



The impact of AI on employees' well-being in different hierarchical positions

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Abstract

Title: The impact of AI on employees' well-being in different hierarchical positions

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The significance of Artificial Intelligence (AI) has been rapidly increasing. In addition to changing our lives, these technologies are essential for enhancing how businesses operate by doing activities more quickly, more effectively, and more affordable. At the moment, a new concept is beginning to take shape: AI as a leader. The workplace will undoubtedly be impacted by this new leadership. However, humans have something that AI, for now, it's not able to have: emotional characteristics. So, this dissertation intends to study the effects that AI, in its different hierarchical positions, has on employees' well-being, more concretely in Emotional Satisfaction and Job Satisfaction. I proposed an experimental investigation to try to evaluate the effect of these roles of AI by manipulating the independent variable. The research presents one of the two scenarios, AI as a leader or as a colleague, to the participants to test the effects that AI's roles may have on the well-being of the employee. The study's findings did not support the hypothesis that AI as a leader will result in less Job satisfaction in comparison with AI as a colleague, but supported the fact that AI leadership will lower levels of employee emotional satisfaction in comparison to AI as a colleague. This thesis is the first contribution to fill the research gap of how the presence and functions of AI in the workplace may lead to different effects on the well-being of employees.

Keywords: Artificial Intelligence, AI as a leader, AI as a colleague, Employees' well-being, Emotional Satisfaction, Job Satisfaction.

Sumário

Título: O impacto da IA no bem-estar dos trabalhadores em diferentes posições hierárquicas

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A importância da Inteligência Artificial (IA) tem aumentado rapidamente. Além de mudar as nossas vidas, estas tecnologias são essenciais para melhorar a forma como as empresas operam, realizando atividades de forma mais rápida, mais eficaz e mais acessível. Neste momento, um novo conceito está a começar a ganhar importância: a IA como líder. O local de trabalho será, indubitavelmente, impactado por esta nova liderança. Porém, os humanos têm algo que a IA, por enquanto, não é capaz de ter: características emocionais. Assim, esta dissertação pretende estudar os efeitos que a IA, nas suas diferentes posições hierárquicas, tem no bem-estar dos colaboradores, mais concretamente na Satisfação Emocional e na Satisfação no Trabalho. Propus uma investigação experimental para tentar avaliar o efeito destes papéis da IA através da manipulação da variável independente. A pesquisa apresenta aos participantes um dos dois cenários, IA como líder ou como colega, para testar os efeitos que as funções da IA podem ter no bem-estar do trabalhador. As conclusões do estudo não apoiaram as hipótese de que a IA como líder resultará em menos satisfação no trabalho em comparação com a IA como colega, mas apoiaram o facto de que a liderança da IA reduzirá os níveis de satisfação emocional dos trabalhadores em comparação com a IA como colega. Esta tese é a primeira contribuição para preencher a lacuna de investigação sobre como a presença e as funções da IA no local de trabalho podem levar a diferentes efeitos no bem-estar dos colaboradores.

Palavras-Chave: Inteligência Artificial, IA como líder, IA como colega, Bem-estar do trabalhador, Satisfação Emocional, Satisfação Laboral.

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Glossary

&	And
AI	Artificial Intelligence
ANOVA	Analysis of Variance
DF	Degrees of Freedom
ES	Emotional Satisfaction
JS	Job Satisfaction
M	Mean
p	p-value
PANAS	Positive Affect and Negative Effect
RQ	Research Question
SD	Standard Deviation
SS	Sum of Squares
VA	Voice Assistance

Introduction

Quote - "It is true that some workers will need support and retraining as we make this transition into an AI-powered workplace" - Bill Gates; Tenore, H. (2023, July 12)

Have you ever wondered how Artificial Intelligence (AI) got to the point it is today?

The fourth industrial revolution has begun and brings with it innovative and creative approaches. In addition to reshaping the global economy, the Fourth Industrial Revolution, driven by AI, also brings new opportunities and challenges (Lee, Yun, Pyka, Won, Kodama, Schiuma, Park, Jeon, Park, Jung, Yan, Lee, & Zhao, 2018).

AI characterizes a new generation of technologies capable of interacting with the environment and aiming to simulate human intelligence and is defined as the capacity of a computer or computer-controlled robot to carry out actions typically associated with intelligent individuals, such as the capacity to reason, find meaning, make generalizations, or learn from prior experiences (Copeland, 2018). In our ever-evolving world, it is necessary not only to improve the relationship between humans and AI but also to think deeply how AI impacts workplace well-being. For professionals looking to integrate smart devices and computer systems into their work, it is important to increase their understanding of how AI impacts people, teams, companies, and corporations as a whole. In fact, by 2025 robots will perform 52% of current work tasks, almost twice as many as in 2019 (Oosthuizen, 2019). Well-being not only includes people's assessments and evaluations of their own lives, but also extends to reflective cognitive judgments, such as life satisfaction (Diener, Oishi & Tay, 2018). Additionally, it also includes emotional responses to regular life experiences, distinguishing between positive and pleasant emotions and unpleasant and negative emotions. That's why I will include two important aspects of well-being in the next chapters: Job Satisfaction (JS) and Emotional Satisfaction (ES).

The impact of AI on employee's well-being may spread throughout the organization, impacting key outcomes like employee performance and productivity (Li, Bastone, Mohamad & Schiavone, 2023). This connection between employee well-being and job performance highlights the urgent need to protect and improve the health of the workforce.

Moreover, the concept of AI at the workplace, as a colleague, reflects the interaction and collaboration between humans and AI. These collaborations impact job satisfaction, meaningfulness, and job performance (Sadeghian & Hassenzahl, 2022). As a way to grasp the pace at which AI might assume control within the work environment, around 80% of large

companies already use some form of AI into their core business, this is an increase of 70% in five years (Ghosh, Daugherty, Wilson, & Burden, 2019) and this trajectory shows no signs of slowing down in the foreseeable future. In addition, according to the International Federation of Robotics (2020), there are 113 robots for every 10.000 employees globally, a number that continues to rise each year (Stoica, Zaman, Suci, Purcărea, Jude, Radu, Catană & Radu, 2022). However, lately, researchers have begun to investigate a new role for AI, which involves AI taking on leadership functions. AI as a leader describes the way a computer agent controls people hierarchically inside a work environment (Höddinghaus, Sondern & Hertel, 2021). AI is expected to take on leadership roles in critical areas including manufacturing, healthcare, and finance due to the ability it has to analyze vast volumes of data, identify complex patterns, and make decisions based on this information (Aldoseri, Al-Khalifa & Hamouda, 2023). The emergence of AI as a leader is supported by the expectation of increased operational effectiveness, accuracy, and lower costs. Technology advances make it more likely that businesses will continue to investigate AI's leadership potential. The influence of AI on employee well-being is a complex topic, including both advantages and disadvantages. While AI might speed up procedures, boost safety, and improve work-life balance, it can also result in employment insecurity, fewer human interactions, and many more (Bhargava, Bester & Bolton, 2021). I will explore the complex relationship between workplace well-being and the growing roles of AI in the upcoming chapters, providing insights into the complex dynamics and possible consequences of this developing relationship.

Problem statement

The following research intends to investigate the potential disparities on how the existence of AI as a leader and as a colleague in the workplace affects workers' well-being. This study aims not only to identify potential negative effects in employee well-being related to the various roles and incorporation of AI in organizational contexts but also, to provide valuable insights into both the advantages and potential disadvantages of integrating AI into the workforce.

In order to achieve that, I'll conduct a scenario study in which I ask half the participants to imagine a specific scenario related with AI as a leader introduction at the workplace and the other half to imagine the same scenario but, this time, related to AI as a colleague and then

compare outcomes. The outcomes pertain to well-being thus encompass both job satisfaction and emotional satisfaction.

To substantiate the problem statement, the following research questions will be explored:

RQ1: Will an AI as a leader impact negatively employees' well-being more than an AI as a colleague?

RQ2: Will an AI as a leader impact negatively employee's job satisfaction, in comparison to AI as a colleague?

RQ3: Will an AI as a leader impact negatively employee's emotional satisfaction, in comparison to AI as a colleague?

Managerial and academic relevance

More and more, every day, it is of major importance to learn about the potential impacts that AI and its different roles will have on the future workplace. Managers can use the insights from this research to be aware of AI's impact on employees' sense of purpose at work. This concept is intricately connected with life satisfaction. However, as mentioned before, well-being is not only related with job satisfaction, which is a parameter of life satisfaction, but also to the complex emotional responses exhibited by employees (Diener, Oishi & Tay, 2018). Consequently, this study does not solely investigate the correlation between AI and job satisfaction, but further scrutinizes the emotional dynamics entailed in the equation with JS. As such, this research presents a multifaceted approach to understand the way in which AI can influence employees' well-being, thus helping managers create work environments that foster both JS and emotional harmony.

Furthermore, this research can communicate to workers how they might be affected by AI in their different roles in the workplace, enabling them to make better decisions about their careers. Regarding academic relevance, this research advances knowledge of the complex connection between AI and people's well-being in organizational environments. This study emphasizes the significance of taking into account the human factor while implementing AI, offering knowledge that can direct future study and real-world applications in the rapidly developing field of AI technology.

Finally, it's important to mention how helpful this research will be to society, as a whole, due to the fact AI is present in our everyday lives and, consequently, has an impact on everyone.

Structure

In order to answer the research question, an experimental study was conducted. This thesis will be organized in the following way: Firstly, this dissertation begins with a brief introductory chapter followed by a literature review of analysis on a variety of subjects, including AI, AI as a leader, AI as a colleague, Well-being and both JS and ES. In Chapter 3, we will have the methodology section, which will include some details about the participant's process, the design, and the procedure and materials needed. In Chapter 4, the study's data is going to be analysed. Finally, Chapter 5 includes a discussion of the study's results, it will highlight the key inferences made, including the limitations and proposals for future studies. Furthermore, it will also discuss the study's weaknesses and offer suggestions for further investigation. The final chapter will highlight the most important conclusions.

Literature Review

Artificial Intelligence

The appearance of AI and its significant influence on the workplace demands a thorough comprehension of its origins, capacities, and uses. AI's journey, while deeply rooted in human contemplation, embarked on a systematic exploration only in the mid-20th century. Visionaries like Alan Turing and John McCarthy paved the way, breathing life into the concept of machine intelligence and crafting the very first programming languages, laying a foundation for AI (FutureLearn, 2022). As the sands of time flowed, rule-based systems yielded to the marvels of machine learning and deep learning, empowering computers to shift through colossal datasets and make astute judgments. This route, marked by innovative discoveries and constant advancement, has brought us to the current day, in which AI is crucial to many aspects of our lives. AI has undergone significant development and sophistication in the last decade (Wamba-Taguimdje, 2020; Wiljer & Hakim, 2019). Regarding the field of business innovation, AI has the potential to transform not only our everyday lives, but also the way organizations make decisions relating to employees, work tasks, and customers (Haenlein & Kaplan, 2019). So, AI is commonly defined as a new generation of technologies capable of interacting with the environment and aiming to

simulate human intelligence (Glikson & Woolley, 2020). The intelligence of AI technologies is expanding rapidly, and they act as semi-autonomous decision-makers in an increasing diversity of complex contexts (Davenport & Kirby, 2016).

Aside from that, business innovation has been linked to AI as a potential source. Once everything is in place, companies will begin to realize the value AI can bring to them. In addition to cutting costs, automation improves corporate operations' uniformity, speed, and scalability. This is clearly illustrated by an Accenture's study, where organizations that manage to grow achieve three times the return on their investments in AI, as opposed to those who are still in the pilot stage. In addition, some Accenture clients report time savings of 70%. AI not only aids in the accurate assessment of employee performance but simultaneously provides a path for self-learning opportunities and recommends changes that boost employee productivity (Tong et al. 2021).

Besides that, it is widely acknowledged that the use of intelligent machines will bring a radical change in the way organizations function and tasks are executed (Hecklau et al., 2016; Huang & Rust, 2018) and by now, we can already see this transformation evident in the robots that are being used as nurse assistants, caregivers, and even in military applications (Royackers & van Est, 2015). Beyond these specific areas, their integration in several other fields has transformed the workplace, with humans now working alongside robots as active co-workers (Zirar, Ali & Islam, 2023). Machine learning, a popular application of AI, allows computers to learn from past experiences and large datasets without extensive programming by humans. Moreover, AI technology is also being used in customer service interactions, where virtual, embodied conversational agents like chatbots are employed. Superintelligent AIs can perform much better than humans across most cognitive tasks and, although not realized yet, they are commonly seen as key in the near term (Bostrom, 2014).

While Accenture's study (Tong et al. 2021) sheds light on the returns organizations can achieve with successful AI implementation, the World Bank report offers a broader perspectives, stating that "while the idea of robots replacing workers is striking a nerve, the threat to jobs from technology is exaggerated" (The World Bank, 2019). Some researchers say that robots are unlikely to steal jobs, but jobs will likely to change and new jobs will emerge (Fleming, 2019). That being said, in order for employees to effectively collaborate with AI agents, the adoption of AI technology may necessitate the acquisition of new skills or to adapt to current ones. In the future, companies may have to offer assistance and training to employees so they can learn the requisite skills and manage these changes.

The increasing number of robots in work environments is questioning conventional beliefs about control hierarchies, giving rise to ethical, legal, and political considerations for those in decision-making roles. These advancements carry substantial implications for the dynamics within organizations. As we explore the transformative effects of AI in the workplace, it's critical to take into account the changing dynamics of human-technology interaction. This relation is frequently explained by theories such as Media Equation Theory and the Computers as Social Actors paradigm (Reeves & Nass, 1996), which suggests that humans will act as if computers and other forms of technology are human. As a result, humans can interact with technology by following the same social scripts, schemas, and rules, such as politeness, that are used in human-human interactions (Reeves & Nass, 1996). Moreover, as robots become increasingly socially engaging, some authors argue that they may exploit the human tendency to anthropomorphize by manipulatively creating in humans the felt experience of an authentic human relationship (Fossa, 2018; Mackenzie, 2018; Turkle, 2012). Here, the concept of anthropomorphism means that humans tend to attribute human-like qualities and characteristics to AI technologies, including social robots. With the emergence of AI in the workplace, many employees might have different feelings towards this scenario, which is something that will be studied more deeply in the next chapters. However, we can already draw some conclusions from the following research. A study conducted by Lee (2018), examining employee perspective on AI, revealed that employees who fear they will be replaced by Smart Technology, AI, robotics, and algorithms (STARA) experience higher turnover, cynicism, and depression, and have lower organizational commitment and career satisfaction (Brougham & Haar, 2018). Moreover, it's also said that once AI has been successfully assimilated into an organization, employees are more likely to experience better psychological outcomes and higher performance. Research suggests that effective socialization can lead to increased productivity as well as higher employee engagement and reduced turnover from employees (Kammeyer-Mueller & Wanberg, 2003; Wanberg & kammeyer-Mueller, 2000).

Artificial Intelligence as a colleague

AI as a colleague refers to a partnership between the computer and humans in which AI plays an equal role as the human form, both adapting to each other and directly affecting the end product and creative process (Lubart, 2005). Task-related communication between a robot

and an employee, which can take place in explicit (verbal, written, or through signals and gestures) or implicit (through motion, behavior, form, and appearance) forms, is a critical facilitator of successful collaboration between the human form and AI at work (Fong et al., 2003). Hence, in this scenario, the accomplishment of task-related objectives is characterized by successful Human-AI collaboration.

While having an AI as a colleague can have many benefits, such as accuracy, speed, flexibility, adaptability, and capability of problem-solving, some potential drawbacks should be noted (Esterwood & Robert, 2020; You, Kim, Lee, Kamat & Robert, 2018). Firstly, the presence of AI as a colleague in the workplace can cause lack of human interaction.

According to a 2014 study by D'Mello and colleagues, the engagement with virtual tutors who modelled human-like affective behaviour outperformed those who connected with virtual tutors that did not in terms of learning outcomes. In addition, it can also result in perceived autonomy challenges since employees may end up relying too much on AI, impacting their sense of control and independence. Also, the lack of contextual understanding might be a challenge when using AI in the form of a colleague since AI lacks the ability to understand context and situations, which can lead to incorrect outcomes. Biases and lack of creativity might also be an issue, since AI lacks true creative and innovative way of thinking (Baidoo-Anu & Ansah, 2023).

Besides that, when employees receive assistance from various sources, their perception of autonomy varies. According to a study (Ossadnik, Muehlfeld & Goerke, 2023), receiving assistance from a Voice Assistant (VA) resulted in a higher sense of perceived autonomy than did seeking assistance from a colleague. On the other hand, assistance from traditional technology was linked to higher levels of cognitive independence compared to VA. These results imply that employees' perceptions of autonomy and, thus, their degree of JS, are influenced by the type of help provider. Comparing working with a digital VA to working with traditional technology, the study findings indicated that working with a digital VA results in higher psychological costs and reduced perceived autonomy. In addition, participants believe that a human coworker provides greater support than a digital virtual assistant (VA) or computer (Ossadnik, Muehlfeld & Goerke, 2023). It is discovered that JS is highly correlated with both autonomy and organizational support. This study emphasizes the significance of comprehending these effects in the workplace and the possible harm that new technology may cause to employees' perceived JS.

Artificial Intelligence as a leader

Lately, AI has moved from being a mere tool to a partner as a result of the quick acceleration of technology breakthroughs. It is now being used at higher organizational levels and this progression includes scenarios where AI becomes more involved in management and leadership than humans do (Makarius, Mukherjee, Fox & Fox, 2020).

Leadership development is being revolutionized by AI-driven learning platforms, which enable leaders to design customized development plans that are tailored to their requirements and help them improve their knowledge and abilities in the areas that matter the most. This advanced technology represents its central place in the broader framework of the fourth industrial revolution, as it aims to mimic human intelligence (Schwab, 2017). This revolution radically changes our traditional understanding of the dynamics between humans and technology by relocating agency and control from human actors to technological entities (Murray, Rhymer, & Sirmon, 2020).

Moreover, AI-powered learning systems are transforming leadership development into a more successful, efficient, and enjoyable process by enabling the creation of personalized learning paths and content that adapt to the needs, interests, and progress of the leader (Leadership, 2023). Therefore, using AI in leadership development and succession planning can improve workforce engagement and retention by offering more individualized, timely, and relevant support, feedback, and chances for professional growth and promotion (Schawbel, 2023).

As a leader, AI can enhance decision-making and problem-solving capabilities. However, leaders need to consider the social aspects of AI integration. Employees may have concerns and uncertainties about the impact of AI in this new role on their jobs and the organization. By effectively integrating AI as a leader into the organization and addressing workers concerns, employees can ensure the successful adoption and implementation of AI systems. However, as we explore these positive shifts, it's crucial to delve into potential challenges and drawbacks that accompany the integration of AI into leadership roles. Firstly, using historical data is a big challenge because it can contain biases and inaccuracies that could result in incorrect findings (Chamorro-Premuzic & Ahmetoglu, 2016). Additionally, AI as a leader might not be able to negotiate uncertain situations with the creativity, ingenuity, and intuitiveness needed that human characters have (Tuskmelon, 2023). It might also ignore ethical, cultural, and legal concerns unless specifically trained to do so (Wesche & Sonderegger, 2019; Chamorro-Premuzic & Ahmetoglu, 2016). One major drawback is that

AI cannot understand or react to human emotions, which makes it difficult for their followers to form meaningful social relationships (ChamorroPremuzic & Ahmetoglu, 2016; Möhlmann & Henfridsson, 2019; Wesche & Sonderegger, 2019).

Saying this, AI as a leader does raise concerns about the lack of emotion, empathy, and moral compass it has and to have a certain amount of power can, effectively, be dangerous (PTI, 2023). AI systems with executive capabilities, for example, could potentially make decisions that prioritize efficiency over human life, such as drastically reducing the human population to resolve the climate crisis (PTI, 2023). This scenario illustrates how AI's lack of empathy and moral compass could have devastating consequences for society.

Well-being

Well-being is a complex combination of factors related to a person's physical, mental, emotional, and social health (Department of Health & Human Services, 2022). Happiness and life satisfaction are closely related to this idea. In short, it could be described as how you feel about yourself and your life, both personal and professional (Department of Health & Human Services, 2022). Besides that, researchers investigating happiness have found the following factors enhance a person's well-being: happy relationships, a network of close friends, an enjoyable and fulfilling career, enough money, enough sleep, and many others (Ntili & Ntili, 2021). The factors that influence well-being are interrelated and some factors also make up for the lack of others (Department of Health & Human Services, 2022).

In order to reduce stress and foster productive workplaces where people and businesses may prosper, it is important to promote well-being. A vital component of employee engagement and corporate performance might be good health and well-being (CIPD, 2023).

More resilience, improved engagement, fewer sick days, and improved output and performance can all result from an investment in employee well-being (CIPD, 2023).

Throughout the past ten years, there has been an increase in the number of mental health disorders that have been recorded, and it is widely known that many workplace health hazards are psychological (Foy, 2023). Hence, it becomes crucial to investigate workplace well-being, given the contemporary landscape, and particularly imperative to examine the impact of AI on employees' overall welfare.

A study made by Pok Tang (2023) in the United States, Taiwan, Indonesia, and Malaysia, conducted four cross-cultural experiments, which yielded consistent result. Studies on the effects of AI on mental health have revealed that those affected had higher degrees of

attachment anxiety (Khan, 2023). This was demonstrated by increased emotions when interacting with AI systems and feelings of nervousness, insecurity and anxiety for social relationships (Khan, 2023). In addition, in a specific experiment with 166 engineers at a Taiwanese biomedical company, it was observed that employees who interacted more frequently with AI systems were more prone to feelings of loneliness, insomnia, and increased after-work alcohol consumption (Khan, 2023).

Concerning emotional and social issues at work, computer leaders are considered to have specific advantages over human leaders when it comes to direct interaction with human subordinates. Computer leaders are not influenced by emotions, which may reduce conflicts and enable objective feedback (Chamorro-Premuzic & Ahmetoglu, 2016).

Therefore, human subordinates' needs for social contact might not be fulfilled as they might miss true human empathy, recognition, and appreciation. However, taking into account the advancements made in the domains of affective computing (Picard, 1997) and artificial emotional intelligence (Krakovsky, 2018) by adopting techniques such as deep learning (Rouast, Adam, & Chiong, 2019, early access) and multimodal data fusion (D'Mello & Kory, 2015), it can be assumed that it will not be long before computers can recognize and reproduce affective states.

Job Satisfaction

As mentioned previously, well-being has several factors connected with this concept, being two of them JS and ES. People who perceive their work as meaningful and who feel it serves a higher purpose have better well-being states and report higher JS (Steger, Dik & Duffy, 2012). So, concretely, JS is the result of fulfilling several wants and needs through work activities.

Intrinsic job happiness has a significant impact on the organization because happy employees perform well, maintain consistency in their work, and actively seek out new challenges to enhance their performance. They will, however, typically produce less and inefficiently if they are inherently unhappy (Herzberg et al., 1959; Miao et al., 2016). According to this point of view, completing a set of tasks that provides constructive criticism of one's performance satisfies an individual's requirements, which leads to JS (Miao et al., 2016).

AI, in a general way, has various uses in the workplace, and for the ones that consider it makes labour easier, it's possible to say that it benefits employees. However, even for those

who are "not directly affected by automation" workers may, nevertheless, be afraid of losing their jobs due to advancements in technology. This fear is important because it negatively affects workers' JS. Additionally, according to the research made by Schwabe and Castellacci (2020), "40% of currently employed workers fear that their jobs may one day be replaced by smart machines as a result of automation in industrial firms". Currently, workers' job happiness, thus JS as well, is significantly impacted by this fear of replacement in the future. But they also claim that the "low-skilled workers" who perform "routine-based tasks" and are most vulnerable to automation replacement are the ones driving this "negative effect" (Schwabe & Castellacci, 2020).

The findings of the study made by Luísa Nazareno and Daniel Schiff suggest that even though AI, and its different roles, may decrease stress initially, it may also make work less interesting, challenging, meaningful, and satisfying. Therefore, the study indicates that the impact of the increase significance of AI on JS is complex and may not always result in positive outcomes (Nazareno & Schiff, 2021).

H1: AI as a leader will result in less Job satisfaction in comparison with AI as a colleague.

Emotional Satisfaction

A vital part of well-being is ES. It refers to people's subjective assessments of their lives as well as the emotions they encounter daily, both good and bad. Income, social support, health, and personality qualities, are several aspects that can have an impact on this emotional side (Stone, 2013).

While AI in the workplace can improve well-being, productivity, and personal growth, all of which have a favourable impact on employee ES, it can also lead to concerns about surveillance and employment insecurity. According to Cao's (2021) Integrated AI Acceptance-Avoidance Model, people's differing opinions about AI are a reflection of how they weigh its advantages and disadvantages. The model demonstrates that when performance and effort expectations are accomplished, that is when AI will assist them as a colleague in achieving their objectives and that is easy to use, employees' opinions about AI are positive.

On the other hand, when taking into consideration perceived dangers of the evolution of AI (e.g. the conviction that judgments made by AI could have negative effects) and concerns

about personal well-being such as stress and anxiety brought on by AI use, they may adopt more pessimistic opinions (Bankins, Ocampo, Marrone, Restubog & Woo, 2023). Increased workloads, multitasking, and performance expectations brought by AI in a higher position lead to stress, overload, exhaustion, and burnout, all of which are detrimental to workers' mental health and well-being satisfaction (Johnson et al. 2020). In addition, some drawbacks mentioned previously regarding AI as a leader might also result in these kind of outcomes. As a matter of example, the fact that AI as a leader cannot understand or react to human emotions, which makes it difficult for their followers to form meaningful social relationships, might also increase these negative effects on employees' well-being. In addition, employee's concerns and uncertainties about the impact of AI as a leader may also result in these negative aspects mentioned above.

According to an article made by Paul K. McClure (2017), the evolution of AI in the workplace impacts employee mainly in the contexts of nervousness, anxiety and troubles sleeping. These findings further demonstrates that some participants dread technology advancements, especially when it comes to workforce robotics and trusting AI (Gates, 1996; Kurzweil, 2006; Schmidt & Cohen, 2014). While a basic lack of knowledge or access to educational technology may be the root of this fear, it's also plausible that the participants in this sample feel frightened by technology both because it could eventually replace them in their careers and also because it may turn out to be their own leader.

H2: AI leadership will lower levels of employee emotional satisfaction in comparison with AI in a colleague role.

Methodology section

The process used to carry out the study, to verify the hypothesis and respond to the research questions, is described in detail in the next chapter. This research is based on an experimental study, which enables a researcher to observe and influence a specific phenomenon (Bailowas et al., 2021). This method examines the cause-and-effect relationships between the following variables: AI as a leader, AI as a colleague, JS and ES. The participant characteristics are covered in the first section of the chapter, followed both by the method used and the procedure.

Participants

Participants for this study were recruited through various methods. This survey was spread through family, friends, and university colleagues who voluntarily participated. Participants were volunteers recruited through social media, mainly from Instagram and WhatsApp. The way to gather participants used represents a quick, uncomplicated, and low-cost sampling approach with the potential to provide reliable data. However, it might also introduce bias to the sample as the survey was filled out voluntarily and the state of mind of the respondent is unknown.

As we are dealing with an experimental between groups, a minimum of 65 respondents per group is required (Durlak, 2009). 181 complete answers were gathered, 56 of which were filled by men and 125 filled by women. The mean (M) age is 26.92 and the standard deviation (SD) is 9.78. The level of education is spread as follows: 4 people have the secondary level, 115 have a bachelor's degree, 61 have a master's degree and only 1 has a doctoral degree. Regarding employment status, 36 are students with a job, 45 are students without a job, 94 are employed, 3 are self-employed, 1 person is unemployed and 2 are retired. Concerning nationality, 137 of the participants are Portuguese, 22 are Spanish, 18 are German, 1 is from Antigua and Barbuda, 1 Brazilian, 1 Moldova and 1 from the United Kingdom. For more demographic information see Appendix B.

In the course of conducting this thesis, which seeks to explore the multifaceted impacts of AI's roles on employee well-being, an inclusive approach was adopted to embrace responses from both currently employed individuals and those who are not in the workforce. This broader perspective was motivated by the desire to understand how the future generation will feel both having AI as a leader and AI as a colleague in their future workplace.

Design

In this research, I aim to test in what way AI as a leader and AI as a colleague affects differently the well-being of an employee. In order to do that, I created an experimental research in which I examined two scenarios where the only thing that changed was the introduction of the role of AI, as a leader or as a colleague. I decided to undertake an experimental study because, according to Aguinis and Bradley (2014), it is particularly helpful for determining causation in the case of speculative circumstances. This study consisted of an online study designed with Qualtrics, an online survey tool, where the

participants will be faced with two scenarios. A between-subjects design was employed to assess participant behavior between these two circumstances without allowing for spillover effects (Charness et al., 2012).

In this study, the independent variable that had two levels, AI as a leader and AI as a colleague, was manipulated in order to see how the dependent variable, well-being, would be affected. Here, the well-being variable will be tested as two things: JS and ES. As mentioned previously, well-being is essentially a combination of life satisfaction and ES. I decided to focus on well-being as JS and ES since the main topic of this dissertation is the impact that AI might have on employees, which means that JS is a crucial parameter for this analysis. Even though the overall life satisfaction is important for this thesis as well, this is a broad concept that includes several others aspects that are not exactly what I intend to study here, this is the reason why I'm focusing on JS.

In the development of the experience design for this research, I got inspiration from the work of a previous student at Católica University, Moreira (2020). Moreira's thesis presented a scenario in which participants were required to provide responses concerning their workplace experiences both before and after certain significant changes were implemented. These changes revolved around variations in leadership roles, specifically comparing the impact of AI leaders versus human leaders, and involved manipulations of leader's perceived trustworthiness and fairness. Given the conceptual similarities between Moreira's (2020) study and the current research, an effort was made to adapt a similar experiential framework to the context of this analysis. In the present study, I have manipulated the independent variable, with participants assigned to an AI as a leader or as a colleague scenario, aiming to discern the specific ways in which AI's roles influences the well-being of workers within various organizational settings.

Procedure and Materials

Firstly, participants had a brief introduction of the goal and the theme of the survey and once they moved on with that section, they read and accept the consent where they get aware of their anonymity while filling out the survey and understand the goal of the study.

Furthermore, participants were assigned to one of the two scenarios available: AI as a leader or AI as a colleague. The independent variable is being manipulated to see how the dependent variable would be affected. After one of the two scenarios was presented, they answered a few statements made about JS. Here, it was possible to take insights of their JS. Moreover, it

was also asked the impact that this previous scenario had on their daily emotional well-being at the workplace, always imagining themselves in that situation under the conditions presented.

Finally, some demographic questions will arise right in the end to understand what kind of participants we have. Questions related to current employment status are also asked in order for me to understand in which way AI can actually be present in their daily lives. The general questions aim to get a clear picture of the respondents. In addition, attention tests were included in order to identify through scale items questions if the participants were paying enough attention in order to be accurate in using their answers. Besides that, it was also asked if they did the study all at once or interrupted it. The study ended with the possibility for participants to leave any comments or questions regarding the study or the topic, through my email. For detailed information, please see Appendix A.

Independent Variable

Both AI as a leader and AI as a colleague are the two levels of the independent variable, AI's hierarchical position, in this study. In the framework of this experimental research design, the manipulation of the independent variable entailed the presentation of two distinct scenarios constructed to mirror identical workplace conditions. Participants were randomly assigned to one of the two scenarios available, whether AI as a leader or AI as a colleague, having in mind that in this last one, the leader would be a human figure, noticeable by the picture presented before the questions. Both scenarios had in common the fact that it was a typical workday and they were about to go to a meeting where these changes would be announced. This method was used to evaluate differences in AI as a colleague and in AI leadership in the workplace environment and how it could affect both job and emotional satisfaction, thus providing insights into the aim of the study.

An explanation picture of the proposed hierarchy was shown to the participants. On one hand, it showed the AI, in the form of a computer, and the subordinates on the bottom, to represent AI as a leader (see Figure 1). On the other hand, representing AI as a colleague, we had a person at the top and at the bottom both the computer and another person at the same stage (see Figure 2). By doing that, I anticipate that the change in AI's position will be the cause of all variations arising from the manipulation. I used the same scenario and questions to characterize both kinds of AI's roles.

The purpose of this scenario is to make the participants view their work from a perspective that takes AI into account. They might view their employment differently, not only in terms of meaning if they consider the current and potential future implications, but also in terms of how it can impact their well-being.

Figure 1 - AI as a leader

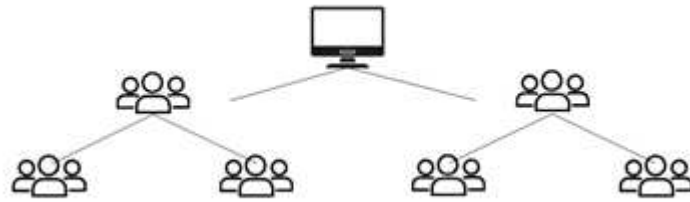
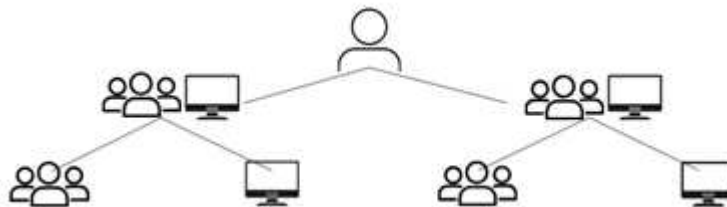


Figure 2 – AI as a colleague



Dependent Variable

In this study, well-being will be measured through several tools such as a seven-point Likert-scale format ranging from 1 (Completely disagree) to 7 (Completely agree). Having seven points tends to be a good balance between having enough points of discrimination without having to maintain too many response options. This scale will be used in order to measure JS, present in the first part of the survey. In this section, participants will rate some agreements under the scenario implemented, regarding JS, using the Likert-scale.

Besides that, it was also used a Positive Effect and Negative Effect scale (PANAS) ranging from 1 to 5, in order to evaluate the different emotions that arise in both scenarios. Through this scale, it will be possible to understand how the participants feel that the different roles that AI can have in the workplace might affect their well-being, more in concrete, emotional satisfaction. Here, it will be possible to see the different results between positive and negative emotions. For more detailed information, see Appendix A.

Results draft

Data cleaning

A sample consisting of 181 respondents was carefully selected for the research study at hand. Within this initial group, none of the individuals was subsequently excluded from the final dataset. The reasons for that included that all the 181 participants voted for “Yes” when asked if they answered the survey without any interruption. Besides that, on a scale from 1 to 7 the M for the following statement “I am paying enough attention in this study for you to use my data” was 6.61. Saying this, I conclude that the participants met specified attention standards and that their provided data was suitable for use in the study. Besides that, all the incomplete answers were predefined to be automatically excluded in SPSS. For a more comprehensive and detailed understanding of this selection process and its implications, please refer to Appendix B.

Descriptive statistics and Bivariate Correlations

The study's findings are presented in this chapter, starting with descriptive statistics and followed by bivariate correlations. With an emphasis on the primary objective of this research, which is to analyze the impact on the employees' well-being, more concretely job and emotional satisfaction, with the implementation of AI as a leader and as a colleague in the workplace, Appendix B presents the key factors of importance.

According to the descriptive statistics, there are 93 occurrences of the scenario of AI as a leader and 88 observations of AI as a colleague. We can see that positive emotions have a higher M than negative ones (3.4 vs. 2.84) in the field of ES. This suggests that participants in this study, reported experiencing more positive emotions than negative ones when assessed using the PANAS scale.

Nevertheless, I ran a bivariate correlation between the independent variable and JS and ES. The relationship between the variable ConditionAI, designated as 1 for AI as a leader and -1 for AI as a colleague, and both JS and ES appears to be positive but weak. The correlation coefficients of .091 regarding JS and -.156 concerning ES, suggests no association since $p > .05$. However, it's noteworthy that the p-value for JS is .224 while for ES it is .036, revealing a statistical significance in this last one ($p < .05$). This implies that the observed correlations between the conditions of AI and JS, may not reflect a meaningful relationship in

the studied sample. However, the same doesn't happen for ES that shows $p < .05$.

Furthermore, the correlation between JS and ES is weak, with a coefficient of $-.071$, and the associated p-value of $.342$ suggests a lack of statistical significance. For more detailed information, see appendix B.

Hypothesis testing

The following hypothesis will be tested in this study: AI as a leader will result in less Job Satisfaction in comparison with AI as a colleague and AI leadership will lower levels of employee emotional satisfaction in comparison with AI in a colleague role. All scales used in this experiment were tested and confirmed as reliable by the literature. However, I still conducted a reliability analysis to test for the scale's Cronbach alpha. The JS presents a Cronbach's Alpha of $.722$ and the ConditionAI variable, it has an alpha of $.696$. ES presents an alpha of $.709$, while negative emotions have $.785$ and positive emotions have $.406$, the lowest value. Regarding positive emotions, if we only account Satisfied and Excited as part of that and exclude Curiosity, Cronbach's alpha increases to $.496$, which is still very low. George and Mallery (2003) provide the following rules of thumb towards Cronbach alpha: " $> .9$ – Excellent, $> .8$ – Good, $> .7$ – Acceptable, $> .6$ – Questionable, $> .5$ – Poor, and $< .5$ – Unacceptable" (Gliem & Gliem, 2003.) Therefore, due to the unsatisfying internal reliability, positive emotions were excluded from the analysis. For more detailed information see Appendix C.

Hypothesis 1: AI as a leader will result in less Job Satisfaction in comparison with AI as a colleague.

The multivariate tests were conducted to assess the impact of the condition of AI on JS and ES. Through the Wilk's Lambda we can see that there is not a statistical significance between JS and ES and the independent variable with a p-value of $.062$.

Results from the between-subjects effect table, showed a non-significant effect of the ConditionAI on JS by yielded an $F=1.489$, $p=.224$, partial eta squared= $.008$, showing a non-significant effect between these variables. Examining the group means and standard deviations reveals that individuals in the AI as a leader group reported a higher M of JS ($M = 5.14$, $SD = .58$) compared to the AI as a colleague group ($M = 5.02$, $SD = .72$). This indicates that exposure to AI as a leader is associated with a higher level of JS.

Once we add the control variables, we can see that the ConditionAI variable reveals a non-significant effect on JS, $F = .817$, $p = .367$, partial eta squared = .005. Examining the control variables individually, significant effects are observed for Education ($F = 7.749$, $p = .006$, partial eta squared = .043) in relation to JS. This implies that individuals with higher levels of education experience greater JS. Based on this analysis I am able to reject H1.

Hypothesis 2: AI leadership will lower levels of employee Emotional Satisfaction in comparison with AI in a colleague role

As stated, I ran a multivariate ANOVA using ES and JS as the dependent variables, while the independent variable was ConditionAI, designated as 1 for AI as a leader and -1 for AI as a colleague. Due to the low positive emotions' Cronbach's alpha, I will focus solely on ES since it is not possible to use negative and positive emotions separately. The ES variable was obtained through the average of positive emotions minus the average of negative emotions. Regarding the between-subjects effects table, it's possible to conclude that a statistical significance effect is observed for ES ($F=4.476$, $p=.036$, partial eta squared=.024), such that individuals in the AI as a colleague group reported a higher M of ES ($M = .696$, $SD = .807$) compared to the AI as a leader group ($M = 0.42$, $SD = .91$). This suggests that exposure to AI as a colleague is associated with a higher level of ES, demonstrating a meaningful effect. Once we add the control variables, we can see that there is a relationship between the Condition AI and ES ($F=4.702$, $p=.031$, partial eta squared=.026), such that individuals in the AI as a colleague group reported a higher M of ES ($M = .696$, $SD = .807$) compared to the AI as a leader group ($M = 0.42$, $SD = .91$), there is no change in these results with or without the control variables. This suggests that exposure to AI as a colleague is associated with a higher level of ES, demonstrating a meaningful effect. Examining the control variables individually, we can see that none of them reveal a significant effect in relation to ES. This indicates that factors such as gender, age, nationality, education, and employment status do not independently contribute to explain the variability in ES. With this analysis, I'm able to accept this hypothesis since there is statistical difference between the variables.

Discussion

Research findings and main conclusions

The pervasive integration of AI in various business functions necessitates a comprehensive examination of its implications, as it has become an undeniable reality in our daily professional lives, shaping our future. The impact of AI, and its different roles in the workplace, on employees' JS and ES has prompted extensive research. Therefore, the primary objective of this study was to investigate the influence of AI leadership and AI as a colleague on employees' well-being. Additionally, I aim to highlight some potential solutions for addressing related issues, making it possible to constitute a first step towards understanding the ramifications of giving AI agents organizational functions.

As mentioned previously, the study aimed to test hypotheses related to the impact of AI, in its different hierarchical position both as a leader and as a colleague, on employee emotions and JS. The results do not support the hypothesis that AI as a leader will result in less Job satisfaction in comparison with AI as a colleague. We can conclude that based on the $p > .05$, showing no significant difference between the variables. We can see that this result is not in line with the literature that suggests that the implementation of AI in the workplace may result in work less interesting, challenging, meaningful, and satisfying, meaning that the impact of the increase significance of AI on JS may not result in positive outcomes (Nazareno & Schiff, 2021).

Furthermore, I could also conclude that the hypothesis related to the fact that AI leadership will decrease employee ES, in comparison with AI as a colleague was accepted. Both This hypothesis revealed statistically significance ($p < .05$). In opposite to the first hypothesis, this one goes in line with the literature that sustains the idea that several aspects brought by AI in a higher position lead to stress, overload, exhaustion, and burnout, all of which are detrimental to workers' mental health and well-being satisfaction (Johnson et al. 2020).

In a general way, the literature proposed that AI as a leader and AI as a colleague would diminish employee JS and decrease ES, which would ultimately lead to a decline in general well-being. However, the findings suggest that AI's roles in the workplace may, in fact, not result in a decrease of JS but will result in a decrease on ES, that ultimately will lead to a decrease of the well-being. Assessing the likelihood of negative effects and creating strategies to mitigate them is crucial for maximizing the benefits of AI opportunities.

Academic and Managerial Implications

Even though these topics have been the focus of numerous studies, this one adds a fresh and important component: the effect of AI's roles on employee's well-being, keeping in mind that this thesis has a whole new concept which is AI as a leader. This is important to study because if there is a real impact on the employees, companies can start to implement strategies to surpass that. In addition, it is a valuable first contribution to this new research field taking into account the consequences that can arise. Future researchers can follow up on these results by replicating them or uncovering further effects by including other explanatory variables. Furthermore, this study offers managerial takeaways for companies thinking about implementing AI leaders and for the ones that are already using AI as a colleague in the workplace.

Although there are many benefits of using AI agents for leadership jobs, as mentioned in the literature, such as enhanced information capacity, objectivity, and efficiency in completing tasks, this thesis advises organizations to exercise caution. Companies need to be especially mindful of the potential decline in workers' well-being, as the literature indicates that this could have unfavourable effects such as a decrease in JS (Detert & Burris, 2007; Edmondson, 1999; Edmondson & Lei, 2014). Besides that, this thesis can be useful also for people that are working in collaboration with AI. It's important to be aware of the impacts that AI as a colleague is causing already and the future consequences of AI as a leader, as well.

Moreover, this study may serve as a starting point for other research employing a comparable experimental design under alternative conditions.

Therefore, in order for organizations to fully benefit from this new style of leadership in the future, it is critical that they comprehend how it will affect the attitudes and well-being of their workforce. Only then they will be able to take action to mitigate these negative effects. The fact that this thesis proves that in fact AI may have an impact on ES, can be a starting point to start counterattacking these negative effects. Besides that, it will be essential to prioritize employee engagement, and training, and give specific skills and knowledge to make sure AI's beneficial effects outweigh its drawbacks and create a thriving workforce.

Ultimately, the study provides practical insights that might guide approaches to maximize AI's, in both roles, advantages while preserving worker welfare in the quickly changing context of modern workplaces.

Limitations and future research

This study has notable limitations that should be acknowledged and considered for further investigation. While the experimental approach offers benefits, such as the ability to anticipate outcomes in hypothetical scenarios, the results may lack the real-world relevance found in actual work environments. Despite the initial findings, it is essential to replicate the experiment in a genuine workplace setting that more closely represents the broader working population, rather than a hypothetical scenario. Currently, limited opportunities for such replication exist due to the emerging nature of AI leadership, which, though anticipated to become a reality soon, has not yet gained widespread adoption (Wesche & Sonderegger, 2019). The fact that, in the survey, was presented a situation to imagine a scenario where was implemented something that is not implemented so far in real life, even though the participants had the picture to help them understand, might have made people not completely sure of what that was.

In addition, it's possible that I measured the variables incorrectly. For example, I could have questioned participants about their understanding of AI as a leader because they might not have known much about it or might not have associated it with AI in the same positive perspective as they do with AI as a colleague, which could have affected their responses. The fact that there is not much information and studies about AI leadership, might have made participants with some difficulties in imagining a scenario where this would happen, even though there was a picture helping the visualization of the situation.

Secondly, we have the sample's diversity issue, in which the majority of participants were Portuguese, more specifically 137 of the 181 participants. Given that Portugal is among the nations where the proportion of digitally native businesses is still low when compared to certain other EU nations (Eurostat, 2022), a more varied sample may even aid in the discovery of the predicted outcome. The fact that Portugal is less digitally advanced than other European nations is significant because it could have an impact on the final results of this study. Moreover, the fact that this survey was anonymous can lead participants to answer carelessly and not be accurate.

This study specifically concentrates on examining the influence of AI, assuming different roles as a colleague and as a leader, within an organization's context on the well-being of its employees. Future research could delve into a more comprehensive exploration of the repercussions of deploying AI agents in various roles within organizational frameworks, shedding insights into their effects on the aforementioned variables, as well as other pertinent

aspects. New variables such as job security, could examine how the introduction of this new leadership affects the job security of employees and how it can affect their well-being. It would be also interesting to add a human group instead of focusing only in different hierarchical positions of AI. In addition, future studies, could not only explore how opportunities for training and skill development in this context might impact employee confidence and satisfaction, but also investigate the workload with this new leadership and how it contributes to the work-life balance of a worker. In a subsequent investigation, it could also be used other kind of control variables such as years of experience, exposure to AI, job autonomy, and many others. In addition, further studies may help us understand how to manage AI in the workplace and how to operate with it.

Lastly, each participant of the survey was exposed to a of the between-subjects scenario, in which only responded to a single randomized scenario. The same individual might act differently if there had been no randomization in the survey. This would have allowed them to compare conditions.

Conclusion

Despite the outcomes of this research, it is crucial to acknowledge that AI leadership remains a nascent area of inquiry and the consequences of AI as a colleague is still being study. As such, our comprehension of the implications linked to the existence of AI, both as a leader and as a colleague, in work settings is still developing. My aspiration is that these findings will foster a more understanding and, in turn, contribute to the cultivation of improved workplace dynamics for all employees.

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Appendix

Appendix A – Survey

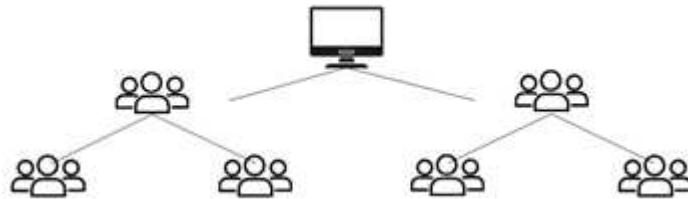
Start of Block: Intro

Welcome and thank you for considering participating in this experiment on AI. I, Maria Raquel Fernandes, am conducting this experiment as part of my Master's Thesis at Católica Lisbon School of Business and Economics, under the supervision of Professor Filipa de Almeida. The study consists of answering an open question and an individual AI task. And it will take about 5 minutes to complete. The purpose is to gain insight into the introduction of AI in the workplace, with a particular emphasis on AI's roles and its impact on employee well-being. Your participation will contribute to research on AI. Please answer as honestly as

possible. All answers will be kept strictly confidentially and are anonymous. This means that it will not be possible to link your responses to your identity. The data collected will be used for research purposes only and may be presented in my thesis or disseminated in academic journals, always in an aggregated form, never about any individual response. We ask you to take the study in one go, without interruptions. There are no expected side effects of participating in this study beyond those associated with looking at a computer screen for about 5 minutes. You may change your mind and drop out at any point of the study during its completion. If you have any questions about this study, please email Maria Raquel Fernandes (152122413@ucp.pt). By continuing you agree to participate. Thank you!

Scenario 1: You will now be presented with the following scenario. Please imagine yourself in the described situations and answer as realistically as possible. Thank you

Imagine a scenario where you work in a certain company and today you are going to have a meeting with the rest of your team. The theme of this meeting is the fact that this year the company will shift from a conventional use of AI into an AI as a leader. This study requires you to give us your opinion on the issues raised in the situation presented.



Please select the option that rates better the following agreements:

I feel secure about my job (23)


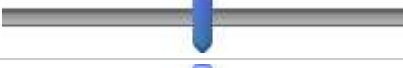
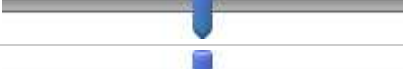







I believe my management is concerned about me (24)

On the whole, I believe work is good for my health (25)

Q2 With the implementation of AI as a leader in your company, I believe I would feel:

Very slightly or not at all A little Moderately Quite a bit Extremely

1 2 3 4 5

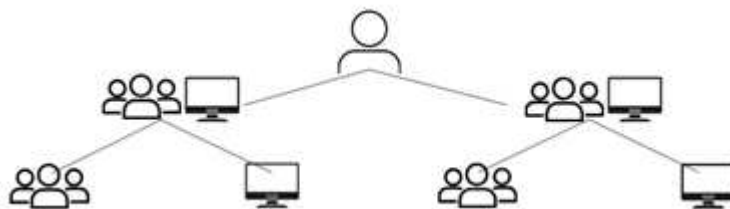
Satisfied ()	
Disheartened ()	
Anxious ()	
Irritable ()	
Excited ()	
Angry ()	
Frustrated ()	
Curious ()	
Helpless ()	
Nervous ()	

End of Block: Scenario 1

Start of Block: Scenario 2

Scenario 2 You will now be presented with the following scenario. Please imagine yourself in the described situations and answer as realistically as possible. Thank you

Imagine a scenario where you work in a certain company and today you are going to have a meeting with the rest of your team. The theme of this meeting is the fact that this year the company will use AI as a colleague. This study requires you to give us your opinion on the issues raised in the situation presented.



Q3 Please select the option that rates better the following agreements:

I believe my management is concerned about me (24)

On the whole, I believe work is good for my health (25)

Q4 With the implementation of AI as a colleague in your company, I believe I would feel:

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
	1	2	3	4	5
Satisfied ()					
Disheartened ()					
Anxious ()					
Irritable ()					
Excited ()					
Angry ()					
Frustrated ()					
Curious ()					
Helpless ()					
Nervous ()					

End of Block: Scenario 2

Start of Block: Demographic questions

Q5 What is your gender?

- Male (1)
 - Female (2)
 - Non-binary / third gender (3)
 - Other (4) _____
-



Q6 How old are you?

Q7 What is your nationality?

▼ Afghanistan (8) ... Zimbabwe (257)

Q8 What is your highest level of education?

- Less than Secondary education (1)
 - Secondary education (2)
 - Bachelor's degree (3)
 - Master's degree (4)
 - Doctoral degree (5)
 - Other (Please specify) (6) _____
-



Q9 What is your current employment status?

- Student with a job (2)
- Student without a job (4)
- Employed (1)
- Self-employed (8)
- Unemployed (3)
- Retired (6)
- Other (Please specify) (7) _____



Q10 Please rate how much do you agree with the following statement:

	0	1	2	4	5	6	7
It was easy for me to imagine the situation described ()							
I am paying enough attention in this study for you to use my data ()							
I'm likely to join a company in which is led by AI ()							
I'm likely to join a company in which humans are the main leaders ()							



Q11 Did you complete this study at once, without being interrupted?

- Yes (1)
- No (explain the nature of the interruption, please) (2)
-

End of Block: Demographic questions

Appendix B - Descriptives

Table 1

What is your gender? - Selected Choice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	56	30,9	30,9	30,9
	Female	125	69,1	69,1	100,0
	Total	181	100,0	100,0	

Table 2

How old are you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19	2	1,1	1,1	1,1
	20	4	2,2	2,2	3,3
	21	2	1,1	1,1	4,4
	22	27	14,9	14,9	19,3
	23	30	16,6	16,6	35,9
	24	45	24,9	24,9	60,8
	25	35	19,3	19,3	80,1
	26	8	4,4	4,4	84,5
	27	5	2,8	2,8	87,3
	28	1	,6	,6	87,8
	30	1	,6	,6	88,4
	33	1	,6	,6	89,0
	34	1	,6	,6	89,5
	36	2	1,1	1,1	90,6
	42	1	,6	,6	91,2

43	1	,6	,6	91,7
44	1	,6	,6	92,3
45	1	,6	,6	92,8
47	1	,6	,6	93,4
48	1	,6	,6	93,9
55	2	1,1	1,1	95,0
56	3	1,7	1,7	96,7
57	2	1,1	1,1	97,8
59	1	,6	,6	98,3
61	1	,6	,6	98,9
67	1	,6	,6	99,4
85	1	,6	,6	100,0
Total	181	100,0	100,0	

Table 3

What is your highest level of education? - Selected Choice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary education	4	2,2	2,2	2,2
	Bachelor's degree	115	63,5	63,5	65,7
	Master's degree	61	33,7	33,7	99,4
	Doctoral degree	1	,6	,6	100,0
	Total	181	100,0	100,0	

Table 4

What is your current employment status? - Selected Choice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	94	51,9	51,9	51,9
	Student with a job	36	19,9	19,9	71,8
	Unemployed	1	,6	,6	72,4
	Student without a job	45	24,9	24,9	97,2
	Retired	2	1,1	1,1	98,3
	Self-employed	3	1,7	1,7	100,0
	Total	181	100,0	100,0	

Table 5

What is your nationality?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Antigua and Barbuda	1	,6	,6	,6
	Brazil	1	,6	,6	1,1
	Germany	18	9,9	9,9	11,0
	Moldova	1	,6	,6	11,6
	Portugal	137	75,7	75,7	87,3
	Spain	22	12,2	12,2	99,4
	United Kingdom, The	1	,6	,6	100,0
	Total	181	100,0	100,0	

Table 6

**Did you complete this study
at once, without being
interrupted? - Selected
Choice**

	N	%
Yes	181	100,0%

Table 7

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Please rate how much do you agree with the following statement: - I am paying enough attention in this study for you to use my data	181	2,00	7,00	6,6133	,77074
Valid N (listwise)	181				

Table 8

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
AIAsALeaderAverage	93	1,70	4,30	3,0548	,51468
AIAsAColleagueAverage	88	1,50	4,30	2,9636	,51799
JobSatisfactionAverage	181	2,54	7,00	5,0803	,65602
EmotionalSatisfactionAverage	181	1,50	4,30	3,0105	,51688
NegativeEmotions	181	1,00	4,57	2,8437	,66559
PositiveEmotions	181	1,33	5,00	3,3996	,62600
Valid N (listwise)	0				

Table 9

Correlations				
		ConditionAI	JobSatisfaction Average	EmotionalSatisf actionAv
ConditionAI	Pearson Correlation	1	,091	-,156*
	Sig. (2-tailed)		,224	,036
	N	181	181	181
JobSatisfactionAverage	Pearson Correlation	,091	1	-,071
	Sig. (2-tailed)	,224		,342
	N	181	181	181
EmotionalSatisfactionAv	Pearson Correlation	-,156*	-,071	1
	Sig. (2-tailed)	,036	,342	
	N	181	181	181

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix C – Reliability Tests

Table 10 - Job Satisfaction

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,722	,748	13

Table 11 - AI

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,696	,698	23

Table 12 - Positive Emotions

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,406	,405	3

Table 13 – Positive Emotions only with excited and satisfied

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,496	,500	2

Table 14 - Negative Emotions

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,785	,787	7

Table 15 - Emotional Satisfaction

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,709	,703	10

Appendix D – Multivariate ANOVA

Table 16 – Descriptive Statistics

Descriptive Statistics				
	ConditionAI	Mean	Std. Deviation	N
JobSatisfactionAverage	-1,00	5,0192	,72454	88
	1,00	5,1381	,58192	93
	Total	5,0803	,65602	181
EmotionalSatisfactionAV	-1,00	,6959	,80756	88
	1,00	,4235	,91773	93
	Total	,5559	,87425	181

Table 17

Multivariate Tests^a							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	,984	5512,312 ^b	2,000	178,000	<,001	,984
	Wilks' Lambda	,016	5512,312 ^b	2,000	178,000	<,001	,984
	Hotelling's Trace	61,936	5512,312 ^b	2,000	178,000	<,001	,984
	Roy's Largest Root	61,936	5512,312 ^b	2,000	178,000	<,001	,984
ConditionAI	Pillai's Trace	,031	2,827 ^b	2,000	178,000	,062	,031
	Wilks' Lambda	,969	2,827 ^b	2,000	178,000	,062	,031
	Hotelling's Trace	,032	2,827 ^b	2,000	178,000	,062	,031
	Roy's Largest Root	,032	2,827 ^b	2,000	178,000	,062	,031

a. Design: Intercept + ConditionAI

b. Exact statistic

Table 18

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	JobSatisfactionAverage	,639 ^a	1	,639	1,489	,224	,008
	EmotionalSatisfactionAv	3,356 ^b	1	3,356	4,476	,036	,024
Intercept	JobSatisfactionAverage	4664,970	1	4664,970	10869,082	<,001	,984
	EmotionalSatisfactionAv	56,651	1	56,651	75,551	<,001	,297
Condition AI	JobSatisfactionAverage	,639	1	,639	1,489	,224	,008
	EmotionalSatisfactionAv	3,356	1	3,356	4,476	,036	,024
Error	JobSatisfactionAverage	76,826	179	,429			
	EmotionalSatisfactionAv	134,222	179	,750			
Total	JobSatisfactionAverage	4749,018	181				
	EmotionalSatisfactionAv	193,512	181				
Corrected Total	JobSatisfactionAverage	77,465	180				
	EmotionalSatisfactionAv	137,578	180				

a. R Squared = ,008 (Adjusted R Squared = ,003)

b. R Squared = ,024 (Adjusted R Squared = ,019)

Table 19 - With control variables

Multivariate Tests ^a							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	,501	86,769 ^b	2,000	173,000	<,001	,501
	Wilks' Lambda	,499	86,769 ^b	2,000	173,000	<,001	,501
	Hotelling's Trace	1,003	86,769 ^b	2,000	173,000	<,001	,501
	Roy's Largest Root	1,003	86,769 ^b	2,000	173,000	<,001	,501
Gender	Pillai's Trace	,002	,164 ^b	2,000	173,000	,849	,002
	Wilks' Lambda	,998	,164 ^b	2,000	173,000	,849	,002
	Hotelling's Trace	,002	,164 ^b	2,000	173,000	,849	,002
	Roy's Largest Root	,002	,164 ^b	2,000	173,000	,849	,002
AgeMetric	Pillai's Trace	,011	,934 ^b	2,000	173,000	,395	,011
	Wilks' Lambda	,989	,934 ^b	2,000	173,000	,395	,011
	Hotelling's Trace	,011	,934 ^b	2,000	173,000	,395	,011

	Roy's Largest Root	,011	,934 ^b	2,000	173,000	,395	,011
Nationality	Pillai's Trace	,031	2,734 ^b	2,000	173,000	,068	,031
	Wilks' Lambda	,969	2,734 ^b	2,000	173,000	,068	,031
	Hotelling's Trace	,032	2,734 ^b	2,000	173,000	,068	,031
	Roy's Largest Root	,032	2,734 ^b	2,000	173,000	,068	,031
Education	Pillai's Trace	,049	4,414 ^b	2,000	173,000	,014	,049
	Wilks' Lambda	,951	4,414 ^b	2,000	173,000	,014	,049
	Hotelling's Trace	,051	4,414 ^b	2,000	173,000	,014	,049
	Roy's Largest Root	,051	4,414 ^b	2,000	173,000	,014	,049
EmploymentStatus	Pillai's Trace	,004	,322 ^b	2,000	173,000	,725	,004
	Wilks' Lambda	,996	,322 ^b	2,000	173,000	,725	,004
	Hotelling's Trace	,004	,322 ^b	2,000	173,000	,725	,004
	Roy's Largest Root	,004	,322 ^b	2,000	173,000	,725	,004
ConditionAI	Pillai's Trace	,029	2,615 ^b	2,000	173,000	,076	,029
	Wilks' Lambda	,971	2,615 ^b	2,000	173,000	,076	,029
	Hotelling's Trace	,030	2,615 ^b	2,000	173,000	,076	,029
	Roy's Largest Root	,030	2,615 ^b	2,000	173,000	,076	,029

a. Design: Intercept + Gender + AgeMetric + Nationality + Education + EmploymentStatus + ConditionAI

b. Exact statistic

Table 20

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	JobSatisfactionAverage	5,404 ^a	6	,901	2,175	,048	,070
	EmotionalSatisfactionAv	5,304 ^b	6	,884	1,163	,328	,039
Intercept	JobSatisfactionAverage	70,897	1	70,897	171,189	<,001	,496
	EmotionalSatisfactionAv	,580	1	,580	,763	,384	,004
Gender	JobSatisfactionAverage	,104	1	,104	,252	,616	,001
	EmotionalSatisfactionAv	,075	1	,075	,098	,754	,001
AgeMetric	JobSatisfactionAverage	,058	1	,058	,140	,709	,001
	EmotionalSatisfactionAv	1,261	1	1,261	1,658	,200	,009
Nationality	JobSatisfactionAverage	2,274	1	2,274	5,490	,020	,031

	EmotionalSatisfactionAv	,004	1	,004	,005	,941	,000
Education	JobSatisfactionAverage	3,209	1	3,209	7,749	,006	,043
	EmotionalSatisfactionAv	,559	1	,559	,735	,393	,004
EmploymentStatus	JobSatisfactionAverage	,263	1	,263	,635	,427	,004
	EmotionalSatisfactionAv	,003	1	,003	,003	,954	,000
ConditionAI	JobSatisfactionAverage	,338	1	,338	,817	,367	,005
	EmotionalSatisfactionAv	3,574	1	3,574	4,702	,031	,026
Error	JobSatisfactionAverage	72,062	174	,414			
	EmotionalSatisfactionAv	132,273	174	,760			
Total	JobSatisfactionAverage	4749,018	181				
	EmotionalSatisfactionAv	193,512	181				
Corrected Total	JobSatisfactionAverage	77,465	180				
	EmotionalSatisfactionAv	137,578	180				

a. R Squared = ,070 (Adjusted R Squared = ,038)

b. R Squared = ,039 (Adjusted R Squared = ,005)