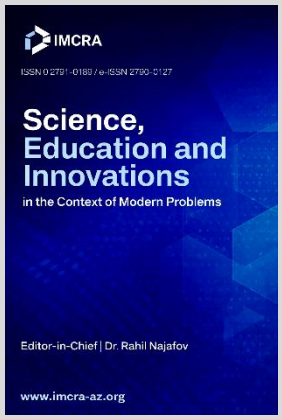

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RESEARCH ARTICLE

Artificial Intelligence and the Limits of Interpretive Understanding: A Philosophical and Methodological Inquiry from the Perspective of Interpretive Sociology

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Abstract

The accelerating integration of artificial intelligence (AI) into social research has generated unprecedented methodological optimism regarding its capacity to analyze complex social phenomena. However, this technological expansion simultaneously raises a fundamental philosophical question: Can artificial intelligence genuinely understand social action in the interpretive sense articulated by classical and contemporary social theory? This article critically examines the epistemological and methodological limits of artificial intelligence in interpreting social action. Drawing on interpretive sociology and the philosophy of social sciences, the analysis argues that social action cannot be reduced to algorithmic processing, statistical correlation, or predictive modeling. Unlike instrumental forms of rationality, interpretive understanding (Verstehen) presupposes intentionality, subjective meaning, contextual awareness, and embodied experience—dimensions intrinsic to human consciousness but absent in artificial systems.

Through engagement with Alfred Schutz's phenomenology of the lifeworld, Jürgen Habermas's theory of communicative action, and Michael Polanyi's concept of tacit knowledge, the study demonstrates that human social understanding relies on a dynamic stock of knowledge, reciprocal perspective-taking, and communicative validity claims that exceed computational formalization. While artificial intelligence may excel in causal explanation, data classification, and behavioral prediction, it remains structurally incapable of participating in the shared world of meanings that constitutes social reality. The paper further addresses key methodological challenges confronting computational models, including the context problem, bias, and the absence of subjective experience. It concludes that artificial intelligence can serve as a powerful analytical instrument within social sciences, yet it cannot replace the interpretive capacities rooted in human reflexivity and communicative engagement. The study thus reaffirms the philosophical distinction between explanation and understanding and contributes to ongoing debates concerning the epistemological boundaries of artificial intelligence in social inquiry.

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Introduction:

Amid the rapid technological developments and the intervention of artificial intelligence in various fields of knowledge, a profound methodological and philosophical issue emerges concerning the nature of social knowledge and the possibility of encompassing human action within algorithmic frameworks. This article raises a central question regarding the interpretive capacities of artificial systems in understanding and explaining social action, drawing on classical and contemporary theoretical frameworks from the philosophy of social sciences and cognitive sciences.

The analysis departs from a fundamental premise that social action is a complex entity grounded in subjective meaning, intentionality, and interactive context. From this perspective, the article examines the essential gaps afflicting computational models in simulating the interpretive processes unique to the human mind. Through recourse to Alfred Schutz's phenomenological framework, Habermas's theory of communicative action, and Polanyi's concept of tacit knowledge, it becomes clear that human social understanding relies on a cumulative stock of knowledge, embodied experience, and contextual presence that cannot be reduced to formal rules or statistical models.

Likewise, the research addresses the deep methodological issues facing the computational modeling of social behavior, most notably: the problem of context, bias, and the absence of subjective experience that forms the basis of human consciousness. The article also reaffirms the Weberian distinction between understanding (Verstehen) and explanation, clarifying that artificial intelligence may achieve a high degree of efficiency in causal explanation and statistical prediction, but remains incapable of achieving interpretive understanding, which requires engagement in the world of meanings and negotiation over them.

To establish the argument presented in this article, it is necessary to return to the philosophical backgrounds of social construction and the meanings that actors provide for their behaviors, for social action is not merely transient behavior or mere act but has backgrounds derived from a stock of knowledge and tacit agreement among actors on its content, and the same applies to the knowledge that actors acquire from their behaviors and actions.

Therefore, the construction of our argument will be gradual, starting from: the philosophical foundation, then the methodological issue, up to the lowest level of methodological construction, which is the technical theoretical framework for studying actors' behaviors in the interpretive understanding approach.

1- Philosophical Foundation of Our Argument: Phenomenology of the Lifeworld and Tacit Background

1-1 Alfred Schutz's Interpretive Phenomenology:

Alfred Schutz (1899-1959), pioneer of phenomenological theory, establishes a radical understanding of the nature of social knowledge. Schutz posits that the social world is constructed through "the meanings that actors confer on their experiences," and that these meanings arise from the "stream of conscious experience" lived by the actor. In contrast, artificial intelligence lacks what Schutz terms the "stock of knowledge"—the accumulation of experiences, practices, and cognitions that form the actor's background and guide their interpretations.

The central point here is that the stock of knowledge is not merely a database that can be stored digitally, but a dynamic structure that continuously transforms through interaction with the world. As Schutz (1970) indicates in his book "On Phenomenology and Social Relations," human understanding relies on the "reciprocal attunement of perspectives," that is, our assumption that others share with us a common background of meanings; this shared assumption in the lifeworld enables actors to communicate and mutually understand.

1-2 Habermas's Theory of Communicative Action:

Jürgen Habermas (Habermas, 1984) distinguishes in his theory of communicative action between two basic types of action:

a- Instrumental action or instrumental reason.
b- Communicative action or communicative reason.

Instrumental or goal-oriented reason is directed toward success and can be reduced to cause/effect relations; instrumental reason views nature and reality from a perspective of similitude, disregards particularity, and seeks to fragment reality into

disconnected parts, treating humans as akin to material natural parts; for instrumental reason, humans are fixed and quantitative entities. In contrast, communicative action is oriented toward reaching understanding and presupposes a shared world of meanings; it is based on activating humans' communicative role in society and highlighting their existential value. Unlike instrumental reason, communicative reason emphasizes and integrates the scientific and ethical dimension, as well as the aesthetic-expressive dimension. (Hassan, Hamdi; 2012)

Thus, while artificial intelligence can effectively simulate instrumental action—where behaviors based on rational calculation can be modeled—it is entirely incapable of engaging in communicative action, which, as Habermas clarifies, requires the "capacity of speech and action to justify itself before validity claims"; communicative action presupposes a dialogic space where claims to truth, rightness, and sincerity can be discussed, a space that demands intentional consciousness and self-critical reflexive capacity (Atiyat; 2002).

1-3 Tacit Knowledge in Michael Polanyi:

Michael Polanyi (Polanyi, 1966) presents in his book "The Tacit Dimension" a crucial concept for understanding the limits of artificial intelligence (tacit knowledge); Polanyi argues that "we know more than we can tell," and that a large part of our knowledge is tacit and not amenable to explicit formulation. This knowledge encompasses practical skills, intuition, and contextual understanding acquired through embodiment and practice.

Tacit knowledge forms the foundation upon which explicit knowledge is built, and it is not reducible to rules or algorithms. As Polanyi indicates in "Personal Knowledge," all human knowledge is ultimately personal knowledge involving personal commitment and tacit understanding. Consequently, artificial intelligence, lacking embodiment and personal experience, remains incapable of possessing this tacit knowledge that forms the basis of human understanding of the social world.

2. Essential Methodological Issues:

2-1 The Context Problem:

The context problem is one of the oldest and most complex issues in artificial intelligence. The problem lies in determining which information is relevant to interpreting a particular action or situation; humans solve this intuitively through what Searle (Searle, 1992) calls the "background of capacities," a set of knowledge and skills acquired through embodiment and interaction with the world.

The context problem is not merely a technical limitation but an existential issue related to the nature of human understanding; as Fitch (Fitch, 2005) clarifies, human understanding relies on "contextual appropriateness" determined through our embodied experience, meaning we interpret speech, dialogue, and action within a specific context known to us through our backgrounds; for example, we can pose a question to another person, but our intent is not the question itself but sarcasm or astonishment; this is what artificial intelligence fails to understand or interpret.

Consequently, artificial intelligence, lacking this experience, is forced to process all possible information rather than only that relevant to the context, leading to what is known as the "combinatorial explosion" that renders effective processing impossible.

2-2 Double Hermeneutic:

Anthony Giddens (Giddens, 1984) presents in his book a crucial concept for understanding the nature of social sciences: the double hermeneutic. He means by it that the researcher in the social sciences interprets a world of actors who interpret their own world. This implies that the concepts developed by the researcher become part of the world he studies, creating a dynamic interpretive loop.

Here, artificial intelligence does not participate in this interpretive loop either. As Taylor (Taylor, 1985) observes, interpretation in the social sciences requires integration between the researcher's perspective and that of the actors. This integration negotiates and transforms meanings, a creative dialogic process lacking in algorithms and digital mechanisms; artificial intelligence analyzes data from the outside as if they were things, whereas social meanings are by definition

internal phenomena negotiated through interaction.

2-3 Absence of Subjective Experience:

The concept of "qualia" (here, one can delve deeper through reading the article "The Qualia Problem: Consciousness and Perceptual Individuality" by Professor Salah Osman) refers in philosophy of mind to the subjective qualities of conscious experience—what it "feels like" to feel pain, see the color red, or experience joy upon seeing a beloved car; as Nagel (Nagel, 1974) poses in his famous article "What Is It Like to Be a Bat?", the subjective nature of conscious experience makes it impossible to understand from a third-person perspective.

The absence of qualia in artificial intelligence creates an existential gap in its ability to understand social action. Thus, the hard problem of consciousness lies in explaining how subjective experience arises from physical processes. Even if artificial intelligence could simulate human behavior with precision, this does not mean it experiences the world as we do. This absence of subjective experience deprives it of understanding the emotional and axiological meanings that motivate social actions.

3. Theoretical Frameworks in Sociology: Understanding versus Explanation

3-1 Max Weber's Interpretive Sociology:

Max Weber (Weber, 1978) establishes in "Economy and Society" a central methodological distinction between explanation and understanding; explanation deals with causal relations in the natural world, while understanding deals with meanings in the social world. According to Weber's definition, social action is "human behavior when the actor attaches a subjective meaning to it and orients the behavior toward the behavior of others."

Artificial intelligence may be capable of causal explanation—linking variables and predicting outcomes—and we say it may be capable considering its reduction of practices to statistical numbers and mathematical equations, but it is incapable of interpretive understanding. As Weber clarifies, understanding requires "direct observational understanding of the meaning of an action" and "explanatory understanding" of its motives in the context of the actor's life history; this type of understanding requires, as Ricoeur (Ricoeur, 1981) indicates, a "game of question and answer" that transcends mere information processing to a dialogic interpretation with the social text.

3-2 Symbolic Interactionism: Constructing Meaning in Interaction

Symbolic interactionism developed from the works of George Herbert Mead (Mead, 1934) and Herbert Blumer (Blumer, 1969) to emphasize that social meaning is not given a priori but constructed through interaction. Blumer (1969) summarizes this in three basic premises:

a- Humans act toward things on the basis of the meanings those things have for them.
b- These meanings arise from social interaction.
c- These meanings are modified through an interpretive process.

This interactive interpretive process cannot be reduced to an algorithm. As Goffman (Goffman, 1959) explains in "The Presentation of Self in Everyday Life," social interaction involves complex impression management dynamics where actors present "their selves" in social scenarios. This dynamic requires precise understanding of social expectations, the ability to adjust behavior according to reactions, and flexibility in adapting to unexpected situations—all capacities based on contextual interpretive understanding (within the socio-cultural context in which it interacts).

3-3 Intentionality in Phenomenological Thought:

The roots of the concept of intentionality trace back to Franz Brentano, who defined it as "the characteristic of consciousness that is directed toward something." Edmund Husserl developed this concept in phenomenology, affirming that consciousness is always consciousness of something existent or occurring.

John Searle (Searle, 1980) argues in his famous "Chinese Room" thought experiment that artificial intelligence lacks internal intentionality. The computer system possesses only derived intentionality, not genuine; it processes symbols

formally without understanding their meaning. Searle includes in his experiment a man who does not know Chinese placed in a room with Chinese words and texts; the man inside the room does not understand a single word of Chinese; he simply follows formal (syntactic) instructions without any apprehension of the signification of those symbols or the meaning of the sentences. From this, Searle concludes that the computer system, operating in the same manner (applying rules to abstract symbols), cannot have true understanding or consciousness. The program provides syntax, but consciousness requires semantics and intentionality, which the computer system inherently lacks. As Searle (1992) clarifies, human intentionality arises from the brain's biological structure and our embodied experience in the world.

In the social sciences, intentionality is not merely orientation toward a goal but, as Schutz (Schutz, 1967) describes, an "action project" involving anticipation of outcomes and envisioning alternatives. This project relies on what Schutz calls "temporal knowledge," i.e., understanding the past and anticipating the future in light of the present. Artificial intelligence lacks this temporally rooted experience in human existence.

4- Technological Limits: What Artificial Intelligence Can and Cannot Do

4-1 In Qualitative Research: Assistant, Not Analyst

Artificial intelligence can play an assistive role in qualitative research, but with strict limits; as Miles and Huberman (Miles & Huberman, 1994) clarify, computer-based qualitative data analysis tools, including those produced by artificial intelligence, can assist in organizing data and accelerating its extraction, but they do not replace the researcher's interpretive analysis. (CAQDAS) Computer-assisted qualitative data analysis software.

Topic analysis assisted by artificial intelligence faces profound methodological challenges. As Braun and Clarke (Braun & Clarke, 2006) indicate, identifying themes in qualitative research is not merely discovering statistical patterns, but a creative interpretive process involving "discovering something important about the data in relation to the research question." Artificial intelligence may detect lexical repetitions within field notes of qualitative research such as interviews, but it cannot judge their semantic importance in the cultural and social context.

Additionally, sentiment analysis faces similar challenges. As Liu (Liu, 2015) observes, human emotions are complex and multidimensional, often expressed indirectly through sarcasm, irony, or metaphorical expressions. A respondent may pose a question intending sarcasm, or answer a question with negation intending affirmation, and understanding these complexities requires deep cultural knowledge and social experience, not mere statistical word analysis.

4-2 In Quantitative Research: Artificial Intelligence's Strength and Danger

In quantitative research, artificial intelligence's strength is evident, but with significant risks; its ability to process massive datasets and conduct complex statistical analyses opens new horizons in inference and explanation, yet it poses a major problem: the risk of transforming "reliance on big data into faith in volume," where data volume is believed to eliminate the need for theory and interpretation in sociological research.

Another technical problem is the illusion of objective neutrality in artificial intelligence analyses, representing a massive methodological danger. As Gitelman (Gitelman, 2013) clarifies that "raw data is an oxymoron," data are not objective facts but always "cooked," products of collection and preparation processes, thus carrying assumptions and values. Artificial intelligence, by processing this data, hides these assumptions under a veil of complex mathematics, creating the illusion of objective neutrality.

Additionally, the causality problem emerges clearly in the lack of credibility of artificial intelligence analyses. Artificial intelligence may discover statistical relationships, but interpreting these as causal relationships requires, as Morgan and Winship (Morgan & Winship, 2015) explain, "causal thinking that goes beyond mere data analysis."

4-3 Algorithmic Biases and Reproduction of Inequality

Artificial intelligence algorithms face the problem of systemic bias. As O'Neil (O'Neil, 2016) documents in his book "Weapons of Math Destruction," algorithms often reproduce existing social biases. This problem arises from several sources: biases in training data, biases in algorithm design, and biases in result application.

This occurs through the "black box" issue in deep learning algorithms, creating a serious methodological challenge. To clarify further, the black box concept has gained utmost importance in the last decade with the rise of deep learning models and modern artificial intelligence; many deep neural networks, especially those with hundreds of layers and billions of parameters, are typical examples of black boxes. These models achieve very high accuracy levels in tasks like image recognition, natural language processing, and complex decision-making, but the mechanism by which they reach these decisions remains opaque and not directly interpretable by humans.

The problem lies in that these models not only produce outputs but produce decisions affecting individuals' lives (such as determining creditworthiness, medical diagnosis, or crime prediction). Lack of transparency generates what is known as the interpretability crisis; developers or end-users cannot identify the precise reason behind a specific decision, making discovering bias or logical errors extremely difficult. This renders artificial intelligence's ability to properly interpret actions and behaviors according to a social dimension very difficult, unreliable, and biased.

As Burrell and Garrod (Burrell & Garrod, 2016) explain, inability to interpret how the algorithm arrives at its results undermines the basis of scientific credibility. In the social sciences, where methodological transparency is an essential condition, this opacity represents an existential problem for interpretive logic.

5- Toward an Integrative Approach and Role Clarification

5-1 Redefining Research Roles

The role of artificial intelligence in social research must be redefined as an assistive tool, not a researcher. As Kitchin (Kitchin, 2014) suggests, two basic roles can be envisioned:

a- As a data exploration tool that helps generate hypotheses.
b- As an analytical tool that helps test hypotheses. But in both cases, the human researcher remains responsible for interpreting results and placing them in a theoretical framework.

Research efficiency in the artificial intelligence era requires the researcher to have the ability to ask the right questions of the artificial intelligence tool. The future researcher needs new skills:

a- Technical knowledge to understand artificial intelligence's capabilities and limits.
b- Interpretive skills to understand and interpret its outputs.
c- Theoretical knowledge to place results in their social and cultural context.

5-2 Research Ethics in the Artificial Intelligence Era

Uses of artificial intelligence in social research raise profound ethical challenges. According to Zuboff (Zuboff, 2019), large-scale data collection and analysis create new risks to privacy and autonomy.

The principle of informed consent from research subjects regarding the use of their data and statements faces new challenges in the artificial intelligence era; as Nissenbaum (Nissenbaum, 2010) clarifies, consent does not mean merely signing a form presented by the researcher to the subject, but requires true understanding of how the data will be used. Because, in short, complex artificial intelligence analyses make it difficult to predict all possible data uses, undermining the subject's ability to comprehend what they are actually consenting to.

5-3 Defending Human Centrality in the Social Sciences

Defense of the idea that the social sciences are inherently human sciences is essential, as Taylor (Taylor, 1985) affirms; human understanding requires "interpretive engagement" with the world of meanings in qualitative data, not mere external observation. This engagement requires, as Ricoeur (Ricoeur, 1981) describes, a game of question and answer between the text and the reader, where the researcher interacts with the data as with a literary text—with all its complexities, ambiguities, and multiple interpretive possibilities.

Defending human centrality does not mean rejecting technology, but placing it in its proper position. As Vlieghe (Vlieghe, 2018) suggests, technology can be considered a tool that helps us think about ourselves, not a substitute for human

understanding. Through this, artificial intelligence can help us see patterns we would not have seen, but it cannot replace the interpretive vision that transforms these patterns into meaningful "social phenomena."

6- Future Scenarios

6-1 Scenario of Balanced Integration

In this scenario, an integrative research model evolves where artificial intelligence plays the role of analytical assistant while the human researcher's interpretive understanding remains central. As Savage and Burrows (Savage & Burrows, 2007) suggest, the future may witness the emergence of computational sociology as a multidisciplinary field concerned with human behavior theories through applying computational techniques to data from social media sites, the internet, or other digital archives such as administrative records. As a complementary branch, it will not replace interpretive traditions in sociology.

6-2 Scenario of Partial Replacement

In this scenario, over-reliance on artificial intelligence may lead to erosion of researchers' interpretive skills. As Turkle (Turkle, 2015) warns in his book "Reclaiming Conversation," reliance on technology may undermine our ability for "deep thinking" that requires patience, attention, and reflection.

Here, protecting methodological diversity becomes a priority in this context. As Lamont (Lamont, 2009) affirms, reliance on "methodological pluralism" through using diverse methods that integrate with each other to provide richer understanding of social phenomena. Artificial intelligence should be an addition to this pluralism, not a substitute for it.

6-3 Reshaping Research Education

The artificial intelligence era requires reshaping methods of teaching research methodologies. As Cousins and Simmons (Cousins & Simmons, 2018) propose, educational curricula for researchers need to combine:

a- Technical training on artificial intelligence tools.
b- Theoretical foundation in the philosophy of social sciences.
c- Development of interpretive and critical skills.
d- Understanding algorithm operating principles, recognizing their potential biases, and ability to evaluate their limits. This type of knowledge enables researchers to use artificial intelligence critically and effectively.

Conclusion

This article affirms that artificial intelligence, despite its astonishing technological progress, remains fundamentally incapable of understanding social action as conceived by interpretive sociology. This incapacity is not a temporary technical limitation, but an existential one related to the nature of human consciousness, intentionality, and meaning.

Defending the particularity of the social sciences in the artificial intelligence era is not a rejection of technological progress, but an affirmation that certain aspects of human existence cannot be reduced to data and algorithms. For "man is an interpretive being," and this interpretive nature is what makes social understanding possible and protects it from mechanical replacement.

The optimal future lies in a cautious integrative model, where researchers benefit from artificial intelligence's analytical power while retaining centrality for human interpretive understanding. In this model, artificial intelligence becomes a tool for expanding the boundaries of our perception, not a substitute for our reflection. Thus, we protect the particularity of the social sciences as human sciences, while remaining open to new possibilities for understanding the complexity of the social world.

Ethical Considerations

This study is theoretical and philosophical in nature and is based exclusively on the analysis of published academic literature within the fields of interpretive sociology, philosophy of social sciences, and cognitive theory. It does not involve

human participants, empirical data collection, interviews, surveys, or experimental procedures. Therefore, ethical approval from an institutional review board was not required.

The author adhered to internationally recognized standards of academic integrity, ensuring accurate citation of sources, faithful representation of theoretical arguments, and avoidance of plagiarism or misinterpretation. The research was conducted with full respect for intellectual property and scholarly ethics.

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Conflict of Interest

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