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The fundamental thinking processes in the Sociology of Communication: A conceptual review of epistemological foundations in the Artificial Intelligence era

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Abstract:

This paper revisits the foundations of thinking processes within the sociology of communication. As AI shifts the focus from causal explanation to predictive statistical thinking, the discipline faces a potential displacement of human thinking processes. The author concludes that maintaining rigorous scientific reasoning requires synthesizing the ways AI tools are governed by human critical judgment, ensuring that sociological inquiry transcends mere correlation to achieve ethically informed, explanatory depth.

Keywords: Sociology of Communication, Artificial Intelligence reasoning, Human Thinking, Thinking processes

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1. INTRODUCTION

Sociology of Communication emerges as a field of sociology dedicated to studying the reciprocal exchanges and influences between communication processes with its components and relationships, and the society with its systems and patterns. It is the domain to which sociology has delegated a margin of its investigative and methodological authority to examine how "society uses communication to shape identities, transmit cultures, and steer public opinion." (Iba & Zulfiah, 2024, pp. 44-57)

The sociology of communication has long relied on classical communication models and theories to understand and explain the human role in information transfer, achieve social interaction, and identify breakdowns or interferences along the pathway.

Human cognition served as the intellectual cornerstone upon which researchers built knowledge and advanced human understanding within this field. This involved conscious observation that transforms phenomena into research questions, deconstructing the complex into comprehensible components, and logical reasoning in both: inductive and deductive. These processes, wholly or partially, "constitute the channels of the researcher's critical humanistic inclination that rejects pure assumptions" (Valsiner, 2017, p. 41).

In other words, it is the synthetic process of thinking which involves multiple operations that has transformed the outputs of sociological studies into new theoretical research projects. These

projects have contributed to converting researcher inquiries and studies into explanatory realities, thereby deepening the quality of social research within a disciplined, precise, and innovative framework. This ‘cognitive system’ is the “hallmark of objective scientific research, which has ensured the continuity of knowledge development and accumulation in the sociology of communication until the recent past” (Bourdieu, 2004, p. 53).

"Thinking" within the sociology of communication remained a human process based on pure, direct human interaction until technological systems emerged with their intelligence and algorithms, acting as "an intermediary agent possessing the capacity to engineer individual perception and direct collective consciousness through intelligent information filtering" (Sapkota & Others, 2025, pp. 01-30). These systems then expanded, and the forms and elements of communication, content, and even the formation of individual and collective perception and consciousness grew more complex. This shift in the mode of thinking has placed research in the sociology of communication in a unique methodological dilemma touching the very core of knowledge production. This transformation cannot be fully grasped by merely posing technical questions about the technology itself, its authority over primary data systems, or the level of connection between algorithmic power and the means of knowledge production. Instead, it is parallelled with propositions concerning the epistemology of artificial intelligence in the sociology of communication as a perceptual framework "that determines what is observable and what lies outside the scope of

research, leading to the replacement of the social agent with the digital datum" (Olteanu & Others, 2019, pp. 01-33). Therefore, the epistemology of artificial intelligence becomes: “the new laboratory that questions the legitimacy of human interpretation against algorithmic precision and redefine the boundaries between human consciousness and artificial intelligence in shaping contemporary social structures” (Deivide Garcia, 2025, pp. 01-08).

The landscape of AI studies in sociology compels the re-examination or review of the theoretical research concepts essence, such as power, media, identity, or social action, among other research paradigms. Whereas these social patterns—and others under study— were generated through fundamental human cognitive processes like understanding, interpretation, and abstraction, the logic of artificial intelligence “has arrived with its research tools, such as prediction and statistical modelling” (Mitra & Taherdoost, 2025, pp. 01-12). and shifts the theoretical research from the traditional human explanatory approach based on understanding causes to “an algorithmic logic based on detecting patterns” (Deivide Garcia, 2025, pp. 01-08). This shift has weakened efforts focused on contextualization and human interpretation of social problems and has redirected methodological thinking gaps in research requirements “from what is imposed on the sociology of communication to its response and adaptation capacities” (Leydesdorff, 2001, p. 41). Consequently, the epistemological foundations of the sociology of communication have become coupled with a mechanical, computational logic.

Amidst the radical transformations of the technological era, especially the intelligence and machine research item, the sociology of communication is called upon more than ever before to research and understand “the level of entanglement between social structures and intelligent communication tools -with their complex outputs in the digital era- and their impact on symbolic interactions and social media discourses” (Addeo & Ohters, 2022, pp. 01-16), as well as the production and reproduction of social meanings on one hand. On the other hand, it must grapple with the radical epistemological shift instigated by artificial intelligence, particularly in studies shifting focus from “the communicator and the medium to the study of the machine and algorithms” (Taddicken & Schumann, 2021, pp. 01-09). This necessitates a profound re-evaluation of the scientific thinking foundations upon which the sociology of communication rests.

This conceptual review "scientific paper" aims to investigate what has driven the change in the epistemological foundations of thinking processes in the sociology of communication whether it is adaptation to machine logic of thinking on one hand, or a response to the pressures of real communication problems on the other hand by posing the following question:

How does Artificial Intelligence redefine the epistemological foundations of basic thinking processes in the Sociology of Communication?

The researcher adopted the following plan to analyze the question:

1. The epistemological foundations of 'traditional' basic thinking processes in the sociology of communication
2. The cognitive foundations of thiniking processes in artificial intelligence
3. The shared human and artificial thiniking processes in the sociology of communication

1. The epistemological foundations of 'traditional' fundamental thinking processes in the sociology of communication.

The epistemological grounding of thinking processes in the social sciences is generally attributed to Positivists, who "attempted to apply the research methodologies of the applied sciences to social phenomena" (Ussif, 2020, pp. 83-91), particularly problems of human communication. Since the 18th century, it became "a system amenable to observation and objective measurement to determine its causal laws." (Polyvyanyy & Pika, 2019, pp. 01-11)

1.1 Is the social phenomenon understood superficially or profoundly?

Understanding, in the context of social science research thinking process, is "the ability to perceive logical relationships and connections between pieces of information, such that it is not limited to the retrieval of facts but extends to the capacity to apply them" (Perkins, 1993, pp. 88-110).

In his book The 'Rules of Sociological Method', Émile Durkheim (1858-1917) considers a social fact to be: "an external

and constraining thing, which must be explained within external and objective frameworks, akin to a fact in the natural sciences" (Durkheim, 1982, p. 35). He percived the social phenomena as explainable by the other, antecedent social phenomena, disregarding the psychological or subjective dimensions of the fact. Conversely, the sociologist Max Weber (1864- 1920), in his work 'The Protestant Ethic and the Spirit of Capitalism', considered social action to "involve internal, interpretive comprehension of individuals' motives or the subjective meaning held by the actor" (Webber, 2001, p. 37).

This 'epistemological debate' on understanding social phenomena "led to the formation of a foundational framework for addressing problems in the sociology of communication" (Saber & Khalfa, 2025, pp. 611-620). Consequently, two distinct perspectives on communicative phenomena emerged to explain the impact of media on public opinion, for instance: one studies societal laws and external causalities, while the other seeks to interpret the meanings and implications produced within the media context.

The polarization of these two methodologies led to the evolution of research thinking processes in the field of communication sociology. These processes are distinguished as follows:

A. Quantitative-positivist approaches, which dominate the effects and institutions research through:

- Description: Or the sensory, systematic scientific observation

of a phenomenon, as the descriptive statistics of viewership rates, exposure patterns, etc.

- Analysis: The skill of breaking something down into its constituent parts in order to explain and understand it. “The mind progresses in the analytical method from the complex to the simple, from the incidental to the essential, and from diversity to unity” (Sambol & Others, 2023, pp. 01-13). Its purpose is to perceive the parts of this whole, establish connections between them, and understand the laws governing them. However, analysis can lead to isolating characteristics not yet linked to their concrete manifestations.
- Explanation: An endeavor to determine causal relationships between measurable variable, such as explaining changes in public opinion as a result of a media campaign.
- Deduction: The study of a problem holistically, starting from “premises, theories, or general knowledge, then moving to particulars through conclusions” (Sauce & Matzel, 2017, pp. 01-08). It is a model of thinking that begins with the general and proceeds to the specific in its subsequent stages of reasoning.
- Abstraction: Max Weber stated regarding the process of abstraction that “the progress of the social sciences is contingent upon conflicts over terms and definitions” (Webber, 2001, p. 112). Disputes over defining concepts and terms are one of the constant facts in the history of the social sciences, as most practitioners in this field deal with concepts in ways that deny any disagreement about their meanings and

significations, as in building abstract models and variables measurable and testable in different contexts, like constructing an "index" for violence in media, for instance.

B. qualitative-interpretive approaches, which are concerned with meaning, discourse, and identity, enacted through:

- Understanding: This process relies on the properties of self-evidence or the impossibility of doubting self-evidence, clarity, and insight, and the direct apprehension of lived experience without subjecting it to causal explanation, such as understanding how a specific audience interprets a media message within its cultural context. That is, understanding means “comprehending the significance, meaning, and purpose of human activity. Human activities possess meaning, that is, they have a purpose, and in the human sciences, meaning, significance, and purpose must be understood” (Romanenko, Fomenko, & Nikitina, 2016, pp. 131-139).
- Analysis: Discourse, semiotic, or cultural analysis of texts and practices, such as analyzing the discourse of a talk show to extract mechanisms of opinion formation.
- Description in the interpretive sense “is considered a form of awareness and mental images, resulting from an interaction with the external environment, within a framework of relationships and situations determined by subjective experience and prior knowledge” (Macfie & Others, 2023, pp. 171-180). It is the process of constructing reality by the person, a psychological activity based on a number of

repeated perceptions in building information whose object is reality. Thus, perception can be considered a network for reading reality, allowing a person to form their perception of a phenomenon through interaction with their reality.

- Induction: The process by which the researcher "ascends from simple cases to complete and general rules and principles simultaneously" (Engeström, 2020, pp. 31-43). Researchers rely on this process if their goal is to obtain results broader than the premise. It is represented in explaining phenomena and problems in a disciplined manner to contribute to reaching accurate conclusions that can be used for generalization, such as deriving ideas and theories from detailed observation of field data, without rigid preconceived hypotheses.

1.2 Do Weber's "subjectivity" and Durkheim's "objectivity" influence thinking styles in the sociology of communication?

The gist of the sociology of communication lies in studying the diffusion of innovations and information, whether social, cultural, or scientific, among individuals and their surrounding environment. There is no debate that the sociology of communication is "one of the most complex fields of contemporary sociology" (Znaniecki, 2025, pp. 11-20). Yet it strives to analyze communicative problems, especially virtual ones, within societal structures and institutions, focusing on interactions and mediations between actors.

Since its inception, the sociology of communication, like other branches of sociology, has studied problems of social communication to grant it a scientific character by employing

various rational thinking styles. Émile Durkheim viewed it as: "the scientific study of societal facts and phenomena, with the necessity of discarding common notions and adopting strict objectivity" (Durkheim, 1982, p. 76). Whereas Max Weber perceived it as concerned with "understanding social activity, interpreting it, and explaining its occurrence causally," (Webber, 2001, p. 103) opening another arena for debate among researchers regarding the role of the thinking subject in relation to the social phenomenon.

This division, as expected, has raised the question: Do we think of the communicative phenomenon as an objective 'thing,'? as the Positivists call it, to determine the form of relationships between phenomena and its variables, studying them the way phenomena are studied in the physical, natural, or empirical sciences, thinking to answer the question of how the phenomenon occurs? Or is it a subjective act, despite being a methodology that has not properly freed itself from the shackles of philosophy, literary essay, and moral contemplation? Or as seen, in addition to Max Weber, by Wilhelm Dilthey and Max Weber: "In it, the researcher's self is present in the subject of research; he sometimes speaks in the first person and does not conceal himself." (Webber, 2001, p. 105).

2. The epistemological foundations of thinking processes in artificial intelligence

Artificial Intelligence stems from human intelligence, it is "machine thinking capabilities that mimic the characteristics of human thought, combining learning, logical reasoning, and

innovation to adapt to changes and solve problems" (Wang & Zhang, 2025, pp. 24-35).

2.1 Circular Deduction:

Reasoning, deduction, or inference, as is known, "is the mental process through which an individual moves from known premises to an unknown conclusion based on the rules of logic" (Engeström, 2020, p. 45). In the case of a human reasoning process regarding the premise of 'Objective media conveys facts as they are, without bias' (Nordquist, 2019), we present the example of a researcher who posits that "since bias distorts the truth, objective media is the only guarantee for public awareness," as an (unknown) conclusion (Aggarwal & Sinha, 2020, pp. 01-13).

The reasoning performed by the 'machine' or Artificial Intelligence is 'incapable' of proposing unknown conclusions. However, it is effective in reaching new conclusions based on the information available to it, which is called circular reasoning. It is a logical process "in which the validity of the conclusion to be proven is assumed within the premises themselves."In other words, the 'reasoning' is 'circular' because the conclusion is merely a rephrasing of the premise, without providing independent or external evidence to support it" (Zeroual., n.D). In the same example, the known premise "Biased media is media that does not achieve objectivity," (Sapkota & Others, 2025, pp. 01-30) leads circular reasoning to present "Objective media as non-biased media." Causality in circular reasoning is illusory because the evidence for the conclusion is the conclusion itself,"

and the spurious causality is the "correlation between the known premise and the conclusion (the known premise).”

2.1.1 Symbolic Deduction:

This type was prevalent in old expert systems and relied on explicit rules (If X happens, then Y results).

- Deductive thinking that Starts from a general rule to reach a specific conclusion.
- Inductive Reasoning that Starts from specific observations to reach a generalization.

2.1.2 Reasoning in deep learning

Current models like “Chat GPT” or “Gemini” do not follow manually written "rules," but rather rely on probabilistic inference and patterns as follows (Chandak & Others, 2015, pp. 01-33):

- Sequence Prediction: When you ask a question, AI does not search for a stored answer, but rather "infers" the next most logical word based on the context and the vast data it was trained on.
- Chain of Thought: This is a modern method followed by advanced models, where AI breaks down a complex problem into small, sequential logical steps to reach the final solution, mimicking organized human thinking.

2.2 How algorithms 'think' in the sociology of communication in the artificial intelligence era?

The convergence of Artificial Intelligence with communication research represents a qualitative shift in the scientific methodology of thinking within the sociology of communication. This convergence is similar to that of the newspaper with print society after the invention of the printing press, or the convergence of classical media with mass society, as all share the common ground of studying social interactions through the logic of science and scientific studies.

In the era of AI, human data analysis is no longer solely tied to the researcher's ability to construct and test scientific hypotheses. Instead, thinking has expanded to “encompass the identification of any recurring trait or relationship within a data sample, enabling the researcher to recognize or distinguish it upon re-encounter” (Sirwan, 2014, pp. 01-06). This capability allows for the prediction of what might immediately follow.

Algorithms, defined as “a set of sequential mathematical and logical steps followed to solve a specific problem or accomplish a defined task” (Taddicken & Schumann, 2021, pp. 01-09). Algorithms perform systematic analytical processes that address communicative social phenomena. These processes range from daily conversations on social platforms and keywords in smart search engines to trends that led to the spread of an idea—all constituting "big data amenable to quantitative measurement and pattern analysis.” (Zitianellis, 2023, p. 02), Despite algorithms “lacking consciousness or intentionality to think in the human sense." (Antonelli, 2021, pp. 01-22) they execute these processes.

For AI thinking, algorithms are analogous to the process

of "synthesis" for the human mind. Both are “thinking skills for assembling the different aspects of a problem” (Angers, 2014, p. 126). For instance, understanding the cinematic interests of a sample audience, analyzed through metrics like exposure cycles, preferences, and films viewed, allows for a comprehensive understanding. This enables the researcher to grasp the subject matter and diligently work to determine which film will garner likes and high cinema attendance, thus defining the film's success as a cohesive unit.

However, algorithms represent the interactions of that audience sample through “complex networks, exposing analysis nodes by tracking patterns such as the spread of influence from previously watched films, uncovering sub-communities (like films not yet seen), and screening schedules” (Dadlani & Others, 2024, pp. 01-40). Here, “the edges represent the nature and strength of the connection between them. The machine can draw dynamic models or maps of social relationships, identify influential members, and monitor the formation of groups and public opinion around specific issues.” (Hansen & Others, 2020, pp. 31-51)

Similarly, the process of "abstraction," which represents the sum of human thinking in the ability to employ, adapt, and transition between scientific and socially circulating concepts, is paralleled in importance by the efforts of AI developers. They work on “processing human language through technological media to enable algorithms to "understand" the content of circulating communication Technologies such as: sentiment

analysis, topic modeling, and the ability to process linguistic patterns, semantic links, and temporal changes in tone and theme have enabled systematic quantitative analysis of public discourse on a scale previously impossible" (Pankaj & Others, 2025, pp. 144-149). This provides insights into the formation of public opinion, the rise of discourses, and even slow cultural shifts. However, these thinking methods are constrained by "the quality of model designs and the biases of training data." (Chabika & Others, 2024, pp. 87-101) The algorithm does not grasp deep social and contextual meaning; rather, it discovers statistical correlations within the data it was given.

Algorithms are not merely inert analytical tools; they are "an active agents shaping the very field of communication sociology. Through their presence on social media platforms, they participate in reformulating everyday language and engineering the social environment of communication" (Raza Naqvi, 2025, pp. 1672-1686). They determine information flow levels on trending topics, shape echo chambers, and define what is "important" or "popular" through trends or hashtags. They generate feedback based on observed communicative behavior and subsequently modify the environment in which this behavior occurs, thereby generating new data for study.

2.3 Correlations vs Causality in AI research thinking.

With the influx of big data and the advancement of algorithms, the outputs of machine thinking have raised fundamental questions regarding the direction of methodology and research in communication sociology studies. The core

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question is: Do we settle for thinking about *why* communicative phenomena occur and answer it by merely observing patterns and correlations?

In scientific research, a correlation is "a statistical measure that describes the strength and direction of a linear relationship between two quantitative variables." (Daren & Others, 2014, p. 150), It is a fundamental tool for understanding how two phenomena change together in a sample or study population. This form of study reveals maps of statistical relationships that are stronger or weaker. It might lead to findings such as "media awareness is correlated with higher educational attainment" or AI usage is correlated with disrupted thinking." (Nielsen, Andersson, & Cuervo-Cazurra, 2014, pp. 1063-1071), However, the limitation of this form of studying relationships is its silence in explaining the phenomenon: Does low educational attainment cause weak awareness? Or does poor education lead to misinformation? Or do third structural factors produce both? Here, correlation stops and gives way to causality.

It is also known that the sociology of communication, like other branches of sociology, does not stop at describing communicative phenomena. It attempts to understand and explain them, then attempts to control them as a basis for achieving social change. Causality in scientific research is "the relationship indicating that a change or event in an independent variable leads to a change or outcome in a dependent variable." (Nielsen, Andersson, & Cuervo-Cazurra, 2014, pp. 1063-1071), while excluding alternative explanations as much as possible. Causality

is what enables us to design a methodology for thinking about investment for example, in the quality of education or the number of schools. Without an answer to the "why?" which is the core of causal thinking, scientific thinking becomes subject to automatic correlation. "Social meaning lies in the 'why.' Social phenomena are not merely numbers; they are the product of human intentions, historical forces, cultural contexts, and power relations. These dimensions are not revealed by statistical correlations alone." (Chabika & Others, 2024, pp. 87-101) They require deep interpretive methodologies, like hermeneutics, ethnographic studies, and critical analysis, to uncover the hidden mechanisms that drive the numbers.

2.4 The shift from sampling techniques to studying the population universe

A defining feature of contemporary field study methodology is “the capacity granted by AI to process big data, enabling the analysis of the entire population instead of partial samples” (Kommisetty, Vijay, & Bhasker Rao, 2024, pp. 155-167). This reduces the researcher's dependence on formulating and testing hypotheses, evaluating margins of error and degrees of freedom, and justifying methodological choices for sampling types. AI is capable of thinking about data from the entire population. Furthermore, it can (Wutich & Others, 2025, pp. 01-14):

- Analyze the comprehensive population and detect rare behavioral patterns or very small groups, which would have been lost in the averages of a representative sample. This is a decisive factor in fields like detecting rare yet significant

transactions.

- Enable analysis of an individual's comprehensive communicative behavior through their data points, building hyper-personalized predictive models that forecast the individual's needs, not the group average. This is the foundation of recommendation systems on Netflix or Spotify, which operate by analyzing the entire universe of user preferences (Polyvyanyy & Pika, 2019, pp. 01-11).
- However, as data expands, so-called "data noise" increases, making the task of distinguishing the true signal from random correlations more difficult (Zitianellis, 2023, p. 24).
- The causal challenge also remains possessing all the data does not automatically explain causal relationships. On the contrary, massive spurious correlations resulting from analyzing millions of variables can mislead researchers if rigorous causal methodology is not applied (Hansen & Others, 2020).
- Integrate Methodologies: Population and Intelligent Sampling: A hybrid approach is emerging. Here, the complete population is used for description and pattern discovery, followed by the use of carefully designed samples which may be smaller but contextually rich) for causal inference and interpretation (Wutich & Others, 2025, pp. 01-14).

3. Shared human and artificial thinking processes

As previously noted, the description is a fundamental process in scientific thinking, preceding the process of

understanding, in order to build meaning around a social phenomenon. If the purpose is scientific, this process aims to provide an accurate and objective picture of the phenomenon under study using human senses. However, there is an intellectual orientation, such as that of John Locke, which does not recognize the process of description as scientific thinking per se, but rather as "a medium that allows the external world, including communicative phenomena, to be transmitted to the thinking mind. This means that human senses like sight, smell, and touch are means of inputting external data to the mind; without them, the mind is incapable of formulating meanings" (Locke, 1689) .

This specific point aligns with machine thinking; "it receives input data in textual form as questions, commands, analytical texts, or visual form as images or videos, or auditory form as recordings or voice commands" (IBM, 2024). Processing via algorithms represents the central stage where artificial "thinking" occurs. As previously discussed, an algorithm is "a set of organized logical and mathematical steps to solve a specific problem" (Taddicken & Schumann, 2021, pp. 01-09). The artificial thinking processes performed by algorithms in data processing vary, including (Stella & Torres, 2025, pp. 01-10):

- Pattern Recognition and Learning Algorithms, which think and learn from data patterns and extract hidden relationships, such as neural networks that mimic the operation of the human brain.
- Natural Language Processing (NLP) Algorithms: These work to deconstruct sentences into their components, understand

grammar and context, and analyze the sentiment and intent behind texts.

- Search and Retrieval Algorithms: These search massive knowledge bases and retrieve the most relevant information for a given query.

These algorithms work in an integrated manner to transform raw input data into meaningful and valuable outputs (IBM, 2024).

The researcher argues that "artificial intelligence thinking complements the human mind in understanding complex communicative phenomena through a complementary model that combines the mutual strengths of both; “human intelligence provides the communicative phenomenon with methods of deep scientific and practical understanding of the problem within its structural context and the ability to connect horizontally across disparate social knowledge domains” (Angers, 2014, p. 154). The researcher thus formulates fundamental questions and defines methodological frameworks. Meanwhile, artificial intelligence thinking handles “the processing and analysis of big data, revealing statistical relationships, discovering hidden and non-intuitive patterns through advanced algorithms, and executing complex mathematical simulations and modeling that are beyond the capacity of the abstract human mind, all within a short timeframe” (Bianchini, Müller, & Pelletier, 2022, pp. 01-15).

In addition to that, the skills in qualitatively interpreting the phenomenon within the broader context result in the formulation of new hypotheses that are automatically tested again to frame

new, more valuable and ethical research problems. "This cognitive alliance not only compensates for the limitations of each party individually but also creates a new model of understanding that enables humanity to face complex challenges requiring comprehensive understanding that surpasses the individual capabilities of intelligence alone." (Cui & Yasseri, 2024, pp. 01-20)

3.1 How artificial intelligence directs researcher thinking to new areas of research

As known, artificial intelligence embodies its unique research capabilities by “analyzing vast amounts of data that exceed human comprehension capacity, revealing hidden patterns and unexpected statistical relationships between phenomena that initially seem unrelated” (IBM, 2024). It directs "researchers' thinking towards new areas of problems through its unique ability to act as a “knowledge compass” exploring unprecedented horizons. “This discovery of hidden correlations pushes researchers to reconsider prevailing thinking methods and even the epistemological principles that were dominant until the recent past” (William , Sandoval, & Jeffrey, 2016, pp. 457-496).

The dominant communication theories of this era have proven their effectiveness and ability to cover influence, relationships, or usage. However in the digital era “they derived their cognitive momentum from the ability of their axioms to prove themselves, re-present themselves, and answer themselves anew as they traversed different social structures and fabrics” (Ott, 2024, pp. 01-19). Certain questions may have been absent from

the researcher's intellectual map due to societal patterns or the nature of the phenomenon itself. This is where technology intervenes.

Advanced AI systems work by "mapping the comprehensive landscape of human knowledge in specific scientific fields, identifying knowledge gaps and areas characterized by minimal scientific exploration or containing unresolved contradictions." (Salem & Others, 2025, pp. 01-10), For instance, through network analysis of scientific literature and available data on digital identity across social media platforms, these systems point researchers towards "knowledge vacuums worthy of investigation, revealing neglected or unfamiliar research pathways. They uncover a gradual and unnoticed shift in public discourse on a sensitive societal issue." (Kaal, 2017, p. 16), For example, the emergence of new vocabulary carrying hybrid connotations: automated analysis might show that the use of "accepted" terms has begun to decline systematically among teenagers. We find that some models are capable of "generating non-intuitive research hypotheses by synthesizing concepts from disparate domains in creative ways, thereby expanding the boundaries of traditional scientific imagination." (Kommisetty, Vijay, & Bhasker Rao, 2024, pp. 155-167),

The interaction between rechercher and machine thinking leads to a fundamental shift in the research methodology itself, where the sociology of communication moves from the traditional linear "hypothesis and test" model to a more dynamic model based on exploration and generation. Instead of the researcher's role

being limited to testing predefined hypotheses, they can now embark on exploratory journeys led by AI into uncharted regions of knowledge space.

The intellectual pattern also shifts from linear thinking to multi-dimensional, network thinking, where AI draws attention to complex networks of intertwined relationships rather than simple causal links.

4. CONCLUSION

In conclusion, the dual cognition paradigm integrating human and machine intelligence in the sociology of communication research presents a significant epistemological problematic; the uncritically adopted reliance on unverifiable statistical patterns or inherently biased algorithmic data risks steering inquiry toward sterile, correlation-driven hypotheses that lack explanatory power. Therefore, human critical judgment remains the indispensable helm, essential for navigating against the potential deluge of spurious statistical artifacts and profound methodological fallacies, ensuring that the formidable analytical power of artificial intelligence is ultimately directed by scientific rigor, contextual wisdom, and ethical foresight.

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