

ARTIFICIAL INTELLIGENCE AS A RESEARCH TOOL IN SOCIAL SCIENCES

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Abstract

Artificial Intelligence (AI) has emerged as a transformative tool in various domains, including the social sciences, offering tools that can process large datasets, identify patterns, and make predictions with unprecedented speed. AI has the potential to democratise social science research by making sophisticated analytical tools more accessible to a broader range of researchers. The study explored how AI is currently adopted in Social Science research, examined the benefits of AI-based methods compared to traditional approaches and investigated the challenges and criticisms raised concerning its usage, and how such challenges can be effectively addressed. It relied on primary and secondary data, in the sense that primary data was obtained directly by the researcher through prompts to AI tools such as ChatGPT and Otio. It is acknowledged, however, that AI-generated responses are derived from pre-existing datasets on which these models were trained, which places them in a contested methodological category, that scholars may regard as secondary or tertiary in nature. The researchers have nonetheless treated them as primary data given the original and direct nature of the collection process. The secondary data was sourced from books, journal articles, online materials and other publications. The study found that the challenges related to the use of AI are real, and cannot be overlooked. It was also discovered that AI tools continue to be fine-tuned and as such evolve daily, which means that the field of Social Sciences must rise to the occasion before it is late. This work concludes that AI has huge potential to improve and enhance the conduct of research in the Social Sciences, but several challenges come with it. These challenges can be navigated, nevertheless, by implementing guidelines for AI's use in research work.

Keywords: Artificial Intelligence, AI tools, ChatGPT, open-source AI models, Social Sciences research.

Word Count = 246

Introduction

Artificial Intelligence (AI) is the programming of machines to mimic human thought processes and learning. AI technologies encompass a variety of tools and techniques that significantly enhance numerous fields, especially education and research. These technologies include algorithms, natural language processing, and data analytics, all of which improve the processing and utilization of information. Since the release of ChatGPT on November 30, 2022 by OpenAI (OpenAI, 2022), AI tools have gained widespread usage in virtually all sectors including healthcare, finance, transportation, marketing, physical training and sports, the educational sphere, to name but a few.

In Social Sciences, research has traditionally been conducted through qualitative and quantitative methods including surveys, interviews, ethnography, content analysis and several others, and its hallmarks include interpreting human behaviour, understanding social phenomena, etc. In recent times, however, we see Artificial Intelligence entering and disrupting this research tradition. The arrival of AI tools symbolizes a shift in how Social Scientists can now conduct research; the slow, manual and limited process can now be faster, broader and more analytical.

AI can now be applied across the full research cycle – from literature review and data collection through to analysis and dissemination (Giordanno and Romis, 2023; Guden, 2023; Wang & Wang, 2024; Xu et al., 2024), as well as in forecasting

social trends, including migration patterns and conflict risks.

In spite of this relevance, its use is still, however, blighted by fears of how it could produce incorrect results, known as hallucinations, how it can magnify or reinforce current biases, as well as how it could negatively impact on the quality of knowledge produced and make researchers lazy and over-reliant on it.

This study examined how AI is currently being adopted in Social Science research, the benefits of AI-based methods compared to traditional approaches, the challenges and criticisms related to its use and propose ways in which these can be navigated. Many research puzzles deserving to be addressed to solve the research problem identified above are as follows:

1. How is Artificial Intelligence currently being adopted in social science research?
2. What are the potential benefits of using AI as research tools, compared to traditional methods?
3. What are the criticisms and challenges of the application of AI in Social Science research, and how can they be addressed?

Literature Review

A body of literature has developed around three major concerns that mirror the research questions of this study: how AI is being adopted in social science research, what benefits it offers over traditional methods, and what challenges its use presents. This review examines existing scholarship thematically across these three

areas before identifying the gaps this study seeks to address.

AI Adoption in Social Science Research

The integration of AI into Social Science research reflects what scholars describe as a methodological paradigm shift. Grossmann et al. (2023) observe that AI tools are transforming core Social Science research activities — data collection, analysis, and interpretation — across sociology, psychology, political science, and economics. This transformation is even more prominent now with the emergence of generative AI tools. Davidson and Karel (2025), introducing a special issue in *Sociological Methods & Research*, identify three main ways through which generative AI is reshaping Social Science methodology: the measurement and validation of AI-generated outputs, the optimization of model performance through prompting, and the simulation of social attitudes and behaviours. Collectively, they represent an expansion of existing tools as well as the opening of entirely new methodological possibilities.

Beyond research design, AI has found practical application across different stages of the research process. Xu et al. (2024) document how AI tools support literature reviews, data collection, analysis, visualization, and the dissemination of findings. Wang and Wang (2024) similarly note that AI has begun to shift the paradigm of academic research by enabling researchers to engage more efficiently with large bodies of literature and complex datasets. Tasks that once required weeks of manual labour — systematic literature

searches, qualitative coding, or the identification of research gaps — can now be substantially assisted by tools such as Research Rabbit, NVivo, and ChatGPT (Xu et al., 2024; Bail, 2024). However, adoption has not been uniform. O'Grady (2025), writing in *Science*, cautions that the rapid development of AI may also disrupt established online research methods — particularly surveys and experimental studies — pointing to a transitional moment in which AI simultaneously enables new possibilities and unsettles existing ones.

Benefits of AI as a Research Tool

The literature identifies several categories of benefit that AI offers social science researchers over traditional methods. The most consistently documented is efficiency in data processing. AI tools can analyze large datasets with a speed and precision that would be impossible through manual means, identifying patterns and correlations that human researchers may overlook (Wang & Wang, 2024; Xu et al., 2024). This is particularly significant in Social Sciences, where researchers frequently contend with large volumes of qualitative data — interview transcripts, survey responses, social media content — that require careful and time-intensive analysis.

A second significant benefit is the democratization of research capability. A 2026 study published in the journal *AI and Society* observes that machine learning, natural language processing, and generative models now enable researchers to work with multimodal datasets and complex analytical tasks that were

previously accessible only to those with advanced technical training (Mokadi et al., 2026). Arosio (2025) examining the use of generative AI in teaching social research methodology, corroborates this, demonstrating that these tools can lower the methodological barriers facing researchers and enable a broader range of scholars to conduct rigorous empirical work. Other than data processing, AI's generative utility in the early stages of research — brainstorming, outlining, literature summarization, and writing assistance — is equally well-attested in the literature (Kasneci et al., 2023; Bail, 2024; Davidson & Karell, 2025). Taken together, these benefits suggest that AI holds genuine transformative potential for social science research practice.

Challenges and Criticisms

Despite the advantages described above, the literature contains substantial and well-documented concerns about AI's integration into social science research. The most prominent is algorithmic bias. Because AI systems are trained on existing datasets, they inherit and often amplify the biases embedded in those datasets — whether racial, gender-related, or socioeconomic (Noble, 2018; O'Neil, 2016). Boelaert et al. (2025), examining how generative language models respond to standardized opinion polls, find systematic bias patterns in AI-generated responses, raising significant questions about the validity of AI-generated data in social science contexts. This is consistent with Grub and Humprecht's (2025) systematic review, which documents that AI-generated content exhibits regular biases

across gender, race, age, and geographic dimensions. The study by Mokadi et al. (2026) further identifies data extractivism and the reinforcement of structural inequalities as among the ethical challenges AI's integration into Social Sciences raises.

A second major challenge is the hallucination problem — the tendency of AI to generate plausible but factually incorrect or entirely fabricated information, including non-existent academic references (Christou, 2023). This is of particular concern in academic research, where source reliability is foundational. Bail (2024) warns that the unreflective use of generative AI risks the production of what he terms 'junk science' work that mimics scholarly form without meeting scholarly standards of rigour. A third concern is academic integrity: the ease with which AI-generated text can be submitted without acknowledgment has intensified debates about plagiarism, and scholars have raised the additional concern that over-reliance on AI may gradually erode researchers' critical thinking and engagement with primary sources (Sok & Heng, 2023; Christou, 2023).

Research Gaps

While scholarship on AI in social sciences has grown substantially since 2022, several notable gaps remain. First, the bulk of existing studies engage with AI's potential theoretically or conceptually; there is limited documentation of researchers actually applying AI tools within the research process and critically evaluating the results. Second, most studies have

been conducted in high-income, Western academic contexts, leaving the implications of AI adoption for researchers in developing countries — where infrastructure, language, and access challenges are distinct — insufficiently examined. Third, literature has largely treated social sciences as a homogeneous field, with little attention to how AI adoption may differ across sub-disciplines such as sociology, political science, and economics. This study contributes to addressing the first of these gaps through a practical engagement with AI tools alongside documentary analysis.

Theoretical Frameworks

Diffusion of Innovation Theory (DOI):

This study is primarily anchored in Rogers' (2003) Diffusion of Innovation (DOI) theory. The theory is accredited to Everett M. Rogers, and was developed in 1962. It explains how, why, and at what rate new ideas and technology spread across cultures and social system through five stages -- knowledge, persuasion, decision, implementation and confirmation – and identifies five innovation characteristics that determine adoption speed.

The Diffusion of Innovation (DOI) theory provides the most direct analytical framework for understanding the adoption of AI as a research tool in Social Sciences. In this context, AI tools represent innovation, and the social science research community constitutes the social system into which these tools are diffusing. The theory is especially pertinent because adoption of AI in Social Sciences research is neither universal nor complete — it is ongoing, uneven, and contested —

precisely the conditions the DOI framework is designed to explain. Rogers' (2003) five innovation characteristics — relative advantage, compatibility, complexity, trialability, and observability — are each demonstrably present in the case of AI research tools. AI offers clear relative advantages in speed and scale over traditional methods; many tools are compatible with existing research workflows; their complexity varies (some have intuitive interfaces while others require technical expertise); most can be trialed freely; and their outputs are highly visible in academic work. This explains why some scholars and institutions have adopted AI enthusiastically while others remain resistant. Rogers' adopter categories — innovators, early adopters, early majority, late majority, and laggards — are similarly applicable: the social sciences community currently contains all five, with the majority still navigating early or late adoption.

Critical Theory

Alongside the Diffusion of Innovation theory (DOI), Critical Theory — associated with the Frankfurt School and its concern with power structures embedded in knowledge production (Horkheimer, 1972) serves as a secondary but necessary analytical lens. Where DOI theory accounts for how and why AI is spreading into social sciences research, Critical Theory interrogates what is at stake in that spread. The ethical concerns this study engages — algorithmic bias, the perpetuation of structural inequalities, threats to academic integrity, and the risk of reduced researcher agency — are precisely the

concerns that Critical Theory is equipped to surface and examine. Together, the two frameworks form a complementary analytical architecture: DOI gives the trajectory of AI adoption, while Critical Theory evaluates its consequences for knowledge quality, equity, and scholarly practice.

Methodology

This work employed a qualitative research design, using a Desk Review approach to gather and critically analyse existing literature relevant to the three research questions. The review was organised around three corresponding thematic areas: AI adoption in Social Sciences research, the benefits of AI as a research tool in comparison with traditional methods, and the challenges and criticisms associated with its use, including how these can be navigated.

Sources were identified through searches conducted on Google Scholar, ResearchGate, and the Scopus indexing database, using search terms including 'artificial intelligence social sciences research,' 'AI research tools social sciences,' 'generative AI research methodology,' and 'challenges of AI in academic research.' The search covered publications from 2018 to 2026, prioritising peer-reviewed journal articles and academic books published in English. A total of approximately 35 sources were identified as directly relevant to the study's research questions and were mapped for the review. Core papers forming the analytical foundation of this study include Bail (2024), Wang and Wang (2024), Xu et al. (2024), Grossmann et al. (2023),

Davidson and Karell (2025), and Arosio (2025), selected on the basis of their direct engagement with AI as a research tool in Social Sciences, their recency, and the quality of their publishing outlets.

In addition to the documentary review, AI tools — specifically ChatGPT, Otio, and You.com — were engaged through structured prompts as part of a practical dimension of the study, demonstrating AI's utility as a research instrument. The outputs generated were critically evaluated against the existing literature as part of the study's findings rather than treated as authoritative sources. Data analysis employed a critical-evaluative approach, combining critical appraisal of source credibility with evaluative comparison of arguments across the literature and the AI-generated outputs.

Review Analysis

AI Adoption in Social Sciences Research

The literature reviewed confirms that AI adoption in social science research is real, growing, and practically significant, but also that it remains at a transitional stage where enthusiasm and skepticism coexist. Grossmann *et al.* (2023) characterise AI as transforming the fundamental operations of social science research across virtually all sub-disciplines, while Davidson and Karell (2025) go further in arguing that generative AI introduces genuinely new methodological possibilities — particularly in the simulation of social attitudes and behaviours — that were not previously feasible. Xu *et al.* (2024) document over 250 AI applications catalogued specifically

for Social Science research tasks, organized across literature review, data collection, analysis, visualisation, and dissemination. This breadth corroborates the view that AI adoption in the field is both wide in scope and practically grounded.

When the AI tool You.com was engaged with a related prompt in the course of this study, its response aligned with this scholarly consensus, independently identifying a comparable database of social science AI tools and their categorical applications (You.com, 2024). This corroboration is meaningful, though it must be qualified: the tool was unable to provide specific case studies as requested, which speaks to the gap between AI's capacity to synthesize existing knowledge and its limitations in documenting emerging empirical practice. O'Grady (2025) adds a further nuance, noting that AI's growing role in research is simultaneously disrupting established online research methods. This tension — between AI as enabler and AI as disruptor — is perhaps the defining feature of the current moment in Social Science research methodology, and it is one the field must consciously navigate rather than ignore.

Benefits of AI as a Research Tool

A review of the literature reveals that AI's comparative advantages over traditional Social Science research methods are most clearly demonstrated in three areas: scale, speed, and analytical accessibility. On scale and speed, Wang and Wang (2024) and Xu *et al.* (2024) both document AI's ability to process and analyze data volumes that would be prohibitive for human researchers

working alone — an advantage particularly relevant for studies involving large qualitative corpora or social media datasets. Arosio (2025) highlights a dimension that is frequently understated: AI's capacity to lower methodological barriers means that sophisticated research tasks are no longer exclusively the preserve of researchers with advanced technical training. This has real implications for inclusivity and equity within the discipline.

When ChatGPT was prompted to discuss the benefits of AI as a research tool in the course of this study, its response identified efficiency, predictive capability, democratisation of research tools, and methodological personalization as the four primary advantages (OpenAI, 2024). This broadly mirrors the scholarly literature, though with important qualifications. Davidson and Karell (2025) emphasise that the benefits of AI — particularly in data generation and simulation — are most reliably realised when outputs are rigorously validated rather than accepted uncritically. In other words, AI's benefits are not automatic; they accrue to researchers who combine AI competence with strong methodological grounding. This study endorses that position: the evidence suggests AI is best understood as a powerful instrument in skilled hands, not a substitute for scholarly judgement.

Challenges and How They Can Be Navigated

The challenges associated with AI use in Social Science research are well-documented, and this study's direct engagement with AI tools confirmed several of them. The most immediately

observable was the unreliability of AI-generated references. Otio.ai, when prompted for an extensively referenced discussion of AI within a Critical Theory framework, returned a response in which only two of the cited works were verifiable upon cross-checking; the remainder did not exist as described. This directly exemplifies the hallucination problem identified by Christou (2023) and Bail (2024) as among the most consequential risks of generative AI in scholarly contexts. More structurally serious is the problem of algorithmic bias. Boelaert *et al.* (2025) demonstrate that generative language models produce systematically biased responses even to standardised survey questions — findings with direct implications for Social Science researchers who use AI to generate or analyse data. Because these biases are embedded in training data, they cannot be corrected by individual users without a deeper engagement with how models are built (Noble, 2018; Grub & Humprecht, 2025). Mokadi *et al.* (2026) further identify that AI risks reinforcing structural inequalities in domains — welfare, criminal justice, education — that are of central concern to Social Scientists. Taken together, these findings suggest that bias is not a peripheral issue but a foundational one that must be addressed at the level of model development, not merely managed at the level of use.

Navigating these challenges requires responses at multiple levels. Institutionally, Sok and Heng (2023) call for clear guidelines from academic authorities on the ethical use of AI in research. At the

disciplinary level, Bail (2024) proposes that Social Sciences come up with open-source AI models specifically attuned to the discipline's epistemological values — a step that would give Social Scientists greater agency over the tools they use. At the individual level, the most immediate actionable safeguard is rigorous verification: every AI-generated claim, citation, and argument should be cross-checked against independent sources before inclusion in scholarly work (Christou, 2023; Sok & Heng, 2023). This study itself applied this practice throughout, and the finding that ChatGPT's references were verifiable while Otio's were largely fabricated illustrates precisely why such verification is non-negotiable.

Limitations of the Study

This study is subject to a number of limitations. First, the scope was confined to a desk review and direct engagement with AI tools, without empirical fieldwork or primary data collection from human participants, which limits the depth of experiential insight the study can offer. Second, the study could not practically demonstrate certain AI applications in Social Sciences research, particularly large-scale data collection and dataset analysis, due to the resource and access constraints. Third, the rapidly evolving nature of AI tools means that some findings may be subject to change as these tools are updated, as indeed observed in this study's own findings regarding the accuracy of AI-generated references. Finally, the study did not examine AI's application across specific Social Sciences sub-disciplines in depth, focusing instead on the field broadly. These

limitations, notwithstanding, the researchers made frantic efforts to inject humaneness into the work to reduce their impact on the outcome of the study.

Suggestions for further research

Further research that would entail empirical fieldwork or primary data collection from human participants to limit the depth of experiential insight the study can offer is hereby suggested. Also, scholars can attempt further research by focusing on specific Social Science sub-disciplines to examine in-depth AI application instead of a broadly conceived study.

Conclusion

The present study has demonstrated that AI holds substantial potential for transforming research practice in the Social Sciences, augmenting the researcher's capacity across the research cycle — from literature review and gap identification to data collection, analysis, and dissemination. This potential is, however, accompanied by well-documented

challenges: the hallucination of references and events, the perpetuation of algorithmic bias, threats to academic integrity through undisclosed AI use, and the risk of researcher over-reliance and reduced critical engagement. These challenges are real but navigable. They can be addressed through institutional guidelines, transparent disclosure of AI use, rigorous cross-referencing of AI-generated content, and collaboration between Social Scientists and AI developers to build tools that better reflect the discipline's epistemological values. The diffusion of AI into Social Science research is already underway and will only accelerate; the field's response — whether reactive or proactive — will shape the quality, credibility, and equity of Social Science knowledge production for decades to come. This study concludes that the responsible, critically informed integration of AI into Social Science research is not merely possible but necessary, and calls on researchers, institutions, and policymakers alike to ensure that the tools reshaping scholarship are governed with the same rigour that scholarship itself demands.

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Acknowledgement

We acknowledge the use of AI tools in this work, as stated in the Methodology section. The outline for the work was generated by ChatGPT-4o mini (OpenAI, 2024) but was reviewed and edited to suit this study. We equally acknowledge the contributions of all scholars whose works were cited in this study.