Workplace Artificial Intelligence Role Classification: Impacts on Employee Psychology and Behavior, and Coping Strategies

Authors: Tan Meili, Yin Xiangzhou, Zhang Guanglei, Xiong Puzhen, Xiong Puzhen

Date: 2025-02-17T00:00:00+00:00

Abstract

The roles assumed by artificial intelligence in the workplace are becoming increasingly diversified; however, existing research on the systematic classification of AI roles and systematic investigation of their influence on employee psychology and behavior remains relatively limited. Grounded in the practical applications of artificial intelligence in workplace settings, this study synthesizes relevant theoretical literature and, from an employee perspective, categorizes AI into four distinct roles: "opponent," "assistant," "colleague," and "leader." Employing a "replacement-assistance-enhancement-management" framework, it analyzes how different AI roles affect employee psychology and behavior. Furthermore, the study proposes management and adaptation strategies at both organizational and individual levels, and outlines directions for future research. This research enriches theoretical discourse on the taxonomy of AI roles in the workplace and their impact on employees, while also providing practical insights for organizations and individuals to more effectively adapt to diverse AI role applications.

Full Text

Preamble

Workplace Artificial Intelligence Role Classification: Impacts on Employee Psychology and Behavior and Coping Strategies

Tan Meili, Yin Xiangzhou, Zhang Guanglei, Xiong Puzhen*

Abstract: Artificial intelligence (AI) is increasingly playing diverse roles in the workplace, yet existing research has yet to systematically explore AI role classification and its impacts on employees' psychological and behavioral outcomes.

Based on the practical application of AI in workplace settings and a review of relevant theoretical literature, this study categorizes AI into four distinct roles from the employee perspective: "opponent," "assistant," "colleague," and "leader." Using a substitution-assistance-augmentation-management framework, we analyze how these different AI roles influence employee psychology and behavior. Furthermore, we propose management and adaptation strategies at both organizational and individual levels and outline directions for future research. This study enriches theoretical discussions on AI role classification in the workplace and its effects on employees, offering practical insights for organizations and individuals to more effectively adapt to diverse AI role applications.

Keywords: artificial intelligence, role classification, psychology and behavior, coping strategies, workplace

Research on artificial intelligence (AI) began as early as the last century, and after decades of accumulated development, AI applications such as facial recognition attendance systems and intelligent customer service robots have become ubiquitous in today' s workplaces. Nevertheless, scholarly debate on AI remains ongoing (Kong et al., 2021; Mirbabaie et al., 2022), as AI' s "practice-first" characteristic renders its impact on humans complex and multifaceted, preventing definitive and uniform judgment of its 阶段性 merits and drawbacks. From a macro perspective, current technological advancements are reshaping labor markets, creating challenges such as human-machine relationship transformation and workforce displacement (Luo et al., 2023), which present new challenges for organizational and human resource management. From a micro perspective, AI interacts with employees through various roles, creating a dual effect of convenience and efficiency alongside insecurity, thereby influencing work outcomes such as employee well-being and innovative behavior (Liang et al., 2022; Loureiro et al., 2022). AI' s influence now spans across retail, healthcare and pharmaceuticals, finance, manufacturing, and other industries (He et al., 2023), where it serves as an employee' s "opponent," "assistant," "colleague," and even "leader" in managing employees (Yu et al., 2024; Einola & Khoreva, 2023; Teng et al., 2024). However, current research reflects a fragmented understanding of workplace AI-employee relationships, lacking a holistic perspective to systematically organize the diverse relationships between workplace AI and employees and to investigate AI' s impacts on employee psychology and behavior.

Existing literature widely acknowledges the double-edged sword effect of workplace AI. On the positive side, AI as a technological advancement plays an augmenting role in supporting organizational and individual work, such as providing decision support, conducting data analysis, reducing employee cognitive load, and enhancing innovation awareness (Janssen et al., 2022; Brachten et al., 2020; Liang et al., 2022). Conversely, on the negative side, adverse experiences such as insecurity become significant driving factors, creating perceived identity threats for organizational employees (Mirbabaie et al., 2022). Additionally, issues related to AI usage and algorithmic management fairness raise concerns about privacy leakage and potential unfair treatment and implicit bias

toward certain populations (Bai et al., 2022; Köchling & Wehner, 2020). Despite ongoing discussions about AI' s positive and negative effects, historical technological revolutions demonstrate that technological progress inevitably involves a 曲折 adaptation process, indicating that deeper AI integration is unstoppable. China' s Ministry of Science and Technology and five other departments issued the "Guiding Opinions on Accelerating Scenario Innovation to Promote High-Quality Economic Development through High-Level AI Application" in 2022, encouraging AI to penetrate manufacturing, agriculture, finance, and other industry application scenarios. Therefore, it is necessary to comprehensively analyze workplace AI' s impacts on employees to provide insights for the sustained and deep application of technology.

First, this study retrieved relevant articles from the China National Knowledge Infrastructure (CNKI) and Web of Science (WOS) core databases (see Appendix for retrieval process and rules). The results indicate: First, in terms of publication volume, AI-themed research has shown significant growth over the past five years across all disciplines and management-related fields (see Figure 1 [Figure 1: see original paper]). Chinese scholars' attention to AI continues to grow, a phenomenon confirmed by Stanford University' s "2021 AI Index Annual Report," which states that China ranks among the top globally in AI paper publications and citations (Zhang et al., 2021). Second, in terms of research content, most domestic management research on AI focuses on corporate strategy, financial management, and human resource management at the macro level, with relatively fewer studies examining workplace AI' s impacts on employees from an individual perspective, such as increased workplace insecurity and loneliness (Chen et al., 2022; Mu et al., 2023; Tu et al., 2023). Foreign literature more broadly explores AI's application impacts on organizations and individuals from both macro and micro perspectives, enriching research progress on AI-employee relationships (e.g., Einola & Khoreva, 2023; Lei & Rau, 2021; Tang et al., 2022). Third, in terms of research type, although empirical studies are increasingly abundant, existing review articles remain limited, with most focusing on relatively single relationship 梳理, such as human-machine collaboration (Wang & Yao, 2022), or preliminary discussions of employee attitudes toward AI, such as adoption intention and behavior (Li & Tao, 2022).

Given the increasingly frequent use of AI in workplaces and the academic community' s gradual attention to its evolving role in employee relationships (Mu et al., 2023; Lei & Rau, 2021; Tang, Koopman, Mai, et al., 2023), it is necessary to systematically organize AI-employee relationships and examine AI' s impacts on employee psychology and behavior to help organizations and employees more dialectically understand and use AI, thereby empowering their own development.

Through literature retrieval and screening, this study 梳理 current literature perspectives on AI-employee relationships and, combined with AI' s diverse applications in practice, outlines AI's different roles and their impacts on employee psychology and behavior. Specifically, this study elaborates on AI' s impacts on employees from the following aspects: First, it reviews and organizes AI

concepts and forms; second, it draws on AI-related research and Tsai et al.' s (2022) perspective to focus on different focal points in "AI-employee" human-machine relationships, classifying AI roles from the employee perspective; third, it 梳理 the impacts of different AI roles on employee psychology and behavior; and finally, it proposes coping strategies and future research 展望 from both organizational and employee perspectives.

[Figure 1: see original paper] Figure 1: Publication Trend of AI-themed Papers in CNKI and WOS (as of April 30, 2024)

2.1 The Concept and Forms of Artificial Intelligence in the Workplace

The Concept of Workplace Artificial Intelligence. A unified definition of AI has not yet been established in academia, as its connotation continuously expands with technological development over time (Brachman, 2006). A widely accepted definition of AI is the ability of machines to learn from experience, adapt to new inputs, and perform human-like tasks (Duan et al., 2019). Combining perspectives from other scholars (Kaplan & Haenlein, 2019; Tang, Koopman, Yam, et al., 2023), we can comprehensively summarize the following characteristics of AI: First, human-likeness, meaning it originates from the neocortical pattern recognition mechanism and expands based on human skills; second, task-orientation, meaning it completes work through established instructions; and third, continuous improvement, meaning it constantly updates and iterates to strengthen functionality. These three characteristics 高度概括 AI' s connotation, providing insights into the ultimate form of workplace AI.

Forms of Workplace Artificial Intelligence. To clarify the boundaries of AI technology and distinguish the impact levels and degrees of different AI roles on the workplace, it is necessary to further specify AI' s existing forms. Through literature review, current AI can be broadly categorized into weak AI, strong AI, and super AI (see Table 1). The distinction between weak and strong AI originates from Searle' s (1980) philosophical discussion on AI and humanity' s future, a classification system that has been widely accepted. Computer scientist and futurist Nick Bostrom (2014) further refined AI types, proposing Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), and Artificial Superintelligence (ASI).

Table 1: Different Forms of Artificial Intelligence

AI Form	Definition	Development Status
Weak AI	Systems that exhibit human-like or higher-level cognition within a limited functional set, can only solve single-domain specific problems without consciousness	Relatively mature and widely applied, such as generative AI
Strong AI	Can replicate human-like or higher-level cognition across all domains, possesses consciousness indistinguishable from humans	Preliminary exploration, not yet achieved
Super AI	Stronger than the human brain in almost all domains	Theoretical concept

Source: Compiled from relevant literature

However, current academic circles still have 分歧 on the concepts of weak and strong AI. Although non-technical scholars widely discuss strong AI-related issues, such as legal frameworks from a strong AI perspective (Zhang, 2024), ethical dilemmas in strong AI applications (Zhang, 2023), differences in strong and weak AI narratives (Bory et al., 2024), and the impact of gender and emotion on strong AI usage (Renz et al., 2024), most studies fail to accurately match technical field definitions of strong and weak AI, even misapplying relatively advanced weak AI (such as generative AI) as strong AI. Considering Bostrom' s (2014) and other technical field perspectives that the distinction between strong and weak AI lies in whether consciousness is possessed (Li, 2024), the AI form discussed in this study is weak AI.

In the management field, discussions about AI remain heated, not only because theoretical development needs to catch up with practice, but also because AI' s future forms trigger deep-seated anxiety in human society (Bostrom, 2014). When AI surpasses the human brain in almost all domains, what role it will play in the workplace becomes a core concern for scholars, managers, and employees alike.

2.2 Classification of Artificial Intelligence Roles in the Workplace

In enterprise management, Industry 4.0-driven digital transformation has fundamentally 重构 and regenerated business models (Vuksanović et al., 2020), yet AI technology penetration is not achieved overnight but has undergone half a century of technological iteration and accumulation. As Murray (2015) stated: "Companies must either figure out for themselves how digital technologies will transform their businesses, or face challenges from others who have already figured it out." Before clarifying how AI further influences employee psychology and behavior in workplace control, coordination, and cooperation processes, we must first identify what roles AI currently plays in the workplace and the corresponding human-machine relationships.

Academic research on workplace human-machine relationships, like other topics, is characterized by 多元化 features, with heated discussions but inconsistent viewpoints. Information systems development has spawned structured theories and actor-structure theories on human-machine relationships (Xie et al., 2021), while Leonardi (2011) described human-machine relationships as dynamic agency constitution. Additionally, Tsai et al. (2022), referencing the evolution path of leader-employee relationships in leadership literature (i.e., leader-centered, to dyadic relationship focus, to follower-centered), proposed that AI' s role evolution in human-machine collaboration follows a similar paradigm, with the focus shifting from leader, to collaborator, to follower. Given that this study primarily explores AI's impact on employees, the core perspective should focus on how employees perceive AI roles. Therefore, this study combines existing research perspectives to deeply analyze different AI-employee interaction relationships and accordingly classifies workplace AI into four roles from the employee perspective: "opponent," "assistant," "colleague," and "leader," which are discussed in subsequent sections based on the "substitution-assistance-augmentation-management" framework (see Table 2).

Table 2: Classification of AI Roles in the Workplace with Illustrative Perspectives

AI Role	AI Form	Focus	Illustrative Literature Perspectives
Opponent	Intelligent robots performing fast, repetitive, physical tasks	Substituting employees to complete partial repetitive, structured, basic tasks	Proposes technical job insecurity dimensions in AI development context (Tu et al., 2023); Employees gradually realize unemployment risks after being replaced by intelligent robots (Arias-Pérez & Vélez-Jaramillo, 2022)
Assistant	Personal digital assistants	Assisting employees to complete structured, basic tasks	AI 被视为协助完成工作的工具，充当”助手”角色 (Yin & Niu, 2024; Allen et al., 2022); Virtual assistants help execute work-related tasks (Brachten et al., 2020)
Colleague	Data analysis and prediction tools	Augmenting employee skills to complete complex tasks	AI 被视为”同事”in interactions with employees (Mu et al., 2023; Tang, Koopman, Mai, et al., 2023); AI helps employees with knowledge management as a partner (Jarrahi et al., 2023)
Leader	Algorithmic systems used by delivery platforms	Managing employee task allocation and execution supervision	Employers use algorithms to control employees (Kellogg et al., 2020); Algorithms replace managers to perform partial coordination and control functions (Möhlmannn et al., 2023)

Source: Compiled from relevant literature

(1) Substitution Perspective: AI as "Opponent" Role. With AI technol-

ogy' s rapid development, AI has evolved from performing mechanical tasks to executing complex cognitive tasks, demonstrating powerful analytical, learning, and decision-making capabilities. In other words, AI can not only replace repetitive, rule-based work but also possesses the potential to perform partial cognitive work (Dwivedi et al., 2021). AI' s substitution of employee job responsibilities is one of the core issues in current research, and its widespread application may trigger employees' concerns about job replacement or unemployment (Vorobeva et al., 2022).

(2) Assistance Perspective: AI as "Assistant" Role. In technology-driven dynamic transformation, enterprises increasingly adopt AI to improve efficiency and reduce costs. AI as an "assistant" is embedded in employees' daily work, empowering them and improving work efficiency. Related applications cover both routine transactional task scenarios, such as chatbot customer service (Kamoonpuri & Sengar, 2023; Poba-Nzaou et al., 2021), and high-precision, high-efficiency task scenarios, such as accurate cancer cell detection in images (Shah, 2019).

(3) Augmentation Perspective: AI as "Colleague"Role. Beyond assisting humans, AI technology demonstrates complementary agency in many aspects. AI "colleagues" in enterprises have been successfully integrated into production assistance processes (Yue et al., 2023), working alongside human employees to complete the same position tasks, and can even have augmentation effects on knowledge workers when completing complex tasks (Huang & Rust, 2018). In interactions, AI differs from "assistants" that are subordinate to employees, instead serving as "colleagues" working in parallel with employees (Mu et al., 2023; Tang et al., 2023).

(4) Management Perspective: AI as "Leader" Role. AI can jointly supervise, evaluate, provide feedback, and make decisions with managers, offering employees rapid and standardized guidance to achieve efficient workflows (Duggan et al., 2020). For example, Unilever uses AI to provide work guidance for new employees, helping them quickly adapt to their positions (Marr, 2018). It should be noted that in dual human-machine management contexts, the emergence of AI' s "leader" role affects not only employees but may also influence the psychology and behavior of peer managers.

In summary, with the development of the digital era, AI technology is gradually integrating into organizational relationship networks, redefining organizational management objects (Murray et al., 2021; Sergeeva et al., 2020). The objects of organizational management are no longer limited to people but have expanded to include AI technology and the complex systems composed of AI and human employees under technology empowerment (Li & Yang, 2018). The above classification of AI roles from the employee perspective helps further explore the deep impacts of AI on employee psychology and behavior.

3.1 Impacts of AI as "Opponent" on Employees

Reviewing previous industrial revolutions, it is evident that technological progress often comes at the cost of substituting partial labor forces, such as the first industrial revolution eliminating craftsmen and the second ending the steam era. Similarly, the "substitution" crisis has become an unavoidable important issue in the Industry 4.0 era. In the academic field, AI as an "opponent" has mixed effects on labor substitution (see Table 3), and its direct impacts through the workplace and indirect impacts through the social environment on employee psychology and behavior urgently need clarification.

Table 3: Summary of Perspectives on Whether AI Will Replace Employees

Source (Year)	Perspective
Allen et al. (2022)	Although people believe advanced AI will replace most positions, they think their own positions won' t be threatened
Einola & Khoreva (2023)	Although AI is portrayed as humanity' s new competitor, it won' t necessarily take over tasks currently performed by humans in the foreseeable future
Frey & Osborne (2017)	According to research, about 47% of jobs in the U.S. face the risk of being replaced by AI
Song et al. (2022)	In terms of interpersonal interaction and communication quality, consumers still prefer human staff over chatbots
The World Economic Forum (2020)	The "2020 Future of Jobs Report" predicts that by 2025, machines may replace 85 million jobs but will also create 97 million new jobs, driving economic growth

Source: Compiled from literature and reports

(1) Psychological Impacts. For employees whose work already incorporates AI, they typically directly perceive substitution threats and pressure. Research shows that when enterprises introduce chatbots in customer service centers, employees' job insecurity significantly increases, especially when robots possess human-like features (Wang et al., 2023). Panel data studies have found similar effects, where enterprise digital transformation exacerbates employees' perceived job insecurity (Dengler & Gundert, 2021). Meanwhile, the social environment is

filled with discussions on the topic of "Can AI replace humans,"manifested by the continuous emergence of "AI replacement" related topics on major online platforms (Chen & Wei, 2023), and mass media typically future-oriented displays of changes caused by AI to the public (Larson & DeChurch, 2020). Although no research has directly examined the impact of online communication about "AI replacement" on employee psychology and behavior, combining Li et al.' s (2023) research on the effects of online communication after the COVID-19 outbreak, it can be inferred that when major AI technologies (such as Chat-GPT) are announced, the related online environment may have a double-edged sword effect on employees' threat perception.

(2) Behavioral Impacts. Academia has extensively explored how AI substitution-induced threat and pressure perceptions affect employee behavior. On one hand, some studies combining conservation of resources theory and social comparison theory find that when employees compare AI devices with themselves, they worry about their own career development, triggering defense mechanisms manifested as increased service sabotage, knowledge hiding, organizational deviance, career migration, and work withdrawal behaviors (Arias-Pérez & Vélez-Jaramillo, 2022; Ma & Ye, 2022; Teng et al., 2024; Zhang & Jin, 2023; Zhao et al., 2023), as well as decreased innovative behavior (Liang et al., 2022). On the other hand, AI may also trigger positive employee behaviors by increasing pressure. Research finds that when employees view AI substitution threats as challenging factors, pressure can be transformed into a motivating driver (He et al., 2023), promoting employee innovative behavior and proactive learning behavior (Liang et al., 2022; Zou et al., 2023). However, the boundary conditions for these positive and negative behaviors still require further research to clarify the long-term impacts of AI substitution on employee behavior.

3.2 Impacts of AI as "Assistant" on Employees

Enterprise adoption of AI "assistants" to support employees widely exists in various workplaces. For example, architectural designers must master computer-aided design skills to participate in architectural firms' work practices (Orlikowski, 2000), and large technology companies like Microsoft, Apple, and Amazon have launched digital assistants (such as Siri) to help employees improve daily work efficiency (Maedche et al., 2019). Overall, research finds that AI brings performance gains to employees, but it 隐含 the risk of employees' high dependence on AI.

(1) Psychological Impacts. According to Deloitte' s 2017 risk consulting report "Dancing with Robot Bosses, Are You Ready?" , nearly 75% of surveyed managers believe that within the next five years, their work will require AI assistance, with this need being more urgent in larger enterprises. Although the psychological impacts of AI "assistants" on employees have not received much attention, there are already indications that excessive use of AI assistants easily creates path dependence and intelligent dependence (Tang et al., 2022). For

example, with the development of generative AI technologies like Chat-GPT, scholars have begun to pay attention to the excessive use of AI as assistants in scientific research production and creative work, expressing concerns about the hidden dangers of this phenomenon (Ma et al., 2024; Chamberlain et al., 2018). Notably, employees' dependence on AI may not only reduce their moral perception (Gratch & Fast, 2022) but may also form path dependence in information search and feedback mechanisms, further exacerbating the "information cocoon" effect (Wang et al., 2013).

(2) Behavioral Impacts. As an "assistant," AI can reduce employee resource depletion, lower cognitive load, and save time to improve work performance (Brachten et al., 2020). Additionally, AI can further enhance employee productivity by improving perceived satisfaction and work engagement (Marikyan et al., 2022). When employees perceive AI as beneficial to their work, they may exhibit positive behaviors conducive to task performance, such as job crafting, innovation, and proactive service (Zhang et al., 2023; Cheng et al., 2023; Huang & Gursoy, 2024; Tang, Koopman, Yam, et al., 2023).

However, the application of AI "assistants" also imposes quality requirements on employees. In other words, new technology does not always mean improved work flexibility; it may instead increase complexity. During digital transformation, organizations not only require employees to proficiently use AI "assistants" to execute tasks (Lee & Sirgy, 2019) and schedule progress (Anderson et al., 2002) but also demand multitasking abilities for instant feedback (Kohl & Swartz, 2019). In response, some scholars propose critical perspectives, suggesting that AI "assistant" application is a means for managers to control organizations and extract value through AI (Donnelly & Johns, 2021).

In this context, employees passively cope with the gap between organizational expectations and personal capabilities, which may make them feel at a loss about opportunities brought by new technology, even 固守 original tool usage patterns and miss benefits brought by new technology (Dittes et al., 2019). Moreover, when employees are forced to use AI at work, they may experience special technology stress more severe than general work stress, leading to high anxiety, fatigue, doubt, and inefficiency related to technology use (Salanova et al., 2013).

3.3 Impacts of AI as "Colleague" on Employees

The application of AI "colleagues" mostly exists in high-cognitive work scenarios, characterized by AI and employees demonstrating complementary agency to jointly complete the same position tasks. Although AI "colleagues" can empower employees, they also bring issues such as role conflict and function ambiguity.

(1) Psychological Impacts. When enterprises apply AI "colleagues," they often fail to establish clear norms and frameworks in advance, resulting in AI overlapping functions with employees, blurred contribution boundaries, and unclear responsibility attribution, making employees uncertain about their roles

and responsibilities and unable to distinguish their own and AI' s responsibility boundaries (Cascio & Montealegre, 2016; Man Tang et al., 2022). This issue has stronger practical complexity, especially when human-machine collaboration achieves success or experiences failure (Lei & Rau, 2021) and when facing accountability from external groups.

Additionally, for employees who jointly perform management responsibilities with AI "colleagues," the psychological impacts may involve not only role ambiguity but also power imbalance. Currently, algorithms are gradually becoming new authorities in organizations. In situations where humans and AI "colleagues" jointly manage, leaders participating in tasks such as allocation and decision-making may experience stronger work threat perception (Kolbjørnsrud et al., 2017).

(2) Behavioral Impacts. At the behavioral level, AI "colleagues" enhance employees' decision-making, service, and data analysis capabilities by expanding their cognitive boundaries and thinking abilities, improving work accuracy and increasing innovative behavior (Bankins et al., 2024; Mirbabaie et al., 2022). Compared with the human brain, AI systems have greater advantages in grabbing and processing large amounts of data (Tang et al., 2022), thereby achieving complementary advantages between human brains and intelligent machines.

However, while collaborating with AI "colleagues," employees largely reduce interactions with human employees. Research finds that facing AI for long periods makes it difficult for employees to gain energy from interpersonal interactions, consequently exhibiting more social cyberloafing and fewer proactive service and innovative behaviors in their actions (Mu et al., 2023; Huang & Gursoy, 2024; Yin et al., 2024).

3.4 Impacts of AI as "Leader" on Employees

Currently, work scenarios fully managed by AI remain rare, with countries holding different attitudes toward AI regulation and governance (Jia & Jiang, 2017). On one hand, AI "leaders"possess higher accuracy and stability, effectively reducing human corruption issues (Pan, 2017). On the other hand, AI "leaders" rely on algorithmic black boxes in management decisions, lacking empathy, moral sense, and social judgment capabilities (Giroux et al., 2022), inevitably triggering ethical issues. Therefore, both academia and industry maintain reservations about the accuracy, consistency, and stability of AI management (Glikson & Woolley, 2020).

(1) Psychological Impacts. The psychological impacts of AI "leaders" on employees are mainly manifested in management contexts such as communication, supervision, and feedback. First, in communication contexts, conversations with AI "leaders" have fewer interpersonal cues, are more structured, and are less rich in communication than human leaders (Claggett & Karahanna, 2018). Dehumanized communication often leads to more instrumental connections (such as shared cognition) rather than emotional connections (such as team cohesion) be-

tween superiors and subordinates, ultimately causing employee social inhibition and other psychological problems (Leonardi, 2018; Wang et al., 2020).

Second, in supervision contexts, AI "leaders" may face ethical dilemmas when obtaining employees' private information. Taking electronic monitoring systems that can collect, store, analyze, and report employee work performance as an example, although they can provide rapid feedback on various employee behaviors, they ignore employees' personal sharing willingness (Dwivedi et al., 2021). This automated monitoring behavior may damage employee morale and organizational trust (Cheatham et al., 2019). Additionally, disclosing to employees the side effects of AI supervision on productivity is called the "disclosure effect" (Tong et al., 2021), while some enterprises may unilaterally conceal the existence of AI supervision from employees to avoid side effects of deploying AI "leaders" (such as employee resistance). Although ethically, employees have the right to know they are being monitored by AI, current society lacks laws and regulations mandating enterprise disclosure, and enterprises have not fulfilled corresponding responsibilities from within or proactively established norms within organizations (Zhang et al., 2024).

Finally, in feedback contexts, although AI "leaders" can accurately assess employee productivity and generate personalized work improvement suggestions (Heaven, 2020), AI feedback may trigger cognitive inconsistency and actual judgment inconsistency. The former may lead to algorithm aversion (the phenomenon where people prefer human judgment over algorithms), while the latter may cause employees to lose confidence in AI prediction accuracy (Dietvorst & Simmons, 2015). Contrary to this view, when non-professionals receive professional advice from algorithms rather than humans, they may develop higher trust (Logg et al., 2019), a phenomenon that affects employees' judgment of feedback results and subsequent work decisions. Additionally, when employees strongly feel controlled by AI, they may experience cognitive load, emotional exhaustion, and ego depletion (Zhang et al., 2024; Wang et al., 2024).

(2) Behavioral Impacts. AI "leaders" have a double-edged sword effect on employee behavior. On one hand, AI can optimize traditional task processes by monitoring employees (Kellogg et al., 2020), providing higher allocation efficiency and accuracy, thereby improving employee productivity (Bai et al., 2022). This automated and optimized management model allows employees to focus more energy on tasks themselves, thus promoting work performance improvement.

However, on the other hand, algorithms as the foundation of AI operation may cause employee psychological tension, which in turn affects employee work well-being, manifested as inhibiting employee voice behavior (Kensbock & Stöckmann, 2021), weakening creativity (Li et al., 2024), increasing deviant behavior (Wang et al., 2024), and raising turnover intention (Yu et al., 2024). Moreover, AI "leaders" may weaken employees' trust in decision-making processes, especially when algorithms cannot fully understand emotional factors, cultural backgrounds, and complex social dynamics, making employees more likely to

feel alienated and powerless toward their instructions, thereby reducing work enthusiasm and cooperation willingness. In the long term, employees may feel that their personality, expertise, and creativity are not fully recognized or utilized, consequently affecting their job satisfaction and organizational loyalty.

Given the dual nature of AI "leader" role impacts on employees, enterprises should comprehensively evaluate potential impacts when adopting AI for management and decision-making tasks, especially fully considering the pros and cons of algorithms as the core mechanism of AI implementation (see Table 4), balancing the contradiction between efficiency gains brought by algorithms and employee emotional needs, to ensure the reasonable application of AI "leaders" in management and promote their positive development.

Table 4: Summary of Opposing Perspectives on Algorithm Use

Perspective	Viewpoint
Positive	Higher work autonomy and flexibility; fairer task allocation logic
Negative	Discomfort from being monitored; damaged interests due to algorithmic bias
Appreciating Algorithms	Non-professionals lack algorithm knowledge; need to handle logical reasoning or difficult problems
Distrusting Algorithms	Easier to lose trust when algorithms err; involves subjective domains of individual preferences; want to maintain control over decisions

Source: Compiled from relevant literature

4.1 Organizational-Level Management Strategies

(1) Proactively Help Employees with AI-related Training. When applying AI technology to improve enterprise competitiveness, organizations need matching human capital to address challenges in technology implementation. However, the mismatch between employee skills and organizational needs has become a major obstacle to enterprise digital transformation (Dwivedi et al., 2021). Therefore, organizations should "activate" every employee through training to become "super individuals" to cope with Industry 4.0 challenges (Chen & Zhu, 2017).

Existing research shows that when employees work with AI and AI' s status is higher than employees, it may trigger employees' self-serving bias, affect-

ing their sense of responsibility and organizational identification. Therefore, when coordinating the relationship between the two, organizations should not set AI as an overly high authority role (such as a complete leader role) to prevent damaging employee responsibility and organizational interests (Lei & Rau, 2021). Additionally, enterprises should proactively empower employees through AI technology to avoid job insecurity brought by AI "substitution" crises and balance employees' different roles when facing AI in the workplace.

(2) Establish a Good AI Culture Atmosphere and Values. Research shows that organizational culture determines shared values and beliefs within organizations. Therefore, to better embed AI in the workplace, organizations should promote digital culture and values transformation, guide employees to fully utilize AI to obtain more value and avoid adverse effects, enhance organizational capacity to absorb new knowledge, and strengthen overall learning and creative abilities (Sun et al., 2021).

Furthermore, some studies point out that factors such as team building and organizational support play important moderating roles in AI application (Mu et al., 2023; Ma & Ye, 2022). A good organizational support atmosphere helps enhance employees' sense of belonging, thereby reducing negative emotions brought by AI shock awareness. When organizational AI readiness is high, employees can not only obtain more complete technical support but also use AI to empower their work in a more stable environment (Yin et al., 2024).

(3) Proactively Establish AI Use Norms and Ethical Rules. The previous sections have fully discussed the impacts of different AI roles on employees in the workplace, which stem from the current situation where theoretical development on workplace AI application lags behind practice. Decades after AI' s birth, scholars realized the value of "Robot Ethics," and it was not until 2019 that the OECD released the world' s first intergovernmental AI standard (OECD, 2019). However, imperfect legal systems should not become excuses for enterprises to evade responsibilities. Enterprises should proactively establish internal norms for AI use and monitoring to ensure technology compliance and employee rights.

Specifically, on one hand, enterprises need to clarify AI's boundaries in employee information acquisition and proactively seek employee authorization. For example, they can adopt anonymized information protection measures (Hornung & Smolnik, 2022), or in platform work environments, enhance employee acceptance of AI management through work gamification or improved algorithm transparency (Yu et al., 2024; Wang et al., 2024). On the other hand, in AI-involved feedback and decision-making processes, enterprises should proactively disclose relevant information to improve transparency. According to algorithm reductionism, AI output processes are controlled by algorithms, so disclosing algorithm black box mechanisms to let employees understand AI decision logic helps improve employee trust and acceptance of AI feedback.

4.2 Individual-Level Adaptation Strategies

(1) Proactively Develop Individual Skills. AI' s substitution effect mainly occurs at the task level rather than the entire job level (Huang & Rust, 2018). Research points out that in interpersonal interactions, employees' overall performance is better than AI (Song et al., 2022). Therefore, considering AI' s substitution of partial labor, employees need to master more skills that are difficult for AI to replace, especially creative and social abilities (Frey & Osborne, 2017). Additionally, from the perspective of AI tool usage, when individuals have richer AI knowledge, they can better comprehensively evaluate AI and empower their work (He et al., 2024). Against the backdrop of AI' s widespread application in workplaces, employees need to improve five key skills: data analysis, digitalization, complex cognition, decision-making, and continuous learning (Jaiswal et al., 2024), thereby gaining greater advantages in human-machine collaboration. Furthermore, some scholars emphasize that cultivating AI literacy helps employees view AI as opponents, partners, or managers more dialectically (Einola & Khoreva, 2023; Jarrahi et al., 2023). Therefore, continuously developing unique human capital and comprehensive AI usage literacy will help employees adapt to future work environments and enhance career development competitiveness.

(2) Regulate Internal Cognition. AI shock awareness, AI usage, and algorithmic management inevitably bring negative impacts to employees' cognition and emotions. Such concerns about AI-human interaction can manifest as employees feeling higher job insecurity, work pressure, and emotional exhaustion. Research finds that individual employee characteristics can serve as boundary conditions for these negative impact pathways. For example, individual characteristics such as conscientiousness, self-affirmation, and core self-evaluation (Yam et al., 2022; Tang et al., 2022; Tang, Koopman, Yam, et al., 2023) can help employees conduct positive self-affirmation, reduce self-esteem damage from using AI, and thereby restore internal resources such as work well-being.

Moreover, employees' attitudes toward AI are also key moderating factors affecting employee adaptation. When employees view AI as a challenging stressor, they can often transform it into career development opportunities. Research shows that learning goal orientation can buffer AI' s negative impacts on employees (Xu & Wang, 2022), a phenomenon that also applies to platform employees under algorithmic management (Zhan & Zhao, 2024). However, excessively high competitive psychological climate and technology anxiety will bring higher threat perception (Liu & Xie, 2024; Lingmont & Alexiou, 2020). Therefore, employees need to dialectically view AI' s impacts on themselves while improving personal skills, fully utilizing its advantages to empower their work performance and career development.

5 Summary and Future Research Outlook

This study takes as its starting point how employees perceive AI roles in the workplace and 梳理 the mechanisms through which AI impacts employee psychology and behavior. Specifically, from the employee perspective, AI in the workplace is classified into four roles: "opponent," "assistant," "colleague," and "leader," and the differential impacts of these roles on employee psychology and behavior are further analyzed. Finally, corresponding measures are proposed at both organizational and individual levels to address the impacts of AI roles.

Based on existing literature and the content 梳理 above, this study focuses on research findings from Chinese samples and constructs a mechanism framework for the impacts of AI roles on employee psychology and behavior (see Figure 2 [Figure 2: see original paper]). This framework, based on AI' s four roles in the workplace, systematically reveals how different AI roles affect employees' cognition, emotions, behavior, and career development from both organizational and individual levels. On this basis, this study further proposes future research outlooks to deepen research on AI-employee relationships in the Chinese context.

[Figure 2: see original paper] Figure 2: Framework of Impacts of Different AI Roles on Employee Psychology and Behavior (Based on Chinese Samples)

First, enrich the impact mechanisms of different AI roles on employee psychology and behavior in the Chinese context. Currently, existing literature still lacks sufficient differentiation of AI forms, and attention to how different types of AI affect work performance is limited (Tang et al., 2022). Therefore, future research should further subdivide AI categories and incorporate them as important antecedent variables. Second, although individual behaviors (such as innovative behavior) have received extensive attention in existing research, the impact mechanisms at the team level have not been fully explored. Therefore, future research should expand its perspective to not only focus on individual-level impacts but also deeply investigate how AI shapes team behavior. Additionally, research on AI' s work-family spillover effects remains scarce (Tang et al., 2023), and future research should further explore its impacts on employees' work-life balance.

Second, explore boundary conditions for the impacts of different AI roles on employee psychology and behavior in the Chinese context. Existing research has examined how organizations and employees cope with AI' s impacts on employee psychology and behavior from organizational factors and individual employee characteristics perspectives, pointing out that AI' s role in enhancing employee creativity has stronger promotion effects on high-skill employees than low-skill employees (Jia et al., 2024). However, future research still needs to incorporate more boundary conditions (such as AI literacy) to optimize the coexistence model between AI and human employees, to more comprehensively understand how employees cope with challenges brought by AI.

Third, explore AI' s impacts across different industries and functional back-

grounds to enrich diverse understandings of its roles. On one hand, AI' s impacts on employees in different industries vary significantly. For example, in manufacturing, AI substitutes for a considerable number of positions (Bankins et al., 2024), while in service industries, it is used to undertake partial functions to assist employees (Li et al., 2024). On the other hand, AI' s impacts on workers in different functions vary significantly. For example, from a manager' s perspective, AI that assesses employee attendance and performance can serve as a decision support tool, while from a regular employee' s perspective, it is more like an "invisible leader." Therefore, future research can further explore the dynamic transformation of AI roles across different industry contexts and deeply analyze how AI applications in specific industries affect employee experiences.

Fourth, expand multi-directional comparative research on workplace AI usage and its impacts on employee psychology and behavior. On one hand, from a horizontal comparison perspective, given differences in AI technology adoption levels, cultural backgrounds, and employee thinking patterns across countries, future research can conduct cross-cultural comparisons to deeply understand how AI technology impacts employees in different cultural contexts, providing references for Chinese organizations and employees to cope with AI technology shocks by analyzing similarities, differences, and mutual learning. On the other hand, from a longitudinal dynamic perspective, as society' s understanding of AI gradually deepens, employees' perceptions of AI roles are also changing, which in turn affects their attitudes, usage patterns, and evaluation criteria toward AI. Therefore, future research can adopt longitudinal data analysis to examine employees' dynamic cognition of workplace AI and explore how changes in AI roles will dynamically affect employee psychology and behavior. Moreover, there may be interaction effects between AI' s impacts on employee psychology and behavior, and more cross-cutting research is needed to explore mutual influence mechanisms.

Fifth, expand research methods to promote more scientific and comprehensive understanding of employee-AI relationships. AI' s rapid development not only reshapes employees' work roles but also provides new technical support for academic research methods. Existing research has used archival data analysis to elaborate on the long-term impacts of AI usage on employee job insecurity from a macro perspective (Yam et al., 2022). Meanwhile, other scholars have called for drawing on methods from brain cognitive science, computer science, and other disciplines to improve the scientificity and accuracy of organizational behavior and human resource management research in the AI context (Luo et al., 2022). Future research can consider starting from panel data to study AI' s long-term impacts on labor markets from the perspective of industry AI application and analyze how AI technology application shapes employees' career paths. Additionally, future research can adopt methods such as EEG experiments to deeply explore employees' cognitive reactions and emotional changes when facing AI, supplementing existing questionnaire-based research methods and improving scientificity and reliability.

Finally, strengthen interdisciplinary collaboration in AI research perspectives. AI research has been conducted across multiple disciplines, each with different emphases. How AI dynamically affects employee psychology and behavior remains a controversial topic, and the balance between its positive and negative effects is still inconclusive. Therefore, future research needs to integrate multidisciplinary knowledge and strengthen deep interdisciplinary cooperation. In terms of research perspectives, issues such as human-machine relative status (e.g., how third-party customers view AI-human employee interactions) have attracted attention from consumer behavior scholars (Lei & Rau, 2021); journalism and law disciplines focus on the formation mechanisms and coping strategies of algorithmic ethical issues; and administrative management focuses on the application and challenges of algorithmic decision-making in public management. It is evident that different industries and disciplines have different theoretical foundations and practical priorities in AI research, which is of profound significance for comprehensively understanding AI development trends and harmonious human-machine coexistence models. Future research should further strengthen interdisciplinary collaboration, expand more forward-looking and innovative perspectives in AI research, thereby laying a solid theoretical foundation for the scientific application of AI in organizational management and providing practical guidance for enterprises and society to more effectively cope with opportunities and challenges brought by AI.

References

Chen, C., Kang, C., Yang, Y, & Wan, Y. (2022). AI potential substitution risk and employee vocational ability development: From the perspective of employee insecurity. *Human Resources Development of China*, 39(1), 84–97.

Chen, Z., & Wei, Y. (2023). In this year of AI's rapid development, how much of our work has been replaced? *The Paper*. https://m.thepaper.cn/newsDetail_{{{forward}}}_{{25440475}}}

Chen, C., & Zhu, L. (2017). Strategic thinking and organizational capability in the digital era. *Chinese and Foreign Management*, (12), 88-90.

Jia, K., & Jiang, Y. (2017). Three basic issues of AI governance: Technical logic, risk challenges, and public policy choices. *Chinese Public Administration*, (10), 40–45.

Li, P., & Yang, Z. (2018). Human-machine fusion intelligence: Artificial intelligence 3.0. *Tsinghua Management Review*, (7),73–82.

Li, X., Shi, Z., & Guo, X. (2023). Spreading anxiety or providing support? The double-edged sword effect of virtual space social networks. *Journalism and Communication*, 30(6), 50–66+127.

Li, Y., & Tao, N. (2022). A multi-level dynamic impact model of employee AI technology adoption: A literature review. *Human Resources Development of China*, 39(1), 35–56.

Li, Y. (2024). Cognitive relativity—The path to strong artificial intelligence. *Journal of Electronics and Information Technology*, (2), 408-427.

Liu, X., & Xie, L. (2024). Joy or worry? The dual-path impact mechanism of service robot roles on employee well-being—A qualitative and quantitative study based on human-robot interaction contexts in the hospitality industry. *Nankai Business Review*, 1-25.

Luo, W., Huo, W., Zhao, Y., & Wang, Z. (2022). AI-driven organizational and human resource management transformation: Practical insights and research directions. *Human Resources Development of China*, 39(1),4-16.

Ma, Y., Huang, H., Wu, L., & Huang, D. (2024). "Technology empowerment" or "tool dependence" : Research on the impact of generative AI on graduate students' research innovation ability. *E-Education Research*, (12), 58-66.

Mu, X., Mao, R., & Wang, J. (2023). "Temperature"or "efficiency"? Research on the double-edged sword effect of AI usage on employee work behavior. *Human Resources Development of China*, 40(9), 6-21.

Pan, Y. (2017). The value and positioning of AI' s involvement in the judicial field. *Exploration and Free Views*, (10), 101-106.

Sun, Z., Xie, W., & Shu, Z. (2021). A cross-level mechanism model for enterprise digital innovation realization. *Science and Technology Management Research*, (23),205-212.

Tu, Y., Hao, P., & Long, L. (2023). Job substitution or job transformation? The connotation, consequences, and sources of technological job insecurity. *Advances in Psychological Science*, 31(8), 1359-1373.

Wang, L., Qu, W., & Li, J. (2013). Program parallelization based on AI search and data dependency analysis. *Modern Electronics Technique*, (6), 1-3.

Wang, Z., & Yao, M. (2022). A review of research on the impact of workplace human-machine collaboration on employees. *Foreign Economics and Management*, 44(9), 86-102.

Xie, X., Zuo, Y., & Hu, Q. (2021). Human resource management in the digital era: A perspective based on human-technology interaction. *Management World*, 37(1), 200-216+13.

Xu, G., & Wang, H. (2022). Research on the impact of technology shock awareness on employee change support intention—In the context of AI development. *East China Economic Management*, 36(6), 119-128.

Yin, M., & Niu, X. (2024). Dancing with AI: AI-employee collaboration from a systematic perspective. *Advances in Psychological Science*, 32(1), 162-176.

Yu, S., Liu, M., Liu, S., & Liu, T. (2024). Research on the impact mechanism of platform algorithmic control on gig workers' turnover intention. *Journal of Management*, 21(8), 1152-1162.

Zhan, X., & Zhao, L. (2024). "Empowerment" or "burden" ? The double-edged sword effect of digital labor platform algorithmic management on workers' job performance. *Soft Science*, (7), 101-106.

Zhang, G., Meng, Y., Long, L., & He, W. (2024). Where is the "crisis" for enterprises in the AI crisis. *Tsinghua Management Review*, (6), 103-111.

Zhang, J. (2024). Reflections and prospects on generative AI embedded in digital government construction—Based on a strong AI perspective. *Research on Financial and Economic Issues*, (7), 3-14.

Zhang, L., Li, J., & Mao, M. (2024). Research on the impact mechanism of gig workers' perceived algorithmic control on work engagement—Based on a dual-path model of cognition and emotion. *Business Economics and Management*, (3), 47-58.

Zhang, Y. (2023). Ethical dilemmas and risks faced by strong AI devices. *Jiangsu Social Sciences*, (2), 58-67.

Zou, Y., Zhou, Y., & Huang, Q. (2023). Employee proactive learning behavior under AI technology impact. *Science and Technology Management Research*, 43(17), 180-187.

Allen, R. A., White, G. R. T., Clement, C. E., Alexander, P., & Samuel, A. (2022). Servants and masters: An activity theory investigation of human-AI roles in the performance of work. *Strategic Change*, 31(6), 581-590.

Anderson, S. E., Coffey, B. S., & Byerly, R. T. (2002). Formal organizational initiatives and informal workplace practices: Links to work-family conflict and job-related outcomes. *Journal of Management*, 28(6), 787-810.

Arias-Pérez, J. & Vélez-Jaramillo, J. (2022). Understanding knowledge hiding under technological turbulence caused by artificial intelligence and robotics. *Journal of Knowledge Management*, 26(6), 1476-1491.

Bai, B., Dai, H., Zhang, D. J., Zhang, F., & Hu, H. (2022). The impacts of algorithmic work assignment on fairness perceptions and productivity: Evidence from field experiments. *Manufacturing & Service Operations Management*, 24(6), 3060-3078.

Bankins, S., Ocampo, A. C., Marrone, M., Restubog, S. L. D., & Woo, S. E. (2024). A multilevel review of artificial intelligence in organizations: Implications for organizational behavior research and practice. *Journal of Organizational Behavior*, 45(2), 159-182.

Bory, P., Natale, S., & Katzenbach, C. (2024). Strong and weak AI narratives: an analytical framework. *AI & SOCIETY*, 1-11.

Bostrom, N. (2014). *Superintelligence: Paths, dangers, strategies*. New York: Oxford University Press.

Brachman, R. J. (2006). AI more than the sum of its parts. *AI Magazine*, 27(4), 19–34.

Brachten, F., Brünker, F., Frick, N. R., Ross, B., & Stieglitz, S. (2020). On the ability of virtual agents to decrease cognitive load: An experimental study. *Information Systems and e-Business Management*, 18, 187–207.

Cascio, W. F., & Montealegre, R. (2016). How technology is changing work and organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 3(1), 349–375.

Chamberlain, R., Mullin, C., Scheerlinck, B., & Wagemans, J. (2018). Putting the art in artificial: Aesthetic responses to computer-generated art. *Psychology of Aesthetics, Creativity, and the Arts*, 12(2), 177.

Cheatham, B., Javanmardian, K., & Samandari, H. (2019). Confronting the risks of artificial intelligence. *McKinsey Quarterly*, 2(38), 1-9.

Claggett, J. L., & Karahanna, E. (2018). Unpacking the structure of coordination mechanisms and the role of relational coordination in an era of digitally mediated work processes. *Academy of Management Review*, 43(4), 739–764.

Dengler, K., & Gundert, S. (2021). Digital transformation and subjective job insecurity in Germany. *European Sociological Review*, 37(5), 799–817.

Dietvorst, B. J., Simmons, J. P., & Massey, C. (2015). Algorithm aversion: People erroneously avoid algorithms after seeing them err. *Journal of Experimental Psychology: General*, 144(1), 114–126.

Dittes, S., Richter, S., Richter, A., & Smolnik, S. (2019). Toward the workplace of the future: How organizations can facilitate digital work. *Business Horizons*, 62(5), 649–661.

Donnelly, R., & Johns, J. (2021). Recontextualising remote working and its HRM in the digital economy: An integrated framework for theory and practice. *The International Journal of Human Resource Management*, 32(1), 235–258.

Duan, Y., Edwards, J. S., & Dwivedi, Y. K. (2019). Artificial intelligence for decision making in the era of Big Data–evolution, challenges and research agenda. *International Journal of Information Management*, 48(2), 63–71.

Duggan, J., Sherman, U., Carbery, R., & McDonnell, A. (2020). Algorithmic management and app-work in the gig economy: A research agenda for employment relations and HRM. *Human Resource Management Journal*, 30(1), 114–132.

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ··· & Williams, M. D. (2021). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 57(1), 101994.

Einola, K., & Khoreva, V. (2023). Best friend or broken tool? Exploring the co-existence of humans and artificial intelligence in the workplace ecosystem. *Human Resource Management*, 62(1), 117–135.

Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation?. *Technological Forecasting and Social Change*, 114, 254–280.

Giroux, M., Kim, J., Lee, J. C., & Park, J. (2022). Artificial intelligence and declined guilt: Retailing morality comparison between human and AI. *Journal of Business Ethics*, 178(4), 1027–1041.

Glikson, E., & Woolley, A. W. (2020). Human trust in artificial intelligence: Review of empirical research. *Academy of Management Annals*, 14(2), 627–660.

Gratch, J., & Fast, N. J. (2022). The power to harm: AI assistants pave the way to unethical behavior. *Current Opinion in Psychology*, 47, 101382.

He, C., Teng, R., & Song, J. (2023). Linking employees' challenge-hindrance appraisals toward AI to service performance: the influences of job crafting, job insecurity and AI knowledge. *International Journal of Contemporary Hospitality Management*, 36(3), 975–994.

He, C., Teng, R., A. (2024). When employees meet AI: The role of AI literacy in shaping employee outcomes. *Journal of Business Research*, 152, 113456.

Heaven, W. D. (2020). This startup is using AI to give workers a "productivity score" . *MIT Technology Review*.

Hornung, O., & Smolnik, S. (2022). AI invading the workplace: Negative emotions towards the organizational use of personal virtual assistants. *Electronic Markets*, 32, 123–138.

Huang, M. H., & Rust, R. T. (2018). Artificial intelligence in service. *Journal of Service Research*, 21(2), 155–172.

Huang, Y., & Gursoy, D. (2024). How does AI technology integration affect employees' proactive service behaviors? A transactional theory of stress perspective. *Journal of Retailing and Consumer Services*, 77, 103342.

Jaiswal, A., Arun, C. J., & Varma, A. (2022). Rebooting employees: Upskilling for artificial intelligence in multinational corporations. *The International Journal of Human Resource Management*, 33(6), 1179–1208.

Janssen, M., Hartog, M., Matheus, R., Yi Ding, A., & Kuk, G. (2022). Will algorithms blind people? The effect of explainable AI and decision-makers' experience on AI-supported decision-making in government. *Social Science Computer Review*, 40(2), 478–493.

Jarrahi, M. H., Askay, D., Eshraghi, A., & Smith, P. (2023). Artificial intelligence and knowledge management: A partnership between human and AI. *Business Horizons*, 66(1), 87–99.

Jia, N., Luo, X., Fang, Z., & Liao, C. (2024). When and how artificial intelligence augments employee creativity. *Academy of Management Journal*, 67(1), 5-32.

Kamoonpuri, S. Z., & Sengar, A. (2023). Hi, May AI help you? An analysis of the barriers impeding the implementation and use of artificial intelligence-enabled virtual assistants in retail. *Journal of Retailing and Consumer Services*, 72(2), 103258.

Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who' s the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons*, 62(1), 15-25.

Kellogg, K. C., Valentine, M. A., & Christin, A. (2020). Algorithms at work: The new contested terrain of control. *Academy of Management Annals*, 14(1), 366-410.

Kensbock, J. M., & Stöckmann, C. (2021). "Big brother is watching you" : surveillance via technology undermines employees' learning and voice behavior during digital transformation. *Journal of Business Economics*, 91(4), 543-580.

Köchling, A., & Wehner, M. C. (2020). Discriminated by an algorithm: a systematic review of discrimination and fairness by algorithmic decision-making in the context of HR recruitment and HR development. *Business Research*, 13(3), 795-848.

Kohl, K., & Swartz, J. (2019). Building industry 4.0 talent. *Thriving in Digital Workspaces: Emerging Issues for Research and Practice*, 10(1),15-39.

Kolbjørnsrud, V., Amico, R., & Thomas, R. J. (2017). Partnering with AI: how organizations can win over skeptical managers. *Strategy & Leadership*, 45(1), 37-43.

Kong, H., Yuan, Y., Baruch, Y., Bu, N., Jiang, X., & Wang, K. (2021). Influences of artificial intelligence (AI) awareness on career competency and job burnout. *International Journal of Contemporary Hospitality Management*, 33(2), 717-734.

Larson, L., & DeChurch, L. A. (2020). Leading teams in the digital age: Four perspectives on technology and what they mean for leading teams. *The Leadership Quarterly*, 31(1), 101377.

Lee, D. J., & Joseph Sirgy, M. (2019). Work-life balance in the digital workplace: The impact of schedule flexibility and telecommuting on work-life balance and overall life satisfaction. *Thriving in Digital Workspaces: Emerging Issues for Research and Practice*, 10(1),355-384.

Lei, X., & Rau, P. L. P. (2021). Effect of relative status on responsibility attributions in human-robot collaboration: Mediating role of sense of responsibility and moderating role of power distance orientation. *Computers in Human Behavior*, 122, 106820.

Leonardi, P. M. (2011). When flexible routines meet flexible technologies: Affordance, constraint, and the imbrication of human and material agencies. *MIS Quarterly*, 20(3),147-167.

Leonardi, P., & Contractor, N. (2018). Better people analytics. *Harvard Business Review*, 96(6), 70-81.

Liang, X., Guo, G., Shu, L., Gong, Q., & Luo, P. (2022). Investigating the double-edged sword effect of AI awareness on employee' s service innovative behavior. *Tourism Management*, 92, 104564.

Lingmont, D. N., & Alexiou, A. (2020). The contingent effect of job automating technology awareness on perceived job insecurity: Exploring the moderating role of organizational culture. *Technological Forecasting and Social Change*, 161, 120302.

Logg, J. M., Minson, J. A., & Moore, D. A. (2019). Algorithm appreciation: People prefer algorithmic to human judgment. *Organizational Behavior and Human Decision Processes*, 151, 90-103.

Loureiro, S. M. C., Bilro, R. G., & Neto, D. (2022). Working with AI: Can stress bring happiness?. *Service Business*, 17(1), 33-255.

Ma, C., & Ye, J. (2022). Linking artificial intelligence to service sabotage. *The Service Industries Journal*, 42(13-14), 1054-1074.

Maedche, A., Legner, C., Benlian, A., Berger, B., Gimpel, H., Hess, T., ···& Söllner, M. (2019). AI-based digital assistants: Opportunities, threats, and research perspectives. *Business & Information Systems Engineering*, 61, 535-544.

Man Tang, P., Koopman, J., McClean, S. T., Zhang, J. H., Li, C. H., De Cremer, D., ···& Ng, C. T. S. (2022). When conscientious employees meet intelligent machines: An integrative approach inspired by complementarity theory and role theory. *Academy of Management Journal*, 65(3), 1019-1054.

Marr, B. (2018). The amazing ways how Unilever uses artificial intelligence to recruit & train thousands of employees. *Forbes*. https://www.forbes.com/sites/bernardmarr/2018/12/14/the-amazingways-how-unilever-uses-artificial-intelligenc e-to-recruit-train-thousands-of-employees/?sh=23d2eabb6274

Mirbabaie, M., Brünker, F., Möllmann, N. R., & Stieglitz, S. (2022). The artificial intelligence-understanding the AI identity threat at the workplace. *Electronic Markets*, 32, 73-99.

Möhlmannn, M., Alves de Lima Salge, C., & Marabelli, M. (2023). Algorithm sensemaking: How platform workers make sense of algorithmic management. *Journal of the Association for Information Systems*, 24(1), 84-108.

Murray, A. (2015). The New Industrial Revolution (And Our Giga-Good Fortune). *Fortune*, 171(6), 6-6.

Murray, A., Rhymer, J. E. N., & Sirmon, D. G. (2021). Humans and technology: Forms of conjoined agency in organizations. *Academy of Management Review*, 46(3), 552–571.

OECD. (2019). *Scoping the OECD AI principles: Deliberations of the Expert Group on Artificial Intelligence at (AIGO)*. Digital Economy Papers, No.291, Publishing. https://doi.org/10.1787/d62f618a-en.

Orlikowski, W. J. (2000). Using technology and constituting structures: A practice lens for studying technology in organizations. *Organization Science*, 11(4), 404–428.

Poba-Nzaou, P., Galani, M., Uwizeyemungu, S., & Ceric, A. (2021). The impacts of artificial intelligence (AI) on jobs: an industry perspective. *Strategic HR Review*, 20(2), 60–65.

Renz, S., Kalimeris, J., Hofreiter, S., & Spörrle, M. (2024). Me, myself and AI: How gender, personality and emotions determine willingness to use Strong AI for self-improvement. *Technological Forecasting and Social Change*, 209, 123760.

Salanova, M., Llorens, S., & Cifre, E. (2013). The dark side of technologies: Technostress among users of information and communication technologies. *International Journal of Psychology*, 48(3), 422-436.

Searle, J. R. (1980). Minds, brains, and programs. *Behavioral and Brain Sciences*, 3(3), 417–424.

Sergeeva, A. V., Faraj, S., & Huysman, M. (2020). Losing touch: An embodiment perspective on coordination in robotic surgery. *Organization Science*, 31(5), 1248–1271.

Shah, N. R. (2019). Health care in 2030: will artificial intelligence replace physicians?. *Annals of Internal Medicine*, 170(6), 407–408.

Song, M., Xing, X., Duan, Y., Cohen, J., & Mou, J. (2022). Will artificial intelligence replace human customer service? The impact of communication quality and privacy risks on adoption intention. *Journal of Retailing and Consumer Services*, 66, 102900.

Tang, P. M., Koopman, J., Mai, K. M., De Cremer, D., Zhang, J. H., Reynders, P., ···Chen, I. (2023). No person is an island: Unpacking the work and afterwork consequences of interacting with artificial intelligence. *Journal of Applied Psychology*, 108(11), 1766–1789.

Tang, P. M., Koopman, J., McClean, S. T., Zhang, J. H., Li, C. H., De Cremer, D., ···Ng, C. T. S. (2022). When conscientious employees meet intelligent machines: An integrative approach inspired by complementarity theory and role theory. *Academy of Management Journal*, 65(3), 1019–1054.

Tang, P. M., Koopman, J., Yam, K. C., De Cremer, D., Zhang, J. H., & Reynders, P. (2023). The self-regulatory consequences of dependence on intelligent

machines at work: Evidence from field and experimental studies. *Human Resource Management*, 62(5), 721–744.

Teng, R., Zhou, S., Zheng, W., & Ma, C. (2024). Artificial intelligence (AI) awareness and work withdrawal: evaluating chained mediation through negative work-related rumination and emotional exhaustion. *International Journal of Contemporary Hospitality Management*, 36(7), 2311-2326.

The World Economic Forum. (2020). *The future of jobs report 2020*. Retrieved March 14, 2023, from http://hdl.voced.edu.au/10707/555914

Tong, S., Jia, N., Luo, X., & Fang, Z. (2021). The Janus face of artificial intelligence feedback: Deployment versus disclosure effects on employee performance. *Strategic Management Journal*, 42(9), 1600-1631.

Tsai, C. Y., Marshall, J. D., Choudhury, A., Serban, A., Hou, Y. T. Y., Jung, M. F., ···& Yammarino, F. J. (2022). Human-robot collaboration: A multilevel and integrated leadership framework. *The Leadership Quarterly*, 33(1), 101553.

Vorobeva, D., El Fassi, Y., Costa Pinto, D., Hildebrand, D., Herter, M. M., & Mattila, A. S. (2022). Thinking skills don' t protect service workers from replacement by artificial intelligence. *Journal of Service Research*, 25(4), 569–585.

Vuksanović Herceg, I., Kuč, V., Mijušković, V. M., & Herceg, T. (2020). Challenges and driving forces for industry 4.0 implementation. *Sustainability*, 12(10), 4208.

Wang, B., Liu, Y., & Parker, S. K. (2020). How does the use of information communication technology affect individuals? A work design perspective. *Academy of Management Annals*, 14(2), 695–725.

Wang, Y., Wang, Z., & Li, J. (2024). Does algorithmic control facilitate platform workers' deviant behavior toward customers? The ego depletion perspective. *Computers in Human Behavior*, 156, 108242.

Wesche, J. S., & Sonderegger, A. (2019). When computers take the lead: The automation of leadership. *Computers in Human Behavior*, 101, 197–209.

Yam, K. C., Tang, P. M., Jackson, J. C., Su, R., & Gray, K. (2022). The rise of robots increases job insecurity and maladaptive workplace behaviors: Multimethod evidence. *Journal of Applied Psychology*, 108(5), 850–870.

Yin, M., Jiang, S., & Niu, X. (2024). Can AI really help? The double-edged sword effect of AI assistant on employees' innovation behavior. *Computers in Human Behavior*, 150, 107987.

Yue, B., & Li, H. (2023). The impact of human-AI collaboration types on consumer evaluation and usage intention: a perspective of responsibility attribution. *Frontiers in Psychology*, 14(2), 1277861.

Zhang, D., Mishra, S., Brynjolfsson, E., Etchemendy, J., Ganguli, D., Grosz, B., Perrault, R. (2021). *The AI Index 2021 Annual Report*. Retrieved March 14, 2023, from https://aiindex.stanford.edu/ai-index-report-2021/

Zhang, X., & Jin, H. (2023). How does smart technology, artificial intelligence, automation, robotics, and algorithms (STAARA) awareness affect hotel employees' career perceptions? A disruptive innovation theory perspective. *Journal of Hospitality Marketing & Management*, 32(2), 264–283.

Zhao, J., Hu, E., Han, M., Jiang, K., & Shan, H. (2023). That honey, my arsenic: The influence of advanced technologies on service employees' organizational deviance. *Journal of Retailing and Consumer Services*, 75, 103038.

Note: Figure translations are in progress. See original paper for figures.