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THE ROLE OF ARTIFICIAL INTELLIGENCE IN IMPROVING THE EFFICIENCY OF MANAGING THE PROCESS OF COLLECTING EMPIRICAL DATA IN FIELD RESEARCH

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ABSTRACT

Purpose: *The article examines the application of artificial intelligence (AI) in the design and implementation of social research, with a focus on the processes of conceptualization and operationalization, empirical data collection, and research ethics.*

Need for the study: *Despite the growing interest in AI in the social sciences, there are still research gaps regarding the use of modern technologies, such as natural language processing (NLP) and machine learning, in the research process. Key challenges include the interpretability of AI models, the risk of algorithmic bias, and the integration of AI with classic qualitative and quantitative research methods.*

Methodology: *The article is based on an analysis of literature and case studies on the use of AI in social research, including both an overview of AI tools and an analysis of their potential applications and limitations.*

Findings: *AI significantly supports researchers at various stages of the research process, from formulating research questions to analyzing data to coordinating field research. At the same time, significant challenges are identified, such as the lack of transparency of algorithms, the risk of automating biases, and the dehumanization of the research process.*

Practical Implications: *The integration of AI in the social sciences requires the development of methodological standards and ethical regulations. Researchers should combine AI with traditional research methods to minimize the risk of errors and ensure the reliability of analyses.*

Keywords: artificial intelligence, automation of field research, field research, management of the research process, methodology of social science, research ethics.

Jel codes: C18

1. INTRODUCTION

In recent years, the topic of applying artificial intelligence (AI) to the social sciences has been gaining popularity, especially in research process design and implementation. Existing analyses point to the widespread use of AI as a tool to support various stages of social research, such as data analysis, social behavior modeling, or trend prediction (Brynjolfsson & McAfee, 2021; Noble, 2018). AI is also being

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studied in the context of its impact on society and human interactions, with the integration of AI into the social sciences growing in importance, especially concerning advanced language models (Xu et al., 2024) and their applications in various research fields (Prieto-Gutierrez et al., 2023). However, despite the growing interest and number of studies on the use of AI in the social sciences, several important research gaps in literature require further exploration.

First, many works overlook modern technologies such as natural language processing (NLP) and deep learning, which offer the potential for more accurate analysis of texts, emotions, and linguistic nuances, which is particularly important in qualitative research (Zeng et al., 2023; Rohlinger, 2024). There is a dearth of studies that examine these technologies in detail in the context of social analysis, despite their potential to revise research methodology (Xu et al., 2024). Second, the problem of interpretability of artificial intelligence models is a major limitation, especially in the analysis of complex social interactions, where context is crucial (Hassabis & Beguir, 2024; Brynjolfsson & McAfee, 2021). Models based on deep neural networks, while effective in analyzing large data sets, remain "black boxes," making it difficult to understand their decisions in a social context. Another major deficit is the lack of interdisciplinarity in research on the use of AI in the social sciences - while AI is widely used in data analysis, few works combine the technology with social research methodologies, which limits the development of new approaches that take into account the complexity of social and cultural contexts (Eubanks, 2018). Additionally, ethical issues related to the use of AI in social data analysis, such as algorithmic biases and their impact on social structures, are not sufficiently discussed in the literature, which risks reinforcing social inequalities (O'Neil, 2016; Zuboff, 2019). Finally, there is a lack of sufficient research on the impact of AI on qualitative research methodology, especially in the context of interpreting emotions and linguistic nuances, which is an important gap in social research (Gill, 2024).

The scientific article aims to analyze the possibilities of using artificial intelligence as a tool supporting researchers in the design and implementation of research processes in the social sciences. The article discusses the application of AI at various stages of the scientific cognition process, from literature review, through conceptualization and operationalization, and design of measurement tools, to coordination of the process of collecting empirical data in the field. The key issue is to understand how modern AI technologies, such as natural language processing, machine learning, or deep neural networks, can support individual processes of designing and conducting social research, especially in the context of striving to ensure a high level of empirical material quality, i.e. measurement accuracy and reliability. The article will also identify potential challenges related to the implementation of AI in social research, including ethical issues (e.g. researcher attitudes) the limitations of AI, and the ability to point out erroneous solutions.

The article's contribution to science is to provide a description and analysis of the role of artificial intelligence in the social sciences, especially in the context of the new insights provided by AI tools in the design and implementation of research processes in the social sciences. The authors of the paper highlight the possibility of using AI at different stages of the research process, from research planning to measurement implementation, pointing out specific benefits that can significantly improve the quality of social research, as well as areas of potential problems. The paper fills a gap in the literature by pointing out the challenges associated with the interpretability of algorithms, as well as the need to address ethical issues such as algorithmic biases and the impact of AI on the research process. The article also provides valuable insights into the use of modern technology in social research methodology, offering practical solutions for future research.

2. LITERATURE REVIEW

In recent years, artificial intelligence has gained prominence in the social sciences, offering new research tools and methods. Its applications include literature search, identification of research gaps, formulation of objectives, hypothesis formation, and analysis of empirical data, among others.

Traditional literature review methods are time-consuming and can lead to errors due to the subjectivity of the researcher. The first tools to support the formulation and evaluation of scientific hypotheses using natural language processing techniques, such as Arrowsmith, were described as early as the previous century (Smalheiser & Swanson, 1998). Over time, other solutions have emerged, such

as a scalable method for discovering hidden connections in literature (Cohen et al., 2010) or the use of neural networks for literature-based discovery in both open and closed approaches (Crichton et al., 2020). All of these methods support researchers in analyzing the existing literature to better understand the context of the research problem and identify new connections between existing data. This is crucial in the process of formulating research goals and hypotheses.

Researchers are increasingly turning to artificial intelligence-based tools to help search, organize, and analyze scientific literature. One example is Semantic Scholar, which, as noted by Fricke (2024), significantly facilitates the identification of research gaps. Thanks to advanced AI algorithms that analyze vast amounts of data, researchers can detect patterns and trends that may indicate areas that require further research (Matthews, 2024). Such tools allow for more precise formulation of research questions and project goals. Moreover, AI can also suggest potential research directions, pointing to previously unexplored topics or new methodological approaches, as noted by Cha (2024). An example of an application is the use of machine learning algorithms that analyze existing data, allowing the generation of hypotheses based on detected patterns and correlations, as described by Jones (2024). With such technologies, researchers can minimize the risk of overlooking important research aspects and increase the accuracy of formulated hypotheses. AI tools can also provide support in aligning scientific texts with the editorial requirements of individual journals. Many scientific publishers and journals allow the use of AI to improve spelling, grammar, and punctuation, or to check that the bibliographic record conforms to the style indicated by the editors (e.g., APA style, Chicago style), as long as the text submission process indicates which AI tool and what it was used for.

In recent years, researchers in the social sciences have increasingly turned to artificial intelligence (AI) to support the process of analyzing empirical data. With advanced techniques such as machine learning and neural networks, researchers are able to process huge data sets, including data from social media, surveys, or public records. Hao (2024) emphasizes that such tools allow data to be analyzed more efficiently than traditional statistical methods. An example of the application of AI in social research is sentiment analysis, used to assess public sentiment based on social media posts, which is particularly valuable in studies of public opinion or consumer behavior (Matthews, 2024).

In addition, AI tools make it possible to uncover hidden patterns and relationships in data that would be difficult to detect using conventional analytical methods. An example is the research of Ma, Ebeid, de Wit, Xu, and Yang (2023), which shows how computational tools support research on nonprofit organizations to understand complex social phenomena. Nelimarkki (2023) discusses how computational thinking can be used in the social sciences, combining programming with AI methods to facilitate social data analysis. The work of Wang, Song, and Su (2023), on the other hand, shows how the development of computational social science is linked to the increasing centralization of research and the extensive use of AI in data analysis, highlighting its importance in the field. Finally, Edelmann, Wolff, Montagne, and Bail (2020) note how AI is increasingly being used to analyze large data sets in sociology, indicating its growing role in social research. With these technologies, researchers can not only uncover hidden relationships but also formulate research questions and conclusions more precisely, allowing for an even more relevant and comprehensive approach to data analysis.

With the increasing use of artificial intelligence (AI) in social research, researchers are beginning to pay close attention to the ethical implications of this process. Jones (2024) points out that the automation of many aspects of research can lead to the dehumanization of science, with researchers losing influence over the interpretation of results and science itself becoming increasingly mechanistic. In contrast, Cha (2024) emphasizes that AI algorithms, if not properly designed and monitored, can introduce or even reinforce existing biases and inequalities, which can lead to erroneous conclusions in social research. In response to these challenges, Hanna and Bender (2025) highlight the influence of large technology corporations on the development of AI, stressing that their role in shaping the technology must be subjected to detailed ethical analysis. Eichstaedt (2025), on the other hand, discusses issues related to the creation of chatbots that seek to tailor their responses to users' expectations, raising questions about the ethicality of such practices in the context of social research. Barto and Sutton (2025) in their analysis warn against hasty deployment of AI technologies without proper testing and safeguards, calling for an informed and ethical approach to the use of artificial intelligence in social science. All of these researchers' experiences point to the need for careful monitoring and responsible use of AI in research to avoid its potentially harmful effects.

The use of artificial intelligence in social research opens up new opportunities but also poses ethical and responsibility challenges for researchers. Integrating AI into the research process requires not only technical expertise but also a critical approach and reflection on the consequences of its application. Only in this way can the social sciences take full advantage of the potential that artificial intelligence brings.

3. OPERATIONALIZATION OF THE RESEARCH PROJECT AND DESIGN OF MEASUREMENT TOOLS

The development of AI has led to tools based on generative artificial intelligence being used for more than just repetitive, routine tasks. They can also prove themselves in tasks that require creativity, but so far, they have more potential to support such tasks than to replace humans in them, and the most important impact of AI is likely to be in automating some tasks while leaving time for other duties (Gmyrek et al., 2023).

One of the tasks that can be automated in the process of creating a survey questionnaire is adapting the format to the tool that will be used to collect the data. AI is able to check the questionnaire created by the researcher(s) for clarity, unambiguity, and logical consistency for transitions between questions, and suggest corrections. It is also able to prepare versions of questions according to formats supported by tools such as LimeSurvey or Qualtrics or prepare instructions for self-entering questions into a specific tool. It can also provide, if needed, a division of the questionnaire into sections, add conditional logic, or suggest settings (e.g., mandatory or non-mandatory questions, blocking the possibility of multiple completions of the survey).

At the same time, AI is able to support researchers in the process of multiplying the possibilities of questionnaire formulation. Artificial intelligence tools can, for example, transform questions and create their variants, including versions with synonyms or altered syntactic structure of a sentence. They can also transform questions into open-ended, closed-ended, matrix, or rank questions, for example. It is also possible, for example, to support the adaptation of questions to the language of the respondents (e.g., by age), or to prepare an explanation of how the questionnaire should be completed if the way of filling it out is non-standard. It is also possible to support the adaptation of the language of the survey invitation according to the population to be surveyed.

However, despite such support, it is the researchers' responsibility to ensure that the final tools are prepared in accordance with the principles of social research methodology and research ethics. AI may behave in a biased manner or show biases if only because of the biases contained in the datasets used to train the AI model (Carey & Wu, 2022)

AI and machine learning can also support the search for previously used metrics, indexes, and scales. This can range from using AI to review the literature from this angle (e.g., Consensus or Scite) to support analysis, including distilling measures from new data sources, and supporting causal inference and theory development (Molina & Garip 2019).

AI support does not only apply to closed questions but also to data from open-ended questions and from the use of quantitative methods. L. Nelson (2017) proposed a three-stage methodological framework - computational grounded theory. These three stages include: (1) inductive pattern detection and computational text mining, (2) pattern refinement, and (3) pattern confirmation. They can be applied to many research questions and any qualitative text, such as transcribed speeches and interviews, but also to data from open-ended questions in surveys or field notes.

AI can also support people who are taking their first steps in research or help train new employees in a research project. AI works well in creating a personalized learning environment (Mollick & Mollick, 2024), including the creation of different scenarios, problems, and cases to consider. Appropriately written prompts can create methodology tasks in which different consequences of choosing particular solutions in a scenario/questionnaire need to be considered or design a task with ethical challenges. At the same time, there is always a risk that the AI will make a mistake, hence such training is a supplement to standard training that prepares one for the role of a researcher under the guidance of experienced researchers, rather than a replacement for such training.

4. PREPARING FOR THE FIELD WORK

The opportunity mentioned in the previous section to use AI to create a personalized learning environment (Mollick & Mollick, 2024), including stepping into different roles, can also be an opportunity to simulate interviews with respondents. Such an activity as simulating conversations with respondents provides an additional opportunity to validate research questions as well as research tools. AI can take on roles differentiated by variables relevant to the study (such as age, gender, education level, or attitudes toward the issue under investigation).

For the aforementioned researchers with less research experience, this can also provide additional preparation for going into the field, including practicing arguing and responding to reluctance or critical approaches to research. Previous research (Noy & Zhang, 2023) indicates that AI-guided training has greater benefits for employees with less seniority. ChatGPT significantly improves productivity, including reducing the average time required to complete a task and increasing the quality of the completed task (Noy & Zhang, 2023).

Less experienced researchers can also use AI to test question comprehension or ask AI to point out ambiguities in questions or interviewer instructions. However, as already mentioned, it is the researchers who are responsible for the research projects they carry out and the publications that are produced based on the results, hence AI-based solutions can provide support, but the responsibility for each stage of the research lies with the authors. In addition, it should always be indicated what artificial intelligence tool was used and how, for example, to improve the readability of the survey invitation.

5. FIELD RESEARCH COORDINATION

One of the key ethical considerations in social research is ensuring that participants are fully informed about the nature, purpose, and potential consequences of the study. Artificial intelligence can significantly assist researchers in developing procedures to ensure that the implementation of field research complies with research ethics, especially in obtaining informed consent from participants. Artificial intelligence can help automate this process, minimizing errors and improving the transparency of communication between the field researcher or interviewer and participants.

One of the primary applications of artificial intelligence in this area is the generation and optimization of informed consent forms. Artificial intelligence-based tools can analyze and suggest wording that is more understandable to different groups of participants, taking into account their level of education, language skills, or specialized terminology, whether scientific or legal. This allows the content of the consent to be tailored to the specifics of the population being studied, avoiding overly complicated or unclear language, and increasing a realistic understanding of the conditions for participation in the study, in accordance with ethical principles as well as the laws of the country.

Another opportunity to support the researcher involves the process of translating informed consent documents into different languages and adapting them to local cultural and legal contexts. Language models make it possible to translate the text accurately, as well as to account for differences in ethical regulations in different countries and institutions. This allows researchers to ensure that procedures comply with international standards, such as the Declaration of Helsinki the European Commission's research guidelines, or data protection regulations.

The consent process for researchers can be carried out through interactive communication systems such as chatbots or digital assistants, which are successfully used in business environments and whose performance can be measured (Przegalinska et al., 2019). Such solutions can support and answer participants' questions in real time, clarify doubts, and ensure that every aspect of consent has been properly understood. This is particularly important for research that requires the consent of vulnerable groups, such as children, the elderly, or people with disabilities, for whom AI can be an additional support. Such solutions also make it possible to monitor and document the consent process, ensuring that it complies with ethical and legal guidelines. These systems can track whether participants have received all the necessary information and whether their consent was given voluntarily, without pressure or manipulation. This can include analyzing the content of conversations, tracking user interactions with documents, or even assessing participants' emotional responses to the information presented.

Thus, artificial intelligence provides valuable support in the development and implementation of ethical procedures in social research. It can not only increase the efficiency of the informed consent

process but also enhance its quality by tailoring content to the needs of participants and ensuring compliance with national and international standards. The use of artificial intelligence in this area allows research to be conducted more transparently, ethically, and with integrity, fostering trust between researchers and participants.

Artificial intelligence can also significantly improve the optimization of human and equipment resources during field surveys. Using data analysis algorithms, artificial intelligence can help plan field trip routes, selecting the shortest and most efficient paths to reach surveyed locations. It can also take into account road and weather conditions, as well as the availability of transportation means, thus minimizing costs and increasing the efficiency of the research team.

The use of artificial intelligence also makes it possible to optimally manage the schedule of researchers in the field. Intelligent systems can analyze data on the duration of various stages of research and then adjust the schedule in real time. This approach allows for flexible responses to unforeseen circumstances, such as the need to change the route or adjust the schedule of meetings with informants or respondents. In addition, artificial intelligence can suggest the best allocation of responsibilities within the research team, optimizing individuals' work time and ensuring that the workload is evenly distributed according to their roles within the team and their experience and skills.

In terms of managing hardware resources, artificial intelligence can monitor the use of research equipment such as audio recorders, tablets, and digital cameras. It can analyze their technical condition, predict failures, and suggest the need for equipment maintenance or replacement. In this way, researchers can avoid problems associated with sudden malfunctions that could affect the quality of empirical data collection. It can also identify data repositories that are suitable for a particular research project, including those that are appropriate in terms of regulations and ethics. This application fits into the area of intelligent management processes.

Moreover, artificial intelligence can support the analysis and management of data collected during field research. Artificial intelligence-based systems can automatically classify and catalog materials, organize notes, and integrate various sources of information, greatly facilitating subsequent analysis of results. In the case of quantitative research, artificial intelligence can also support researchers in on-site statistical analysis, pointing out potential trends and patterns in real-time.

With the development of artificial intelligence, there are also questions about copyright issues and loopholes that need to be filled to minimize the threat posed by regulatory gaps in AI. Researchers of this issue will highlight the dissonance between the rapid development of AI and the much slower progress in changing legal frameworks and ethical guidelines (Nweke & Nweke 2024).

The problem goes beyond the simple question of authorship (Shumakova et al. 2023), and a lack of regulation can threaten science as well as the creative industries. Among the problems that could affect science, the only ones of significance could be copyright infringement, infringement of personal rights, labor entrenchment, labor market disruption, unfair competition, or an originality crisis (Shumakova et al. 2023).

Artificial intelligence can significantly improve the organization and efficiency of field research by optimizing human and equipment resources. Automating route planning, team scheduling, equipment monitoring, and data analysis allows researchers to focus on key aspects of the research while minimizing the risk of errors and increasing the quality of the information collected. The use of artificial intelligence in these processes can contribute to better organization of work and more efficient use of available resources, resulting in higher quality research results and greater reliability.

6. LIMITATIONS OF ARTIFICIAL INTELLIGENCE IN FIELD RESEARCH

Artificial intelligence is becoming an increasingly common tool in the social sciences, supporting the process of data analysis, research planning, and organization of research work. However, despite its potential, the use of AI in field research comes with significant limitations that need to be taken into account in the design and implementation of research.

One of the key problems with applying AI to field research is the difficulty in interpreting the social context. AI, especially models based on natural language processing, can analyze respondents' statements, identify emotions, or classify responses, but has difficulty capturing cultural nuances, irony, or sarcasm. Moreover, analyzing qualitative data, such as interview transcripts or field notes, requires

not only pattern detection but also interpretive skills that are the domain of experienced social scientists. AI can suggest erroneous conclusions if it fails to take into account the broader context of the statements or the specifics of the local community.

AI models, especially those based on deep neural networks, often operate on a "black box" basis, meaning that their decision-making process is difficult to explain. In the context of field research, where data analysis requires transparency and precise reasoning, the inability to fully understand the mechanisms of AI is a significant limitation. Researchers need to be sure that the results generated by AI are reliable and consistent with methodological assumptions, which in practice is sometimes difficult to verify.

Table 1. Summary of benefits and limitations of using AI in the research process

Project stage	Application of AI	Benefits	Restrictions
Literature review	Research text search, analysis, and identification of research gaps	Faster identification of sources, better detection of links between texts, optimization of the process	Potential for AI errors and "hallucinations," difficulty in assessing reliability of results, systematic omission of some sources, biases
Formulation of hypotheses	Generate and refine hypotheses based on literature analysis and available data	Identification of new research directions, optimization of the process	Ability to replicate biases contained in training data
Design of research tools	Automatic generation of questionnaires, analysis of question structure	Facilitate adaptation of tools to the study population, improve logical consistency of questions	Possibility of erroneous suggestions, risk of reinforcing erroneous methodological assumptions
Analysis of quantitative data	Processing large data sets, detecting patterns and relationships	Faster analysis, and identification of trends not visible in traditional analysis	The problem of interpretability of models, the possibility of misclassification of data
Analysis of qualitative data	Natural language processing, sentiment analysis	Automation of data coding, better identification of hidden meanings in texts	Difficulty in interpreting social context, AI may not understand linguistic nuances
Implementation of field research	Interview simulations, question testing, logistics planning	Better preparation of researchers, optimization of routes and work schedules	AI will not replace real-world interactions, risk of not adapting to changing conditions
Coordination of field research	Automation of obtaining informed consent, monitoring the research process	Facilitate management of ethical aspects of the study, improve documentation	AI may not take into account cultural differences, privacy risks
Ethics and fairness of algorithms	Detecting biases in AI data and models	Identification of potential inequality problems	AI may reinforce existing prejudices, lack of universal definition of justice
Resource management	Optimize equipment utilization, monitor consumption	Reduced costs, better organization of research work	Potential for errors in optimization algorithms, dependence on quality of input data

Source: own elaboration.

Artificial intelligence, despite sophisticated algorithms, remains susceptible to biases based on the quality and structure of the data on which it was trained. In field research, where social interactions and cultural context play a key role, this can lead to misinterpretations and reproduction of existing inequalities. AI models can favor dominant narratives and marginalize the voices of minority groups, which can lead to an incomplete picture of the phenomenon under study.

Field research in the social sciences is based on face-to-face interactions with participants, often in dynamic and unpredictable conditions. AI can support the interview process, such as by simulating interviews or generating questions, but it cannot replace the flexibility and interpersonal skills of the researcher. In situations where the researcher shows reluctance to respond, reacts emotionally or changes the topic of the interview, AI cannot adjust its behavior accordingly.

The use of AI in field research also raises significant ethical challenges. The collection and analysis of personal data by AI algorithms raises questions about privacy and compliance with legal regulations such as RODO. In addition, the automation of some research processes can lead to the dehumanization of research participants, raising ethical questions about the researcher's role and relationship with the subjects.

Field research often takes place in a dynamic environment, where unforeseen factors such as political, social or economic changes can affect the research. AI, acting on the basis of pre-processed data, may have difficulty adapting to such changes in real time. AI models may not be able to adapt quickly to new circumstances and provide erroneous recommendations.

Although artificial intelligence offers many opportunities to support field research in the social sciences, its application comes with significant limitations. Problems related to data interpretation, ethics, algorithm bias, and limited ability to interact with respondents mean that AI should be treated as a tool to support, rather than replace, traditional research methods. In the future, AI algorithms will need to be further developed and refined to better meet the needs of social research and take into account the complexity of human interaction.

7. ETHICAL USE OF AI IN SOCIAL RESEARCH

Since the proliferation of solutions based on generative AI, more and more ethical questions have been raised, including about the fairness of machine learning (Carey & Wu, 2022). In addition, ethical issues related to the use of AI in social data analysis, such as algorithmic biases and their impact on social structures, are insufficiently discussed in the literature, with the risk of reinforcing social inequalities (O'Neil, 2016; Zuboff, 2019).

The truth is not objective but is socially and linguistically constructed, and in the digital age, this process is increasingly dependent on algorithms (Zarzycki, 2024). The Theory of Algorithmic Truth (Zarzycki, 2024) suggests that what is considered true, and therefore existing, will depend on algorithms competing for social legitimacy as a source of truth, but remaining under the political control of specific capital.

It is therefore all the more important to be aware that generative AI is trained on a variety of sources, from scientific articles to websites and social media, and due to how the training data is selected, it can reproduce stereotypes or discriminatory content. In this context, publications (Zeng et al., 2019) are appearing that emphasize the importance of transparency and responsibility in the process of implementing and using AI. Researchers must be sure that the use of AI will not have unexpected social consequences, such as the reproduction of biases based on gender, ethnicity, or disability (Carton & Haas, 2020). Algorithms also often fail to consider that race is socially constructed and focus on race as a fixed attribute (Hanna et al., 2020).

S. Catron and Ch. Hass (2024) point to four dilemmas related to fairness in machine learning. (1) Fairness versus model performance – mechanisms that increase the fairness of models often do so at the expense of their performance. (2) Incompatibility of different approaches to fairness – should individual or group fairness be prioritized? In addition, legal, philosophical, social, economic and mathematical definitions of justice do not always correspond. (3) Conflict with social and political context – there is no universal definition of justice, much depends on the specifics of a community and its problems. (4) Democratization of machine learning vs. skills gap – more and more people and companies are using machine learning-based tools without knowledge of the fairness of the algorithms.

One of the key challenges of using artificial intelligence in scientific research is the problem of the so-called “black box” (Hassabis & Beguir, 2024) and model hallucinations. If the model generates incorrect results or content that is characterized by stereotypes and prejudices (Eubanks, 2018; O’Neil 2016), users often have no way of changing the algorithm to improve its performance. In addition, the lack of transparency regarding the data sources used to generate responses raises the risk of copyright

infringement, as the model can generate a response based on copyrighted content without indicating the author.

Another problem related to AI is the protection of personal and sensitive data. Entering this kind of information into AI systems, but also transcripts of interviews containing sensitive data and information, or data from research on sensitive groups and topics (e.g. illness, addiction, physical, psychological, and economic violence, the shadow economy, mobbing) carries the risk of violating ethical and legal principles. Many AI tools process the data provided for the model for their own purposes or may even pass it on to other entities. As researchers, we are responsible for the data provided to us, and only authorized persons should have access to the data, especially sensitive data.

The discussion around the use of AI in science also includes issues related to originality and the dehumanization of the research process. While AI can provide important methodological support, its excessive use can lead to a crisis of originality in science. Responsibility for the integrity of research and its compliance with ethical principles and applicable regulations rests with researchers, whose role should not be replaced by algorithms. AI opens up new possibilities for analyzing data and expanding the research workshop, but its use only makes sense if it actually supports the research process, rather than contributing to its schematization or reducing the quality of the content produced.

8. DISCUSSION AND CONCLUSIONS

Researchers note that artificial intelligence has great potential to revolutionize the social sciences, especially in terms of offering new research tools and methods. In order to take full advantage of AI's potential, it is essential to develop researchers' competencies in artificial intelligence technologies, as well as to promote interdisciplinary research combining social science with computer science and other technical fields (Matthews, 2024). This approach can create new opportunities for social data analysis, enabling more complex and accurate assessment of social phenomena. On the other hand, researchers also emphasize the need for research on the social implications of AI's growing role to better understand what ethical and social challenges arise from its use in various aspects of social life (Hao, 2024). For example, the work of Raja and Buolamwini (2020) demonstrates the need to audit and ensure transparency in AI systems to avoid reproducing existing biases. In the context of computational social science, Wang, Song and Su (2023) note that the development of AI allows for more centralized and complex data analysis, which can foster a better understanding of social phenomena on a broader scale. In addition, Edelmann and colleagues (2020) point to the growing role of AI in sociology, where the technology is being used to analyze large sets of social data, and Hanna and Bender (2025) note the need for responsible AI development, with an emphasis on an ethical approach that takes into account the social implications of the technology. Finally, Ma and colleagues (2023) discuss the potential of AI in research on nonprofit organizations, pointing to the opportunities that artificial intelligence offers in the context of more complex data analysis in the social sciences.

The development and spread of artificial intelligence have added a new dimension to the issue of the digital divide (van Dijk 2020), resulting in a deepening of existing inequalities. Instead of becoming more open and democratic, science will be divided into those who have access to the latest, often paid-for technologies and the skills necessary to use them, and those who are deprived of these opportunities. Although more than a quarter of a century has passed since the term digital divide was coined, many issues are still relevant. Even universal access to the internet has not eliminated inequalities in digital competence and how digital tools are used (Robinson et al. 2020), hence a step towards improving the situation is not only to provide access to tools but also to identify barriers and facilitators in the development of digital skills (Fortuna et al. 2020), now also those related to the use of artificial intelligence.

An analysis of the limitations of applying artificial intelligence to field research in the social sciences points to a number of key challenges related to data interpretation, algorithmic transparency, and ethical issues. As Brynjolfsson and McAfee (2021) note, while AI has great potential in data analysis, its limited ability to capture social and cultural nuances means that its use in qualitative research can lead to simplifications and misinterpretations. This problem also stems from the nature of AI models, which operate on a “black box” basis (Hassabis & Beguir, 2024), making it significantly more difficult for researchers to understand the mechanisms by which analytical decisions are made. Additionally, as

Eubanks (2018) and O'Neil (2016) point out, AI can reinforce existing biases and social inequalities if algorithms are trained on biased data. The automation of research interactions is also of particular concern - while AI can support the data collection process, it cannot replace the researcher's interpersonal skills, pointing to AI's limited adaptability to changing field conditions (Zuboff, 2019). In this context, it seems crucial to combine AI tools with traditional research methods, which could minimize the risk of errors and increase the accuracy of analyses.

The application of artificial intelligence in field research in the social sciences brings both numerous benefits and significant limitations that require further methodological, legal, and ethical reflection. AI can significantly improve the process of analyzing large data sets, but its limited ability to interpret social context and problems related to transparency and algorithmic bias indicates the need for a cautious approach to its implementation (Caton & Haas, 2020). As Xu et al. (2024) point out, it will be crucial to develop interdisciplinary research combining social sciences and computer science to develop more interpretable and fair AI models. In addition, further work should focus on developing ethical standards and regulations for the use of AI in social research to avoid the risks associated with privacy violations and dehumanization of the research process (Hanna & Bender, 2025). In the future, it will also be crucial to find solutions that enable the integration of AI with qualitative methods, which could increase the effectiveness and reliability of analyses conducted in field conditions.

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