brazil (Souza et al., 2015).
- Hypercultural Index: A measure of emerging ways of thinking and acting resulting from the Digital Revolution circa 1990–2010 (Souza et al., 2012).
- Sophotechnich Mediation Scale: A measure of emerging ways of thinking and acting resulting from the AI Revolution that began in late 2022, with a preliminary Cronbach Alpha score of .88 (Souza et al., 2024).

6.3. *Procedures*

A total of 36 students from the People Management 2 course in the undergraduate Business Administration program at a Federal University in Pernambuco, Brazil, approached participants at random on the streets of the Metropolitan Region of Recife between June and August 2024, where they applied the instruments out of earshot of passers-by. Each student aimed to collect data on a combination of equal proportions of men vs. women, age 36 or more vs. younger, with a higher education degree vs. up to high school, and public vs. private job. Incomplete records or those with absurd responses were discarded.

As established by the ethical guidelines for scientific research involving human subjects in Article 1, Item V, of Resolution No. 510 of the National Health Council, this study was exempt from registration or evaluation by the Research Ethics Committee and the National Research Ethics Commission, as no participant identification was requested or recorded, no experimental intervention was conducted that could pose risks beyond those of everyday life, and absolutely no form of diagnosis or counseling was provided as a consequence of the responses or for any other reason. In accordance with international principles on research ethics, participation in this study was fully informed and strictly voluntary.

7. Results

7.1. *Use of GenAI by Individuals*

Approximately 81.0% of respondents had interacted with a GenAI at least once in their lives. Their mean experience was of 11.8 months (SD = 16.71), with roughly 27.0% of the respondents had their first use og GenAIs less than one month before the survey, with 31.9% between one and six months, 16.0% between 7 and 12 months, and 25.1% more than one year.

The distribution of specific uses among those with any experience with GenAIs was:

- Knowledge acquisition or construction – 92.2%;
- Writing, interpreting, or manipulating texts – 83.4%;
- Organization or planning – 48.7%;
- Quantitative or qualitative analysis – 46.8%;
- Programming – 18.1%.

Out of those having some experience with GenAIs, approximately 96.4 declared that they had used ChatGPT, 37.5% Microsoft CoPilot, 30.9% Google Gemini, and 31.1% other GenAIs, with 42.7% had used only one brand of GenAI, 26.5% two, 21.4% three, and 9.4% four or more.

7.2. *Use of GenAI by the Companies*

Figure 1 presents the distribution of companies where participants worked in terms of the extent to which they had implemented a GenAI usage project.

It was observed that approximately 48.3% of companies had no GenAI project nor were considering one. About 29.1% were considering it but had not taken any effective action. Only 22.6% had implemented or were in the process of implementing an initiative involving this technology, which is far less than the percentage of 81.0% of workers that had used it (t-Test with t=25.938 and p<.01).

About 25.4% of the private and 19.3% of the public companies had implemented or were implementing GenAI solutions, with no statistical difference (t-Test with t=1.668 and p=.10).

Figure 2 shows the Box & Whisker plot of the percentage of the companies of employment that had either implemented or were in the process of implementing

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GenAI solutions as a function of its segment of economic activity.

The agricultural companies were the most likely to be engaged in actually implementing GenAIs, followed by those in services and manufacturing. Firms in the segments of education, construction, healthcare, and commerce were the least likely be implementing or have implemented such technology for their work processes (Maximum Likelihood Chi-Square=.14.397, p=.03)

Figure 1

Distribution of Employers by Degree of GenAI Project Implementation

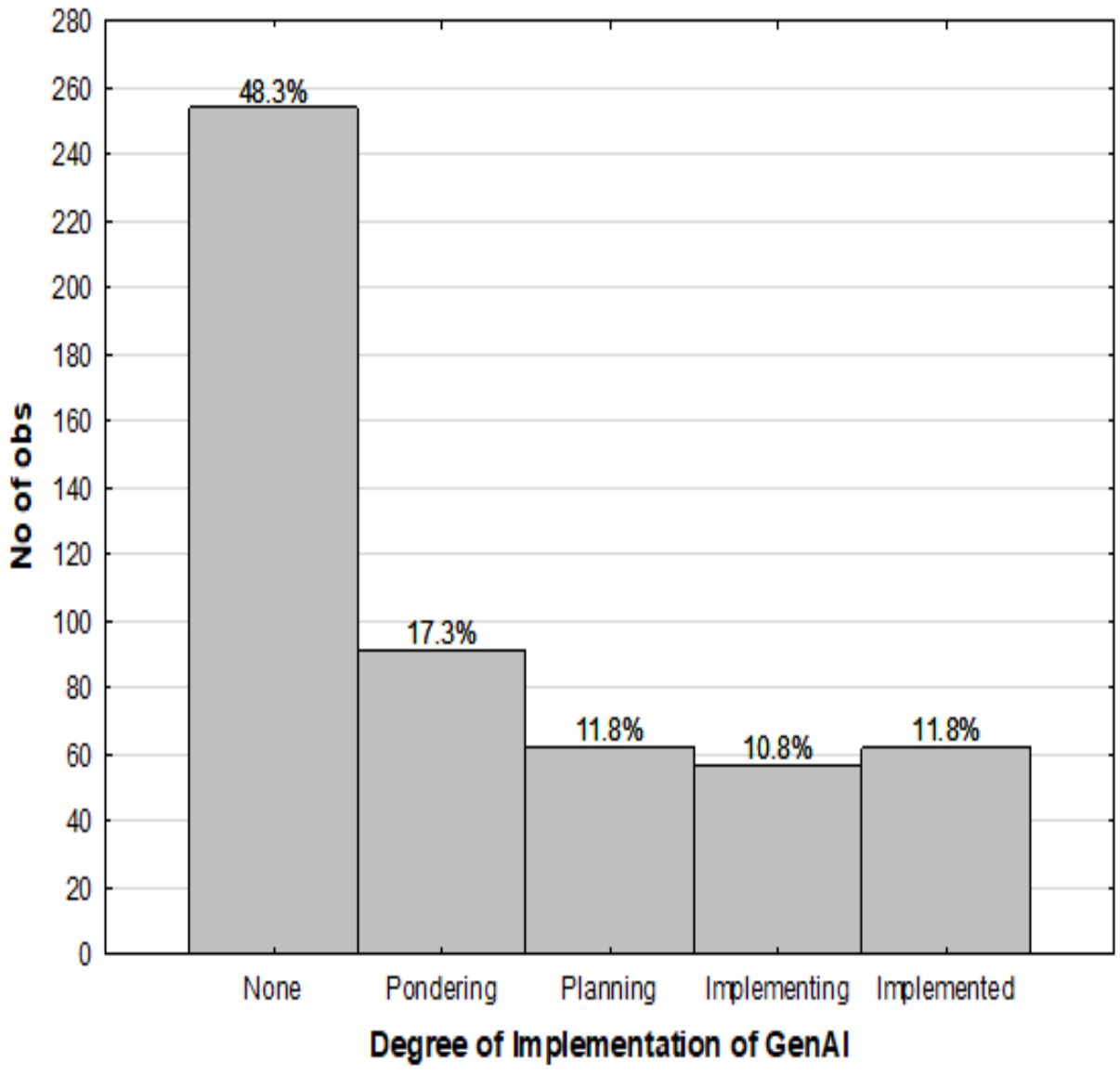

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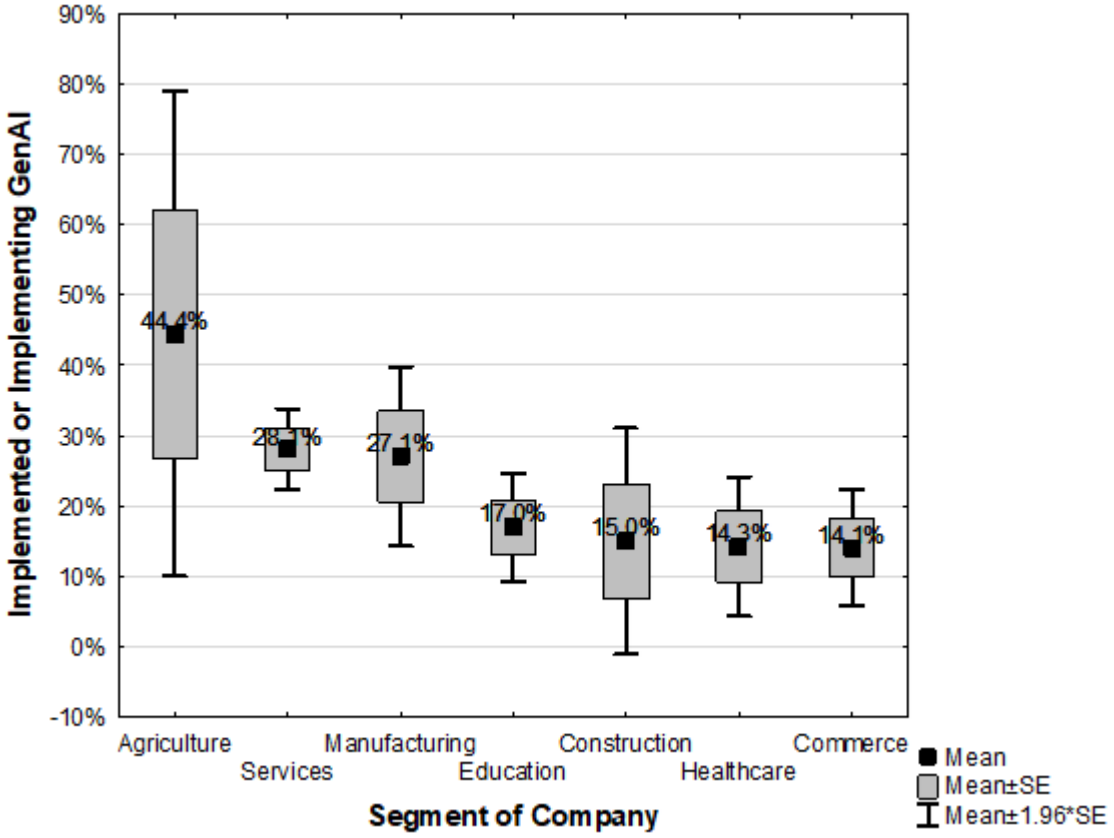
Figure 2

Implementation of GenAI solutions at the company of employment as a function of its economic segment



Beliefs About the Impact of GenAIs

Table 1 shows the respondent's beliefs regarding a "negative", "neutral" or "positive" impact of the adoption of GenAIs upon the company they work in, they themselves, and their occupation, according to the respondent's experience with the use of GenAIs.

Table 1

The distribution of beliefs about the impacts of GenAI on work.

	Recipient of Impact	Believed Impact		
		Negative	Neutral	Positive
All (n=526)	Company	11.6%	32.1%	56.3%
	Self	10.8%	35.7%	53.4%
	Occupation	14.6%	38.4%	47.0%
Had Used GenAIs (n=421)	Company	8.1%	28.3%	63.7%
	Self	7.8%	29.2%	62.9%
	Occupation	12.6%	35.6%	51.8%
Had Not Used GenAIs (n=105)	Company	25.7%	47.6%	26.7%
	Self	22.9%	61.9%	15.2%
	Occupation	22.9%	49.5%	27.6%

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Those that had any experience with the use of GenAIs seemed to have predominantly favorable opinions regarding their impact on their companies, themselves, and their occupations, whereas those without such experience tended to gravitate towards neutrality.

Table 2 shows the comparison between those with or without any experience with GenAIs regarding their perception of the professional impacts of that technology on their companies, themselves and their occupation, all measured on a Likert scale ("Negative"=-1, "Neutral=0", "Positive"=1).

Those with any experience with GenAIs were statistically more prone to having a positive opinion of the impacts of that technology, with a moderate Effect Size for the occupation and a strong one for the company and, especially, themselves.

7.3. Level of Sophotechnia

Figure 3 shows the descriptive statistics of the Sophotechnia Index for the study participants.

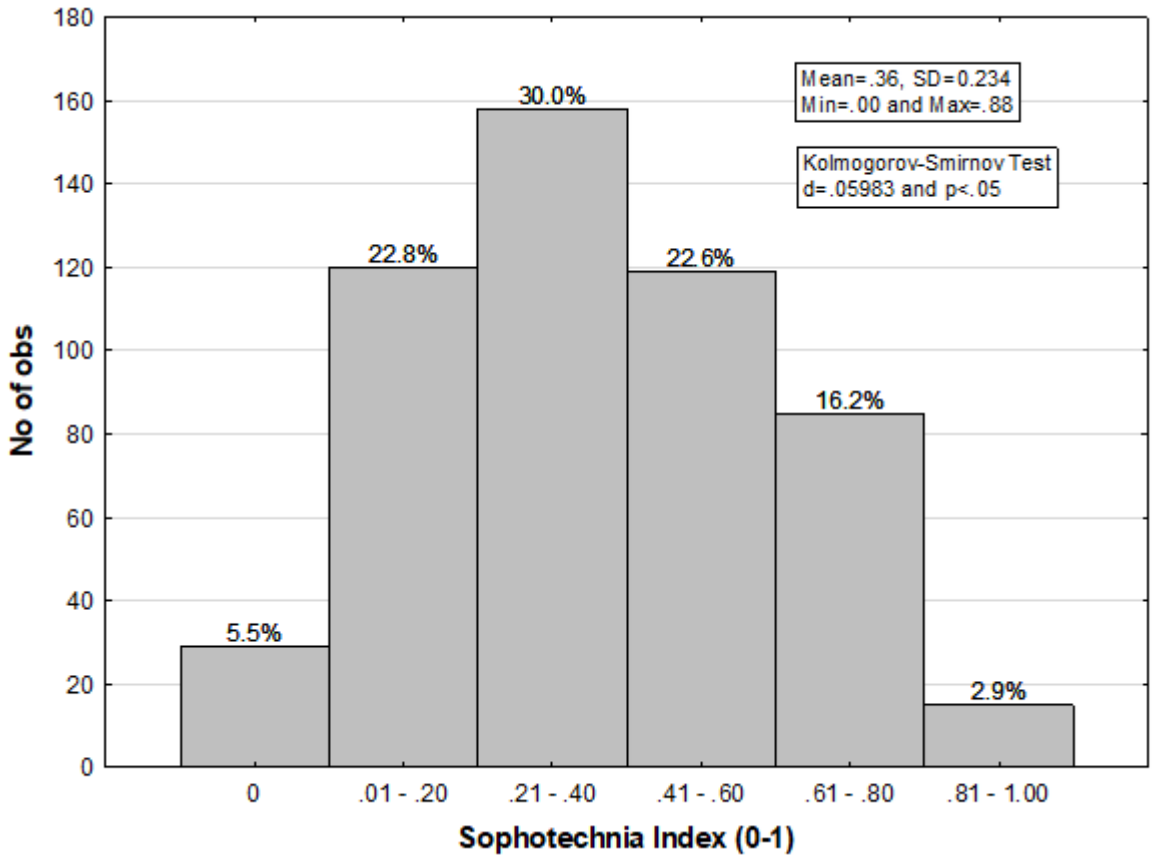
Table 2

Comparison between those with or without experience with GenAIs regarding the perceived professional impact of the technology (Positive=1, Neutral=0, Negative=-1).

Impacted	Had Experience with GenAIs				Cohen's d	Canonic Test (p)
	No (n=105)		Yes (n=421)			
	Mean	DP	Mean	DP		
Company	0.01	0.727	0.56	0.640	0.80	<.01
Self	-0.08	0.615	0.55	0.636	1.00	<.01
Occupation	0.05	0.712	0.39	0.701	0.49	<.01

Figure 3

Descriptive Statistics of the Sophotechnia Index for Study Participants



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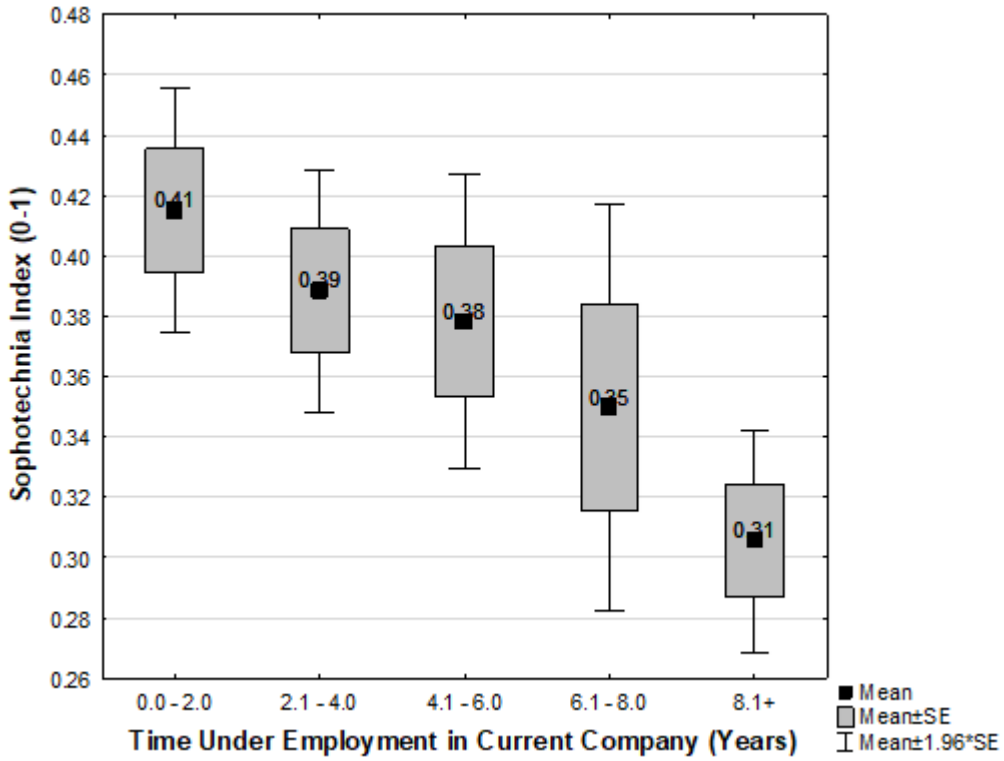
The distribution of Sophotechnia was found to be non-Gaussian according to the Kolmogorov-Smirnov test. This is due to the fact that, although relatively symmetric (Skewness = 0.162), the tails were substantially shorter than expected for the Normal Curve (Kurtosis = -0.908).

7.4. Status at Company vs. Sophotechnia

Figure 4 shows the Box & Whisker diagram of the Sophotechnia Index as a function of how long the individual had been working at his or her current company.

Figure 4

Sophotechnia as a function of time under employment



The Spearman correlation between Sophotechnia and time under employment was Rho=-.19 and p<.01.

Figure 5 shows the Box & Whisker diagram of the Sophotechnia Index as a function of the position of the individual in the company of his/her employment.

The Spearman correlation between Sophotechnia and position at the company was Rho=.38 and p<.01, however, there was no statistical difference between any of the upper three positions (p>.10 in the Mann-Whitney U Test in all comparisons).

Figure 6 shows the Box & Whisker diagram of the Sophotechnia Index as a function of the role of the individual in his or her company of employment.

Those with roles in IT or marketing/publicity showed the highest mean levels of Sophotechnia, with those in general services and nondescript functions had the lowest levels, with the remaining functions being between these two extremes.

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Figure 5

Sophotechnia as a function of the position in the company

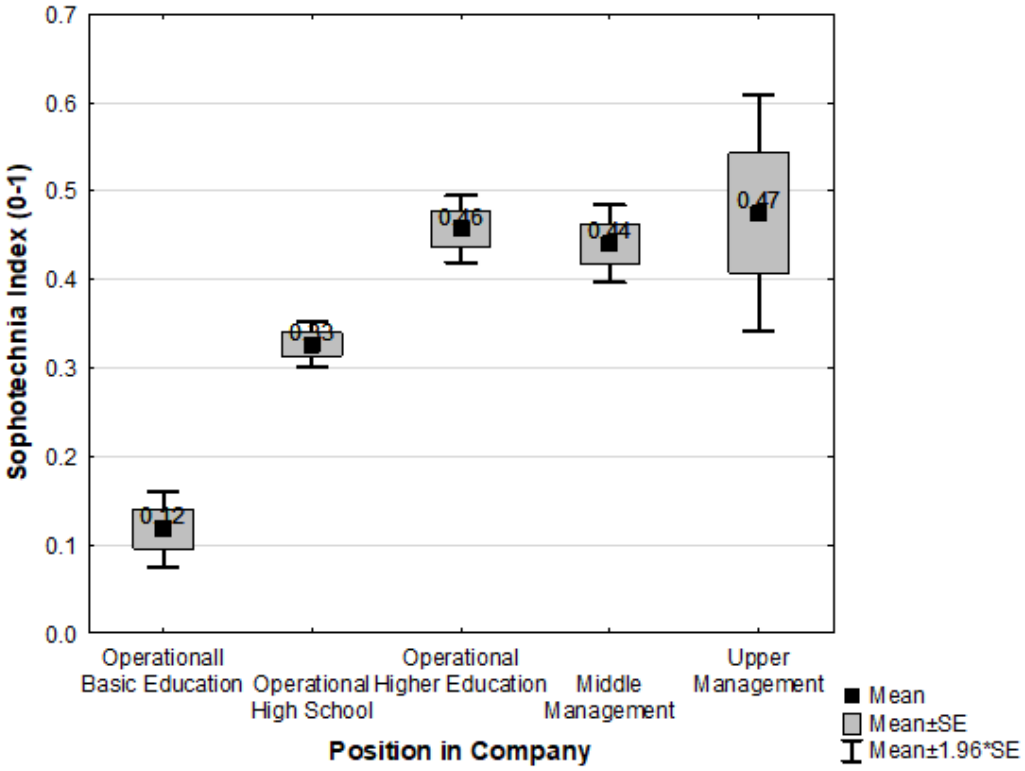
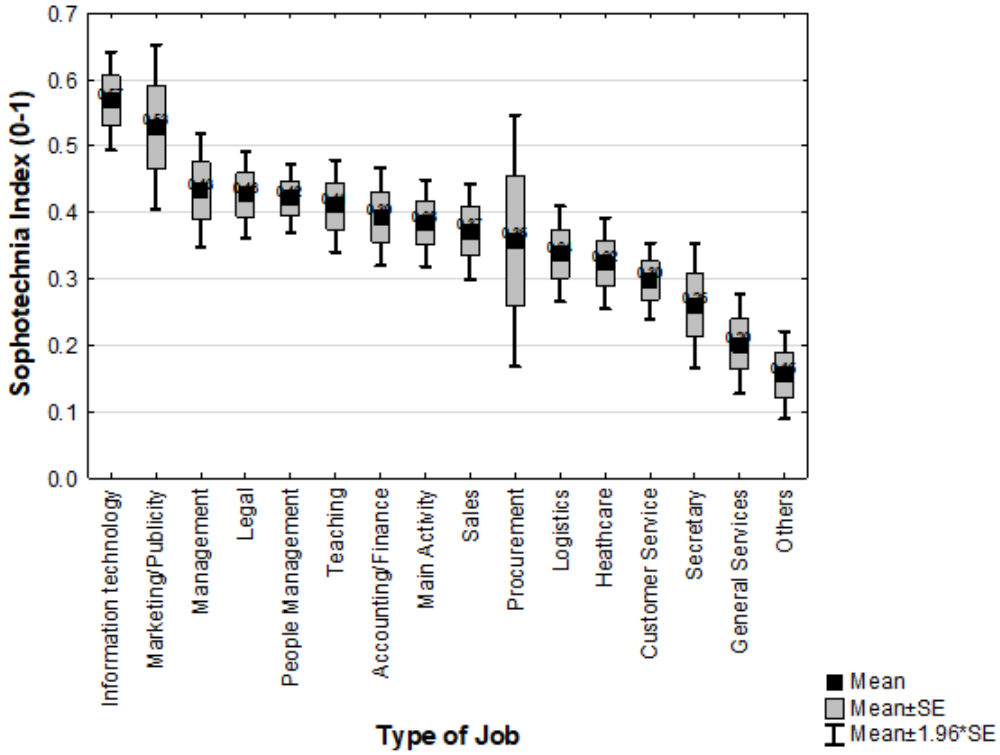


Figure 6

Sophotechnia as a function of the role in the company



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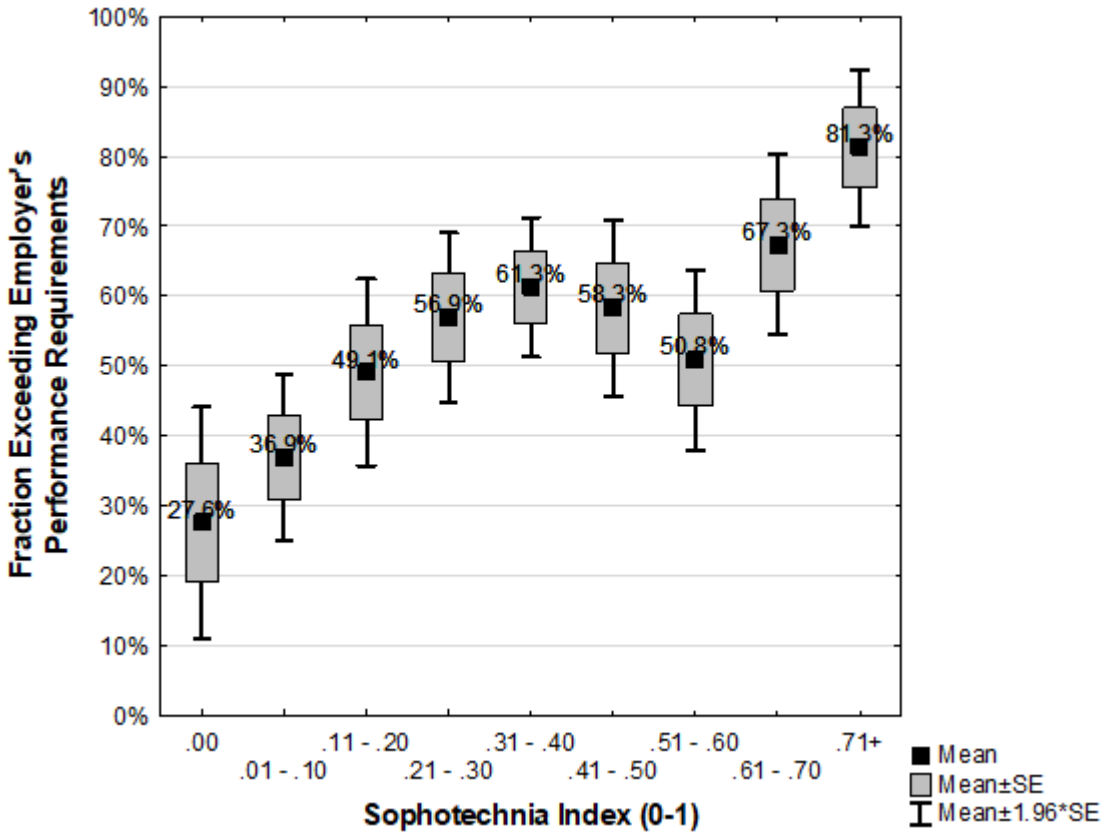
7.5. *Sophotechnia and Job Performance*

Figure 7 shows the percentage of those who declared to be exceeding the performance requirements of their employer as a function of the level of Sophotechnia.

Figure 7

Percentage exceeding their employer's performance requirements as a function of the level of Sophotechnia



The Spearman correlation between Sophotechnia and the level of performance, measured on a 0-4 self-evaluation Likert scale ranging from "far below what is required" to "far above what is required", was Rho=-.19 and p<.01.

7.6. *Sophotechnia and Quality of Working Life*

Figure 8 shows the means and confidence intervals for the level of satisfaction with job rewards (mean of satisfaction with job as a hole, wages, benefits, activities, performance evaluations, and future perspectives) and workplace relationships (mean of satisfaction with relationships with boss, coworkers, and subordinates), all measured on a 0-4 Likert scale, as a function of the level of the Sophotechnia Index.

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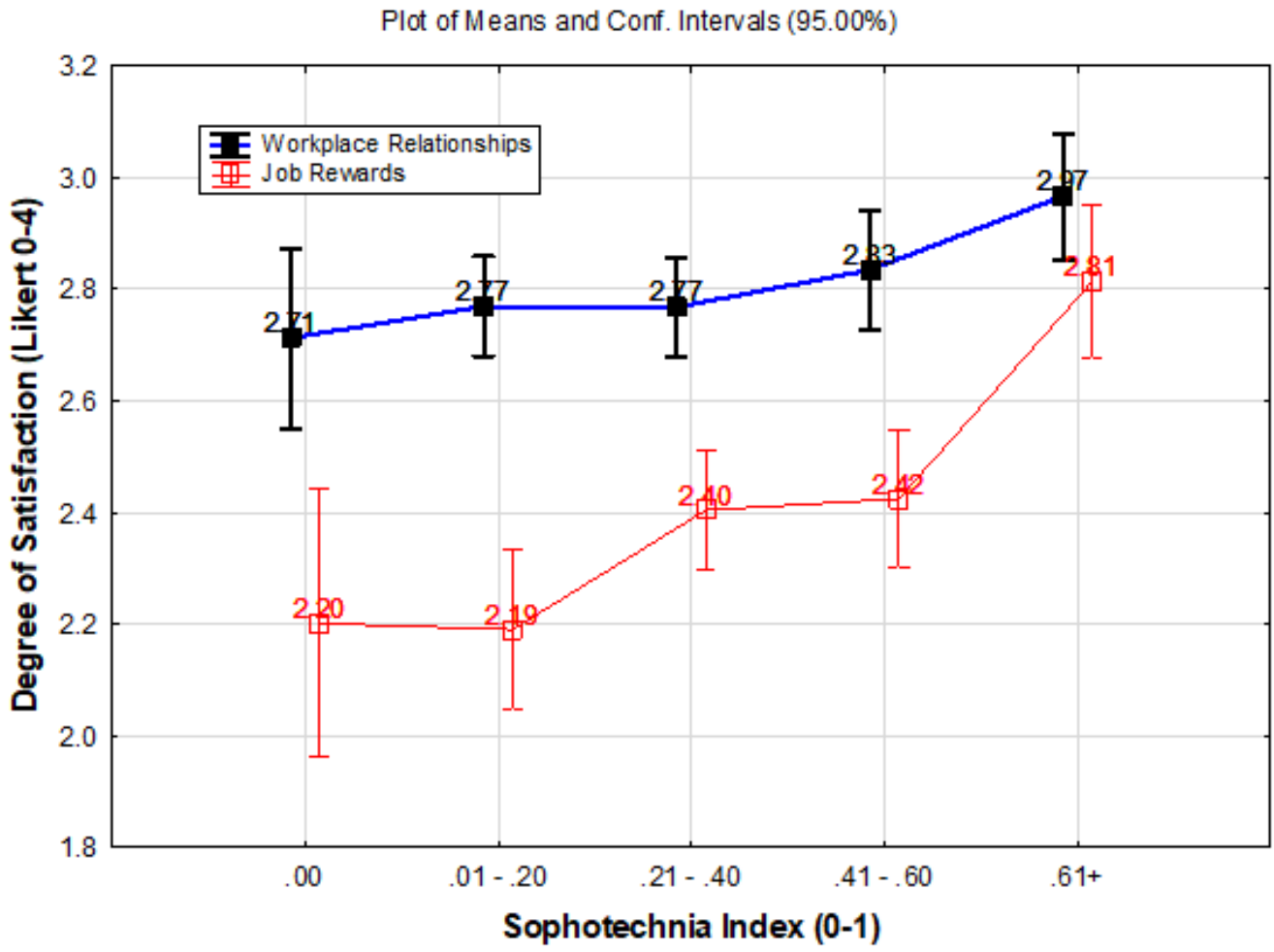
Figure 8

Satisfaction with job rewards and workplace relationships as a function of the level of Sophotechnia



The Sophotechnia Index had a Spearman correlation with the satisfaction with job rewards of Rho=.29, with p<.01, and a correlation of Rho=.15, p<.01, with satisfaction with workplace relationships.

7.7. Sophotechnia and Career Success

The level of one's position in the place of employment multiplied by their income from that employment, both variables normalized on a 0-1 scale, multiplied by 100, adding 1 to the result and then taking its natural logarithm, yielded an index with Mean=1.66, SD=1.08, ranging from 0.00 to 4.62, which can be taken as a measure of career Success.

Figure 9 shows the Career Success index as a function of the range of the Sophotechnia Index.

The Spearman correlation found between Sophotechnia and career Success was Rho=.37 and p<.01.

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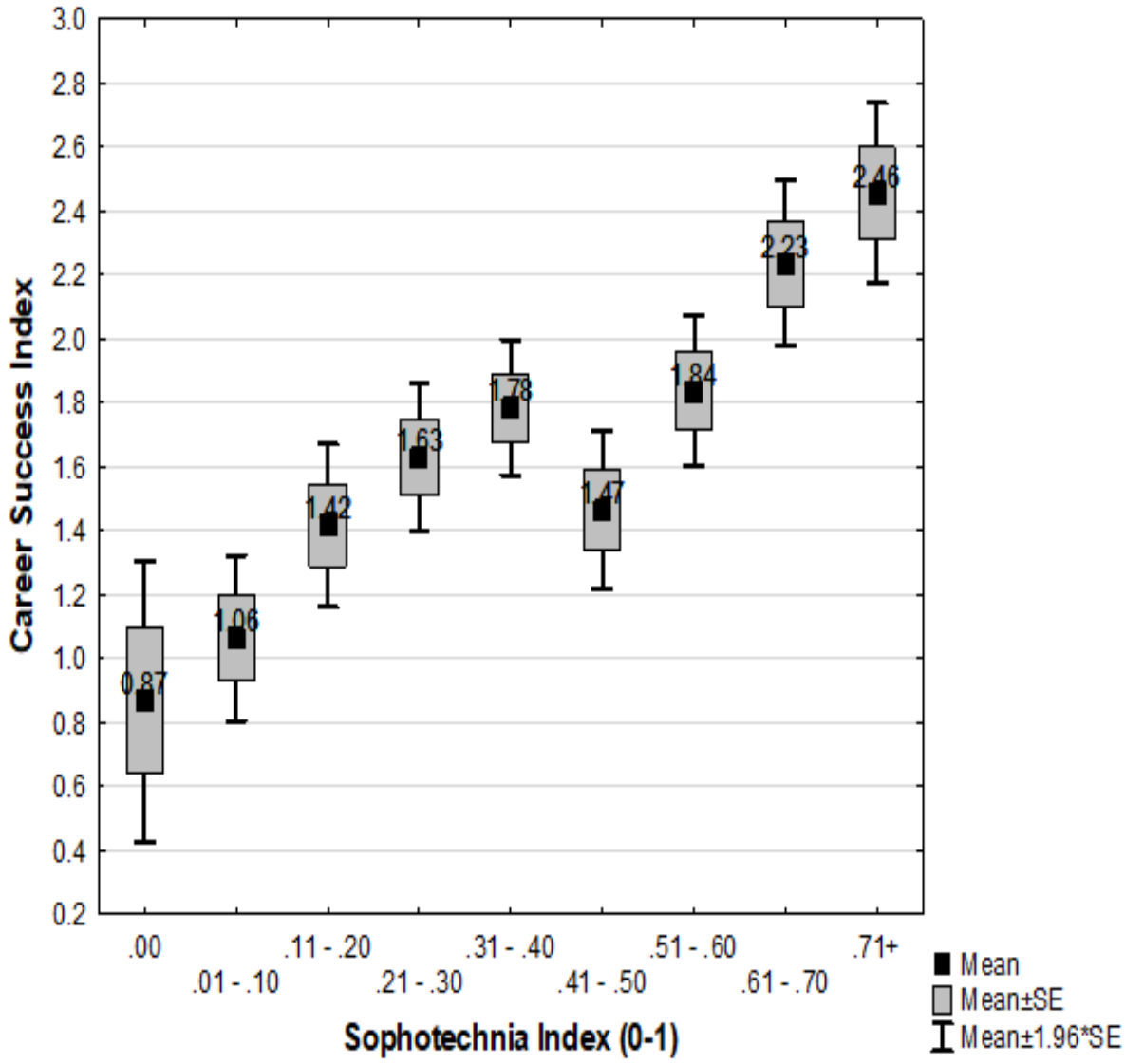
Figure 9

The Career Success index as a function of the level of Sophotechnia



7.8. *Sophotechnia and Work*

Figure 10 shows the number of hours per week spent working, both in total and specifically at home, as a function of the level of Sophotechnia.

The Sophotechnia Index had a Spearman correlation with the total number of hours worked of Rho=.03, with p=.52, and a correlation of Rho=.26, p<.01, with the number of hours worked from home.

Figure 11 shows the percentage of the weekly amount of work that was done from home.

The Spearman correlation between Sophotechnia and the percentage of work done from home was Rho=.22 and p<.01.

7.9. *Individual Profile and Sophotechnia*

Figure 12 shows the 2D Smallest Space Analysis of sex, age, level of education, engagement in training & development in general, engagement in STEM training & development, IQ, Big Five traits, Hyperculture, and Sophotechnia, with partitioning according to the tenets of Facet Theory.

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Figure 10

Amount of work in total and at home as a function of the level of Sophotechnia

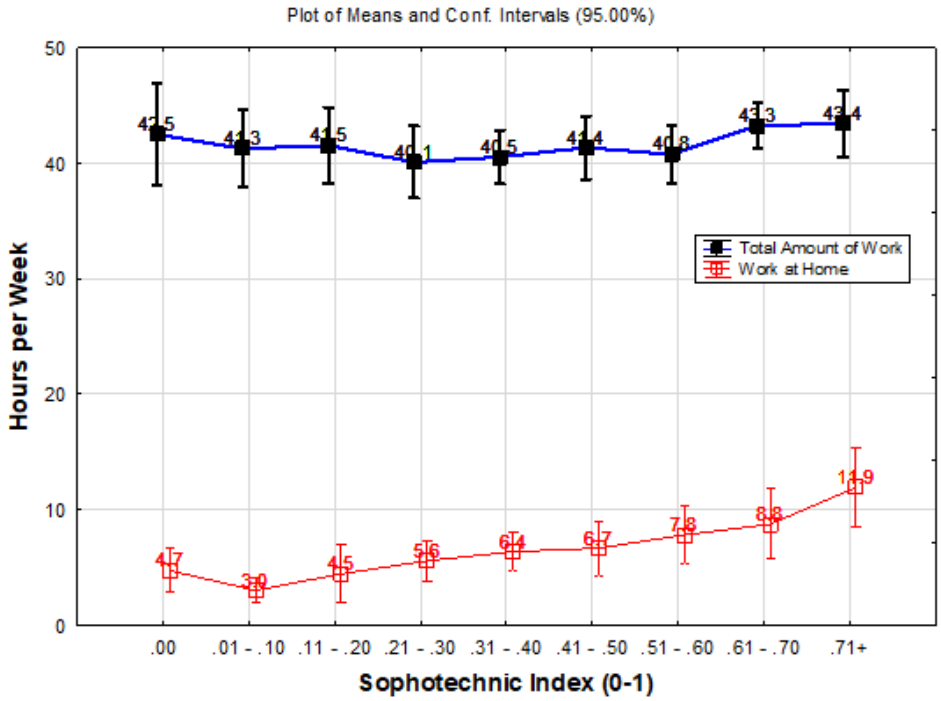

Figure 11

Amount of work in total and at home as a function of Sophotechnia

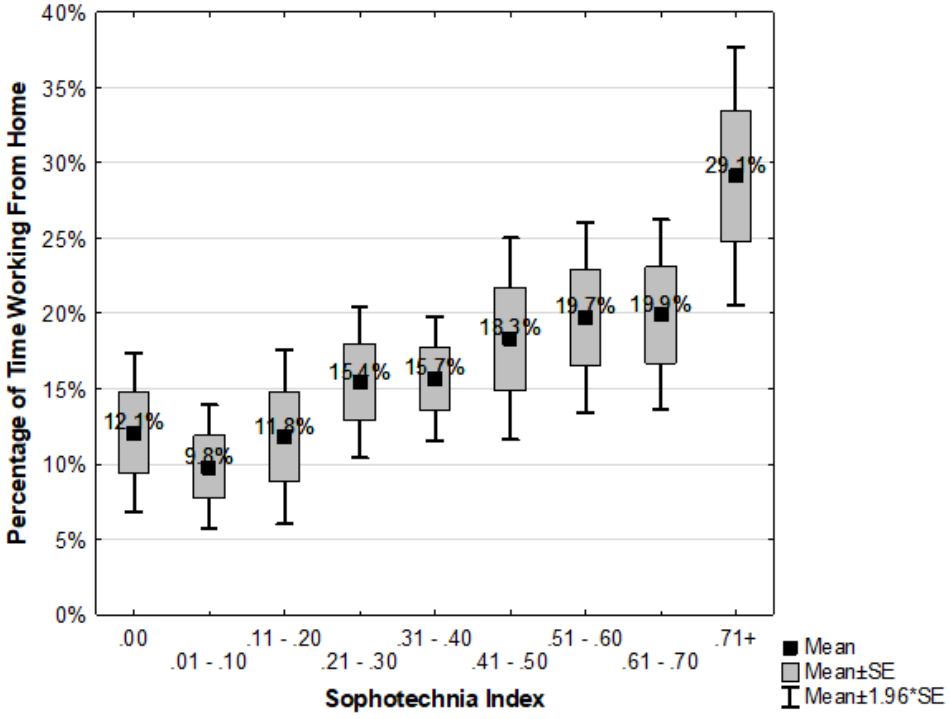

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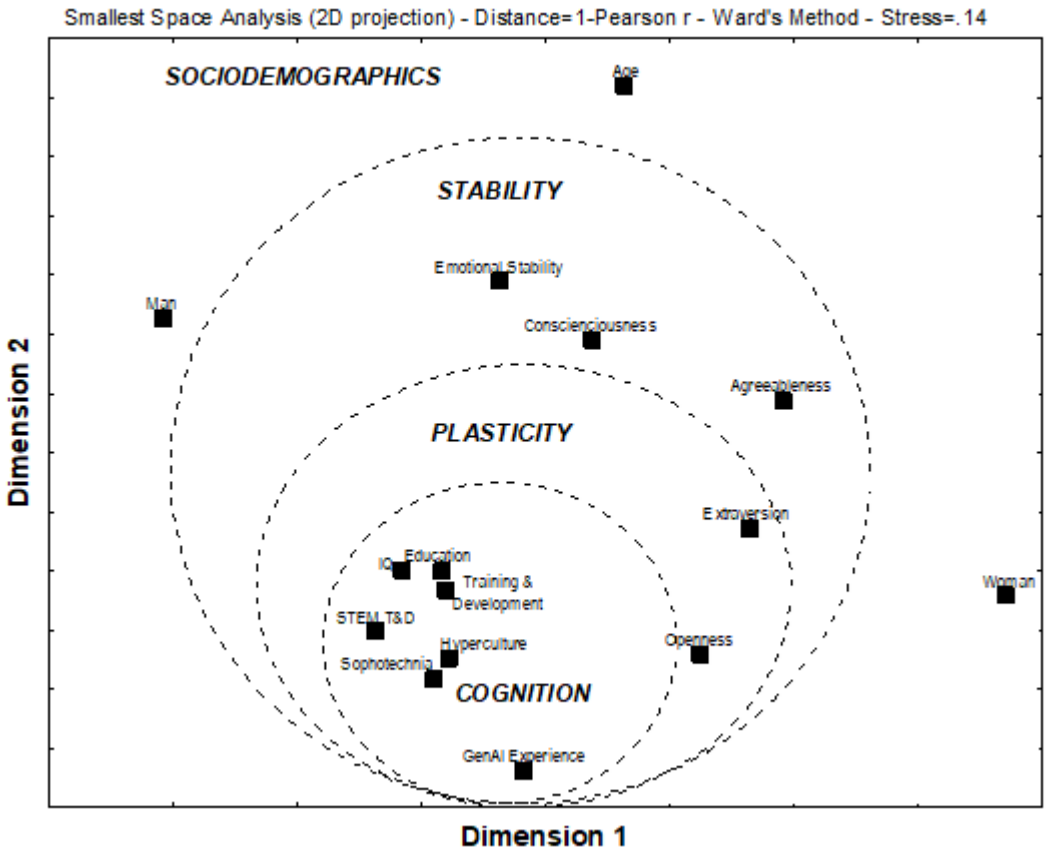
Figure 12

SSA Diagram of psychological and sociocultural variables with partitions



The variables in the Multivariate Analysis can be seen as a displaying a modular structure with the following partitions:

- Sociodemographics: Being a man, Being a woman, and age;
- Stability: Conscientiousness, Agreeableness and Emotional Stability;
- Plasticity: Big Five traits of Openness to Experience and Extraversion;
- Cognition: Sophotechnia, Hyperculture, amount of experience with GenAIs, T&D, STEM T&D, level of education, IQ.

8. Discussion

8.1. Contrast Between Employees and Employers

The findings of this study offer significant insights into the patterns of Generative AI (GenAI) adoption in professional environments, its relationship with Sophotechnia, and the broader cognitive and organizational implications of AI integration in the workplace. The results suggest that while individual workers are increasingly engaging with GenAIs, their employers remain largely hesitant to formalize the adoption of these technologies within organizational structures. The interplay between individual cognitive traits, professional roles, and AI-mediated cognition is critical in understanding the evolving landscape of work in the era of artificial intelligence.

8.2. The Informal Integration of GenAI in the Workplace

A salient finding of this study is that most workers have had some experience with GenAIs, primarily using them for knowledge-related and text-processing tasks. This suggests that AI-driven tools are becoming integral to cognitive and professional routines, even in the absence of formal adoption by organizations. The fact that employees engage with GenAIs outside formal company frameworks raises questions about what has been termed "stealth adoption"—a phenomenon wherein workers leverage AI autonomously to enhance their productivity, problem-solving abilities, and creative processes (Brynjolfsson et al.,

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2023; West & Allen, 2023). This aligns with predictions from Cognitive Mediation Networks Theory (CMNT), which posits that the internalization of technological mediation precedes and often drives institutional changes (Souza et al., 2024).

The Actor-Network Theory (ANT) perspective further suggests that GenAI, by embedding itself into individual cognitive workflows, is reconfiguring the traditional structure of workplaces by allowing workers to interact with AI as an active cognitive agent (Latour, 2005). This process of "translation"—where AI transitions from an external tool to an embedded part of cognitive and organizational networks—implies that organizations will eventually need to formalize AI integration to harness its full potential while maintaining oversight and alignment with corporate objectives (Gutiérrez & Calderón, 2024).

8.3. *Sophotechnia and the Evolution of Work Cognition*

The study provides robust evidence that Sophotechnia is a distinct cognitive trait strongly associated with experience using GenAIs, Hyperculture, IQ, education, training & development, and STEM-related competencies. This aligns with previous research indicating that digital mediation fosters new cognitive modes, wherein individuals adept at navigating technological interfaces develop superior pattern recognition, adaptability, and decision-making capabilities (Souza et al., 2012). Furthermore, individuals with high levels of Sophotechnia exhibit a more favorable perception of AI's impact on their careers, organizations, and industries, reinforcing the notion that cognitive readiness for AI integration is a key determinant of its perceived utility (Souza et al., 2024).

From a psychological standpoint, the association between Sophotechnia and Plasticity (Openness and Extraversion) suggests that intrinsic personality traits play a role in AI adoption and proficiency. Individuals exhibiting curiosity, adaptability, and sociability may be more inclined to experiment with and integrate novelties into their cognitive repertoires (DeYoung, 2015; Gosling et al., 2003). This finding underscores the importance of fostering a culture of curiosity and technological engagement in organizational training programs to enhance AI literacy and workplace adaptation.

8.4. *Performance, Job Satisfaction, and Career Implications*

One of the most compelling findings of this study is the positive correlation between Sophotechnia and self-reported job performance, job satisfaction, and workplace relationships. Workers with higher levels of Sophotechnia reported exceeding performance requirements, greater satisfaction with job rewards, and more positive interpersonal dynamics. These findings lend empirical support to the argument that AI-driven cognitive augmentation does not merely streamline workflows but enhances professional efficacy and workplace engagement (McKinsey & Company, 2023).

Moreover, the study finds no evidence that high-Sophotechnia individuals work more hours than their counterparts, but they do tend to spend more time working from home. This suggests that GenAI users optimize work efficiency rather than merely increasing work volume. Given that remote and hybrid work models are becoming increasingly prevalent, organizations should explore how AI-mediated work practices can be leveraged to improve productivity while maintaining work-life balance.

8.5. *Occupational Differences and the Future of Work*

The occupational disparities in Sophotechnia observed in this study indicate that certain professional roles are more conducive to AI integration than others. Individuals in IT and marketing/publicity exhibit the highest levels of Sophotechnia, whereas those in general services and administrative support display the lowest. This trend may reflect both the cognitive demands of these occupations and the availability of AI-relevant training and tools within these fields.

The implications for workforce development are profound: if GenAI-driven cognition becomes a key determinant of professional success, disparities in AI literacy could exacerbate socioeconomic inequalities. Policymakers and corporate leaders must consider strategies to democratize access to AI training, particularly for workers in lower-skilled roles, to prevent technological stratification within organizations (Deloitte, 2025; European Parliament and Council of the European Union, 2024).

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8.6. *Limitations of the Study*

Self-report measures introduce potential biases such as social desirability, self-perception distortions, and recall inaccuracies, which may inflate absolute levels of reported job performance, career success, or AI usage. However, some things, such as satisfaction, are impossible, or at least difficult, to measure in other ways, which is why they were used. Regardless, the aforementioned biases should not alter the relative ranking of individuals on these variables, preserving the validity of the observed correlations. Furthermore, in the present paper, the consistency between the different results of the statistical analyses were used to confirm the coherence of the self-reports, such as observing that something which influences performance similarly influences satisfaction with job rewards received and career success. This, in combination with the anonymity that was provided to the participants, is seen as an indication of a reasonable validity for the findings arising from the self-reports.

Another limitation was the use of short instruments for psychological testing, which, even when adequately validated (as in the present case), tend to have less precision. This lowers one's confidence in negative results such as the lack of an association, though, conversely, it makes the associations that are found more robust.

Finally, cross-sectional studies can lead associations that may erroneously suggest temporal dynamics and/or causality. In the present paper, this was mitigated by means of cautious interpretation of multivariate data, and also through a retrospective control of time.

8.7. *Future Directions*

Future research should explore the longitudinal dynamics of Sophotechnia development, examining whether increased AI exposure fosters enduring cognitive transformations or remains a transient effect, while also incorporating objective performance metrics, supervisor evaluations, and AI interaction logs to validate findings and ensure methodological robustness. Additionally, investigations into ethical and regulatory considerations will be crucial as organizations move from stealth adoption to formalized AI integration. Ultimately, understanding the interplay between human cognition and AI will be key to shaping a workforce that is not merely reactive to technological shifts but actively co-evolves with them.

9. Conclusion

This study aimed to investigate the stealth adoption of Generative Artificial Intelligence (GenAI) in the workplace and its cognitive and organizational implications. By applying the Cognitive Mediation Networks Theory (CMNT), we examined the emergence of Sophotechnia as a novel cognitive mode that reflects AI-mediated reasoning. Utilizing data from 576 professionals in Recife's Metropolitan Region, we analyzed how sociodemographic and psychological factors influence the development of Sophotechnia and how its presence correlates with job performance, career advancement, and workplace satisfaction. The study also explored the discrepancy between individual AI adoption and formal organizational implementation, highlighting a significant gap in corporate AI strategies.

The findings obtained are in agreement with the notion that Sophotechnia is a cognitive trait that is closely related to Hyperculture and developed by experience with GenAIs. Furthermore, individuals who exhibited higher levels of Sophotechnia were observed to achieve superior job performance, experience greater job satisfaction, and advance more quickly in their careers. Despite this, a substantial proportion of organizations have yet to formally integrate GenAI into their workflows, leading to a phenomenon where employees leverage AI independently to gain competitive advantages.

The results found suggest that, at least in the context of the Metropolitan Region of Recife, in Pernambuco, Brazil, it is likely that a considerable portion of an organization's processes and productivity is driven by the spontaneous and stealth use of GenAIs by their workers. This would imply that:

- Public and private organizations are currently far more dependent on GenAIs than they might know, with ignorance of which companies provide them and, therefore, of what might their strong points and shortcomings be, as well as their availability of service;
- The most productive workers are unmonitored and, thus, unmanaged, methods and procedures in their work, possibly leading to untapped potential for an even higher level of productivity but also to potential safety issues and even ethical breaches regarding information disclosure;
- Sophotechnia is an important criterion for personnel selection, as well as a skill to be

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fostered through training and development, is being neglected or overlooked;

- Plans for the formal adoption of GenAIs in organizations are often being made and implemented without knowledge of the skills, tools, and processes already present and in use;
- It is unknown how much Sophotechnia adds to productivity simply through the skill in using important new tools versus it being also a novel mindset and cognitive capacity that has repercussions even when one is not directly using GenAIs.

It would appear that that AI-mediated cognition is quietly reshaping workplace hierarchies and professional competencies, emphasizing the need for organizations to acknowledge the reality of stealth AI adoption and to implement structured strategies for integrating the new technology in a way that aligns with both employee development and corporate governance.

Future research should focus on the longitudinal evolution of Sophotechnia, examining how continued exposure to AI impacts cognitive development over time, along with the use of a broader range of more precise instruments and more objective measures of productivity and performance. Additionally, further studies should explore the ethical and regulatory implications of stealth AI adoption, particularly concerning transparency, bias, and workforce equity. Expanding this research to diverse geographical and organizational contexts would provide a broader understanding of how AI is reshaping professional landscapes worldwide.

Authors' Contributions

All authors equally contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

Not applicable.

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