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NAVIGATING DIGITAL FRONTIERS: METHODOLOGICAL POTENTIALS AND ETHICAL CHALLENGES IN SOCIAL RESEARCH

Editorial

*by Gabriella Punziano and Angela Delli Paoli**

Abstract

This special issue, "Navigating digital frontiers: methodological and ethical challenges in social research", will contributes to the debate about the implications of the complex interactions between digital technology, social research and social life.

The different papers collected in this issue look both at *epistemic concerns* related to the nature of digital data and *normative concerns* related to the consequences of digital social research. On the *epistemic side*, it critically analyses the changing nature of the data collection process, the place and role of technological objects, affordances and applications, the influence and entity of digital biases by at the same time looking at the methodological principles which are not easily dismissed by the new availability of data and the strengthened potentials of methods and techniques. On the *normative side,* social research in the digital context also raises several ethical dilemmas deriving both from institutional deregulation and innovative challenges.

Keywords

Digital social research, ethics, AI, bias

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1. INTRODUCTION

This special issue explores the evolving intersection of digital technologies and contemporary social research. It touches the intersection between methodology and ethics.
On the one hand, the works collected looks at the consequences of digitalization for social research, and, on the other hand, at the consequences of digital social research for people. These two souls of the special issues are highly interdependent.

Starting from the former, the digital transformation of social life opens new opportunities for social research, not without costs. The opportunities lie in the huge availability of new type of data, of new data collection techniques and research environments (e.g. Metaverse), potentiated methods and data analysis. The huge availability of data together with computing advancements make possible a previously unimaginable magnitude of data collection, storage and retention. Digital information is moving objects, constantly changing nature according to the evolutions in the use and affordances of digital devices and platforms (Veltri, 2019). They are generated as a result of online life from our daily use of the Internet and digital applications (e.g. posts, comments published on social media, communities, blogs, photos of our private life, profiles of our social accounts), from our online behavior (e.g. searching for certain keywords on search engines, clicking certain links, visiting certain websites, etc.), or from the use of the Internet of Things (sensors for health monitoring or self-tracking devices, the use of home automation such as the recording of domestic energy consumption or of assisted home automation such as the monitoring of movements in the case of driving aids, etc.) (Marres, 2012; Amaturo & Aragona, 2019). Although their internal differences, they share a common feature: they are not requested and not designed but spontaneously released by internet users (Lewis, 2015; Molteni & Airoldi, 2018) and "found" or scraped by the social researcher.

Digital data are the basis also of AI systems and their algorithms which may support in the whole social research process (citation assistance, communication assistance, data analysis assistance, and data extraction assistance). They may potentially allow very large samples. However, sample size is not a sufficient (or even necessary) condition for sampling representativeness. A sample is representative of the population if it reproduces on a smaller scale its characteristics with insignificant deviations attributable to chance (isomorphism, Marradi, 2022).

Randomness is a property of the extraction procedure; representativeness is a property of the outcome of that procedure independent from

randomness and evaluated based on the similarity on certain characteristics between the sample and the population.

In digital research both the extraction procedure and the outcome of that procedure may be biased. The extraction is affected by selection and accessibility biases. Selection biases derive from the opacity of algorithmic mechanisms of information selection. This opacity can in fact produce direct and/or indirect digital discrimination in extraction in the form of inequalities based on income, education, gender, age, ethnicity, and religion. This risk increasing inequality both by reproducing or exacerbating the marginalization of historically disadvantaged groups and by creating new inequalities or reinforcing the power hierarchies that contribute to economic inequalities. Digital discrimination debunks the myth of data objectivity and algorithm neutrality, emphasizing the need for human oversight in automated processes (Criado & Such, 2019).

Moreover, the accessibility of information is challenged by Cambridge Analytica (Bruns, 2019; Perriam et al., 2019) and regulated by social platforms which sets limits on accessibility (Olteanu et. al., 2019).

Representativeness is affected by the digital divide which although lower in the last years, is still present and cuts out of digital research the segment of the population excluded from the Internet. Moreover, also generalization of results to the Internet population is critical due to the wrong equivalence between access and participation and the different level of participation of users: some studies have demonstrated that the minority of internet users actively participate in discussion on digital fields whereas the majority participate only occasionally and many of users act as lurkers, passively following and reading comments and posts by others without participating in the discussion (Lombi, 2015; Olteanu et al., 2019; Addeo, Punziano & Padricelli, 2021).

Thus, digital representativeness only refers to the internet population leaving digital traces useful for social research and this may exclude some relevant social groups with relevant social consequences. However, this representativeness is not based on traditional sampling criteria built along known demographic axes, not always available or reliable on the internet. This makes digital research typically a post-demographic approach.

On the data analysis side, the developments in computational science have caused the spread of explanatory models (topic modelling, machine learning, etc.) driving social research toward a *data-driven approach* with a revival of the myth of data objectivity (Kitchin 2014).

Turning to the latter issue–the consequences of digital social research for people–there are growing discontinuities between digital research practices and established principles and tools of research ethics

regulations. Principles and tools cannot be cleanly exported from biomedical research to digital social research. Ethics is complicated in digital research practices due to the data subjectivity of digital information, the difficulties in data management which may lead to deliberate or accidental releases of private information, in data slippage deriving from moving data from one context to another, in technology design for search engine biases, by the risk inherent in the affordances of machine learning and so on.

Four factors may wrongly bring to gloss over the ethical issues: the formal public nature of some private information, the textual nature of data produced by people (which makes difficult to determine the relationship between data produced by people and people themselves), the fragmentation and abstraction of people into a constellation of data points and the idea that big flows of data tell much about humanity and can speak by themselves.

Although it is not easy to distinguish private for public in digital context, to understand to what extent some data involve or not people, it is necessary to acknowledge that at some extent digital data are people and they can cause harm if disclosed.

The role of researcher appears crucial in collecting, analysing and interpreting ethically results, contextualizing them and making sense of the correlations identified within a dataset, without considering them automatically meaningful or reflecting causal relationships (correlation is not causation) only because they derive from big flow of data.

The scholars involved in this special issue ask whether digital social research should be forced to conform to existing norms or whether particular regulatory concepts like "privacy", "informed consent", "anonymity", should be re-focused and new protocols and commitments are needed (Markham, Tiindenberg, Herman, 2018).

Contributions critically examine how transformations in digital infrastructures—such as API restrictions, generative artificial intelligence, and immersive virtual environments like the Metaverse—are redefining methodologies, ethical standards, and theoretical frameworks in social sciences. Addressing critical themes like algorithmic transparency, digital discrimination, and public engagement, these studies leverage interdisciplinary approaches, notably Actor-Network Theory (Latour, 2005) and sociotechnical imaginaries (Jasanoff & Kim, 2009), highlighting the need for ethical responsibility and methodological innovation. Collectively, these articles call for heightened awareness and proactive adaptation in addressing emerging challenges posed by digital transformations (Zuboff, 2019).

2. WALKING THE RED THREAD BETWEEN PARADIGMS, ETHICAL ISSUES, AND DIGITAL FRONTIERS

In curating this issue, there were selected papers that trace the underlying red thread sustaining the methodological debate, drawing upon paradigm shifts, critical reflections on ethics, and the evolving digital frontiers of social research. Each contribution engages with key epistemological and methodological tensions, offering insights into the challenges and opportunities posed by computational methodologies, algorithmic mediation, and the dynamic nature of digital environments. Through this collection, we aim to foster a deeper understanding of the interplay between methodological innovation, ethical imperatives, and the transformative impact of digital and AI-driven research in the social sciences.

On the *Digital Data Double Standards in Social Research*, the paper by Dario Pizzul and Alessandro Caliandro critically analyzes the concept of a digital data double standard, highlighting disparities between economic exploitation of digital data by private platforms and the ethical and technical restrictions imposed on social science research. It explores the dynamics of surveillance capitalism, framing digital data as both a commodity and a source of social and economic power asymmetry, emphasizing the contrast between corporate freedom and academic constraints. The authors adopt an autoethnographic approach, reflecting on their direct experiences in navigating Research Ethics Committees (RECs) approvals. The paper discusses the limitations imposed by RECs, often guided by biomedical ethics rather than the specific needs of qualitative and digital social research. It also addresses methodological alternatives, such as scraping, tracking, and data donation, proposed as viable research strategies in the post-API era, illustrating their respective advantages and technical or ethical challenges. The paper highlights significant concerns related to privacy, consent, data transparency, and autonomy. It critiques the double standards of data ethics applied differently to academia versus private platforms, arguing for a more participatory and user-controlled approach exemplified by data donation, where users voluntarily contribute their digital data. The research underscores the adverse impacts of API closures and platform control over data access, proposing digital data donation as an innovative, ethical method of data collection. Tools facilitating data donation, such as Port and OSD2F, are presented as promising solutions enabling greater transparency and ethical responsibility in digital research. The authors advocate for the reformation of REC practices, urging the establishment of discipline-specific ethical frameworks that align better with the practical realities and methodological

requirements of digital social research. This would effectively address the identified double standards, promoting a more equitable and ethically robust approach to digital data use.

The paper by Suania Acampa, on the side of *API Restrictions and the Future of Digital Social Research*, critically explores the significant challenges posed by recent restrictions on social media APIs to digital social research, particularly highlighting their impacts on theory, methodology, and ethics within digital contexts. Historically, APIs facilitated extensive studies on social phenomena such as disinformation, hate speech, and political polarization. However, increased restrictions by platforms such as Meta (Facebook and Instagram) and X (formerly Twitter), especially following incidents like Cambridge Analytica, have severely constrained academia's capability for replicable, large-scale analyses. The paper argues that API restrictions push research toward "data-driven determinism," where available data dictate research questions, potentially reducing the critical independence of scholars. These limitations force researchers toward smaller datasets and alternative collection methods, like scraping, which raise significant ethical and legal concerns. The closures have thus led to a shift toward less restricted platforms or data-collection techniques violating platforms' Terms of Service, fueling ethical dilemmas around privacy and consent. European regulations, notably GDPR and the Digital Services Act (DSA), have complicated access by imposing stringent rules balancing transparency with privacy protection. While GDPR enforces user consent and anonymization, the DSA explicitly mandates regulated data access for qualified researchers, though practical implementation remains challenging. Consequently, this regulatory environment, coupled with platform-imposed barriers, necessitates rethinking research methods, including adopting approaches like interface methods, digital traces analysis, semantic web integration, digital experiments, and crowdsourcing. The paper calls for robust cooperation between academia, technology platforms, and regulatory bodies to ensure ethical, transparent, and effective research practices, emphasizing the urgent need for accessible, high-quality data to maintain research independence and societal accountability.

With respect to *Algorithmic Transparency through Actor-Network Theory*, the paper by Ciro Clemente De Falco and Caterina D'Ambrosio provides a systematic review examining how social sciences approach the study of algorithms, with a particular focus on theoretical frameworks, methodologies, and ethical considerations. The Actor-Network Theory (ANT) perspective, influenced by Bruno Latour, emerges as a significant theoretical lens, viewing algorithms as socio-technical constructs

involving complex interactions between human and non-human actors. ANT challenges the notion of algorithmic neutrality, emphasizing the embedded biases and socio-technical networks shaping algorithmic outcomes. The paper employs a comprehensive bibliometric analysis using data from Scopus and Web of Science, complemented by an in-depth analysis of empirical studies published in 2024. Findings highlight that research themes predominantly address the ethical implications of algorithms, algorithmic biases, and interactions on digital platforms, especially in contexts like journalism and social media. The review underscores a methodological diversity that includes traditional qualitative tools such as interviews and ethnography, as well as innovative methods like automated tracking and walkthrough techniques. Significant attention is devoted to algorithmic transparency, accountability, and the societal impacts of algorithmic discrimination. Studies explore harms related to representation and allocation, emphasizing the need for greater awareness and responsible governance. The paper advocates deeper interdisciplinary engagement with ANT and encourages methodological innovation to better capture the dynamics of human-algorithm interactions, thus fostering ethical responsibility and transparency in algorithmic practices.

Following this line of reasoning, *Algorithmic Feedback Loops and Cultural Consumption* are at the basis of the paper by Gabriella Punziano, Giuseppe Michele Padricelli Padricelli and Antonio Vettori that analyzes the evolution of algorithmic feedback loops within soft science disciplines through a comprehensive systematic literature review spanning from 2000 to 2023. The study situates feedback loops within recursive systems, emphasizing their role in shaping user behaviors and consumption patterns on digital platforms like Netflix, Spotify, and YouTube. It highlights how these loops involve complex interactions between users and algorithms, influencing cultural consumption practices and potentially limiting cultural diversity. The paper employs the PRISMA model to conduct a systematic review, using Web of Science as a primary database. The study includes a temporal analysis of publications categorized into hard and soft sciences, employing content analysis and topic modeling techniques such as Latent Dirichlet Allocation (LDA), Lexical Correspondence Analysis (LCA), and Cluster Analysis to map conceptual shifts and thematic trends. The paper discusses the implications of algorithms on cultural diversity, user agency, and societal dynamics, highlighting concerns over filter bubbles, personalization biases, and the societal influence of algorithms. It also stresses the ethical challenges posed by algorithmic governance, emphasizing transparency, accountability, and user autonomy. The research addresses how digital platforms and AI

technologies mediate cultural and social interactions. It illustrates algorithms as social actors embedded in socio-technical systems, influencing socialization, economic structures, and information dissemination. The study advocates an interdisciplinary approach integrating Actor-Network Theory (ANT) to better understand the socio-technical dynamics of algorithms. It calls for methodological innovation and continued ethical scrutiny to ensure algorithmic technologies promote diverse and equitable social outcomes.

Integrating AI in Social Research methodologically and etically is the dimension in discussion in the paper by Alfredo Matrella, Michela Cavagnuolo and Viviana Capozza that explores the integration of Artificial Intelligence into social research, offering a structured classification of AI-powered tools based on their functions and relevance across various research phases. AI is framed as a transformative element within social and behavioral sciences, enhancing research methodologies and outcomes through innovative applications. The paper employs a multichannel strategy for identifying approximately 350 AI tools, systematically categorizing them into six functional domains—content creation, analysis, development, assistance, commerce and marketing, and leisure—further refined into four macro-categories specific to social research: citation assistance, communication assistance, data analysis assistance, and data extraction assistance. These classifications were established through rigorous content analysis, considering tool functionality and potential contributions to research stages, including literature review, data collection, analysis, and dissemination. The paper addresses critical issues, highlighting concerns related to privacy, fairness, transparency, data control, and AI-generated inaccuracies ("hallucinations"). It advocates for responsible usage of AI tools by researchers, emphasizing human oversight, careful prompt formulation, and validation of AI-generated outputs to mitigate biases and ensure research integrity. The paper emphasizes the significant potential of AI to enhance efficiency, robustness, and innovation in social research, providing detailed examples such as automated content synthesis, multilingual communication support, and advanced data processing capabilities. Despite the advantages, it recognizes barriers such as cost, technical expertise, and accessibility, particularly among early career researchers. The paper encourages the responsible adoption of AI in social research, advocating for an informed, balanced approach that integrates ethical vigilance with technological advancement to optimize research practices and outcomes.

On *Generative AI, Ethical Complexities and Methodological Potentials* the paper by Elisabetta Risi and Riccardo Pronzato examines the

relationship between social research and generative artificial intelligence (GenAI), exploring theoretical, methodological, ethical, and digital dimensions. It positions GenAI both as an object of study and as a methodological tool, comparing it with prior developments in Internet research and digital platform studies. It critically addresses two distinct yet interconnected research frameworks: "research on GenAI" and "research through GenAI." The paper discusses the implications of using GenAI in qualitative and quantitative social research. It illustrates how GenAI tools, such as ChatGPT, are primarily framed as research "assistants" rather than autonomous methodologies. This framing highlights the practical utility of GenAI in streamlining data collection, analysis, and interpretation while simultaneously cautioning researchers against methodological pitfalls such as data biases, algorithmic hallucinations, and the opacity of AI systems. Significant attention is dedicated to the socio-technical complexities and moral responsibilities involved in employing GenAI. Concerns around representational bias, data privacy, transparency, and authorship are underscored, urging critical reflection on the hidden labor, power structures, and ethical tensions underpinning AI production and implementation. The paper emphasizes the transformative potential of GenAI, focusing particularly on Large Language Models (LLMs). It explores how interactive conversational interfaces and automated content generation redefine user-system relationships and raise novel methodological and epistemological questions. The authors advocate for an integrated approach, emphasizing that research through GenAI is fundamentally entangled with research on GenAI itself. They call for sustained interdisciplinary engagement and ethical vigilance to ensure that GenAI's integration into social research remains critically reflective and methodologically robust.

Representativeness and Bias in AI-Driven Research are the core of the paper by Beba Molinari critically investigates the integration of Artificial Intelligence into social research, emphasizing theoretical considerations, methodological challenges, ethical implications, and digital contexts. The study positions AI as both an evolution of and a departure from traditional and web-based (e-methods) social research tools, questioning whether AI-generated data represent continuity or entirely new forms of information. The paper scrutinizes the concept of representativeness, exploring how traditional statistical paradigms and notions of error and bias apply within AI contexts. It suggests that AI and machine learning techniques significantly diverge from classical methods by reshaping the processes of data collection, analysis, and interpretation, challenging the conventional boundaries of research reliability and validity. The study

addresses concerns around algorithmic biases, data privacy, transparency, and the accountability of AI-generated outcomes. It stresses the critical need for researchers to maintain human oversight, especially when constructing datasets and machine learning models, to prevent ethical and methodological errors. The paper explores how rapidly changing technological environments impact data quality and analytical methods. It argues for enhanced interdisciplinary collaboration, integrating robust mathematical, statistical, and computing skills within social science research to effectively leverage AI technologies. The paper advocates for redefining methodological boundaries and ethical frameworks within social research to responsibly embrace AI's potential, underscoring the need for a human-centric approach to algorithmic development and utilization.

From the side of *Ethical Challenges in Netnographic Research*, the paper by Angela Delli Paoli discusses the ethical complexities inherent in netnographic research, focusing specifically on digital social research's theoretical, methodological, ethical, and digital dimensions. Netnography is framed as an adaptation of ethnography to digital contexts, emphasizing cultural interpretation through long-term, engaged observation of digital interactions. The paper explores dilemmas such as distinguishing between text-based and people-based research, managing covert versus overt access, and negotiating physical versus digital representations of reality. Netnography leverages user-generated, non-intrusive digital traces such as social media interactions, yet raises questions around the authenticity and social desirability biases within digital identity presentations. The paper identifies critical dilemmas including public versus private data handling, informed consent, anonymity, and confidentiality. It emphasizes the inadequacy of traditional static consent in dynamic digital contexts, advocating for continuous consent processes. Ethical principles are context-dependent and sensitive to participants' perceptions and potential vulnerabilities. The paper underscores the blurred boundaries between public and private spheres online, stressing the need for researchers to adopt innovative practices that protect participant identities and privacy. This involves employing composite narratives, fictionalization techniques, and dynamic consent methods. The paper calls for heightened reflexivity, urging researchers to continually adapt their ethical frameworks to address emergent challenges in digital research contexts, emphasizing self-regulation and context-sensitive ethical considerations.

The paper by Danilo Boriati, focused on *Digital Exclusion of Older Adults in Social Research*, addresses digital discrimination against older adults, particularly focusing on their exclusion from online social research due to perceived deficiencies in digital literacy. It highlights how

digital technologies have become integral to societal inclusion, but the existing digital divide significantly marginalizes older populations, reflecting broader societal ageist biases. The paper reviews existing literature and identifies common biases, including selection and sampling issues, technological barriers, and question design biases. It stresses the importance of inclusive and age-appropriate online research protocols, emphasizing clear communication, user-friendly interfaces, and proactive technical support tailored specifically to older adults. The paper emphasizes the importance of combating ageism by promoting digital literacy and inclusive research methodologies. It argues for ethical responsibility among researchers to ensure equitable representation and accessibility in research studies. Strategies recommended include comprehensive training programs to enhance older adults' digital competencies, developing accessible technologies and research tools, and integrating mixed-method approaches to bridge online and offline methodologies. The paper advocates for proactive strategies to enhance digital literacy among older adults to foster inclusive participation, reduce research biases, and improve the representativeness and validity of online social research outcomes.

Audience Engagement in Science Museums through Digital Platforms is the main topic of the paper by Noemi Crescentini and Andrea Rubin that investigates how science museums are perceived in Italy by analyzing user-generated content from TripAdvisor, emphasizing audience engagement through a mixed-methods approach combining quantitative Topic Modeling and qualitative content analysis. The paper situates science museums as central actors in the Public Engagement with Science and Technology (PEST) paradigm, transitioning from passive knowledge dissemination (the deficit model) towards active public participation and dialogue. The study applies Topic Modeling techniques (Latent Dirichlet Allocation, LDA) to systematically extract thematic clusters from over 31,000 visitor reviews, followed by qualitative analysis using Nvivo software to deepen the understanding of visitor narratives. This mixed-method approach effectively captures both general patterns and nuanced perceptions. The study emphasizes the importance of accessibility, inclusivity, and responsiveness of museums to diverse visitor needs, including multilingual content, physical accessibility, and interactive experiences that accommodate different age groups and abilities. The research highlights how platforms like TripAdvisor transform audience engagement, providing real-time, user-generated feedback that shapes visitor expectations and perceptions. These platforms act as critical digital forums for public dialogue, enabling museums to assess and enhance their communication strategies effectively. The findings identify accessibility,

interactive and educational content, organizational clarity, staff competency, and collection quality as primary determinants of visitor satisfaction. The paper concludes by recommending museums leverage digital tools and user feedback to enhance public engagement, inclusivity, and educational effectiveness.

On *Digital Fashion and Identity in Virtual Environments* the paper by Michele Varini examines the intersection between fashion and digital technologies, particularly within virtual environments of popular multiplayer video games such as League of Legends, Apex Legends, Overwatch 2, and Valorant. It situates fashion as a critical cultural industry historically responsible for shaping identities, social classes, and gender norms, exploring how digitalization challenges or reinforces these paradigms. The study employs netnography and visual ethnography to analyze a dataset of 2,142 official images from selected video game platforms. The coding process is systematically structured into three levels: initial objective categorization (species, gender, ethnicity), conformity to mainstream fashion aesthetics (muscularity, thinness, sexualization), and interpretative semiotic analysis identifying prevalent thematic clusters (e.g., fantasy, cyberpunk, anime). The research critiques the persistence of traditional beauty standards and gender stereotypes within digital spaces, highlighting concerns around representation, inclusivity, and the reinforcement of unrealistic body ideals, particularly concerning female avatars. It questions the extent to which digital platforms genuinely democratize fashion representation or simply replicate existing exclusionary and performative paradigms. The paper underscores the hybrid nature of fashion in digital contexts, emphasizing the fluid boundaries between virtual and physical identities. It discusses the impact of digital capitalism on the commodification of digital avatars, linking these practices to broader socio-economic and cultural dynamics. The paper argues that despite digital fashion's potential for democratization and innovation, prevailing norms and inequalities within traditional fashion systems persist. It advocates further critical exploration and ethical vigilance to address and potentially transform these entrenched dynamics.

With regard to *Constructing Space Exploration Narratives*, the paper by Ilenia Picardi and Marco Serino investigates sociotechnical imaginaries embedded in online discourses surrounding NASA's Artemis program, which aims for a renewed human presence on the Moon. It leverages Science and Technology Studies (STS), specifically the sociology of associations (Actor-Network Theory, ANT), and the concept of sociotechnical imaginaries, to explore how space institutions construct and legitimize their narratives through digital communication platforms. The

research employs a mixed-methods approach combining narrative analysis to uncover discursive structures and Social Network Analysis (SNA) to examine actor relational dynamics within NASA's online narratives. Digital ethnography, content analysis, and network analytics (degree and betweenness centrality measures, community detection) are used to systematically identify claims about space exploration and actors enrolled to support these claims. The paper discusses implicit tensions between inclusive, universalist rhetoric employed by NASA and the pragmatic involvement of private corporations, highlighting concerns about equity, diversity, and the implications of privatized space exploration. The study questions the underlying motivations and beneficiaries of space colonization narratives, pointing to potential conflicts around global commons and ethical considerations in multi-planetary endeavors. The analysis demonstrates how NASA utilizes online spaces and digital platforms strategically to enroll diverse actors—both human and non-human—in promoting and legitimizing its ambitious projects. It emphasizes the role of digital infrastructures and autonomous technologies in shaping public perception and engagement with space exploration initiatives. The paper argues that online narratives about space missions are complex assemblages interweaving scientific, political, economic, and cultural elements. It advocates for critical awareness of the socio-political and ethical dimensions embedded within the construction of sociotechnical imaginaries of human life beyond Earth.

In the end, *Ethical and Methodological Considerations for Social Research in the Metaverse* is the core topic of the paper by Salvatore Monaco that examines the integration of the Metaverse into social research, emphasizing theoretical, methodological, ethical, and digital dimensions. The Metaverse is explored as both a new subject and a novel environment for sociological investigation, raising critical questions about digital identity, community dynamics, social interactions, and economic implications, particularly around labor and consumption. The paper highlights how the Metaverse enables innovative research practices, offering virtual laboratories that facilitate real-time variable manipulation and immersive qualitative research methods, including netnography and autoethnography. It underscores the Metaverse's potential to overcome traditional logistical constraints by providing cost-effective, expansive, and interactive research environments, yet cautions about issues of external validity, representativeness, and the influence of digital self-representation. Significant attention is directed toward privacy, informed consent, data protection, and the implications of algorithmic governance in these digital spaces. The paper stresses the necessity of developing robust ethical

frameworks tailored specifically for virtual environments to mitigate risks associated with data misuse, digital disinhibition, and the potential exploitation of digital labor. The Metaverse is positioned within broader transformations of digital infrastructure, emphasizing its role as a central component of Web 3.0, alongside blockchain, virtual reality, and augmented reality technologies. It argues for the necessity of interdisciplinary skills, encompassing algorithmic literacy, digital analytics, and cybersecurity. The paper calls for comprehensive methodological innovation and ethical vigilance to responsibly harness the Metaverse's capabilities for rigorous and equitable social research, advocating for interdisciplinary collaboration and continuous critical assessment of digital developments.

3. CONCLUSION

The special issue provides a cursory sketch of key issues, shifts, opportunities and costs of contemporary social research, so highlighting the complexities of digital social research.

Although aware of the potential of digital research for expanding the possibilities of social research in engaging with contemporary social life, the contributions resist the temptation of not considering its epistemological and ethical consequences.

By looking critically at digital social research, it poses many dilemmas at different levels of the research process: from research design to data analysis and research consequences. It stresses the importance of avoiding overstating claims to innovations, highlighting also their costs. Writing of innovation in digital research is dangerous due to its rapid ongoing transformations in both digital social life, online environment, digital data and digital methods. Innovating does not neither mean erasing the "old". It is in the tension between continuity and change that we can really understand at the epistemological and ethical levels the potentials and costs of digital social research.

The huge availability of data is complicated by their non-traditional nature, the invisibility of their research design (which causes a lack of knowledge of their scope, provenance and quality), the technological and sometimes economic nature of their acquisition and the ethical consequences of their use for research. In other words it calls into questions the process of data construction as traditionally understood. Extraction and representativity problems put in question the statistical significance of a sample. The accessibility of digital data does not necessarily imply that they can be collected and analyzed without any concern. Possible ethical

pitfalls include breaching user's privacy (Goroff, 2015) or enabling racial, socioeconomic or gender-based profiling (Barocas and Selbst, 2016). The assumption that publicly data cannot harm because they do not directly impact people's lives is wrong since they can be combined with other data sets posing serious risks to individuals and communities. While innocuous in themselves, such anonymous public datasets when merged with other may make individuals highly identifiable (Metcalf and Crawford, 2016). There are several cases of re-identification of de-identified data. This highlights the challenges of dealing with ethical issue in institutionalized mainstream ethical processes such as research ethics committees.

Digital social research subverts existing ethical regulations, their assumptions about responsibility, types of risks and researcher-subject relationship and strategies. Moreover, digital traces pose challenges to the practice of informed consent. New ethics framework balancing between privacy and accuracy should be provided against possible harmful outcomes such as stalking, discrimination, black-mailing or identity theft.

Data analysis is strengthened by computational techniques but for the effect of algorithms the evidence they produce may be inconclusive, inscrutable and misguided. Biased evidence may lead to biased decision-making leading to discrimination. Data-driven discrimination may be more severe than those fueled by anecdotal evidence.

In its complexities, the special issue aims to avoid collecting data, adopting methods simply because they are available or easy to use. It provides grounds to substantiate methodological choices. Social research methodology cannot be delegated to technology. The special issue provides a way to avoid techno solutionism (Heilinger, 2022), the tendency to prioritize technological over non-technological solutions which may lead to choosing unsuitable methods.

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