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Use of generative AI in research: Ethical considerations and emotional experiences

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Abstract

The growing use of generative AI (GenAI) as a research tool has raised ethical concerns and sparked emotional reactions among researchers. This study examines researchers' ethical concerns towards the deployment of GenAI in research and their emotional responses. To acquire an in-depth understanding, a qualitative design using narrative frames and follow-up interviews was employed to collect data from 22 researchers who reported extensive experience with GenAI. An inductive thematic analysis of the collected data revealed three themes capturing ethical concerns that invoked three types of emotional reactions. From an ethical perspective, our participants were concerned with "human ethical agency in AI research practices", "cognitive impacts of overreliance on GenAI in research", and "ethical issues of access, accuracy, and privacy". From an emotional perspective, they showed "mixed emotions", "positive emotions", and "negative emotions" when dealing with GenAI tools. There were close connections between the ethical implications of GenAI and the emotional reactions to them. The intersection of AI ethics and emotional responses revolved around concerns of bias, access, privacy, emotional intelligence and emotional well-being. In this light, we conclude that emotional reactions to GenAI, which are determinants of future use, should be taken more seriously in further research.

Keywords: GenAI, emotional reactions to AI, ethical concerns with AI, ChatGPT, research

Introduction

Generative artificial intelligence (GenAI) tools, such as OpenAI's ChatGPT and similar models, have gained significant attention in research for their ability to generate text, translate languages, and synthesize information based on vast datasets. These tools leverage advanced machine learning techniques, particularly deep learning and natural language processing, to create human-like responses, assist in literature reviews, provide language support, and even

offer insights into complex research questions (Benchekroun, 2024). Their adoption in academia is transforming the research landscape by streamlining data analysis, facilitating hypothesis generation, and enhancing collaborative research (Keegin, 2023). However, the use of GenAI in research also raises ethical concerns, such as the potential for bias, issues of authorship, and the need for critical evaluation of AI-generated content to ensure accuracy and validity (Farangi & Nejadghanbar, 2024).

Bond et al. (2024) highlighted in their systematic review that ethical considerations are a recurring theme in discourse on GenAI, encompassing issues such as plagiarism, authorship, data collection, and privacy. Recent scholarship has underscored the necessity of educating stakeholders about ethical AI use and fostering ethical conduct when interacting with GenAI technologies (Lee et al., 2021; Salas-Pilco & Yang, 2022). Stahl and Eke (2024) believe that ethical issues with GenAI outnumber its advantages, enumerating 91 overlapping ethical issues with GenAI tools such as ChatGPT (an AI-powered large language model developed by OpenAI) can generate human-like text and perform tasks such as writing, answering questions, and synthesizing information. According to Stahl and Eke (2024), content production capabilities (i.e., authoring) (Eke, 2023), use of GenAI in academic research (Nature editorial, 2023), employment issues (Frederick, 2023) and cultural values (Stahl & Eke, 2024) are some main ethical concerns that have been under-explored.

Hallucination and authoring are two important issues related to the content production capabilities of GenAI tools. Hallucination is defined as the production of factually false but semantically/syntactically plausible information (Smith, 2023). The issue of hallucination in GenAI is a critical challenge that warrants deeper exploration, particularly in the context of research. While ‘responsible use’, ‘reliability’, and ‘transparency’ are important concerns, GenAI’s hallucinations can have far-reaching consequences (Stahl & Eke, 2024). One significant risk is the potential for false information to be disseminated and perceived as

academically legitimate. In research settings, where rigor and accuracy are paramount, the inclusion of AI-generated errors could undermine the credibility of findings, mislead future studies, and affect decision-making processes with flawed data. Furthermore, reliance on AI tools without thorough verification may contribute to the erosion of trust in scientific inquiry. Addressing these concerns involves not only improving GenAI's informational accuracy but also fostering critical AI literacy among researchers to ensure that GenAI outputs are rigorously vetted before being incorporated into scholarly work (Stahl & Eke, 2024).

Authoring issues can arise in various ways. For instance, some researchers might consider listing a Gen AI tool as a co-author (Stokel-Walker, 2023) or fail to disclose AI use in their work (Weale, 2023). AI literacy plays a crucial role in ensuring ethical practices (Alotaibi & Alshehri, 2023), but many researchers lack the time to fully understand these tools (McGrath et al., 2023). This gap in knowledge can be exploited or lead to unintentional misuse of AI in research (Bearman et al., 2023). A notable example is researchers who serve as reviewers or editors for scientific journals. Without familiarity with Gen AI, they may struggle to identify unethical AI use in research.

Fear of replacement, once by co-workers but now by AI tools, is another issue of ethical significance (Charow et al., 2021). McGrath et al. (2023) reported wide-spread concerns of replacement among university teachers, and Bearman et al. (2023) identified a replacement discourse in the AI literature on higher education that threatens instructors' positions in favour of students and institutions. They called for careful investigations into the ethical and social implications of AI use in higher education because AIs are transforming socioeconomic interests in higher education but there is a lack of robust research agendas to examine the arising issues. Among others, Farangi and Nejadghanbar (2024), in a mixed-methods study, investigated the frequency and severity of questionable research practices (QRPs), including AI-related QRPs, in the discipline of applied linguistics. AI-related QRPs accentuate issues

such as the lack of AI-related regulations, excessive use of AI as a threat, AI disclosure dilemma, and Al deficiencies and human oversight. The study attributed these QRPs to insufficient ethics training, limited statistical knowledge, and the absence of AI guidelines.

AI tools have raised cultural issues as well. One such issue concerns cultural nudging (Hetzscholdt, 2024). Nudging is a way of subtly influencing the behaviors of people with a predictable pattern of thinking and leading them to desired actions and decisions without disrupting their sense of freedom (Schmauder et al., 2023). AI systems can be trained to produce content that may implicitly nudge users to make decisions in favour of social and cultural stereotypes (Schmauder et al., 2023). Stahl and Eke (2024) contend that there are enough good reasons to believe that the training data for AI systems favour certain social and cultural values to bias their outputs socioculturally.

Thus, ethical issues with AI are many and have far-researching consequences. In addition, they are likely to elicit diverse emotional reactions, with unethical practices potentially provoking negative sentiments and ethical uses fostering positive ones. An individual's emotional reaction to technology significantly influences their continued engagement with it (Langer et al., 2018). As Zhang (2013) notes, emotional factors play a crucial role in human-technology interactions. Similarly, Koechling et al. (2023) posit that GenAI might trigger as-yet-unexplored emotional responses within the academic community, a concern that has not been adequately addressed. Clearly, understanding and shaping the emotional dynamics of human-AI interactions is essential, but research on emotional responses to AI has been sparse. Although explorations of the ethical aspects of AI use in research are ongoing, little attention has been paid to the emotional reactions of researchers to AI in tandem with ethical concerns. It is to the emotional aspects of AI that we turn.

Emotional Responses to AI

The interplay between humans and AI can provoke a spectrum of emotional reactions, as delineated by Bagozzi et al. (2022). These reactions fall into three primary categories: basic emotions, self-conscious emotions, and moral emotions. Basic emotions, such as joy, anger, sadness and fear, are foundational emotional responses triggered by interactions with an AI tool. These emotions primarily depend on the tool's capabilities and the achievement of its intended goals. Basic emotions are considered innate and are typically developed early in life. Self-conscious emotions emerge from the intricacies of human-AI engagement. These emotions, which include pride, shame, guilt and embarrassment, among others, are thought to have a biological underpinning but are significantly shaped by social interactions. In the realm of human-AI interaction, successful engagement with AI technology can foster feelings of self-efficacy and pride, whereas challenges may evoke feelings of embarrassment or shame due to perceived shortcomings. Finally, moral emotions encompass both positive and negative emotional reactions. Negative ones, such as contempt or righteous anger, may surface if AI's actions are perceived as unethical or manipulative. Conversely, positive moral emotions, such as admiration and gratitude, can arise from positive engagements with AI, reflecting its potential to inspire or assist (Bagozzi et al., 2022).

Despite the significance of emotional responses to AI, scholarly attention to them in research has been limited. Previous research has focused predominantly on specific demographics, such as learners, the general workforce, and the broader population. For example, Abeliansky and Beulmann (2021) identified a correlation between AI use and increased anxiety among workers, particularly those nearing retirement or in routine jobs. This apprehension was linked to concerns over job security and career progression, with potential implications for mental health and productivity (Layard, 2017). Similar sentiments have been observed globally, with studies in Japan and Norway revealing negative perceptions of AI's impact on employment (Morikawa, 2017; Schwabe & Castellacci, 2020).

Huang et al. (2024) investigated the impact of GenAI acceptance, perceived teachers' enthusiasm, and self-efficacy on the well-being of 613 language learners. Results showed that AI acceptance positively influenced learners' well-being and self-efficacy, whereas teachers' enthusiasm only predicted self-efficacy. Additionally, self-efficacy for receptive skills mediated the relationship between AI acceptance and well-being, but no such relationship was found for productive skills. Waluyo and Kusumastuti (2024) explored student and teacher engagement with GenAI using an explanatory sequential mixed-methods design. They found high student acceptance of GenAI, particularly in performance and effort expectancy, though social influence was lower. While students reported improved efficiency and confidence, they also expressed concerns about overreliance on GenAI. Teachers voiced ethical concerns and the risk of misuse, emphasizing the need for responsible integration of GenAI in education. The findings underscored GenAI's potential to enhance learning while stressing the importance of academic integrity and critical thinking. Gruenhagen et al. (2024) further explored the relationship between various psychosocial factors (e.g., learning motivation, distress, and resilience) and students' use of AI chatbots, aiming to identify the environmental conditions or risk factors influencing their usage. The study revealed an association of higher psychological resilience with lower chatbot use, suggesting more resilient students' less reliance on AI tools.

McGrath et al. (2023) reported university instructors' feelings of fear and scepticism regarding AI's role in higher education, leading to concerns about being supplanted by AI technologies. Koechling et al. (2023) suggested that such emotions could stem from unfamiliarity with AI processes, exacerbating fears of obsolescence in the face of advancing large language models (LLMs) like ChatGPT. Conversely, AI can also evoke positive emotions, particularly in the context of research and academia. The efficiency and speed of AI tools in processing large datasets can significantly enhance productivity, allowing researchers to focus on complex cognitive tasks (Hetzscholdt, 2024). Han et al. (2023) emphasized the

importance of positive emotions in encouraging continued AI use, noting that perceptions of AI as helpful rather than threatening are crucial for adoption. Similarly, Xu et al. (2022) and Zou et al. (2024) found that setting appropriate expectations could foster positive emotional responses to AI-generated content. These studies notwithstanding, Chu et al. (2022) highlighted the scarcity of research on researchers' emotional reactions to AI.

In summary, while research on emotional reactions to AI tools appears to be in its early stages (Zou et al., 2024), and despite recent research focusing on teachers' and students' engagement with AI, to the best of our knowledge, there seems to be no study addressing researchers' emotional reactions to AI use in research, particularly in connection to their ethical considerations. This study aims to bridge this gap by exploring the emotional responses of Iranian researchers to the use of GenAI tools like ChatGPT in their research activities.

The Present Study

As noted above, ethical considerations are inextricably linked with emotional responses. Thus, our study was designed to achieve three objectives: firstly, to explore the ethical ramifications of AI use in research, as perceived by experienced researchers, particularly those from a country facing greater challenges in accessing technological advancements due to economic and political constraints; secondly, to investigate the emotional responses of researchers to AI tools, an area that has thus far been largely unexamined; and thirdly, to elucidate the relationship between ethical concerns and emotional reactions. To this end, we formulated the following research questions:

RQ1. What ethical concerns arise from the use of GenAI tools in research?

RQ2. What emotional experiences are associated with the use of GenAI tools in research?

RQ3. How are ethical considerations of GenAI use related to researchers' emotional reactions?

Method

Participants

As this was a qualitative study, we gathered data from a sample of 22 Iranian researchers. We started with four researchers. These participants were selected based on two key criteria: (1) their active engagement with GenAI in their research, and (2) their demographic diversity in terms of gender and discipline. These factors were essential to ensure that the starting group represented a variety of perspectives within the research community and connected with a broader and more representative participant pool across different regions of Iran. This sampling strategy was meant to draw on the four participants' connections with different subsets of the eligible participant pool (Morgan, 2008) in our subsequent snowballing sampling across various regions of Iran. The difficulty in compiling a comprehensive directory of researchers actively using GenAI in their work further justified our sampling method.

Based on the nominations made by the four researchers, we reached out to additional 'qualified' prospective participants, who suggested more candidates meeting our criteria (Ary et al., 2018). This sampling process resulted in the recruitment of 22 researchers nationwide. They were roughly gender-balanced (12 males and 10 females), and their ages ranged from 35 to 61 years, with an average age of 41.6 years. The participants held various academic positions: 9 lecturers, 6 assistant professors, 4 associate professors, and 3 professors. Their fields of study spanned pure and applied disciplines, with 4 from soft pure disciplines, 5 from hard pure disciplines, 5 from soft applied disciplines, and 8 from hard applied disciplines. Prior to data collection, we secured their consent to participate in the study and guaranteed their anonymity throughout the study and in publications arising from the study.

Data collection tools

We adopted a qualitative, exploratory research design as it allows researchers to delve into phenomena that are not extensively studied in a specific context. Such a design facilitates a comprehensive understanding of how individuals interpret their lived experiences (Ary et al., 2018). To collect data, we developed a narrative frame to capture the ethical concerns and

emotional reactions of researchers to AI use in their work. Narrative frames, which consist of prompts to initiate and connect, were chosen for their ability to elicit structured reflection, guiding participants in articulating their experiences and emotions (Barkhuizen & Wette, 2008). Participants often feel uncertain about what to write ("I don't know what to say") and how to write narratively ("What style should I use?"); narrative frames offer guidance and provide a skeleton to their writing (Barkhuizen & Wette, 2008).

To construct the narrative frame, we first reviewed the literature to identify key themes related to use of AI in research, such as ethical concerns and emotional reactions. We defined the research focus based on gaps and issues highlighted in prior studies, aiming to explore both ethical dilemmas and emotional responses to AI. From these themes, we formulated open-ended prompts designed to encourage participants to reflect on their experiences. The frame was structured into sections, each addressing a specific theme: ethics or emotional reactions. The first part of the narrative frame featured prompts addressing the ethical aspects of AI use in research, such as: "When using GenAI tools, the primary ethical implications I consider are . . . because . . .", "The most challenging ethical issue I have faced with GenAI tools is . . .", and "When I encounter ethical issues with GenAI, I respond by . . .". The second part of the narrative frame focused on emotional responses, including prompts like: "Using GenAI tools in research makes me feel . . . because . . .", "A positive emotional experience I have had with GenAI tools is . . .", "A negative emotional experience I associate with GenAI tools is . . .", and "My feelings about using GenAI tools relate to ethical issues in the following ways: . . .". Finally, we piloted the frame with a small group to refine its clarity and effectiveness.

Apart from data collected with the narrative frame, one-on-one semi-structured interviews were conducted with all the participants to explore, in greater detail and depth, their ethical concerns and emotional reactions to AI use in research. The interview protocol was crafted to examine their ethical considerations, understanding of responsible AI use, ethical

dilemmas, perceived risks, and views of the repercussions of unethical AI practices. We also probed their emotional experiences with AI, both positive and negative. To tailor our inquiry, we adapted questions from their narrative frame. For example, Participant 20 associated "awe, excitement, and fear" as emotions with AI in research. We based our interview questions on this response, asking "Can you describe the awe you feel? What prompts it?" This method enabled us to capture each participant's distinct experiences and feelings towards AI in their research. The interviews were conducted in Persian. The participants were informed of the audio-recording of the interviews and consented to this procedure. To ensure anonymity, no names or identifying information were recorded. The audio files were then transcribed verbatim for subsequent data analysis.

Data analyses

In line with the methodological procedures developed by Braun and Clarke (2006), we performed a thematic analysis on the collected data, which included 22 narrative accounts coming from 22 semi-structured interviews. Our analytical process encompassed several phases: becoming acquainted with the data, generating initial codes, identifying themes, refining themes, defining and labeling themes, and compiling the final report (Braun & Clarke, 2006). To begin with, we copied our data into Word files and started by reading the data to establish a basic level familiarity and understanding. At this stage we went through the data and searched for words related to ethical issues (e.g., *unethical*, *privacy*, *rights*, *bias*) or emotions-related words (e.g., *feel*, *fear*, *stress*, *afraid*, *excited*) and wrote memos. This allowed us to understand the data better and prepare for the subsequent stages. Further readings allowed for the emergence of initial codes focusing on participants' ethical concerns and emotional reactions to the use of AI in research. We then employed color coding and typographical features such as italicization to annotate the text in the documents, ensuring an inductive approach was maintained across the dataset. From this process we developed codes such as

“AI inability to understand ethical issues”, “AI lacks autonomy”, and “humans can play the AI”

Subsequently, we synthesized the data to formulate overarching themes, cross-referencing codes from different sources to ensure coherence. For instance, codes from interviews that resonated with narrative frame content were grouped under a common theme. As an example, codes refereeing to creativity, critical thinking, overreliance, overuse, machine-like thinking were grouped under the overarching theme of 'The cognitive impact of overreliance on GenAI in research'. We also engaged in collaborative discussions to enhance the trustworthiness of the analysis. Through iterative examination and refinement of codes and themes, we sought to improve the precision of our interpretations. The analysis culminated in the identification of three themes related to ethical concerns – “human ethical agency in AI research practices”, “the cognitive impact of overreliance on GenAI in research” and “ethical issues of access, accuracy, and privacy” – and three associated emotional responses, which we categorized as “mixed emotions”, “positive emotions” and “negative emotions”. In the subsequent section, we will first explore the themes connected to ethical considerations before delving into the emotional responses.

Results

Ethical concerns

“The researchers are responsible for the ethical use of these tools!”: Human ethical agency in AI-related research practices.

An overwhelming majority of our participants (19 out of 22) agreed that researchers have ethical obligations when using AI tools. They emphasized that we cannot expect a machine to act ethically, as ethical reasoning is inherently human. Participant 19 illustrated this perspective:

> I think the person who conducts research should take care of ethical issues and if that person is not very careful of them, it doesn't matter if they are using AI tools or not; they will act unethically. But AI can facilitate their unethical agenda. (Interview)

Our participants' views centred on the premise that AI tools as machines are under the control of individual researchers. As P13 put it, "at this moment, AI tools are the products of human thinking abilities and lack autonomy. They do what we tell them to do. Misusing it is our fault as the human agents". Similarly, P8 noted that "AI tools can be used for good purposes and for optimizing tasks or they could be used as weapons for deception. The researchers are responsible for the ethical use of these tools!" Although GenAI may abide by some principles when responding to commands for research purposes (i.e., when asked to write a full research proposal on a particular topic, an LLM may reply "Sorry, I am not allowed to do that"), participants noted that humans could easily deceive LLMs by rewording the prompts. Likewise, our participants discussed the ethical responsibilities of AI users, particularly researchers. They recognized that researchers and their intentions concerning how to use GenAI were key determinants of ethicality. As Participant 2 elaborated,

> A professional AI researcher can easily deceive even a very experienced and vigilant academic reviewer. The majority of young researchers are familiar with GenAI tools but this is not true for most experienced reviewers, editors or those professors who are very busy. Even if they are familiar, at the present moment, it is very difficult to detect unethical uses of GenAI. In this way, it's very easy to deceive even reviewers for the most prestigious journals if you know the tricks. I think a large number of journals in our field will need to recruit computer engineers to scrutinize manuscripts for AI-generated text, or they will have to wait until efficient AI detection tools are available. (Interview)

Similarly, Participant 2 noted that reviewers also have the potential to misuse GenAI, “Upon submitting one of my manuscripts and receiving feedback, I understood that one of the reviewers had employed GenAI to evaluate my paper." These quotes highlight the importance of human agency, indicating that it's essential for researchers to remain mindful of their social and ethical responsibilities when utilizing new technologies. However, the surging demand for advanced AI detection tools in academia, as recognized by several participants in our study, reflects a lack of self-trust.

“We're at risk of losing our abilities to think critically and creatively”: The cognitive impact of overreliance on GenAI in research.

One of the moral dilemmas discussed by the participants (n = 8) in this study was that overuse of GenAI may, in the long run, diminish researchers’ creativity and critical thinking and lead them to think like machines. They believed that the abilities to think critically and creatively that humans have acquired as a result of evolution are in danger of being lost in due course if we rely too much on AI tools. Participant 3 shared the following anecdote:

> The reliance on GenAI in research is troubling to me. It's not just about the ethical boundaries being blurred, but more about how it's reshaping our cognitive processes. I've noticed a trend where creativity and critical thinking, which are human attributes, are being sidelined. For instance, at an international conference, I could tell that a presenter's speech was heavily reliant on GenAI. It wasn't the language that bothered me; it was the realization that the originality and human touch in his presentation were compromised. This reliance on AI for generating content is a clear sign that we're at risk of losing our abilities to think critically and creatively if we don't tread carefully. (Interview)

Overreliance on GenAI and similar tools can lead to personal and societal harms. We examined this issue from multiple angles. First, Iranian researchers, facing internal censorship

and external tech embargoes, may overuse accessible technologies. Second, the cognitive drawbacks of new tech, such as LLMs, are underexplored. For non-native English-speaking researchers like participants in our study, excessive use of LLMs may result in diminished language skills. Overuse of GenAI to prepare presentation materials, for example, can easily deprive researchers of learning and education opportunities that may in turn impact their cognitive and social functioning. We may be able to reap some short-term benefits but long-term damages are in store.

In this regard, P22 recounted his story of using GenAI to review a manuscript for a very well-known international journal. As he did not want to miss the deadline, he used the tool to review the manuscript just before the deadline. He confided that doing so made him lose opportunities to learn and deprived him of some ideas to work with. Extensive reliance on GenAI could predispose us to think in simplified and algorithm-based ways, without a deeper grasp of the underlying complexities. A similar but bitter story was told by participant 11,

> I had a weird experience with AI tools. Actually, I am currently doing research on a specific topic and one of my research instruments is an open-ended questionnaire. So, I sent the questions to a participant who agreed to participate in this research and asked him to answer the questions. After a while, he sent back the answers and due to the fact that I am quite experienced in working with GenAI tools, I found that he had used AI to answer the questions, to my great frustration and disappointment. (Narrative frame)

In spite of the reported disadvantages, almost all participants in our study believed that they could not just ignore GenAI tools or avoid using them. For example, P3 contended that,

> While AI tools have become integral to our daily routines, enhancing efficiency in certain tasks, there is a growing concern about their impact on our innate skills. For instance, calculators have indeed taken over the task of mental arithmetic, which has led to a decline in our calculation abilities. Similarly, overreliance on AI can lead to a

> reduction in our cognitive development. We must be vigilant in using AI as a tool to augment our abilities, not to replace the complex cognitive processes that define our humanity. It's about finding a balance where AI serves as an aid without diminishing our intellectual engagement and the development of our critical faculties. (Interview).

"It can be a problem in the world of research where equality of opportunities is emphasized": Ethical concerns of access, accuracy, trust and privacy.

In this study, particular ethical concerns ranged from access to accuracy. One of the initial worries among our participants, who came from a developing country, was the availability of free and timely access to GenAI tools. As P2 explained,

> One of the main ethical dilemmas in the world of GenAI is related to the issue of access; Those researchers, educators and students who have early free access to these tools can have an advantage over the others, and it can be a problem in the world of research where equality of opportunities is emphasized. (Narrative frame)

Free and equal access to AI tools is a pillar of ethical use because it ensures equality of opportunities. As a matter of fact, the advantages offered by GenAI are not uniformly available to everyone. This is evident in developing nations, where restricted access to cutting-edge technologies and insufficient infrastructure present obstacles (Mannuru et al., 2023).

P15 considered the technological divide and access from another perspective. In her opinion, junior researchers are likely to be more open-minded to the uses and applications of new technologies compared to senior researchers. This difference in attitude may result from the latter's lack of motivation for change. Big changes require risk taking, which is a trait that often prevails among younger generations. Aware of such geographical and generational differences, several participants (n = 6) argued that free and open access to AI tools should be made available if researchers are trained on how to use them ethically.

Another issue concerns the speed and quality of AI-generated research publications. P10's view was representative:

> The other main concern about GenAI is related to speed and accuracy. These days, many researchers are looking for quick publications but we should care about the depth and quality of our publications at the same time. Although we can generate a manuscript with a GenAI tool in one week, I'm sure the manuscript doesn't qualify as a good academic paper; rather, it's trash and nonsense. (Interview)

This concern is an important one for the present study. The hasty production of research papers via GenAI can flood academia with low-quality or fake science, which may mislead the academic community and erode public trust in academic research. Still another issue identified by the participants had to do with trust. Trust is a precious commodity in academia and may not always be attainable in the age of emerging technologies, as P5 pointed out:

> AI is trained on historical data. This means that the technology can't predict the future or connect with the state-of-the-art innovations. It collects its information based on what has been published previously. Overreliance on AI … can lead to a culture of unoriginality and a lack of trust. (Interview)

The participants concurred that nowadays academics are pressured to publish a required number of works to fulfil their academic duty or pad out their CV for future purposes. GenAI can be a very useful tool for this purpose. However, excessive use of GenAI tools for rapid publishing could lead to unoriginal work and diminished trust because these tools often rely on web scraping to extract data (see Palacios Barea et al.,2023). This creates a degenerate feedback loop where GenAI uses content from academic papers to generate their outputs, which are then used to generate more papers, diminishing trust in scientific progress by misrepresenting scholarly efforts and feeding the academic community with biased outputs.

Finally, the issue of data privacy in the context of AI tools handling large datasets was raised by the participants. P2 put it this way:

> One of my biggest concerns about AI tools is data privacy, especially when we work with a large amount of data. Consider a researcher who gives his or her data to AI tools for analysis. The tools will analyse the data and keep a record of them. Another researcher, from another part of the world, asks a similar question and the AI tools will answer the question based on the previous data and analyses. This is quiet frightening as you have lost your data privacy right away. So our privacy will be degraded in this way. (Narrative frame)

Trust and data privacy go hand in hand. Trust in technology declines when researchers fear losing data privacy, particularly in high-stakes research. Researchers handling high-priority data may find themselves reluctant to expose their data to GenAI tools.

Emotional reactions and their interaction with ethical concerns

While previous research has often overlooked the emotional impact of using GenAI in research, Bagozzi et al. (2022) suggested that interactions with AI can elicit a spectrum of emotions. This was confirmed in our analysis, which identified three categories of emotional responses to GenAI: mixed emotions, where individuals experienced a balance of positive and negative feelings; positive emotions, characterized by strong positive and weak negative feelings; and negative emotions, marked by strong negative and weak positive feelings.

> **"AI is a double-edged sword, and each edge can invoke one type of emotion": Mixed emotions.**

Several participants (n = 12) had mixed emotions toward the use of GenAI tools in research, equally recognizing their benefits and drawbacks. For example, P6 confided:

> I have quite mixed feelings about AI tools. Some nights, I worry they might replace me as a researcher, not immediately, but perhaps soon. Other nights, I'm convinced that

> generative AI tools lack human creativity. They operate on data we've created, drawing from past knowledge, and as of now, they can't foresee or innovate for the future. My feelings are both positive and negative. AI can facilitate our research process by revising and proofreading our texts. On the other hand, it can mislead our research with fake data. (Interview)

Similarly, P5 talked about the positive and negative sides of AI that led to her mixed feelings:

> AI is a double-edged sword, and each edge can invoke one type of emotion. My positive emotion is that AI will free my mind to be creative in producing new results by giving me assistance in revisions and language editing services …. The negative edge may degrade my creativity if I rely too much on the AI tools. I'm afraid that one day, I will be just thinking like a machine…. (Interview)

In the present study, these emotions were tied to the ethical issues mentioned above. Like most participants with mixed emotions, P3 expressed positive feelings about certain AI applications but remained sceptical about others:

> My positive emotions toward AI tools are associated with their medical and constructive uses in society. I think these tools will make our lives easier, healthier and, to a large extent, safer. An AI tool can scan the whole body of a new-born and tell us what are the problems if any; this is a blessing for our health. But, in humanities, with its potential abuse for cheating, I am not sure of its advantages. (Narrative frame)

Similar to P3, other participants (n = 6) believed that beneficial AI applications are more pronounced in everyday life than research due to the lower probability of abuse.

"Imagining a life without AI is really difficult for me!": Positive emotions.

Four participants held predominantly positive emotions towards GenAI. For example, P18 believed that,

> For sure, researchers should use these tools. These tools will become a necessary part of our lives. Imagining a life without AI is really difficult for me! The negative points are very few and can be ignored. (Interview)

Similarly, P20 focused on the advantages, too:

> I am quite sure that these tools will speed up the research process. We don't need to spend a lot of time paraphrasing and revising the text or even reading a large number of unrelated texts. I am thrilled. (Interview)

Positive emotions often grow out of rewarding past experiences. Capable of accelerating our workflows and enhancing our efficiency, the advent of GenAI tools initially sparked excitement. Yet, having exclusively positive or negative emotions may indicate a lack of experience or understanding. It is probable that at the current stage, only people with relevant experience or understanding can see both the benefits and problems. On the other hand, in the present study, some participants (n = 6) expressed joy, happiness, and optimism about the future, believing that the drawbacks of GenAI were manageable and could be offset by implementing appropriate regulations. P10, who used GenAI primarily for research purposes, claimed:

> Using GenAI in research has relieved me of tedious tasks. It has boosted productivity, reduced stress, and enabled me to concentrate on more meaningful aspects of our work. I am grateful to be able to use this. (Interview)

The advantages of GenAI are undeniable, particularly for individuals who previously devoted substantial time to ancillary but laborious tasks. For them, GenAI represents a transformative boon. It is understandable that such individuals will maintain positive sentiments towards GenAI, potentially resisting negative considerations in favor of its beneficial attributes. Not all participants, however, were in favor of GenAI, and some of them presented valid arguments in this regard. The next theme deals with that.

“I will lose the game to them”: Negative emotions.

Predominantly negative emotions were also reported by six participants. Their negative emotions were related to issues of replacement, dependency, competition, fake content and nudging, most of which were discussed above as ethical issues. P11 felt that the publication race, intensified by GenAI’s capabilities to speed up the research processes, invoked ethical concerns and negative emotions. In his own words,

> In the new neoliberal world in which researchers sell themselves through their publications, I have a negative feeling towards using GenAI. I'm an ethical researcher or at least I think I am so and I don't use these tools in a negative way. However, I'm not sure if other researchers in our field follow similar codes of conduct. I'm quite sure that if researchers use AI tools in an unethical way, I will lose the game to them. Let's hope not so. (Interview)

Negative emotional responses were particularly prevalent among those who were hesitant about using GenAI in their work. P9 was also concerned about too much use of AI and preferred a conservative approach towards GenAI use:

> One of my negative emotions is the fact that ChatGPT or other GenAI tools can make students very dependent on them. I mean after using these tools for a while, every student will turn to them for questions coming to their minds. It may turn them into very lazy students who are not willing to accept the role of an authentic researcher and, in turn, will degrade our academic integrity. So, I think we should stay conservative toward the use of GenAI tools, especially in research. (Interview)

As previously contended, members of the academic community – researchers, students, and instructors – risk succumbing to voluntary servitude. Excessive reliance on GenAI tools can lead to an incapacitating dependency. Moreover, unequal access to these tools can

disproportionately benefit certain groups and skew academic discourse. P12 raised concerns about potential GenAI nudging, namely the subtle influence that GenAI-generated content could have on our perceptions and decisions. He argued that the GenAI-produced outputs often reinforce existing social and cultural stereotypes:

> My negative feeling is because we now have to be extremely vigilant about nearly everything. GenAI tools have the capability to generate research, create images and figures, and propose future research directions, but their reliability is questionable. You must exercise caution when viewing an image or reading a manuscript, as the information presented could subtly guide your thoughts and actions in a direction that aligns with prevailing social or cultural biases. (Narrative frame)

Finally, P1 shared an interesting viewpoint:

> One of my negative emotions toward GenAI tools is that they are not mature enough to say “I don't know the answer to this question”. Even when they don't know the answer or they don't have access to the required information, they will provide some information which may not be true. (interview)

Negative emotions like the one P1 had can hinder even ethical use of AI in research. While AI is nascent and will improve, our study has shown that initial optimism about GenAI is now mixed with scepticism. Yet, this does not mean GenAI is doomed to be a strikeout in the field of research; its impact depends on ethical use. Zhang et al. (2024) emphasize the need for a balance between rationality and morality in using GenAI, noting that moral disengagement can lead to misuse. Ethically informed researchers are less likely to abuse GenAI in their research.

Discussion

The findings underscore the consensus among researchers about the necessity of human ethical agency in AI-related research practices. The participants highlighted the intrinsic human responsibility in ethical decision-making, emphasizing that machines, including GenAI, lack

the capacity for ethical reasoning. This aligns with the literature advocating for human oversight and responsibility in the deployment of AI tools (Fleckenstein et al., 2024; Griffin et al., 2023). Given the sophisticated nature of GenAI, which can evade detection of misuse, researchers bear an ethical obligation as user agents. In this regard, Perkins et al. (2023) discussed the difficulties that academic staff and automated systems encounter in identifying AI-generated content in higher education settings. Fleckenstein et al. (2024) showed that even experienced teachers were incapable of detecting GenAI-produced text in their students' essays. On the other hand, Hu (2023) believed that even researchers' self-reported use of GenAI cannot be always trusted because there are already cases of individuals abusing AI tools for their own gains. All in all, Jeanes (2017) recognized the significance of personal and contextual ethics, particularly with respect to immediate ethical challenges that demand individualized responses. According to her, a depersonalized approach to research ethics may not provide answers to many of our questions. We need to stress individual responsibilities in ethical dilemmas, and where we have free will to act, it is crucial to reflect on how our individual perspectives, personal inclinations, academic standing, and methodological approaches influence scholarly work. These factors should shape the way we engage with research and GenAI, contribute to knowledge, and navigate ethical and intellectual challenges.

In addition, the cognitive impact of overreliance on GenAI tools presents a significant ethical and practical challenge. Participants' concerns about diminished creativity and critical thinking reflect broader concerns in the academic community about the long-term implications of AI for human cognition (Heersmink, 2024). This is particularly pertinent for researchers in developing countries who may rely heavily on available technologies due to external constraints. The "online brain" metaphor proposed by Firth et al. (2019) highlights the effects of technologies, like the Internet, on human cognition. The online brain may now become the "AI brain", to which human beings relegate many cognitive tasks and, in return, are in for a

degradation of their critical thinking abilities. As Heersmink (2024) points out, LLMs can affect our cognitive skills as they may impoverish individuals' writing and critical thinking. Our findings echoed those of a previous study by Ahmad et al. (2023), which found potential links between AI use and decreased decision-making abilities, increased laziness, and compromised privacy/security among university students in Pakistan and China.

On the other hand, some researchers have reported that GenAI is incapable of replacing human thinking. In his interview with *Harvard Business Review*, Lakhani (2023) contended cogently that humans cannot be replaced with AI but humans without AI will be replaced by humans with AI. According to him, AI tools can decrease cognition costs just as the Internet has decreased information transmission costs. This view seems plausible because published research on AI has increased drastically in the last two or three years and reported huge numbers of AI applications in everyday life.

Our study also highlighted crucial ethical concerns, including access, accuracy, trust, and privacy. While AI tools alleviate academic workload, Hetzscholdt (2024) warns that they may overwhelm us. Their ability to rapidly generate content can derail learning and research. Researchers must be wary of such misuse, as it compromises integrity and may disseminate false information to the research community. The disparity in access to AI tools between researchers in developing and developed countries raises significant ethical issues, as unequal access can exacerbate existing inequalities in academic opportunities (Mannuru et al., 2023). Alasadi and Baiz (2023) raised concerns about the unequal distribution of AI tools exacerbating educational disparities and affecting career readiness. The ethical harnessing of GenAI in research requires addressing access disparities to prevent further inequities, in line with the principles promulgated by the *Declaration for the Future of the Internet* (U.S. Department of State, 2022). Mannuru et al. (2023) also emphasized the need for interventions and collaborations to overcome the "technological divide" and ensure that GenAI supports

inclusive growth, especially in the resource-limited Global South. In addition, access to AI tools can be viewed from both geographical and generational angles.

In this regard, Abeliansky and Beulmann (2021) found that people close to retirement were more likely to hold negative attitudes toward AI and were less motivated to use such tools. Concerns about the quality and trustworthiness of AI-generated research underscore the need for rigorous standards and oversight to maintain academic integrity. While researchers used to spend a great deal of time reading the relevant literature, writing the drafts, polishing and proofreading them, GenAI can now expedite or even replace all these processes, catapulting users' so-called scholarly productivity (Nolan, 2024). However, this productivity may not be synonymous with quality work and warrants caution. Trust and data privacy were other issues discussed by our participants. According to them, there is a high risk of encountering low-quality papers that cannot be easily trusted, as well as concerns about compromising data privacy when using GenAI for data analysis. Wach et al. (2023) and Sorell et al. (2022) have raised similar concerns about data-handling practices of GenAI and their possible violation of privacy norms.

As Hetzscholdt (2024) argues, 'responsible AI' is built on trust, transparency, and truth to address ethical challenges, particularly in safeguarding data privacy and integrity. This is important as currently consent forms used in research often lack clarity on how AI may process data. Such a lack of clarity can affect participants' information sharing decisions and behaviours. In response, Bak et al. (2022) called for a reevaluation of research values to better align data privacy with the need for access and a more transparent and ethical approach to data handling in AI-driven research.

In our consumerist society, technologies like AI are becoming integral to daily life, often embraced without a full awareness of their impact. The extent of AI's influence is uncertain, but its ubiquity is undeniable. Drawing a parallel to La Boétie's (1577) *Discourse on*

Voluntary Servitude, our uncritical acceptance of AI could lead to a form of dependency, prioritizing needs of technology over our own. Future research should explore this potential ignorance of AI's pervasive yet detrimental role.

The second section of our study focused on emotional responses to GenAI, an area that has received negligible attention from scholars. We found three types of emotions there: Mixed, positive and negative emotions. Mixed emotions are driven by the uncertainty of AI's future roles. The initial awe inspired by generative AI's capabilities has been tempered by concerns about its role in our lives. As we interact more with these tools, apprehension grows regarding their potential uses and the breadth of their impact. This emotional ambivalence is a natural response to the unknowns of AI's future roles. For example, participants appreciated the facilitation of research processes but feared replacement or cognitive diminishment. They feared that GenAI might one day replace them or diminish their cognitive abilities. Conversely, they appreciated how these tools eased their research endeavours. Over time, as we engage more with GenAI tools, we may alleviate these concerns by discovering additional benefits. By mitigating their drawbacks and enhancing their benefits, the collaborative relationship between GenAI and humans can progress. Kartal (2024) supports this view, suggesting that human-computer co-creation is vital for successfully integrating GenAI into our work.

Researchers' emotions played a crucial role in determining the level of trust and willingness to adopt GenAI tools. Fear and concern (as negative emotions) over ethical issues like bias, data privacy, and AI’s inability to grasp complex human values could lead to slower adoption rates. Researchers who are wary of these ethical shortcomings may hesitate to fully integrate GenAI into their work, especially in fields where ethical considerations are paramount (e.g., healthcare, education). This is in line with Gruenhagen et al. (2024) who argued that higher psychological resilience was associated with lower chatbot use. Conversely, excitement

and curiosity (as positive emotions) may motivate others to explore the potential of these tools, leading to faster adoption in innovative domains.

Positive emotions arise from rewarding experiences with AI, which ties into the earlier discussion of trust as an ethical issue. For positive emotions towards GenAI tools to develop, they must first earn users' trust. Several participants did not trust GenAI in research due to the high potential for abuse. However, other participants noted enhanced productivity, reduced stress, and optimism about AI's benefits outweighing its drawbacks. Previous research supports this: Nugroho et al. (2024) found that students using ChatGPT for tasks like translation, idea generation, and writing were generally positive about its utility, though the authors expressed concerns about potential academic dishonesty. Similarly, Han et al. (2023), Xu et al. (2022), and Zou et al. (2024) documented users' positive responses to various AI applications. Positive emotions are crucial for continued use; users with favorable attitudes are more likely to adopt GenAI tools in their future endeavors (Polyportis & Pahos, 2024).

On the other hand, negative emotions stem from concerns about ethical use, dependency, and the reliability of AI-generated content. Our participants (e.g., P11 and P12) emphasized the importance of maintaining integrity and exercising caution in the use of GenAI. They were concerned about the moral implications and the potential for misuse if ethical standards are not upheld. Zhang et al. (2024), similarly, argued for a balance between rationality and morality in using GenAI. Ethical use of AI is crucial to preventing misuse and ensuring that the technology benefits the research community without compromising ethical standards. Similarly, Stokel-Walker (2024) expressed concerns over the misuse of LLMs in research outputs. He noted that 1% of papers published in 2023 employed GenAI, a figure that is destined to skyrocket. Such reported trends can draw adverse reactions from researchers who either lack access to GenAI or are disinclined to adopt it in their work. Moreover, participants expressed apprehension about AI reinforcing social and cultural stereotypes, which is in line

with Stahl and Eke's (2024) warning that we should be careful with GenAI data as there is emerging evidence of GenAI nudging. This requires users to be extremely vigilant about the information generated by these tools.

Conclusion

Ethical concerns about GenAI are prevalent and will continue to be so in the future. As argued by Nejadghanbar et al (2024) and Song and Nejadghanbar (2024) and demonstrated in this study, ethical issues are intricately intertwined with emotional reactions. The complexity of emotions and their nuanced relationships with GenAI are becoming increasingly evident. While emotions can sometimes be overwhelming and drive our (dis)engagement with GenAI, they often have subtler influences. They can color, amplify, hinder, or regulate our rational and ethical thinking when interacting with AI. However, emotions are not just automatic reactions that defy regulation and nurturing. They require deliberate and conscious effort to manage effectively. Anticipated emotions play a crucial role in setting and pursuing goals. Additionally, emotions are often shared and shaped by the groups we belong to, becoming embedded within our social relationships. As AI is increasingly integrated into our social lives, where emotions are fundamental, understanding its intricate interplay with these complex human experiences becomes crucial.

Our findings highlight the importance of developing comprehensive ethical guidelines specifically for the use of GenAI in research. These guidelines should emphasize transparency in AI-related practices and clearly define the boundaries for AI tool usage. This may include mandatory ethics training for researchers, focusing on emotional responses to AI to enhance emotional literacy and promote responsible AI use. Additionally, academic institutions might consider establishing AI regulatory frameworks to guide the disclosure of AI involvement in research outputs and reduce excessive reliance on AI-generated content.

This study primarily focused on the ethical concerns and emotional reactions of Iranian researchers using AI for research purposes. The results reflect the specific context of the participants, making it untenable to draw broad conclusions from this study alone. The cultural and political context of Iran may have influenced participants' ethical concerns and emotional responses toward GenAI. Future research could explore researchers' ethical and emotional reactions to AI use in different contexts. Additionally, cross-cultural studies comparing AI-related practices in various linguistic and educational settings would enhance the understanding of global challenges and opportunities regarding AI in research. Moreover, this study did not examine participants' actual AI use and activities, relying instead on self-reports. Including such data in future research could provide a more nuanced and comprehensive understanding of researchers' use of AI. This is essential, as there is currently a lack of understanding about how researchers actually use AI tools in practice and the implications for research and education. We conducted a qualitative study, and future research should examine emotional reactions to different AI applications in research among a larger and more diverse group, leveraging both qualitative and quantitative methodologies to deepen our understanding of the complex issue of AI use in research.

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