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AI Assistance and Achievement Emotions

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Abstract. With artificial intelligence (AI) expanding its application in the business world, there is an emerging concern to consider not merely the effects AI has on outcomes but also on employees. This literature review aims to summarize existing literature on AI applied in the workplace as well as other environments and provide potential research directions concerning the psychological effects of the use of workplace AI on employees. The literature review will be carried out with respect to AI adoption in the work environment, attitudes/behavior towards AI, achievement-related emotions, and responsibility attribution in human-AI interaction. More precisely, it is suggested to investigate Control-Value theory and Attribution Theory in terms of the research directions related to the psychological consequences of AI use in the professional setting. It is critical to look deeper into the way the variables of perceived control, success/failure appraisal, and responsibility attribution influence achievement-related emotions in AI-assisted work. Even though the literature selected gives some assumptions about their potential effects, it does not necessarily mean that the same effects would be observed in the workplace setting.

Keywords: Workplace, AI, appraisal, control-value theory, attribution theory

1. Introduction

From the time of its development, artificial intelligence (AI) has grown into an omnipresent technology that influences many spheres of people's lives. With the constant development of this technology, various organizations from different industries are introducing AI into their processes to increase productivity and efficiency, as well as improve decision-making [1]. The use of AI technologies is a great challenge for organizations since proper use of them is necessary to avoid any unwanted consequences [2]. Thus, not only does the organization need to know about the possible consequences of using AI for decision-making, but also employees who will be assisted by AI.

In order to dissect the psychological consequences of the introduction of AI, it is necessary to consider the employees' emotional experience of being assisted by AI. Achievement emotions have been considered as one of the main factors that influence the motivation and productivity of workers because of the achievement-oriented environment at the workplace. Emotions related to achievement-based activities and their outcomes, such as enjoyment, pride, anxiety, and shame, are considered crucial and variable [3]. Control-Value Theory claims that achievement emotions depend on the perceived control over the activity and its outcomes, as well as the value of this activity [3].

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This theory was originally developed in the educational context, but is also applicable to the workplace setting, which is similar to the achievement situation.

Another factor that should be considered is the responsibility for the outcomes of AI assistance. In accordance with Attribution Theory, the explanations people develop for the achievement outcomes influence their emotions and motivation [4]. It has already been discussed how AI assistance performance can influence achievement emotions not only through performance effects but also through perceived control and responsibility. However, these relationships have not been investigated enough in the workplace setting.

The purpose of this literature review is to examine the scholarly literature on AI in workplace and non-workplace settings in order to discover how AI assistance influences the emotional experience of employees in the workplace. In the psychological perspective on AI adoption in the organizational context, this article will explore the consequences of the introduction of AI. Moreover, this literature review will identify directions for future research on the impact of AI assistance on the employees' achievement emotions.

2. AI in the workplace

2.1. Benefits and challenges of workplace AI

In professional contexts, AI has been used more often in order to support decision-making, perform routine activities, and boost the performance level of professionals. However, improvements in performance cannot be explained only by the development of technologies; they are also dependent on the perceptions and responses to the new technologies of the employees. Indeed, it is evident that AI changes the nature of the workplace and industry, which means that new requirements for employees have appeared [1]. Thus, considering how employees cope with these new requirements is very important for identifying the reasons behind the changes. AI is quite a useful tool for professional development of employees, but it may be rather problematic for the acquisition of new knowledge and playing new roles [2]. While one employee will find the use of AI helpful for completing an assignment, another one may regard AI as a threat to his or her performance and even position. It means that the advantages and disadvantages of using AI for employees are rather ambiguous. It is necessary to look at the dynamics between the employee and the technology.

2.2. Challenge and hindrance appraisals

One way to understand the differences between these appraisals is the distinction between challenge and hindrance appraisals. Challenge appraisal is the perception of the demand as an opportunity to grow and learn. Hindrance appraisal is the perception of the demand as a barrier to achieving personal goals and effective performance. He et al. investigated the different appraisals of AI among workers in the service industry. They applied the Job Resource-Demand Model to find a connection between the appraisals and workplace outcomes. The authors concluded that challenge appraisals are positively related to performance because of job crafting, whereas hindrance appraisals are negatively related to performance due to job insecurity [5]. Thus, the results of the study suggest that how employees perceive AI can affect the outcome of its implementation. Another recent study explored the connection between challenge and hindrance appraisals of AI and knowledge-sharing behaviors among employees, depending on their locus of control. The results have shown that, first, workers with a stronger internal locus of control gravitate towards adopting the challenge appraisal and sharing knowledge. Second, employees with a stronger external locus of control gravitate to

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adopt the hindrance appraisal and hide knowledge [6]. This research further strengthens the necessity of studying the perception of employees regarding AI.

2.3. Implications for employee emotions

Challenge and hindrance appraisals can also explain how employees feel when using AI. If an employee sees AI as a resource that helps them achieve success, they would have an increased sense of control and expectations. If an employee perceives AI as an imminent threat to their competency, they might feel frustrated or anxious. Studying the emotions employees experience can provide interesting information about the complicated interaction between AI and emotions and motivation, which can be crucial factors in terms of employees' performance and productivity [7].

3. AI outside of the workplace

The research on AI conducted in other contexts can often investigate important psychological issues rather than productivity or performance, which can provide another perspective to understand the psychological processes involved in human-AI interactions. For example, the research in the education context directly studied AI use and achievement emotions, whereas the studies of everyday human-AI interactions researched responsibility and blame attribution. Even though these studies cannot be generalized to the workplace context, they can provide directions for further exploration of the emotional experience in the workplace setting.

3.1. AI and achievement emotions in education

Achievement emotions are mostly discussed in the context of the educational environment. Previous research has analyzed the connection between AI and achievement emotions. One study explored the outcomes of AI-based instruction on achievement emotions and the willingness to communicate of English language learners. 204 Chinese students were randomly assigned to two experimental conditions to receive either AI-based instruction or conventional instruction. After six weeks of instruction, survey results have shown that students who received AI-based instruction had greater positive achievement emotions and greater willingness to communicate compared to students receiving conventional instruction [8]. These results propose that the involvement of AI assistance can have a considerable effect on the emotional experience of its users. At the same time, the outcomes of the study demonstrate the significance of studying not only behavioral outcomes, but also emotions.

3.2. Responsibility attribution in human-AI interactions

As AI technology evolves, the everyday usage of it becomes more and more common, thus researchers started studying how the responsibility for the outcomes of human-AI interactions is perceived. In a study exploring the relationship between the responsibility for the outcome in human-AI interaction and participants' attributions, it was found that, generally, participants were inclined to attribute responsibility to the AI. Furthermore, for positive outcomes, it was more likely for participants to share responsibility between the human and the AI. However, for the negative outcome, it was less clear to whom to attribute the responsibility: either the human or the AI [9]. Thus, the results indicate that responsibility attribution could depend on whether the outcome is favorable or unfavorable. Nevertheless, it confirms the idea that the involvement of AI is recognized as an important factor influencing the outcome. In the achievement context, it could mean the AI

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assistance on the assignment, affecting the level of perceived control of the human employee, which consequently may affect achievement emotions [3]. Another study expanded the analysis of blame assignment in human-AI interaction in the context of AI mind perception. The researcher has carried out three experiments, which showed that a higher level of perception of AI as an entity having a mind similar to humans leads to higher levels of blaming AI [10]. The results confirm the assumption that people's perception of AI technology affects the process of blame assignment in case of negative consequences of human-AI interaction. When AI is seen as an entity having a more advanced mind, the person is more likely to view it as a participant in the interaction who makes a significant contribution to the process, but not as a mere tool. In goal-oriented situations, perception of AI helps influence the blame assignment upon receiving feedback [4].

3.3. Implications for understanding workplace AI

In general, research conducted outside of the workplace environment suggests several potential directions and related psychological mechanisms that should be explored. While it is uncertain that these correlations and effects can be observed within the workplace environment, it is vital to note the presence of interaction between artificial intelligence and the human brain. Further research in this sector can provide a better insight into the influence of AI on the workplace environment.

4. Discussion

The current literature review examines the existing literature related to the usage of AI in workplace and non-workplace settings. It becomes clear from the existing literature that the role of AI in the workplace does not only involve identifying certain factors affecting employees' productivity and efficiency. Further investigation needs to focus on the psychological implications of the use of AI in organizations. In workplace settings, the existing studies have emphasized the effect of AI tool appraisal on employees' performance and behavior [5, 6]. In non-workplace settings, the role of AI in affecting achievement emotions and attribution of responsibility has been examined [8-10]. From the reviewed literature, it becomes evident that the perception of individuals about AI assistance and the emotional experience of using AI require further investigation.

Another consistent trend in the selected literature is that the reaction of people to AI depends on their interpretation of the purpose of AI. He et al. studied the impact of appraisals of AI as a challenge or hindrance on the performance of service industry workers [5]. Similarly, Xu et al. researched the interaction between locus of control and appraisals of AI as a challenge or hindrance to the knowledge-sharing behavior of employees [6]. This research provides a foundation for understanding that individual differences could be expected while implementing AI in workplaces. Non-workplace literature provides some more insights into measuring individual differences. Chen et al. explored the relation between AI-assisted instruction of the English language and achievement emotions [8]. Meanwhile, Brailsford et al. and Joo researched how the responsibility for an outcome is attributed in human-AI interaction. These studies indicate that individual perceptions of AI affect how the responsibility is attributed [9, 10]. All these studies in different contexts combine into a conclusion that there is no single factor that explains the changes in productivity and performance observed; rather, the outcomes of AI implementation involve a complicated interplay of multiple factors.

To better understand the consequences of workplace AI adoption, Control-Value Theory of Achievement Emotions and Attribution Theory provide the framework to investigate the problem. Control-Value Theory claims that achievement emotions depend on an individual's appraisal of

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control and value of the expected achievement outcome [3]. Even though the theory was initially formulated for the educational context, it is reasonable to assume that a similar relationship exists in the workplace, since it is also an achievement-oriented context. The Attribution Theory supports the Control-Value Theory in the sense that it includes control as one of the key factors in attribution. In addition, Attribution Theory provides additional information about the motivation, which is an important factor in workplace performance [4]. Thus, the two theories could help to explain the emotional experience of AI assistance in the working environment.

The present literature review has several limitations. First, the research direction proposed is based on the premise that the same theories that apply in other settings can also work well in a workplace environment. Although the environments share certain common factors, such as being highly stressful environments with heavy emphasis on achievement outcomes, the assumptions may not be correct. Secondly, the correlations and associations established through the course of studies in other contexts cannot necessarily be generalized to the workplace setting. While similar associations might still hold in a workplace setting, research carried out in any setting other than the workplace should not be assumed to apply elsewhere. The present literature review aimed to identify directions for further research on workplace AI use, and not to imply that these findings will apply in a workplace setting. Finally, the focus of this literature review is limited and is not an exhaustive look at all research done on AI in the workplace environment.

5. Conclusion

This review contributes to the existing literature associated with the use of AI in the working environment by focusing not on results and performance metrics in AI-driven assistance but on the psychological experience of employees. Despite a great deal of literature focused on performance outcomes, the literature reviewed above shows that the psychological aspects of AI utilization among workers are often overlooked. Additional research areas regarding the psychological effects of artificial intelligence on workers and suggestions for further investigation can be defined based on the literature reviewed above. First, employees' affective reactions may depend on the level of control over the situation and the utility of assistance offered by artificial intelligence. Furthermore, attribution and emotions might vary depending on whether the feedback is either positive or negative. Investigation of employees' emotions during the process of interaction with artificial intelligence assistance may help to predict future emotions as well as their development due to the obtained feedback. The emotions experienced as a result of working with AI might affect workers' motivation and self-efficacy and lead to changes in their productivity. At the same time, current affective states might influence employees' expectations from working with artificial intelligence in the future; for example, positive emotions might create trusting attitudes towards technology, while negative ones can bring about frustration.

Thus, the proposed study implies future research on how different types of feedback impact the emotions of employees. Moreover, there should be some other factors involved in this dynamic, namely, perception of control, value, responsibility attribution, and locus of control.

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