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Neuroscience tools at work: approaches to use across the employee lifecycle and future research agenda

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Abstract

Purpose – Neuroscience tools offer new frontlines to understand areas of human behavior that are so far unexplored. However, the types and scopes of such NTs are currently known only to a limited number of Human Resource Management (HRM) innovators and scholars. In our study, we investigate and report on the approaches to use NTs across employee life cycle phases, including acquiring, developing, and retaining.

Design/methodology/approach – The review was conducted according to the guidance for scoping reviews and reported following the PRISMA-ScR guidelines.

Findings – Our results indicate that the application of NTs across the employee lifecycle is a growing, interdisciplinary field. However, we found a few empirical studies with existing applications primarily concentrated on the employee development and retention phases. The findings provide an overview of various NT applications and their scope, shedding light on the sectors where these technologies are most prevalent. Additionally, we identify gaps in the literature and, based on these, propose a comprehensive research agenda for future explorations.

Originality/value – The study offers the first literature review on this topic and establishes an agenda for future research.

Keywords Neuroscience, Neuro human resource management, Employee life cycle, Technology

Paper type Literature review

Introduction

The field of Human Resources Management (HRM) has historically exhibited stability in its concepts, methods, and tools. However, the rapid integration of advanced technologies and big data into organizational processes has introduced profound transformations. Among these, neuroscience tools (hereinafter NTs) have emerged as a novel approach to understanding employee emotions, behavior, decision-making, and performance by studying their brain functions and structures to cognitive processes (Poeppel *et al.*, 2020), effectively addressing the long-standing question: "What's going on in this person's head that makes them think or act the way they do?" (Waldman *et al.*, 2017) both metaphorically and realistically.

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Technology has long played a role in HRM, primarily through legacy systems like Human Resource Information Systems, which store and analyze self-reported employee data. However, a new generation of advanced tools, including Artificial Intelligence (AI) (Malik *et al.*, 2023) and, more recently, NTs, is transforming organizational behavior (Waldman *et al.*, 2017) and HRM (Petrou and Rammata, 2021). NTs encompass advanced devices capable of monitoring vital physiological functions (e.g. heartbeat, respiration rate, blood pressure) and reflexive responses (e.g. gaze fixation, pupil dilation, facial expressions), providing valuable insights into individuals' impressions, reactions, and emotional states when exposed to specific stimuli (Alvino *et al.*, 2020). In addition, NTs enable the measurement of brain activity in real time. These tools thus offer previously unavailable insights into decision-making, team dynamics, work performance, information processing, empathy, workload, and engagement. Despite the growing adoption of NTs–such as SmartCap (www.wencomine.com), CogC2 (www.lockheedmartin.com), AttentivU by MIT, and Emotiv (www.emotiv.com) - their use remains largely unfamiliar to most HRM scholars and practitioners.

Integrating NTs into HRM sits at the intersection of neuroscience (the study of neural systems), organizational behavior, psychology, and information technologies. Conceptually, the rise of neuroscience-related methods in organizational settings is driven by a need to refine our understanding of constructs such as management qualities, decision-making, and employee engagement (Waldman *et al.*, 2017). Methodologically, NTs allow for the collection of physiological and neurophysiological data that address the limitations of traditional organizational management and research methods, such as retrospective surveys, by providing real-time insights (Waldman *et al.*, 2017). Practically, this aligns with broader workforce trends: for instance, the UK's National Health Service (NHS) estimates that one in seven people are neurodivergent, encompassing conditions like autism, ADHD, and dyslexia. Reflecting this, UK employers increasingly recognize neurodiversity as a "competitive advantage," with job advertisements mentioning ADHD and autism rising sixfold since 2019 (Borrett, 2024). However, despite the growing awareness, 37% of FTSE 350 board directors and HRM professionals still describe their understanding of neurodivergent employees as "average" or "poor" (Saker-Clark, 2024).

Thus, calls to integrate HRM with neuroscience have been growing, with scholars advocating that such an approach could significantly enhance our understanding of employee behaviour and management strategies (Waldman *et al.*, 2019). NTs offer a diverse range of tools for studying workplace behaviors, including physiological measurements (e.g. respiration rate, heartbeat, blood pressure) and reflex-based assessments (e.g. facial expressions, gaze fixation, and pupil dilation). More advanced NTs, such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG), provide real-time measurements of brain activity, shedding light on complex cognitive processes relevant to HRM. For example, research on leadership has demonstrated that EEG readings can help predict adaptive decision-making and leadership complexity (Hannah *et al.*, 2013).

Discussions about NT applications in organizational settings have gained increasing traction (Farahany, 2023), with companies exploring their potential to enhance employee focus, information processing, and workplace interactions (Fitzell, 2021). Microsoft, for instance, conducted a study using EEG to monitor stress levels during tasks, concluding that employees require reset intervals between meetings to maintain productivity (Rogers, 2021). However, alongside their potential benefits, NTs raise ethical and practical concerns, particularly regarding the ethics of using such technologies (Stanton *et al.*, 2017), for instance, regarding the awareness and accommodation of neurodiversity in HRM processes. Employers may face legal and ethical challenges if HRM practices, such as hiring assessments, fail to account for neurodivergent employees' needs (Saker-Clark, 2024).

Despite the growing interest in NTs, their application in HRM remains less understood than in other relevant organizational disciplines, such as organizational behaviour (Waldman *et al.*, 2017), marketing (Alvino *et al.*, 2020), and strategic management (Kaur, 2024). To the best of our knowledge, there is currently no comprehensive literature review that synthesizes and critically examines the application of NTs in relation to HRM. Consequently, the field remains fragmented: HRM practices involving NTs operate without a solid evidence base, while scholarly research lacks an overview of the "state-of-the-art" and clear directions for future inquiry (Siddaway *et al.*, 2019).

To address this gap, this paper systematically gathers, maps, and analyzes the existing applications of NTs aimed at understanding employees. Our approach provides a structured synthesis of the evidence, enabling us to evidence existing knowledge and highlight research gaps. To organize this analysis meaningfully, we map NT applications across the different phases of the Employee Life Cycle (ELC), including employee acquisition, development, and retention phases (Malik *et al.*, 2023). By integrating and synthesizing this knowledge, we strive to provide clear guidance on how NTs are currently framed in discussions related to HRM and how they can be effectively and ethically embedded into workforce management practices. This contribution is particularly critical given ongoing debates about the utility and ethics of NTs, which, in some cases, are framed as "trust machines" (Farahany, 2023).

To achieve this objective, we conducted a scoping literature review on NTs in organizations across ELC phases. The following section overviews NTs, their types, and main characteristics, outlines ELC phases, and introduces an integrated framework that connects these. It is followed by a detailed description of our review methodology, our findings, and their discussion, concluding with suggestions for future research.

Theoretical background

In organizational settings, NTs have been increasingly utilized to analyze consumer behavior and their decision-making processes, complementing traditional marketing techniques such as interviews and self-reports (Alvino *et al.*, 2020). Historically, NTs have been categorized into *physiological* and *neurophysiological* tools, depending on the type of measurements collected (e.g. eye movements, brain activity) (Ramsøy, 2019).

Physiological NTs can measure voluntary and involuntary reflexes, including fixating on and tracking visual stimuli or analyzing facial expressions, while *neurophysiological* NTs focus on brain activity and cognitive processes. Recognizing the evolving landscape of NTs, Alvino *et al.* (2020), in their literature review, extended this classification by introducing *behavioral* NTs, which are widely employed to extract critical insights into consumer behavior.

Recent reports indicate that organizations are expanding the application of NTs beyond consumer research to study employee behavior, a trend expected to grow rapidly shortly. Traditionally, technologies that collect, store, and analyze employee data have evolved from Human Resource Information Systems to People Analytics and, more recently, with the advent of AI, into AI-augmented HRM (Tursunbayeva, 2024). The integration of these technologies into HRM practices is typically explained through their mapping across employee lifecycle (ELC) phases (e.g. Khan, 2021) - comprising *acquiring*, *developing*, and *retaining* human resources, which outline how employee data can be utilized throughout or inform various HRM processes.

Accordingly, we draw on these frameworks to illustrate how NTs are gradually being integrated into the study and practice of HRM. To this end, we begin with a brief overview of both NTs, the cognitive processes they assess, and discuss their characteristics. Then, we provide an overview of the various phases of the ELC to help the readers understand different stages employees pass throughout their journey within organizations. Finally, we present our conceptual framework, outlining how we envision the integration of NTs within the ELC.

Neuroscience tools and their classifications

Over the years, numerous classification systems of NTs have been proposed (Alvino *et al.*, 2020; Lim, 2018; Ramsøy, 2019; Stasi *et al.*, 2018). For this study, we adopt the most recent and comprehensive classification framework Alvino *et al.* (2020) developed to analyze consumer neuroscience tools, offering a robust foundation also for analyzing NT in HRM.

Physiological tools. Physiological tools are designed to capture autonomous and spontaneous physiological responses that occur without conscious control. These include vital functions such as heart rate, blood pressure, and other key indicators of physiological activity. Below, we provide an overview of the most widely used physiological NTs (see also Table 1).

Table 1. NT and their characteristics*

Category	Tool	Cost	Availability	Accessibility	Pros	Cons
Physiological	ECG (Sattar and Chhabra, 2025)	10K€	High	High	Portable	Sensitivity to motion
	GSR (Sharma *et al.*, 2016)	100 – 2K€	High	High	Portable, low cost	Limited number of applications, needs to be integrated with other tools
	Facial Expression Recognition (Samadiani *et al.*, 2019)	10k€	High	High	Portable	Low individual usefulness
	ET (Kasneci *et al.*, 2024)	From 100–30K€	Medium	High	Portable	Not compatible with contact lenses or people having long eye lashes
Neurophysiological	EEG (Biasiucci *et al.*, 2019)	From 500–35K€	Medium	High	Temporal resolution, portable (wearable/ wireless version)	Spatial resolution
	fNIRS (Pinti *et al.*, 2020)	50K€	Low	Low	Low sensitivity to motion artifact, portable	Spatial resolution
	fMRI (Pekar, 2006)	1M €	Low	Low	Spatial resolution	Temporal resolution, not portable
Behavioral	RT (Wong *et al.*, 2017)	0–1 K€	High	High	Cheap, portable	Context and subject specific, highly dependent on the device, on the stimulus or on the response

Source(s): Adapted by the authors from Alvino *et al.* (2020)

Electrocardiogram. An electrocardiogram (ECG or EKG) (Sattar and Chhabra, 2025) is a non-invasive tool that measures the electrical activity of the heart, enabling the extraction of key physiological parameters such as heart rate variability (HRV). HRV reflects heartbeat fluctuations over time and is an important indicator of autonomic nervous system activity (Mulcahy *et al.*, 2019). ECG is highly portable, and cost-effective, offering a good temporal resolution.

Galvanic skin response. Galvanic Skin Response (GSR) (Sharma *et al.*, 2016), also referred to as Electrodermal Activity (EDA), measures fluctuations in skin conductance in response to sweat secretion (Nagai *et al.*, 2019). The physiological signal reflects changes in autonomic tone (skin and subcutaneous tissue), providing insights into emotional states. While GSR is highly portable and relatively easy to use, it has a low temporal resolution and is highly susceptible to artifacts. A key limitation of GSR is its inability to determine the specific nature or valence of an emotional response – it can only indicate variations in arousal without distinguishing between positive and negative affective states.

Eye tracker. An eye tracker (ET) system allows the measurements of eye position, movement patterns, and pupil dilatation (Kasneci *et al.*, 2024). ET technologies capture eye gaze direction and fixations on specific points within images or videos (Skaramagkas *et al.*, 2023). There are two primary types of ET devices: fixed systems, which are integrated into external displays such as computer monitors, and wearable devices, designed as glasses equipped with cameras. ET is portable and cost-effective. However, its effectiveness can be limited for individuals wearing contact lenses or those with long eyelashes, which may obstruct accurate eye-tracking measurements.

Facial expression recognition. Facial expressions serve as crucial indicators of emotional states (Revina and Emmanuel, 2021) and are generally classified into two categories: observable (externally visible expressions) and unobservable (subtle muscle activations) that can be analyzed through two primary methods. The first is facial electromyography (fEMG), which measures voluntary and involuntary facial muscle movements that reflect emotional responses to stimuli. The second is facial expression recognition software (FERS), which records and analyzes facial expressions using decision classifiers (Cha *et al.*, 2020). Facial expression recognition (Samadiani *et al.*, 2019) is portable and relatively cost-effective in both its versions (fMEG, fERS). However, its standalone use is limited, as it does not provide insights into deeper cognitive processes such as attention, memory, and sensory perception.

Neurophysiological tools. Neurophysiological tools enable the direct measurement of brain activity, providing insights into cognitive and neural processes. Similar to physiological tools, they capture spontaneous physiological responses; however, they are specifically designed to assess the functions of the central nervous system. Below, we present an overview of some of the most widely used neurophysiological NTs (see also Table 1).

EEG. EEG is a non-invasive NT (Biasiucci *et al.*, 2019) that measures brain electrical activity by detecting minute minor electric potential differences between two electrodes placed on the scalp (Louis *et al.*, 2016). While traditional EEG systems used in diagnostic settings are typically wired, recent advancements have led to the development of wireless and portable versions, expanding the flexibility and accessibility of EEG technology. One of the key strengths of EEG is its excellent temporal resolution, capable of capturing rapid brain activity in the order of milliseconds. However, it is limited by relatively low spatial resolution, as the electrical activity detected is primarily generated in the cortex. Additionally, the scalp, cerebrospinal fluid, and dura mater act as filters for high-frequency signals, thereby constraining the ability of EEG to capture more profound brain activity.

fNIRS. Functional near-infrared spectroscopy (fNIRS) is a non-invasive brain imaging technique (Pinti *et al.*, 2020) that provides real-time measurements of the relative concentrations of oxyhemoglobine (oxy-Hb) and deoxyhemoglobine (deoxy-Hb) during brain activity (Ernst *et al.*, 2013). As a subject engages in a task, brain activity increases in the relevant cortical regions, reflected in the dynamic changes in the oxy- and deoxy-Hb ratio. fNIRS is known for its firm temporal resolution, enabling the monitoring of rapid fluctuations in brain activity. However, its spatial resolution is limited, making it challenging to assess cognitive processes that involve deeper brain structures.

fMRI. fMRI is a highly effective brain imaging method (Pekar, 2006) that measures the Blood Oxygenation Level-Dependent response, capturing changes in blood flow related to variations in the relative concentrations of hemoglobin (oxy- and deoxy-Hb) (Bandettini *et al.*, 1992). These changes occur due to cognitive tasks or stimuli presented to the subject (task-related fMRI) or as spontaneous brain activity during rest in the absence of a stimulus (resting-state fMRI). fMRI has a high spatial but low temporal resolution. While non-invasive and capable of measuring a broad array of cognitive phenomena, fMRI's high cost, limited accessibility, and typical use in clinical or specialized research settings reduce its widespread availability.

Behavioral measurements. Neuroscience research also draws valuable insights from traditional methodologies such as surveys, observations, and self-reports (Alvino *et al.*, 2020). While these approaches are complementary, they establish a baseline that enhances the accuracy of neuroscience measurements, particularly when identifying individual preferences, biases, or attitudes on specific topics. Another form of behavioural measurement is reaction time (RT), which offers valuable information about a subject's feelings, attitudes, and various mental states (Wong *et al.*, 2017). RT is measured by recording the intervals between the presentation of a stimulus and the subject's voluntary response (Luce, 1991). Traditionally, RT is conceptualized within a Stimulus-Processing-Response framework, where the brain's processing capacity mediates the relationship between the stimulus presentation and response execution, encompassing stimulus identification, response selection, and programming (see also Table 1). RT are also used in tests such as the Implicit Association Test (IAT), which measures implicit biases by comparing RTs for categorizing congruent associations (e.g. disease → negative), which are processed more rapidly, against incongruent associations (e.g. disease → positive), which require slower, effortful processing to override automatic biases (Healy *et al.*, 2015).

Employee life cycle model

The ELC encompasses all phases of interaction between an organization and its employees, ranging from building an employer brand that attracts the right talent to acquiring, onboarding, developing, managing, retaining, and even recovering talent (Schiemann, 2014). HRM plays a crucial role in managing the ELC, and the effectiveness of this management directly impacts the success of HRM investments (Schiemann, 2014).

Scholarly and industry frameworks have outlined various stages of the ELC, from initial contact to eventual exit. Literature on ELC could be broadly categorized into three key areas. First, there are frameworks detailing the different phases of the ELC and their importance for labour retention and talent optimization (Schiemann, 2014). These phases include introduction, growth, maturity, and decline (Smither, 2003). Secondly, studies are focusing on HRM practices aligned with these ELC phases, exploring how different strategies support attraction, recruitment, onboarding, training, employee development, retention, and separation (Malik *et al.*, 2023; Xiang *et al.*, 2023). This approach is widely adopted in academic research and practical training programs, such as CIPD's "Managing the ELC Essential Insights." Lastly, some publications explore the integration of advanced technologies, like AI, throughout the ELCs (e.g. Khan, 2021; Nyberg *et al.*, 2025). Malik and colleagues (2023) highlight how AI-assisted HRM can strategically enhance HRM across all phases of the ELC, which they propose include Acquiring, Developing, and Retaining, with the scope and impact of AI varying depending on the phase of adoption.

Drawing on the well-established in HRM literature ELC model, and Malik and colleagues' (2023) recent and concise framework, we adopt it to analyze the deployment of NTs in employee acquisition, development, and retention phases. The *acquisition* phase involves practices and processes focused on identifying, attracting, and selecting candidates. The technological tools for this phase can comprise applications like applicant tracking, CV parsing, credentialing, recommender systems, and deployment systems (Khan, 2021). The *development* phase plays a crucial role in strengthening employees' skills, knowledge, and competencies, equipping them to perform their roles efficiently and supporting their professional growth (Bell and Moore, 2018). The activities at this phase are designed to harness human potential, boost individual job performance, and improve overall organizational productivity and success (Bell and Moore, 2018). The technological tools that can support this phase cover applications such as integrated learning management systems, certification and assessment platforms, and career renegotiation tools (Khan, 2021). The *retention* phase is a key component of HRM, involving various activities aimed at helping employees achieve organizational objectives and perform at their best. This includes defining clear performance standards, delivering ongoing feedback, carrying out evaluations, and creating strategies for continuous performance enhancement (Tursunbayeva, 2024). The technology applications that can be used at this phase comprise those for rewards, performance coaching, and personalization (Khan, 2021).

Conceptual framework

To conclude, we conceptualize an integrated framework of NTs applications across different ELC phases. This serves as a basis for our literature review and enables a systematic examination of how NTs can be leveraged to enhance HRM practices and decision-making processes. More importantly, by merging perspectives from neuroscience and HRM, we capitalize on the strengths of each field while contributing to interdisciplinary knowledge advancement.

This integrated framework aligns with the previously presented classification of NTs by Alvino *et al.* (2020) with the phases of the ELC (see Figure 1). A critical aspect of our framework is the ethical and practical implications of applying NTs to HRM, particularly given that employees, unlike consumers, cannot often opt out of NT-driven assessments (Tursunbayeva *et al.*, 2018). This distinction underscores the need for sensitive and ethically responsible approaches to NT deployment in workplaces (Farahany, 2023), ensuring transparency, employee autonomy, and organizational accountability.

Finally, our integrated framework can serve as a foundation for a new stream of research that explores the intersection of neuroscience, technologies, HRM, and ethical considerations in managing workforce behavior. This emerging domain can redefine how organizations approach employee monitoring, engagement, and decision-making, promoting more responsible and evidence-based HRM practices.

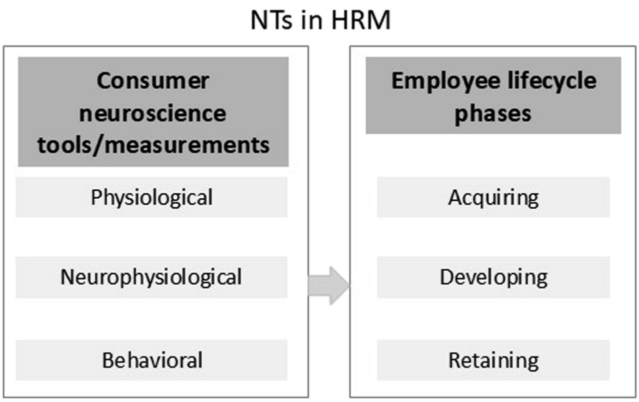

Figure 1. Research model. Source: Created by authors based on Alvino *et al.* (2020) and Malik *et al.* (2023)

Methodology

This review was conducted following the guidance for scoping reviews of Arksey and O'Malley (2005) and is reported following the PRISMA-ScR guidelines (Tricco *et al.*, 2018). Scoping review methods are suitable for exploring emerging fields where relevant evidence and information are accumulating (Arksey and O'Malley, 2005). As the application of NT in organizations and their research is an emerging topic, we adopted this approach in our study. The process of conducting scoping reviews typically involves five distinct stages, which are outlined below.

Identifying the research question

The primary objective of this study is to investigate the potential and approaches for utilizing NTs to gain insights into employee behavior and their effective management within organizational contexts. Thus, we respected the demands of organizational behavior and HRM disciplines to understand employees and advise them on how to manage them respectively (Buchanan and Huczynski, 2019; Kaur, 2024).

Identifying relevant data

The literature search was conducted on 17/11/2022 in the Web of Science international literature database. We selected this specific database for the following reasons: 1. It covers 99.11% of the journals indexed in Scopus (Singh *et al.*, 2021); 2. It includes a wide variety of publication formats; 3. It has broader temporal coverage than Scopus; and 4. It offers consistent returns for the same query used with similar search parameters over time (Kaur, 2024). Following the best practices suggested in previous relevant research to develop search queries (Kaur, 2024), we iteratively developed our search query comprising ("Organisational behaviour" OR "Organisational behavior" OR "Organizational behaviour" OR "organizational behavior" OR "Human Resources" OR Management OR Leadership) AND technology AND neuroscience) keywords. We also manually searched the references of the articles included in the final analysis. This was done to ensure that relevant studies that might not have been returned from the Web of Science were also considered (Yeager *et al.*, 2014).

Data selection

This inclusive search query brought 1811 returns. All outputs were stored in Covidence online software (www.covidence.org), where they were first checked for duplicates ($n = 22$) and then screened independently by two authors based on their titles and abstracts.

As shown in Figure 2, the initial screening of titles and abstracts focused on excluding clearly unrelated topics and texts not written in English. This phase was intentionally broad to minimize the risk of excluding potentially relevant studies, resulting in a preliminary selection of 271 records (see Figure 2). Full-text versions of these articles were then retrieved for a more detailed evaluation. During this stage, more stringent inclusion criteria were applied, with continued emphasis on language and topic relevance (Engel *et al.*, 2016; Hiebl, 2023). Specifically, only articles written in English and explicitly addressing the use or mention of neuroscience tools within HRM-related practices were included. The exclusion criteria for full-text screening were: Articles not written in English; Lack of relevance to the core topic (e.g. no substantive focus on neuroscience in HRM); Inaccessibility of the full text. This two-step approach ensured the inclusion of literature that was both accessible and closely aligned with the research objectives.

Thus, for an article to be included in the review, it needed to specifically address the application of NT for collecting or analyzing employee data in organizational management practices. The presence of a technology component was deemed essential for inclusion. Any uncertainties or ambiguities were discussed between the two authors until a consensus was reached. If there were unresolved disagreements, the third author was an arbitrator to resolve them.

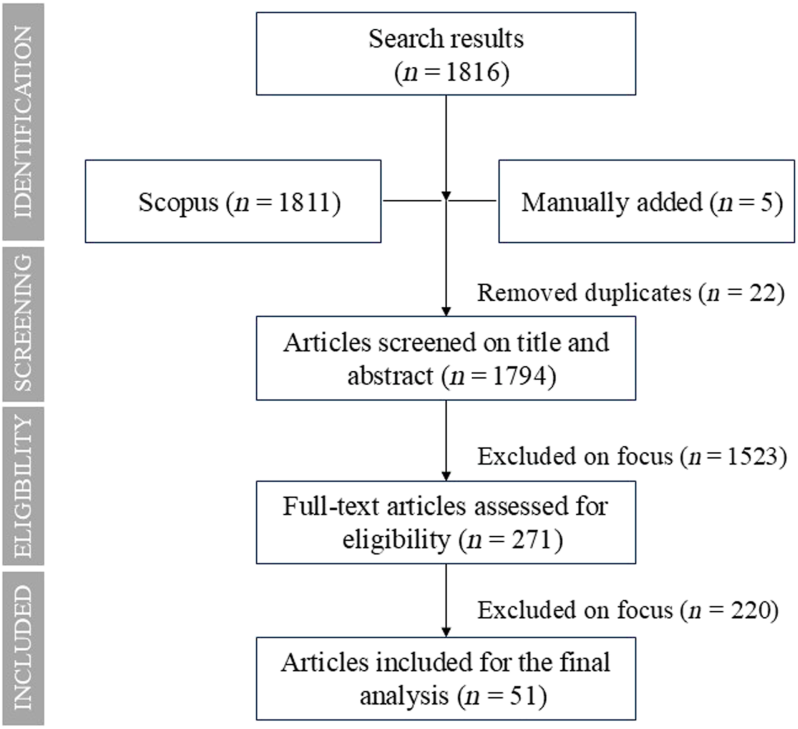

Figure 2. PRISMA flow chart. Source: Created by authors

Our final sample comprised 51 (see Figure 2 and Appendix 1), comparable to the sample size of similar studies in neuromanagement (e.g. Kaur, 2024).

Charting the data

All eligible articles were uploaded to the qualitative data analysis software ATLAS.ti (https://atlasti.com/), as it is a handy qualitative analysis tool, particularly for social science scholarly research (Hwang, 2008).

Initially, the coding involved charting the data following a deductive approach. Here, we organized NTs according to the three categories proposed by Alvino and colleagues (2020) and their applications for understanding employees in organizations according to the ELC phases, including acquiring, developing, and retaining (Malik *et al.*, 2023). While the coding framework provided structure to the data, the inductive coding approach was also employed to ensure that any important emerging themes were not overlooked or disregarded. These were coded openly and then organized into relevant emerging categories. For example, these revealed various approaches to the application of NTs across the ELC (see Table 2) and exposed additional categories of NT, including Transcranial Direct Current Stimulation (tDCS) and structural MRI (s-MRI) that were not considered in a recent review on consumer neuroscience (Alvino *et al.*, 2020).

Collating, summarising, and reporting the results

Firstly, we provide a descriptive analysis of the included studies, examining aspects such as their geographical distribution and the types of NT discussed. Secondly, we summarize and

Table 2. Results synthesis table

		Acquiring	Developing	Retaining	Other
Number of studies		8	21	22	4
Review/discussion papers		3	11	9	4
Empirical studies		5	10	13	0
NTs used in empirical studies					
Physiological	ECG			1	
	GSR/ Electrodermal activity/Skin conductance	1	1	4	
	ET		1	1	
	Facial Expression Recognition		1	1	
Neurophysiological	EEG	3	4	5	
	fNIRS		1	3	
	fMRI	1	2	2	
	MRI		1		
	tDCS		1		
Behavioral measurements	Reaction Time	1	1	2	
NT Applications/focus		Identity construction Candidate selection Refinement of the recruitment process	Assessment of leadership skills and traits Real time neurofeedback Evaluation and Tailoring of Training Programs Trainee Information Acquisition, Attention, and Engagement Assessment	Assessment of emotional states, mental and physical workload Identification and retention of organizational talent Team coordination, dynamics, information sharing, and decision-making Optimization of task allocation Identification of Counterproductive Work Behaviors (Team) Decision making Job profiling Emphasis on the Construction and Finance Sectors	Discussion papers that do not focus on a specific NT
Future research	Focus/Topics	Utilizing NTs for managing neurodiversity Ethical considerations of NTs use in HRM Convergent applications of NTs with other advanced technologies (e.g. AI) Acceptance and perceptions of candidates, employees, and managers regarding the use of NTs in organizations Competencies and skills needed to use NTs for HRM			
	Conceptual	Theoretically informed studies on NTs Exploring the evolution of organizational behavior and management theories in light of new insights from NTs			
	Empirical	Field experiments Implications of replacing or complementing traditional research methodologies with NTs Effective and ethical protocols for implementing and conducting experiments using NTs			

Source(s): Created by authors

present our findings on how NT can be used to understand employees and their behavior in organizations across ELC phases. Here, we always start by reviewing literature reviews and discussion papers first, followed by a presentation of the findings from empirical studies. To aid contextualization and interpretation, we discuss our findings alongside other relevant literature and real-world examples. Eligible articles identified with our search strategy are marked with an asterisk (i.e. *) in the References list to distinguish them from other sources.

Findings

Our final sample comprised 51 publications (see Appendix 1) comprising 26 empirical studies, 13 literature reviews, and 12 discussion articles. The articles were published in journals (or conferences) in different domains: neuroscience (e.g. Neuroscience Letters, European Journal of Neuroscience), organization and management (e.g. Organizational Research Methods), information system (e.g. MIS Quarterly), education (e.g. International Journal of Education in Mathematics, Science and Technology), and engineering (e.g. Journal of Computing in Civil Engineering). The majority of articles were published in neuroscience journals. The empirical research included was conducted in institutions worldwide: China ($n = 6$), Cyprus ($n = 1$), Japan ($n = 5$), France ($n = 1$), Italy ($n = 3$), Spain ($n = 1$), Taiwan ($n = 1$), UK ($n = 1$) and USA ($n = 7$). These classifications were based on the information stated by the authors themselves. Most of the articles analyzed were published since 2019 (see Figure 3).

Neuroscience tools used across employee life cycle phases

Our findings identified several categories of NTs that can be used to gain insights into organizational employees. These included *physiological* NTs such as ET, GSR/EDA, ECG, and Facial Expression Recognition. We also identified *neurophysiological* NTs, including fNIRS, EEG, and fMRI (e.g. Balconi and Fronda, 2020). Finally, other tools not included in the above-mentioned categories, such as t-DCS (Hao *et al.*, 2021) and s-MRI, have emerged in our findings (Kokubun *et al.*, 2020). Unlike fMRI, which focuses on investigating brain function, sMRI uses advanced neuroimaging techniques to extract structural measures from MRI images, such as cortical thickness and intracranial volume. This makes sMRI especially valuable for studying the brain's structural composition and tissue integrity (Kokubun *et al.*, 2020).

Transcranial Direct Current Stimulation (tDCS) is a non-invasive brain stimulation technique that can modulate or interfere brain activity by applying a weak electrical current

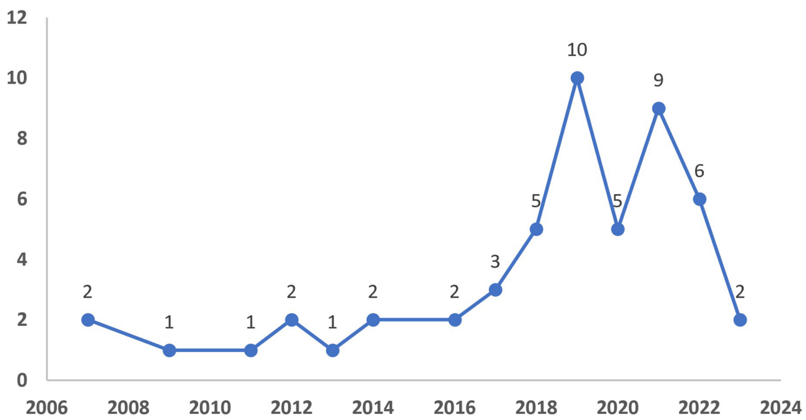

Figure 3. Analysis of the publication year. Source: Created by authors

(measured in milliamperes) to regulate cortical neuron function, promoting specific cognitive or functional outcomes (Hao *et al.*, 2021; Pisoni *et al.*, 2018). While sMRI shares the same advantages and limitations as fMRI, such as high spatial resolution, tDCS is portable, non-invasive, and relatively low-cost, though it is limited by its lower spatial resolution (Kokubun *et al.*, 2020; Esmaeilpour *et al.*, 2020).

Approaches to use neuroscience tools across employee life cycle phases

Acquiring. NTs can be used to enhance employee acquisition by strengthening a company's image and identifying ideal candidates. The literature review of Kasperiuniene and Zydziunaite (2019) suggests that NTs contribute to identity construction on social media by integrating social and physical aspects of the human body. Expanding on this, Lupton (2013) explored the concept of the "quantified self," where individuals track and share biometric data, viewing technology as an active participant–a "friend" or "colleague"- that continuously reshapes their self-perception. Kasperiuniene and Zydziunaite (2019) further argue that mobile devices foster deeper user relationships by monitoring and presenting biometric data, while Hossain and Muhammad (2016), expanding on Lupton's (2013) work, examined how NT-based solutions, such as ECG monitoring or signal watermarking, enhance self-tracking. However, overall, Kasperiuniene and Zydziunaite (2019) also emphasize the need for further research on how smart devices like smart watches shape professional identity.

NT can also improve the accuracy of candidate selection. Sandoval and Castillo (2021) use a bibliometric search and documentation analysis to understand the effect of neuroscience in HRM and conclude that neuroscience-based software such as Neuropsychology, Affectiva, and FACS can enhance hiring decisions by identifying candidates best suited for specific roles.

Meanwhile, Zito *et al.* (2021) demonstrate the potential of EEG in refining the recruitment process. Their exploratory study identified the most stressful interview phases (job explanation and remuneration) and the most engaging ones (company and career progression presentation). Thus, they suggest that by incorporating EEG and GSR data, organizations can pinpoint key stressors and engagement drivers in hiring practices, making recruitment processes more candidate centric.

Developing. Several literature reviews have explored the challenges and opportunities of applying NT tools in this ELC phase. NTs can aid in designing, identifying, and evaluating optimal coaching styles (Waldman *et al.*, 2017; Waldman *et al.*, 2019), assessing individual and team learning capabilities (Sandoval and Castillo, 2021), improving work safety and fatigue management (Caldwell *et al.*, 2019), and enhancing leadership effectiveness (Waldman *et al.*, 2017; Caldwell *et al.*, 2019; Gocen, 2021; Sandoval and Castillo, 2021). For instance, Balconi and Fronda (2020) suggests that the use of various neurophysiological measurements using tools such as fNIRS, EEG and fMRI has enabled the detection of neural correlates between two or more individuals engaged in different social interaction processes.

The literature reviews of Lattanzi *et al.* (2016) and Gocen (2021) focused on neural activations linked to leadership behaviour, emphasizing how brain activity influences employee-manager dynamics and interpersonal relationships. NTs play a crucial role in identifying and assessing leadership skills and traits–such as communication, confidence, resilience, and responsibility aversion – essential for motivating teams and improving overall performance (Lattanzi *et al.*, 2016). Effective leaders not only regulate their own emotions but also recognize and manage the emotions of their teams (Gocen, 2021). Gocen (2021) further argued that understanding the biological foundations of learning (e.g. nutrition, sleep, mindfulness) allows leaders to implement evidence-based strategies that enhance managerial effectiveness and employee development.

Similarly, Waldmann *et al.* (2017 and 2019) highlighted real-time neurofeedback for training-specific competencies, such as entrepreneurial opportunity evaluation and behavioral self-regulation. They underscore two key contributions of NTs to leadership development. First, EEG studies have been used to analyze emotional management and communication skills, which are critical aspects of effective leadership. Waldman *et al.* (2011) discuss that leaders who conveyed socialized, visionary statements exhibited distinct neural patterns in the right frontal brain regions and were perceived as more inspirational. This suggests a bidirectional relationship between brain activity and leadership style, where different neural patterns may shape or be shaped by leadership approaches. Second, the authors explored how NTs can identify and mitigate the effects of emotional distortion in organizations, particularly in relation to corporate psychopathy. Psychopathic individuals in leadership positions pose risks to organizations and colleagues, with research indicating a growing prevalence among senior executives. Brain imaging could aid early identification of psychopathic traits, while neurofeedback training may help mitigate dark triad tendencies, thereby improving workplace dynamics and performance (Waldman *et al.*, 2011).

Beyond leadership development, neuroscience data can help organizations tailor training programs to maximize engagement or minimize burnout (Kokubun *et al.*, 2020). In strategic planning, cognitive processing of information is crucial, and some empirical studies (Ceravolo *et al.*, 2019; Li *et al.*, 2023) show that NTs such as ET can provide insights into cognitive attention mechanisms during information acquisition tasks such as reading.

The findings indicate that EEG, alone or in combination with other NTs, can be effectively used to assess various aspects of employee training and learning. For instance, Wang *et al.* (2021) demonstrate that EEG is a valuable tool for evaluating employee knowledge acquisition and emotional engagement in training. Their study also reveals how EEG monitoring of team members' attention during problem-solving tasks reveals trends in attention allocation over time. Notably, they found that speaking durations influence attention distribution within teams: individuals' attention becomes more dispersed, as time progresses. These insights can inform time management strategies and improve collaborative problem-solving. Wang *et al.* (2022) further suggest that tools like facial expression recognition, in combination with AI, can establish an evaluation model for industrializing worker training.

EEG, combined with GSR/EDA, has also been used to assess emotional engagement in autonomous online learning. Rejón-Guardia *et al.* (2019) measured cognitive load (mental workload), attention, memory processing, and emotional responses while completing quizzes on a learning platform. Their findings emphasize the importance of minimizing cognitive overload in digital learning environments, favouring simplicity to enhance attention, engagement, and memory retention.

Retaining. NTs demonstrate potential in employee retention, concentrating on keeping talent through rewards, performance coaching, and personalization. Research indicates that physiological (e.g. heart rate variability) and neurophysiological measurements (e.g. electrical brain activity) can assess mental and physical workload, fatigue, attention, vigilance, and emotional states, including stress, in different environments (Dimoka *et al.*, 2012; Caldwell *et al.*, 2019; Waldman *et al.*, 2019; Riva *et al.*, 2021). For instance, the literature review of Caldwell *et al.* (2019) highlights the importance of fatigue monitoring, particularly in environments where mental and physical endurance is critical, such as driving (Caldwell *et al.*, 2019). NTs can help explain the biological basis of fatigue and serve as a tool for its detection. Implementing countermeasures at home or in the workplace can encourage employees to adopt healthier lifestyles, ultimately reducing performance and safety risks (Caldwell *et al.*, 2019). Similarly, Dimoka *et al.* (2012) suggest that NT provides valuable insights into cognitive strain and emotional responses under high mental workload conditions. Cognitive neuroscience research highlights the prefrontal cortex as essential for managing tasks requiring high information processing and working memory. The dorsolateral prefrontal cortex (DLPFC) is mainly involved in complex cognitive functions, such as problem-solving. However, as cognitive load increases, DLPFC activation follows an inverted-U pattern–initially rising with task difficulty but decreasing when cognitive overload leads to disengagement. Excessive cognitive load can also activate emotional brain regions, particularly in response to frustration, further influencing cognitive performance and well-being. Hence, understanding these factors can inform organizational strategies for employee well-being and safety.

Beyond fatigue and cognitive load, NTs can also be leveraged to assess how talent can be identified and retained at individual and group levels. Waldman *et al.* (2019) note that NTs can help to identify entrepreneurial talent by revealing neural markers of successful entrepreneurs, particularly in opportunity evaluation (Waldman *et al.*, 2019). Hałgas *et al.* (2023) examine how NTs tools can be used to explore team coordination dynamics and their impact on team functioning and performance. Their review highlights that coordination dynamics reflect cognitive and effective team states, influencing creative processes and overall team performance. Factors such as team size and co-presence affect synchrony, with larger teams showing greater physiological coordination, mainly through skin conductance and cardiovascular activity. The study suggests that NTs offer a promising avenue for real-time assessment and feedback, moving beyond post-task debriefings. Advancements in EEG and unobtrusive sensors may further enhance real-time monitoring, supporting teams in dynamic environments. Similarly, Riva *et al.* (2021) also conceptualized using EEG to study brain and cognitive processes in teamwork distribution.

Empirical studies have focused on the application of EEG as a monitoring tool, particularly in the construction sector (Chong *et al.*, 2022; Saedi *et al.*, 2022; Wang *et al.*, 2022). Concerning job design, EEG has been discussed for optimizing task allocation among construction workers to address workload imbalances (Saedi *et al.*, 2022). Kumar and Raghavendran (2013) suggested that understanding employees' emotions through NTs can reveal intrinsic drivers of performance and engagement, leading to more meaningful work.

FMRI has been used to identify counterproductive work behaviors and to understand managerial effectiveness in recognizing employee emotions (Balconi and Fronda, 2020; Kim and James, 2015; Waldman *et al.*, 2017). Additionally, fMRI has been used to explore gender differences in neurological responses to justice stimuli, aiding in creating fair work environments (Dulebohn *et al.*, 2016).

Other NTs, such as fNIRS, have demonstrated utility in studying decision-making processes and team dynamics. Shimokawa *et al.* (2012) used this NT to study how individuals evaluate investment decision-making in financial systems, as well as engineering cognition and processing information (Shealy and Hu, 2018). Similarly, Liu *et al.* (2021) used fNIRS to measure fronto-temporal activation in groups of nine participants during a drum-beating task to analyze shared neural synchrony and team-wide attention and information sharing. Their findings highlight the left temporoparietal junction as a key contributor to team performance, emphasizing the importance of efficient information exchange among team members. This supports the shared mental models theory, which posits that coordinated understanding enhances team dynamics.

Physiological tools, like GSR, also play a role in workplace assessments. For instance, Leger *et al.* (2014) used GSR to investigate differences in emotional responses between expert and novice users of an enterprise resource planning system in a decision-making context. Similarly, GSR has been applied to explore the impact of emotional states on construction workers' ability to recognize safety hazards (Chong *et al.*, 2022).

The value of NTs is also highlighted for job profiling. For instance, Aricò *et al.* (2019) illustrated how integrating EEG with behavioral and subjective assessments for implementing pre-operational activities (e.g. design process) can provide a high-resolution evaluation of mental workload in operational settings, surpassing traditional methods like questionnaires. EEG provides real-time data, enabling assessment of workload fluctuations during specific tasks, identification of critical points, and optimization of human-machine interaction. Additionally, GSR effectively detects psychophysiological activation, serving as a powerful, non-invasive tool for evaluating human engagement. Integrating neurophysiological measures with behavioral and subjective assessments enhances accuracy, supporting a more comprehensive evaluation of new technologies and their solutions, ensuring better adaptation and efficiency in operational environments.

Finally, Kalgotra *et al.* (2019) contributed to this understanding by using EEG to record brain waves, revealing how workplace technologies influence the cognitive functions of knowledge workers. Their findings pointed to a complex relationship where technology use could simultaneously increase task completion rates while potentially diminishing task performance, underscoring the nuanced effects of technological environments on employee cognition.

Generic. Several discussion papers (Healy *et al.*, 2015; Klein and Potosky, 2019) and literature reviews (Parincu *et al.*, 2020; Vom Brocke *et al.*, 2020) examine the application of NTs in HRM in general. These, surprisingly, do not provide a clear definition of NTs for HRM or neuro HRM or establish its conceptual boundaries, unlike previous studies on advanced technologies in HRM, such as People Analytics (Tursunbayeva *et al.*, 2018) , AI-assisted HRM (Malik *et al.*, 2023), and studies on the use of NTs in leadership (Rock, 2006) or management (Zito *et al.*, 2021).

Discussions

Our results indicate that the topic of applying NTs across ELC is highly interdisciplinary, as scholars from disciplines ranging from neuroscience to information technologies and management discuss it. We also see that the interest in applying NTs to understand employee behaviour has particularly grown in the last four years. Our review also reveals that there is still little empirical evidence on using such tools across the ELC, as many existing studies are reviews or discussion papers.

Most of the analyzed studies focused on the retention and development phases of the ELC, with fewer studies addressing the acquisition phase. Additionally, some literature reviews and discussion papers explored the broader application of NTs in HRM. This is surprising, as for instance, most applications of AI for HRM focused on this phase (Tursunbayeva, 2024), labelling them as “the most immediately valuable opportunity with the least amount of risk” (Nyberg *et al.*, 2025). The results also revealed ten primary neurophysiological, physiological, and behavioral NTs that can be used to understand employees (see Table 2). EEG emerged as the most diffused neurophysiological tool, which is also in line with previous studies on consumer neuroscience (Alvino *et al.*, 2020; Zito *et al.*, 2021). For physiological tools, the most popular was GSR/Electrodermal activity/Skin conductance, while other fields, like consumer neuroscience, use ET more frequently (Alvino *et al.*, 2020; Zito *et al.*, 2021). RT was a behavioral tool used in the analyzed studies, employed always in combination with either neurophysiological or physiological tools (Akimoto *et al.*, 2021). All this suggests that research on NTs across ELC focuses more on addressing changes in employees’ emotional states than their visual attention mechanisms (like in advertising). The findings also illustrate that NTs are more diffused in some specific sectors or industries, such as construction, where the health and safety of employees are the top priority. We also find that most of these studies focus on analyzing individual employees, for instance, to test empathy, learning, training, and financial incentives (Lambert *et al.*, 2022; Farrell *et al.*, 2018). However, there is also potential for these tools to explore complex interpersonal dynamics, such as group relationships (e.g. emergent properties of a team; Wang *et al.*, 2021) and interactions between a company and its employees (e.g. company apologies after an accident; Ohtsubo *et al.*, 2020).

It has been long acknowledged that organizations need to understand employees across different ELC phases. Our findings reveal few approaches to using NTs in the acquisition phase; meanwhile, other advanced technologies, such as AI, are predominantly designed for this ELC phase (Garr and Jackson, 2019). The existing NT applications applied at this phase were reported to support identity construction, enhance candidate selection, and optimize recruitment processes. For the employee development phase, the findings emphasize assessing leadership skills and traits, utilizing real-time neurofeedback, and tailoring training programs to individual needs. A key focus here is capturing trainee information, attention, and engagement to create dynamic, personalized learning experiences. This approach reflects a growing recognition of the importance of continuous development, adaptive learning technologies, and data-driven insights in shaping effective HRM strategies. The employee retention phase focused on key factors like assessing emotional states, mental and physical workloads, identifying and retaining organizational talent, counterproductive work behaviors, and job profiling. Studies also highlighted team coordination, decision-making, and task allocation optimization.

Despite discussing the applications of NTs in HRM, none of the studies we analyzed have explicitly defined what NTs in HRM entail. Likewise, our review did not identify a clear, established definition for neuro HRM. Thus, based on our review, we would like to provide the following working definition of NTs-assisted HRM that can unify future studies on this topic: *NT-assisted HRM is an emerging domain within HRM practice, research, and innovation that focuses on the application of NTs to generate actionable (neuro)physiological and behavioral insights about individuals and teams throughout the ELC – spanning employee acquisition, development, and retention.* These insights can be strategically leveraged to optimize organizational effectiveness, enhance efficiency, and drive better outcomes while improving the employee experience by informing and refining HRM practices.

Conceptual contributions

Breslin and Gatrell (2023) emphasized that a rigorous literature review should be transparent, inclusive, and critical. Our methodology adheres to these principles by clearly outlining how we identified, analyzed, and interpreted the literature (ensuring transparency), establishing clear inclusion criteria (ensuring inclusion), and highlighting gaps, connections, and insights (ensuring criticality) that pave the way for future theorizing. Building on Klein and Potosky's (2019) framework for HRM contributions, below we identify key conceptual contributions our research makes to the HRM literature, setting a solid foundation for further academic exploration (see Table 2).

First, we provide the first *systematic review* of interdisciplinary literature, offering a unique synthesis of the application of NTs in HRM. The previous lack of literature reviews on this topic is problematic, leading to increased specialization and fragmentation, hindering cross-disciplinary insights and knowledge advancement (Coraiola and Caza, 2025). Without having a literature review, research efforts risk being duplicated and disconnected. This gap also makes it difficult for scholars to stay updated on broader developments, limiting innovation (Coraiola and Caza, 2025). While previous reviews have explored the use of neuroscience in organizational contexts, they have predominantly focused on areas such as consumer neuroscience (Alvino *et al.*, 2020), neuromanagement (Zito *et al.*, 2021), neuroleadership (Ruiz-Rodríguez *et al.*, 2023), or neurostrategy (Kaur, 2024). In contrast, this was the first attempt that promised to provide a comprehensive analysis and perspective (Coraiola and Caza, 2025) on different types of NTs applicable across various ELC phases. This classification contributes to HRM theory by mapping NTs relevant to key HRM functions and highlighting new prospects (Coraiola and Caza, 2025) for research on their implications.

Second, we *introduce* NTs as a novel concept to HRM, demystifying their types and characteristics while outlining their potential applications across different ELC phases. By doing so, we bridge the gap between neuroscience and HRM, fostering interdisciplinary dialogue and expanding the theoretical landscape of HRM research. Our work also puts forward the working definition of NTs in/for HRM and clarifies how NTs can be systematically integrated into HRM, providing scholars opportunity to further conceptually examine their impact on employee behavior, decision-making, and performance management.

Third, we *present a taxonomy* of NT types and characteristics tailored to HRM applications. This taxonomy serves as a foundational framework for HRM scholars, enabling them to explore how NTs can enhance recruitment, talent development, performance assessment, and workplace well-being. By categorizing NTs according to their relevance across different ELC phases, we offer a structured approach for future empirical research to assess their validity, ethical considerations, and practical implementation.

Our study also *uncovers unexpected gaps* in the literature, including the perceptions of candidates, employees, and HRM professionals regarding the application of NTs across the ELC, research on neurodiversity (Farahany, 2023) in HRM (Doyle, 2020; Hennekam *et al.*, 2023), and ethical concerns surrounding NT use. These gaps reflect broader trends in HRM literature and the ethical challenges posed by the integration of advanced technologies in HRM practices (Tursunbayeva *et al.*, 2018). Building on these findings, we *propose targeted avenues for future research* at the intersection of HRM and NTs to advance both theoretical understanding and the responsible application of these tools (see Table 2 and discussion below). Future studies should investigate how NTs can be leveraged to better support neurodiverse employees and be effectively integrated with broader HR information systems, including AI-based solutions. A critical area of inquiry involves exploring the perceptions and acceptance of NTs among key stakeholders–candidates, employees, and managers–as their engagement is essential for successful implementation. Furthermore, identifying the specific skills and competencies HR professionals require to interpret and utilize NT-generated insights will be vital for practical integration. Future researchers could also conduct meta-reviews of the measures and outcomes associated with NTs use across different ELC phases, as well as investigate how traditional HRM processes, practices, and professional skills might evolve as NTs become more widespread, generating deeper neuro-insights.

Ethical considerations, including privacy concerns and employee rights, remain critical but were minimally addressed in the reviewed literature. Given that NTs, especially when combined with other advanced technologies like AI (e.g. facial recognition), could pose significant ethical risks, future research must prioritize these issues, particularly in light of emerging regulations like the European AI Act. Additionally, there is a need for more empirical studies, including field research, to better understand the practical implications of NTs in HRM. Future work should include field experiments that evaluate the impact of NTs in real-world HRM contexts and examine their advantages and limitations relative to traditional methods.

While NTs could enhance organizational outcomes such as employee engagement, commitment, and job satisfaction, they also raise concerns about trust and mental privacy, as many NTs could be perceived as intrusive, potentially creating an ethical minefield (Farahany, 2023). Crucially, researchers must also design and apply robust ethical protocols to guide data collection, informed consent, and interpretation, particularly when NTs are used with sensitive or marginalized populations.

Practical contributions

This study's findings also have important implications for organizations considering or currently piloting NTs across ELC. Organizations from sectors with high health and safety concerns, such as mining, railway, aviation, and truck driving, have been long applying NTs (Farahany, 2023). We have recently seen such applications diffusing in office environments, especially in companies with higher technology competencies. Indeed, we can already see Microsoft researchers experimenting with NTs to understand how the brain works during and between video calls (Rogers, 2021). We can also see it being applied in unusual jobs, such as for improving the performance of football players (e.g. Liverpool football team: Kleinhesselink, 2022). Indeed, professional sports are expected to lead NT adoption in HRM, using non-invasive brain monitoring to assess athletes' focus and track head injuries, according to the UK's data watchdog (Cookson, 2023). The same report predicts widespread NT adoption in traditional workplaces by 2028 for employee monitoring and hiring, raising concerns about data privacy (Cookson, 2023). With the help of our review, HRM professionals and managers can develop awareness and an understanding of the capabilities of different types of NTs and also make an informed decision on the potential tool to adopt based on their needs, financial resources, or skills available.

Limitations

This study has several limitations that future researchers could address. Firstly, we included only English-language publications, potentially missing relevant studies in other languages. Additionally, our focus was solely on scholarly literature, which may have excluded real-world applications already used by organizations available in the form of technical reports or working papers. Future research could build on our work by incorporating grey literature and additional sources (e.g. Google Scholar, OpenGrey) to mitigate potential publication bias. However, it is worth noting that we did include conference papers indexed in Web of Science, which are classified as grey literature by Siddaway *et al.* (2019) (see Appendix 1).

Conclusion

Our review highlights that the integration of NTs across the ELC represents a groundbreaking innovation in organizational HRM. These technologies can potentially revolutionize HRM practices by offering unprecedented insights into employees' emotional or cognitive functions. Research and practice of NTs within the ELC spans all three phases–acquisition, development, and retention–with varying degrees of emphasis. Notably, NT tools have been most widely adopted in the development and retention phases, where they are leveraged to deepen understanding of both individual and group dynamics. This trend suggests that organizations continuously strive to enhance talent development, leadership capabilities, and team cohesion.

Our findings underscore that the traditional disciplinary boundaries between neuroscience, technologies, and HRM are dissolving. Scholars and organizations are embracing deeply interdisciplinary approaches that push the frontiers of HRM, enabling access to what has long been considered the "last fortress" - the complexities of the human mind (Farahany, 2023). However, these advancements can serve as a powerful catalyst for organizational growth and human potential only if implemented with a high sensitivity and strong ethical foundation.

Open practices statement

The data and materials for this review will be made available upon written request to the authors.

Supplementary material

The supplementary material for this article can be found online.

References

Akimoto, Y., Yamazaki, R., Sugiura, M., Nouchi, R., Terao, C., Tsukiura, T. and Kawashima, R. (2018), "Approach or avoidance: neural correlates of intelligence evaluation from faces", *European Journal of Neuroscience*, Vol. 48 No. 1, pp. 1680-1690, doi: 10.1111/ejn.13974.

Alvino, L., Pavone, L., Abhishta, A. and Robben, H. (2020), "Picking your brains: where and how neuroscience tools can enhance marketing research", *Frontiers in Neuroscience*, Vol. 14, 577666, doi: 10.3389/fnins.2020.577666.

*Arico, P., Reynal, M., Di Flumeri, G., Borghini, G., Sciaraffa, N., Imbert, J., Hurter, C., Terenzi, M., Ferreira, A., Pozzi, S., Betti, V., Marucci, M., Telea, A.C. and Babiloni, F. (2019), "How neurophysiological measures can be used to enhance the evaluation of remote tower solutions", *Frontiers in Human Neuroscience*, Vol. 13, 303, doi: 10.3389/fnhum.2019.00303.

Arksey, H. and O'Malley, L. (2005), "Scoping studies: towards a methodological framework", *International Journal of Social Research Methodology*, Vol. 8 No. 1, pp. 19-32, doi: 10.1080/1364557032000119616.

Balconi, M. and Fronda, G. (2020), "The dialogue between two or more brains: the 'hyperscanning' for organization", *Frontiers in Psychology*, Vol. 11, 598332, doi: 10.3389/fpsyg.2020.598332.

Bandettini, P.A., Wong, E.C., Hinks, R.S., Tikofsky, R.S. and Hyde, J.S. (1992), "Time course EPI of human brain function during task activation", *Magnetic Resonance in Medicine*, Vol. 25 No. 2, pp. 390-397, doi: 10.1002/mrm.1910250220.

Bell, B.S. and Moore, O.A. (2018), "Learning, training and development in organizations: emerging trends, recent advances and future directions". in *The SAGE Handbook of Industrial, Work & Organizational Psychology: Organizational Psychology*, Vol. 2, 2nd ed., pp. 215-234.

Biasiucci, A., Franceschiello, B. and Murray, M.M. (2019), "Electroencephalography", *Current Biology: CB*, Vol. 29 No. 3, pp. R80-R85, doi: 10.1016/j.cub.2018.11.052.

Borrett, A. (2024), *UK Employers Eye 'Competitive Advantage' in Hiring Neurodivergent Workers*, Financial Times.

Breslin, D. and Gatrell, C. (2023), "Theorizing through literature reviews: the miner-prospector continuum", *Organizational Research Methods*, Vol. 26 No. 1, pp. 139-167, doi: 10.1177/1094428120943288.

Buchanan, D.A. and Huczynski, A. (2019), *Organisational Behaviour*, 10th ed., Pearson.

*Caldwell, J.A., Caldwell, J.L., Thompson, L.A. and Lieberman, H.R. (2019), "Fatigue and its management in the workplace", *Neuroscience and Biobehavioral Reviews*, Vol. 96, pp. 272-289, doi: 10.1016/j.neubiorev.2018.10.024.

Ceravolo, M.G., Cerroni, R., Farina, V., Fattobene, L., Leonelli, L., Mercuri, N.B. and Raggetti, G. (2019), "Attention allocation to financial information: the role of color and impulsivity personality trait", *Frontiers in Neuroscience*, Vol. 13, p. 818, doi: 10.3389/fnins.2019.00818.

Cha, H.-S., Choi, S.-J. and Im, C.-H. (2020), "Real-time recognition of facial expressions using facial electromyograms recorded around the eyes for social virtual reality applications", *IEEE Access*, Vol. 8, pp. 62065-62075, doi: 10.1109/ACCESS.2020.2983608.

*Chong, D., Yu, A., Su, H. and Zhou, Y. (2022), "The impact of emotional states on construction workers' recognition ability of safety hazards based on social cognitive neuroscience", *Frontiers in Psychology*, Vol. 13, 895929, doi: 10.3389/fpsyg.2022.895929.

Cookson, C. (2023), *UK Data Watchdog Warns of Bias Risks from Neurotechnology*, Financial Times.

Coraiola, D.M. and Caza, A. (2025), "Publishing impactful literature reviews in AMLE", *Academy of Management Learning & Education*, amle.2025.0019, doi: 10.5465/amle.2025.0019.

Dimoka, A., Davis, F.D., Gupta, A., Pavlou, P.A., Banker, R.D., Dennis, A.R., Ischebeck, A., Müller-Putz, G., Benbasat, I., Gefen, D. and Kenning, P.H. (2012), "On the use of neurophysiological tools in IS research: developing a research agenda for NeuroIS", *MIS Quarterly*, pp. 679-702, doi: 10.2139/ssrn.1557826.

Doyle, N. (2020), "Neurodiversity at work: a biopsychosocial model and the impact on working adults", *British Medical Bulletin*, Vol. 135 No. 1, pp. 108-125, doi: 10.1093/bmb/ldaa021.

Dulebohn, J.H., Davison, R.B., Lee, S.A., Conlon, D.E., McNamara, G. and Sarinopoulos, I.C. (2016), "Gender differences in justice evaluations: evidence from fMRI", *Journal of Applied Psychology*, Vol. 101 No. 2, pp. 151-170, doi: 10.1037/apl0000048.

Engel, L., Bansback, N., Bryan, S., Doyle-Waters, M.M. and Whitehurst, D.G. (2016), "Exclusion criteria in national health state valuation studies: a systematic review", *Medical Decision Making*, Vol. 36 No. 7, pp. 798-810, doi: 10.1177/0272989X15595365.

Ernst, L.H., Plichta, M.M., Lutz, E., Zesewitz, A.K., Tupak, S.V., Dresler, T., Ehlis, A.-C. and Fallgatter, A.J. (2013), "Prefrontal activation patterns of automatic and regulated approach–avoidance reactions – a functional near-infrared spectroscopy (fNIRS) study", *Cortex*, Vol. 49 No. 1, pp. 131-142, doi: 10.1016/j.cortex.2011.09.013.

Esmaeilpour, Z., Shereen, A.D., Ghobadi-Azbari, P., Datta, A., Woods, A.J., Ironside, M., O'Shea, J., Kirk, U., Bikson, M. and Ekhtiari, H. (2020), "Methodology for tDCS integration with fMRI", *Human Brain Mapping*, Vol. 41 No. 7, pp. 1950-1967, doi: 10.1002/hbm.24908.

Farahany, N.A. (2023), *The Battle for your Brain: Defending the Right to Think Freely in the Age of Neurotechnology*, St. Martin's Press.

Farrell, A.M., Goh, J.O. and White, B.J. (2018), “Financial incentives differentially regulate neural processing of positive and negative emotions during value-based decision-making”, *Frontiers in Human Neuroscience*, Vol. 12, 58, doi: 10.3389/fnhum.2018.00058.

Fitzell, S. (2021), “How to maximize employees’ brain power (and why it’s worth the investment)”, *LinkedIn*, available at: https://www.linkedin.com/pulse/how-maximize-employees-brain-power-why-its-worth-susan (accessed 15 February 2024).

Garr, S.S. and Jackson, C. (2019), *Diversity & Inclusion Technology: the Rise of a Transformative Market*, Mercer, available at: https://www.mercer.com/our-thinking/career/diversity-and-inclusion-technology.html

*Gocen, A. (2021), “Neuroleadership: a conceptual analysis and educational implications”, *International Journal of Education in Mathematics, Science and Technology*, Vol. 9 No. 1, pp. 63-82, doi: 10.46328/ijemst.1237.

Hałgas, E.A., van Eijndhoven, K.H., Gevers, J.M., Wiltshire, T.J., Westerink, J.H.M. and Rispens, S. (2023), “A review of using wearable technology to assess team functioning and performance”, *Journal of Applied Psychology, Small Group Research*, Vol. 54 No. 1, pp. 41-76, doi: 10.1177/10464964221125717.

Hannah, S.T., Balthazard, P.A., Waldman, D.A., Jennings, P.L. and Thatcher, R.W. (2013), “The psychological and neurological bases of leader self-complexity and effects on adaptive decision-making”, *Journal of Applied Psychology*, Vol. 98 No. 3, pp. 393-411, doi: 10.1037/a0032257.

Hao, S., Xiaoqin, W., Yao, Y. and Xiaoqiang, Z. (2021), “Modulating the activity of right temporo-parietal junction by anodal tDCS enhances the agent’s repayment in hold-up game”, *Brain Research Bulletin*, Vol. 168, pp. 17-24, doi: 10.1016/j.brainresbull.2020.12.013.

Healy, G.F., Boran, L. and Smeaton, A.F. (2015), “Neural patterns of the implicit association test”, *Frontiers in Human Neuroscience*, Vol. 9, p. 605, doi: 10.3389/fnhum.2015.00605.

Hennekam, S., Volpone, S. and Pullen, A. (2023), “Special issue: neurodiversity at work: challenges and opportunities for human resource management”, *Human Resource Management*.

Hiebl, M.R. (2023), “Sample selection in systematic literature reviews of management research”, *Organizational Research Methods*, Vol. 26 No. 2, pp. 229-261, doi: 10.1177/1094428120986851.

Hossain, M.S. and Muhammad, G. (2016), “Cloud-assisted industrial internet of things (IIoT) – enabled framework for health monitoring”, *Computer Networks*, Vol. 101, pp. 192-202, doi: 10.1016/j.comnet.2016.01.009.

Hwang, S. (2008), “Utilizing qualitative data analysis software: a review of atlas.ti”, *Social Science Computer Review*, Vol. 26 No. 4, pp. 519-527, doi: 10.1177/0894439307312485.

*Kalgotra, P., Sharda, R. and McHaney, R. (2019), “Don’t disturb me! understanding the impact of interruptions on knowledge work: an exploratory neuroimaging study”, *Information Systems Frontiers*, Vol. 21 No. 5, pp. 1019-1030, doi: 10.1007/s10796-017-9812-9.

Kasneci, E., Gao, H., Ozdel, S., Maquiling, V., Thaqi, E., Lau, C., Rong, Y., Kasneci, G. and Bozkir, E. (2024), “Introduction to eye tracking: a hands-on tutorial for students and practitioners”, arXiv preprint arXiv:2404.15435.

*Kasperiuniene, J. and Zydziunaite, V. (2019), “A systematic literature review on professional identity construction in social media”, *Sage Open*, Vol. 9 No. 1, doi: 10.1177/2158244019828847.

Kaur, V. (2024), “Neurostrategy: a scientometric analysis of marriage between neuroscience and strategic management”, *Journal of Business Research*, Vol. 170, 114342, doi: 10.1016/j.jbusres.2023.114342.

Khan, S. (2021), “Artificial intelligence for human resources toolkit helps organizations overcome implementation challenges”, World Economic Forum, available at: https://www.weforum.org/press/2021/12/artificial-intelligence-for-human-resources-toolkit-helps-organizations-overcome-implementation-challenges/

*Kim, M.Y. and James, L.R. (2015), “Neurological evidence for the relationship between suppression and aggressive behavior: implications for workplace aggression”, *Applied Psychology*, Vol. 64 No. 2, pp. 286-307, doi: 10.1111/apps.12014.

Klein, H.J. and Potosky, D. (2019), "Making a conceptual contribution at Human Resource Management Review", *Human Resource Management Review*, Vol. 29 No. 3, pp. 299-304, doi: 10.1016/j.hrmr.2019.04.003.

Kleinhesselink, T. (2022), "Neurofeedback in football: liverpool's innovative approach", available at: https://www.sportsbrain.blog/neurofeedback-in-football-liverpools-approach/

*Kokubun, K., Ogata, Y., Koike, Y. and Yamakawa, Y. (2020), "Brain condition May mediate the association between training and work engagement", *Scientific Reports*, Vol. 10 No. 1, p. 6848, doi: 10.1038/s41598-020-63711-3.

*Kumar, H. and Raghavendran, S. (2013), "Not by money alone: the emotional wallet and talent management", *Journal of Business Strategy*, Vol. 34 No. 3, pp. 16-23, doi: 10.1108/JBS-11-2012-0073.

Lambert, S., Dimitriadis, N., Venerucci, M. and Taylor, M. (2022), "Empathic gaze: a study of human resource professionals", *Journal of Work-Applied Management*, Vol. 14 No. 1, pp. 102-112, doi: 10.1108/JWAM-06-2021-0044.

*Lattanzi, N., Menicagli, D. and Dal Maso, L. (2016), "Neuroscience evidence for economic humanism in management science: organizational implications and strategy", *Archives Italiennes de Biologie*, Vol. 154 No. 1, pp. 26-37, doi: 10.12871/00039829201614.

*Leger, P.-M., Riedl, R. and vom Brocke, J. (2014), "Emotions and ERP information sourcing: the moderating role of expertise", *Industrial Management and Data Systems*, Vol. 114 No. 3, pp. 456-471, doi: 10.1108/IMDS-09-2013-0365.

Li, Y., Zhang, L., Shiau, W.-L., Xu, L. and Liu, Q. (2023), "Psychophysiological responses to Mobile reading: evidence from frontal EEG signals under a distracting reading environment and different text genres", *Information Technology and People*, Vol. 36 No. 3, pp. 1048-1075, doi: 10.1108/ITP-02-2021-0111.

Lim, W.M. (2018), "What will business-to-business marketers learn from neuro-marketing? Insights for business marketing practice", *Journal of Business-To-Business Marketing*, Vol. 25 No. 3, pp. 251-259, doi: 10.1080/1051712X.2018.1488915.

*Liu, T., Duan, L., Dai, R., Pelowski, M. and Zhu, C. (2021), "Team-work, team-brain: exploring synchrony and team interdependence in a nine-person drumming task via multiparticipant hyperscanning and inter-brain network topology with fNIRS", *NeuroImage*, Vol. 237, 118147, doi: 10.1016/j.neuroimage.2021.118147.

Louis, E.K.S., Frey, L.C., Britton, J.W., Frey, L.C., Hopp, J.L., Korb, P. and Koubeissi, M.Z (2016), *'Introduction', Electroencephalography (EEG): an Introductory Text and Atlas of Normal and Abnormal Findings in Adults, Children, and Infants [Internet]*, American Epilepsy Society.

Luce, R.D. (1991), *Response Times*, Oxford University Press, New York.

Lupton, D. (2013), "Quantifying the body: monitoring and measuring health in the age of mHealth technologies", *Critical Public Health*, Vol. 23 No. 4, pp. 393-403, doi: 10.1080/09581596.2013.794931.

Malik, A., Budhwar, P. and Kazmi, B.A. (2023), "Artificial intelligence (AI)-Assisted HRM: towards an extended strategic framework", *Human Resource Management Review*, Vol. 33 No. 1, 100940, doi: 10.1016/j.hrmr.2022.100940.

Mulcahy, J.S., Larsson, D.E.O., Garfinkel, S.N. and Critchley, H.D. (2019), "Heart rate variability as a biomarker in health and affective disorders: a perspective on neuroimaging studies", *NeuroImage*, Vol. 202, 116072, doi: 10.1016/j.neuroimage.2019.116072.

Nagai, Y., Jones, C.I. and Sen, A. (2019), "Galvanic skin response (GSR)/Electrodermal/Skin conductance biofeedback on epilepsy: a systematic review and meta-analysis", *Frontiers in Neurology*, Vol. 10, p. 377, doi: 10.3389/fneur.2019.00377.

Nyberg, A.J., Wright, P.M., Zhang, Y. and Gamache, D.L. (2025), "A brave new world of human resources research: navigating perils and identifying grand challenges of the GenAI revolution", *Journal of Management*, Vol. 51 No. 6, pp. 2677-2718, doi: 10.1177/01492063251325188.

Ohtsubo, Y., Matsunaga, M., Himichi, T., Suzuki, K., Shibata, E., Hori, R., Umemura, T. and Ohira, H. (2020), "Costly group apology communicates a group's sincere 'intention'", *Social Neuroscience*, Vol. 15 No. 2, pp. 244-254, doi: 10.1080/17470919.2019.1697745.

Parincu, A.M.T., Capatina, A., Varon, D.J., Bennet, P.F. and Recuerda, A.M. (2020), "Neuromanagement: the scientific approach to contemporary management", *Proceedings of the International Conference on Business Excellence*, Vol. 14 No. 1, pp. 1046-1056, doi: 10.2478/picbe-2020-0099.

Pekar, J.J. (2006), "A brief introduction to functional MRI", *IEEE Engineering in Medicine and Biology Magazine*, Vol. 25 No. 2, pp. 24-26, doi: 10.1109/MEMB.2006.1607665.

Petrou, F. and Rammata, M. (2021), "The emerging impact of neuroscience in human resource management and in the public sector", *SCIREA Journal of Management*, Vol. 7 No. 1, pp. 89-106, doi: 10.54647/management63082.

Pinti, P., Tachtsidis, I., Hamilton, A., Hirsch, J., Aichelburg, C., Gilbert, S. and Burgess, P.W. (2020), "The present and future use of functional near-infrared spectroscopy (fNIRS) for cognitive neuroscience", *Annals of the New York Academy of Sciences*, Vol. 1464 No. 1, pp. 5-29, doi: 10.1111/nyas.13948.

Pisoni, A., Mattavelli, G., Papagno, C., Rosanova, M., Casali, A.G. and Romero Lauro, L.J. (2018), "Cognitive enhancement induced by anodal tDCS drives circuit-specific cortical plasticity", *Cerebral Cortex*, Vol. 28 No. 4, pp. 1132-1140, doi: 10.1093/cercor/bhx021.

Poeppel, D., Mangun, G.R. and Gazzaniga, M.S. (2020), *The Cognitive Neurosciences*, The MIT Press, doi: 10.7551/mitpress/11442.001.0001.

Ramsøy, T.Z. (2019), "Building a foundation for neuromarketing and consumer neuroscience research: how researchers can apply academic rigor to the neuroscientific study of advertising effects", *Journal of Advertising Research*, Vol. 59 No. 3, pp. 281-294, doi: 10.2501/JAR-2019-034.

Rejón-Guardia, F., García-Sastre, M.A. and Alemany-Hormaeche, M. (2019), "Electroencephalographic response of e-learning tasks on a learning management system: an emotional and cognitive approach", *EDULEARN19 Proceedings*, Vol. 1, pp. 6675-6680, doi: 10.21125/edulearn.2019.1604.

Revina, I.M. and Emmanuel, W.R.S. (2021), "A survey on human face expression recognition techniques", *Journal of King Saud University - Computer and Information Sciences*, Vol. 33 No. 6, pp. 619-628, doi: 10.1016/j.jksuci.2018.09.002.

*Riva, G., Wiederhold, B.K. and Mantovani, F. (2021), "Surviving COVID-19: the neuroscience of smart working and distance learning", *Cyberpsychology, Behavior, and Social Networking*, Vol. 24 No. 2, pp. 79-85, doi: 10.1089/cyber.2021.0009.

Rock, D. (2006), *Quiet Leadership: Six Steps to Transforming Performance at Work*, Harper Collins, New York.

Rogers, B. (2021), *Our Brains Need Breaks from Virtual Meetings*, Forbes.

Ruiz-Rodríguez, R., Ortiz-de-Urbina-Criado, M. and Ravina-Ripoll, R. (2023), "Neuroleadership: a new way for happiness management", *Humanities and Social Sciences Communications*, Vol. 10 No. 1, pp. 1-14, doi: 10.1057/s41599-023-01642-w.

*Saedi, S., Fini, A.A.F., Khanzadi, M., Wong, J., Sheikhkhoshkar, M. and Banaei, M. (2022), "Applications of electroencephalography in construction", *Automation in Construction*, Vol. 133, 103985, doi: 10.1016/j.autcon.2021.103985.

Saker-Clark, H. (2024), "Workplaces must change attitudes to neurodiversity, says chef heston blumenthal", *The Standard*, available at: https://www.standard.co.uk/business/business-news/workplaces-must-change-attitudes-to-neurodiversity-says-chef-heston-blumenthal-b1158807.html

Samadiani, N., Huang, G., Cai, B., Luo, W., Chi, C.-H., Xiang, Y. and He, J. (2019), "A review on automatic facial expression recognition systems assisted by multimodal sensor data", *Sensors*, Vol. 19 No. 8, p. 1863, doi: 10.3390/s19081863.

*Sandoval, A.V. and Castillo, L.C.Z. (2021), "A theoretical approach to neuroscience technologies' contributions to administration in the digital transformation context", *Cuadernos de Administración*, Vol. 37 No. 69, e4010691, doi: 10.25100/cdea.v37i69.10691.

Sattar, Y. and Chhabra, L. (2025), "Electrocardiogram", in *Statpearls*, StatPearls Publishing, available at: http://www.ncbi.nlm.nih.gov/books/NBK549803/

Schiemann, W.A. (2014), "From talent management to talent optimization", *Journal of World Business*, Vol. 49 No. 2, pp. 281-288, doi: 10.1016/j.jwb.2013.11.012.

Sharma, M., Kacker, S. and Sharma, M. (2016), "A brief introduction and review on galvanic skin response", *International Journal of Medical Research Professionals*, Vol. 2 No. 6, pp. 13-17, doi: 10.21276/ijmrp.2016.2.6.003<.

*Shealy, T. and Hu, M. (2018), "Opportunities to advance engineering cognition and project level decision making by adopting emergent methods from neuroscience", *Construction Research Congress 2018, presented at the Construction Research Congress 2018*, New Orleans, Louisiana, American Society of Civil Engineers, pp. 127-136, doi: 10.1061/9780784481264.013.

*Shimokawa, T., Kinoshita, K., Miyagawa, K. and Misawa, T. (2012), "A brain information-aided intelligent investment system", *Decision Support Systems*, Vol. 54 No. 1, pp. 336-344, doi: 10.1016/j.dss.2012.05.041.

Siddaway, A.P., Wood, A.M. and Hedges, L.V. (2019), "How to Do a systematic review: a best practice guide for conducting and reporting narrative reviews, meta-analyses, and meta-syntheses", *Annual Review of Psychology*, Vol. 70 No. 1, pp. 747-770, doi: 10.1146/annurev-psych-010418-102803.

Singh, V.K., Singh, P., Karmakar, M., Leta, J. and Mayr, P. (2021), "The journal coverage of web of science, scopus and dimensions: a comparative analysis", *Scientometrics*, Vol. 126 No. 6, pp. 5113-5142, doi: 10.1007/s11192-021-03948-5.

Skaramagkas, V., Giannakakis, G., Ktistakis, E., Manousos, D., Karatzanis, I., Tachos, N., Tripoliti, E., Marias, K., Fotiadis, D.I. and Tsiknakis, M. (2023), "Review of eye tracking metrics involved in emotional and cognitive processes", *IEEE Reviews in Biomedical Engineering*, Vol. 16, pp. 260-277, doi: 10.1109/RBME.2021.3066072.

Smither, L. (2003), "Managing employee life cycles to improve labor retention", *Leadership and Management in Engineering*, Vol. 3 No. 1, pp. 19-23, doi: 10.1061/(ASCE)1532-6748(2003)3:1(19).

Stanton, S.J., Sinnott-Armstrong, W. and Huettel, S.A. (2017), "Neuromarketing: ethical implications of its use and potential misuse", *Journal of Business Ethics*, Vol. 144 No. 4, pp. 799-811, doi: 10.1007/s10551-016-3059-0.

Stasi, A., Songa, G., Mauri, M., Ciceri, A., Diotallevi, F., Nardone, G. and Russo, V. (2018), "Neuromarketing empirical approaches and food choice: a systematic review", *Food Research International*, Vol. 108, pp. 650-664, doi: 10.1016/j.foodres.2017.11.049.

Tricco, A.C., Lillie, E., Zarin, W., O'Brien, K.K., Colquhoun, H., Levac, D., Moher, D., Peters, M.D., Horsley, T., Weeks, L., Hempel, S., Akl, E.A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M.G., Garritty, C., Lewin, S., Godfrey, C.M., Macdonald, M.T., Langlois, E.V., Soares-Weiser, K., Moriarty, J., Clifford, T., Tunçalp, Ö. and Straus, S.E. (2018), "PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation", *Annals of Internal Medicine*, Vol. 169 No. 7, pp. 467-473, doi: 10.7326/M18-0850.

Tursunbayeva, A. (2024), *Augmenting Human Resource Management with Artificial Intelligence. Towards an Inclusive, Sustainable, and Responsible Future*, Springer, Cham, available at: https://link.springer.com/book/9783031752650

Tursunbayeva, A., Di Lauro, S. and Pagliari, C. (2018), "People analytics—A scoping review of conceptual boundaries and value propositions", *International Journal of Information Management*, Vol. 43, pp. 224-247, doi: 10.1016/j.ijinfomgt.2018.08.002.

Vom Brocke, J., Riedl, R. and Léger, P.M. (2011), "Neuroscience in design-oriented research: exploring new potentials", *Service-Oriented Perspectives in Design Science Research: 6th International Conference, DESRIST 2011, Proceedings 6*, Springer, Milwaukee, WI, USA, May 5-6, 2011, pp. 427-439.

Waldman, D.A., Balthazard, P.A. and Peterson, S.J. (2011), "Social cognitive neuroscience and leadership", *The Leadership Quarterly*, Vol. 22 No. 6, pp. 1092-1106, doi: 10.1016/j.leaqua.2011.09.005.

*Waldman, D.A., Ward, M.K. and Becker, W.J. (2017), "Neuroscience in organizational behavior", *Annual Review of Organizational Psychology and Organizational Behavior*, Vol. 4 No. 1, pp. 425-444, doi: 10.1146/annurev-orgpsych-032516-113316.

*Waldman, D.A., Wang, D. and Fenters, V. (2019), "The added value of neuroscience methods in organizational research", *Organizational Research Methods*, Vol. 22 No. 1, pp. 223-249, doi: 10.1177/1094428116642013.

Wang, D., Waldman, D.A., Balthazard, P.A., Stikic, M., Pless, N.M., Maak, T., Berka, C. and Richardson, T. (2021), "Applying neuroscience to emergent processes in teams", *Organizational Research Methods*, Vol. 24 No. 3, pp. 595-615, doi: 10.1177/1094428120915516.

*Wang, J., Song, Y., Yuan, C., Guo, F., Huangfu, Y. and Liu, Y. (2022), "Research on the training and management of industrializing workers in prefabricated building with machine vision and human behaviour modelling based on Industry 4.0 era", edited by Chen, H, *Computational Intelligence and Neuroscience*, Vol. 2022 No. 1, pp. 1-18, doi: 10.1155/2022/9230412.

Wong, A.L., Goldsmith, J., Forrence, A.D., Haith, A.M. and Krakauer, J.W. (2017), "Reaction times can reflect habits rather than computations", *eLife*, Vol. 6, e28075, doi: 10.7554/eLife.28075.

Xiang, H., Lu, J., Kosov, M.E., Volkova, M.V., Ponkratov, V.V., Masterov, A.I., Elyakova, I.D., Popkov, S.Y., Taburov, D.Y., Lazareva, N.V., Muda, I., Vasiljeva, M.V. and Zekiy, A.O. (2023), "Sustainable development of employee lifecycle management in the age of global challenges: evidence from China, Russia, and Indonesia", *Sustainability*, Vol. 15 No. 6, p. 4987, doi: 10.3390/su15064987.

Yeager, V.A., Menachemi, N., Savage, G.T., Ginter, P.M., Sen, B.P. and Beitsch, L.M. (2014), "Using resource dependency theory to measure the environment in health care organizational studies: a systematic review of the literature", *Health Care Management Review*, Vol. 39 No. 1, pp. 50-65, doi: 10.1097/hmr.0b013e3182826624.

*Zito, M., Bilucaglia, M., Fici, A., Gabrielli, G. and Russo, V. (2021), "Job assessment through bioelectrical measures: a neuromanagement perspective", *Frontiers in Psychology*, Vol. 12, 673012, doi: 10.3389/fpsyg.2021.673012.

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