Spektrum Iran | Jg. 38 | Nr. 2 | Sommer und Herbst-2025 | 1-30 |

Original-Forschungsarbeit

Dual-Räumlichkeitsbildung der Intelligenz: Eine theoretische Retrodution der Sozialisierung künstlicher Intelligenz in der Bedeutungsproduktion

Manijeh Akhavan[1], Saied Reza Ameli[2*], Maseud Rahgozar[3], Ehsan Shahghasemi[4]

1 Doktorandin im Medienmanagement, Kish International Campus, Universität Teheran, Kish, Iran

2 Professor für Kommunikations- und Global Studies, Abteilung für Kommunikation, Fakultät für Sozialwissenschaften, Universität Teheran, Teheran,

3 Außerordentlicher Professor für Informatik, Fakultät für Elektro- und Computertechnik, University College of Engineering, Universität Teheran, Teheran, Iran

4 Außerordentlicher Professor für Kommunikation, Abteilung für Kommunikation, Fakultät für Sozialwissenschaften, Universität Teheran, Teheran, Iran

Empfangen: 5. Februar 2025 **Akzeptiert:** 3. Juni 2025

Zusammenfassung:

Fast fünf Jahrzehnte, nachdem Hubert Dreyfus die Bedeutung der Berücksichtigung des sozialen Charakters von Intelligenz bei der Entwicklung künstlicher Intelligenz betont hatte, und trotz der Konsolidierung von KI als aktant innerhalb der Nachrichtenmedien, haben sich praktische Implementierungen schneller entwickelt als die entsprechenden theoretischen Untersuchungen. Da die Fähigkeit zur Bedeutungsbildung innerhalb einer sozialen Institution die Sozialisierung eines kognitiven Systems voraussetzt, kann die Sozialisierung künstlicher Intelligenz entlang eines vergleichbaren Pfads wie die natürliche menschliche Intelligenz untersucht werden. Auf dieser Grundlage untersucht der vorliegende Artikel die Prozesse, durch die KI sozialisiert wird, um eine Rolle in der Bedeutungsproduktion innerhalb einer sozialen Institution wie den Nachrichtenmedien einzunehmen, und behandelt die zentrale Frage: Was ist sozialisierte künstliche Intelligenz? Zu diesem Zweck integriert die Studie das Modell der Dual-Räumlichkeitsbildung der Intelligenz mit der Repräsentationstheorie in einem sozio-organisationalen Rahmen und verwendet einen retroduktiven theoretischen Ansatz zur Beantwortung der Forschungsfrage. In dieser Analyse wird die soziale Ordnung als Funktion des Sozialisierungsprozesses von KI verstanden. Die Dual-Räumlichkeitsbildung der Welt führt folglich zu einer dual-räumlichen sozialen Ordnung. Die Ergebnisse zeigen, dass KI entweder so gestaltet werden kann, dass sie bestehende Wissensformen und verankerte soziale Stereotype ähnlich wie menschliche Kognition repliziert, oder dass sie sozial reguliert wird, um eine algorithmische Rationalität zu fördern, die auf das Gemeinwohl und die Verwirklichung einer nachhaltigen und gerechten sozialen Ordnung ausgerichtet ist. Eine solche Ordnung hängt von der Öffnung repräsentationaler Praktiken durch reflexives Engagement mit sozialen Stereotypen ab, wodurch Transformationen in der Repräsentation und eine größere Vielfalt von Identitäten unterstützt werden. Der Beitrag dieses Artikels liegt in der Vorschlag eines integrierten Modells zum Verständnis der Mechanismen der Sozialisierung von KI in bedeutungsproduzierenden sozialen Institutionen. Darüber hinaus bietet das Modell eine umfassende Perspektive auf die Sozialisierung sowohl natürlicher als auch künstlicher kognitiver Systeme innerhalb der sich entwickelnden Strukturen dual-räumlicher institutioneller sozialer Ordnungen.

Schlüsselwörter: künstliche Intelligenz, dual-räumliche Bildung der Intelligenz, Repräsentation, Sozialisierung, soziale Ordnung

* Korrespondierender Autor ssameli@ut.ac.ir https://orcid.org/0000-0002-0193-4302

Wie dieser Artikel zu zitieren ist:
Akhavan, M., Ameli, S.R., Rahgozar, M., & Shahghasemi, E. (2025). Dual-spacization of intelligence: A theoretical retroduction of the socialization of artificial intelligence in meaning construction. *Spektrum Iran*, 38(2), 1-31.
https://doi.org/10.22034/spektrum.2026.565209.1055

اشپکتروم ایران | جلد ۳۸ | شماره ۲ | تابستان و پاییز ۱۴۰۴ | ۳۰-۱ |

مقاله پژوهشی

هوش دوفضایی؛ پس‌کاوی نظری اجتماعی شدن هوش مصنوعی برای تولید معنا در رسانه‌های خبری

منیژه اخوان[۱]، سعیدرضا عاملی[۲*]، مسعود رهگذر[۳]، احسان شاه‌قاسمی[۴]

۱ دانشجوی دکتری مدیریت رسانه، پردیس بین‌المللی کیش، دانشگاه تهران، کیش، ایران

۲ استاد ارتباطات و مطالعات جهانی، دپارتمان ارتباطات، دانشکده علوم اجتماعی، دانشگاه تهران، تهران، ایران (نویسنده مکاتبه‌ای)

۳ دانشیار علوم کامپیوتر، دانشکده مهندسی برق و کامپیوتر، پردیس فنی دانشگاه تهران، تهران، ایران

۴ دانشیار ارتباطات، دپارتمان ارتباطات، دانشکده علوم اجتماعی، دانشگاه تهران، تهران، ایران

دریافت: ۱۴۰۳/۱۱/۱۶؛ پذیرش: ۱۴۰۴/۰۳/۱۳

چکیده:

هرچند حدود نیم قرن از زمانی که هوبرت دریفوس ضرورت توجه به ماهیت اجتماعی هوش را در توسعه مدل‌های هوش مصنوعی مطرح کرد، می‌گذرد و هوش مصنوعی نیز جایگاه خود را به عنوان یک بازیگر فناورانه جدید در رسانه‌های خبری تثبیت کرده، به نظر می‌رسد پیاده‌سازی عملی سریع‌تر از مطالعات نظری آن پیشرفت کرده‌اند. از آنجا که ظرفیت معناسازی در یک نهاد اجتماعی، اجتماعی شدن یک سیستم شناختی را پیش‌فرض می‌گیرد، اجتماعی شدن هوش مصنوعی را می‌توان در مسیری قابل مقایسه با هوش طبیعی انسان بررسی کرد. بر این اساس، مقاله حاضر فرآیندهایی را بررسی می‌کند که از طریق آنها هوش مصنوعی اجتماعی می‌شود تا نقشی معناساز در یک نهاد اجتماعی مانند رسانه‌های خبری ایفا کند و به این سوال اصلی می‌پردازد: چه چیزی هوش مصنوعی اجتماعی شده را تشکیل می‌دهد؟ بدین منظور، از نظریه هوش دوفضایی و نظریه بازنمایی در رویکرد اجتماعی-سازمانی استفاده شده و در چارچوب رویکرد پس‌کاوی نظری به مسئله پاسخ داده می‌شود. در این پژوهش، نظم اجتماعی به عنوان کارکرد فرایند اجتماعی شدن هوش مصنوعی در نظر گرفته شده است. با دوفضایی شدن جهان، ما با نظم اجتماعی دوفضایی مواجه هستیم. یافته‌های این مطالعه نشان می‌دهد که هوش مصنوعی می‌تواند هم دانش جهان و کلیشه‌های اجتماعی آن را بازتولید کند و عملکردی شبیه انسان داشته باشد یا طوری اجتماعی و تنظیم شود که عقلانیت معطوف به خیر جمعی و نظم اجتماعی پایدار و عادلانه را به ارمغان آورد. چنین نظمی، مستلزم آشکار کردن کلیشه‌های اجتماعی از درون است که می‌تواند روی تغییر وضعیت بازنمایی در مسیر تنوع هویتی اثرگذار باشد. نوآوری این مقاله، ارائه مدلی یکپارچه برای فهم مکانیسم‌های اجتماعی شدن هوش مصنوعی در همه نهادهای اجتماعی معناساز است. همچنین این مدل، رویکردی جامع به اجتماعی شدن سیستم شناختی طبیعی و مصنوعی در بستر تغییرات ساختارهای اجتماعی نهادی دوفضایی دارد.

واژگان کلیدی: هوش مصنوعی، هوش دوفضایی، بازنمایی، اجتماعی‌شدن، نظم اجتماعی

---

* نویسنده مسئول

https://doi.org/10.22034/spektrum.2026.565209.1055

ssameli@ut.ac.ir

https://doi.org/10.22034/spektrum.2026.565209.1055

Spektrum Iran | Vol. 38 | Issue: 2 | Summer & Autumn 2025 | 1-30 |

Original Research Paper

Dual-spacization of intelligence: A theoretical retroduction of the socialization of artificial intelligence in meaning construction

Manijeh Akhavan[1], Saied Reza Ameli[2*], Maseud Rahgozar[3], Ehsan Shahghasemi[4]

1 Ph.D. candidate in Media Management, Kish International Campus, University of Tehran, Kish, Iran

2 Prof. of Communications and Global Studies, Department of Communications, Faculty 3 of Social Sciences, University of Tehran, Tehran, Iran

4 Associate Professor of Computer Science ,School of Electrical & Computer Engineering, University College of Engineering, University of Tehran, Tehran, Iran

5 Associate Professor of Communication, Department of Communications, Faculty of Social Sciences, University of Tehran, Tehran, Iran

Received: Feb., 5, 2025 **Accepted:** Jun. 3, 2025

Abstract

Nearly five decades after Hubert Dreyfus underscored the importance of accounting for the social character of intelligence in the development of artificial intelligence, practical implementations have progressed more rapidly than corresponding theoretical inquiry. This remains the case notwithstanding artificial intelligence's consolidation as an actant within the news media. Because the capacity for meaning-making within a social institution presupposes the socialization of a cognitive system, the socialization of artificial intelligence may be examined along a trajectory comparable to that of human forms of natural intelligence. On this basis, the present article investigates the processes through which AI becomes socialized so as to assume a meaning-making role within a social institution such as the news media, addressing the central question: What constitutes socialized artificial intelligence? To this end, the study integrates the Dual-spacization of Intelligence with representation theory within a socio-organizational framework and adopts a retroductive theoretical approach to address the research question. Within this analysis, social order is understood as a function of AI's socialization process. The dual-spacization of the world consequently gives rise to a dual-spatial social order. The study's findings suggest that AI may either be engineered to replicate existing forms of knowledge and entrenched social stereotypes in a manner analogous to human cognition, or be subject to social regulation that fosters an algorithmic rationality oriented toward the common good and toward a sustainable and just social order. Such an order depends on opening representational practices through reflexive engagement with social stereotypes, enabling transformations in representation and supporting increased diversity of identities. The contribution of this article lies in proposing an integrated model for understanding the mechanisms of AI socialization across meaning-producing social institutions. Furthermore, the model offers a comprehensive perspective on the socialization of both natural and artificial cognitive systems within the evolving structures of dual-spatial institutional social orders.

Keywords: artificial intelligence, dual-spacization of intelligence, representation, socialization, social order

* Corresponding Author ssameli@ut.ac.ir https://orcid.org/0000-0002-0193-4302

How to Cite this Article:
Akhavan, M., Ameli, S.R., Rahgozar, M., & Shahghasemi, E. (2025). Dual-spacization of intelligence: A theoretical retroduction of the socialization of artificial intelligence in meaning construction. *Spektrum Iran*, 38(2), 1-31.
https://doi.org/10.22034/spektrum.2026.565209.1055

1. Introduction

In recent decades, news organizations have increasingly become leading actors in integrating artificial intelligence strategies into their structures, driven by pressures such as access to vast amounts of data, advances in AI technologies, market pressures, imitation of pioneering news giants in adopting AI, technological competition, and the need to respond to audiences' informational needs. For instance, a 2023 global survey examining AI adoption across 105 news and media organizations in 46 countries reports that more than 75 percent of the surveyed organizations employ AI in at least one segment of the news value chain (Beckett & Yaseen, 2023, p. 6).

Since news organizations are among the key social institutions that help sustain a society's social order by making the world meaningful (Rohlinger, 2022), the integration of AI into their value chains implies that artificial cognitive systems now participate alongside natural cognitive systems in meaning production. For humans, acquiring a meaning-making role in news media requires socialization (Breed, 1955). Given that AI—developed through the logic of simulating human intelligence (Ameli, 2021) and now encompassing deep learning and large language models—operates on cognitive principles analogous to natural intelligence, its socialization processes can likewise be examined anthropomorphically (Collins, 2025). Accordingly, this article seeks to understand the mechanisms through which AI becomes socialized.

Along this path, one dimension involves recognizing that AI's capacity for meaning-making depends on its ability to perceive the world, a process that occurs through representation (Sokol & Flach, 2024; Huh et al., 2024). Comprehending both the world in which new communication technologies are socialized and the structural capacities through which it receives and represents that world allows for the formulation of realistic expectations regarding the adoption of ICTs' (see for example Sabbar and Matheson, 2019). In addition, identifying the assemblage of forces that shape the socialization of artificial cognitive systems along their trajectory toward acquiring a meaning-making role is crucial for conceptualizing artificial intelligence as a social phenomenon (Lewis & Westlund, 2014).

On the other side of this trajectory lies socialized AI, whose function is to help maintain social order. With the emergence of the simultaneous

communication industry (Ameli, 2011) and the advancement of digital technologies, this concept requires renewed examination. On one hand, the rise of virtual space parallel to the physical world has expanded the "social space" (Ameli, 2011, p. 2), and the profound interwining of this new space with the physical world has transformed virtual space into a "second life-space" (Ameli, 2017, p. 192). This condition marks the extension of the human life-ecosystem into digital environments, described as the dual-spacization of the world (Ameli, 2003a, 2003b; Ameli, et al., 2024). On the other hand, AI possesses an industrial nature (Ameli, 2021). The syntactic command structure of algorithms (Goffey, 2008), along with their goal-oriented nature and programmability (Fin, 2017), establish a precise order in the pursuit of clearly defined objectives. These new communication technologies have altered the way social phenomena are perceived (Shahghasemi et al., 2025). Consequently, some scholars argue that attention should shift toward the "technology's role in engineering the social world" (Couldry, 2021, p. 11) or "algorithmic regulation" (Ameli, 2023). Therefore, understanding AI socialization requires situating it within the evolving coordinates of social order in a dual-spatial society.

Accordingly, this article addresses the question of what constitutes socialized AI and how AI becomes socialized to attain a meaning-making role in news media—and, more broadly, within any meaning-producing social institution. To answer this question, the study draws on dual-spacization of intelligence theory and the theory of representation, employing a a retroductive theoretical approach.

The novelty of this article lies in presenting a model for understanding the mechanisms for socialization of neural network–based AI (including deep learning systems and large language models), a model applicable to all meaning-producing social institutions. Additionally, the proposed model provides a comprehensive perspective on the socialization of both natural and artificial cognitive systems within the context of transforming dual-spatial institutional structures.

2. Literature Review

New communication technologies have created a significant change in how social phenomena are perceived (Schatzki, 2025; Shahghasemi, 2025;

Hohenstein et al., 2023; Kubin & von Sikorski, 2021; Bytiak et al., 2020; Yıldız & Nur, 2024; Nourbakhsh & Nemati, 2020). The study of mechanisms through which AI becomes socialized to attain a meaning-making role in news media can be traced back to the tradition of sociology of newswork, which focus on newsroom practices, relationships among actors involved in news production, organizational structures, and the norms and values underlying the news-making process (Belair-Gagnon, 2019). Although the historical foundations of this perspective can be traced to the classical works of Max Weber (1976) and the Chicago School (Hughes, 1940), since the end of World War II, the everyday interactions of newswork have become a central concern within sociology. These interactions have been examined through five major traditions that have emerged sequentially over time (Belair-Gagnon, 2019): (1) the gatekeeping approach, which foregrounds mechanisms of social control within the newsroom (Lewin, 1947; White, 1950); (2) the organizational approach, which emphasizes organizational structures, routines, and decision-making processes (Tuchman, 1978; Gans, 1979); (3) the political economy approach, which analyzes the impact of market forces and media ownership on news production (Herman & Chomsky, 1988; Bourdieu, 1998; Hallin & Mancini, 2004); (4) the cultural studies approach to news, which focuses on the social construction of news within relations of power (Hall, 2003; Revers, 2017); and (5) the network approach, which examines the incorporation of digital technologies into the newsroom and the resulting transformations of its ecosystem (Boczkowski, 2005; Anderson, 2013; Groves & Brown, 2015; Shokrkhah, 2018; Ferrucci et al., 2022).

Attention to the socialization of newsroom workers dates back to Warren Breed's seminal work (1955) within the early sociology of news. Breed explains that news organizations, in order to structure the news production process and ensure journalists' conformity to editorial policies, must socialize them effectively. In the organizational tradition, the work of Gravengaard and Rimestad (2014) is noteworthy. By combining newsroom ethnography, linguistic anthropology, conversation analysis, and theories of profession, they examine how journalism trainees become socialized into a particular professional culture and community of practice through interactions with editors.

Within the network approach, only a limited number of studies have directly addressed the socialization of newsroom personnel. For example, Singer (2004), working within the convergence approach and studying four converged newsrooms, argues that convergence acts as a catalyst that redefines the socialization of print journalists and disrupts their perceptions of their professionalism. Sylvie (2018) demonstrates how established roles within newsrooms are being reconfigured, with leadership shifting toward managerial functions and editorial roles evolving into facilitation. Sissons and Smith (2026), using discourse analysis of interactions among journalists in three newsrooms, explore how new technologies have reshaped the identities of newsworkers.

Research on the socialization of AI as a novel technological actor within the newsroom remains limited. Among the few existing studies, Dodds et al. (2025) highlight the managed integration of generative AI into everyday newsroom routines. Based on interviews with editors, journalists, and innovation managers, and grounded in a theoretical framework of professional authority, their study proposes mechanisms through which generative AI can be incorporated into a controlled manner into newsroom practices. Another pertinent contribution is provided by Collins (2025), who explores the socialization of natural and artificial intelligence at the societal level, but does not extend the analysis to the level of social institutions.

A review of the literature reveals that, regarding the nature of *socialized artificial intelligence*, no study has yet examined how an AI model becomes socialized to acquire a meaning-making role within a news organization. To address this theoretical gap, the present article adopts a combined organizational and cultural-studies perspective within the broader framework of the dual-spacization of the world to investigate this question.

3. Theoretical Framework

Dual-spacization of intelligence theory (Ameli, 2021) is situated within the broader paradigm of the dual-spacization of the world advanced by Saied Reza Ameli (2003a, 2003b). This paradigm conceptualizes phenomena as dual-spatial entities operating across two interconnected domains—the physical world and the virtual world—both of which have become integral

to everyday and professional practices (Ameli, 2011). Within this framework, the dual-spacization of the world entails the dual-spacization of intelligence itself, such that artificial intelligence, in parallel with human natural intelligence, extends and reconfigures human cognitive and feedback system across both spatial domains.

The theory provides both a theoretical model and a conceptual system for understanding the nature of artificial intelligence. Within its theoretical model, the defining axes of AI include:

1) The real–virtual nature of virtual space, within which an AI model is developed and which shapes the model's cognitive boundaries.

2) The applied contexts and the operational domain of AI, which are related to the limiting boundaries that ensure AI performance remains aligned with its function and and are based on the following dualities: A) Traditional vs. modern, referring to ethical codes; B) Local vs. global, referring to institutional capacities; and C) Real vs. virtual, referring to hardware, software, and data-related capacities based on modularity, layering, integration, data-drivenness, networked architecture, and algorithmicity (Ameli, 2021);

3) The interconnection between artificial and natural intelligence, may take one of the following modes: A) Exclusivity of physical-space capacities; B) Replication of physical-space capacities in virtual space; C) Integration of physical and virtual capacities; D) Replication of virtual-space capacities in physical space; and E) exclusivity of virtual-space capacities (Ameli, 2017). This relation and interconnection are determined based on the performance similarities and differences between human and artificial intelligence in relation to their function.

The conceptual system of dual-spatial intelligence is a triple classification system that operates on a real/virtual binary. In this system: placing "real" or "virtual" in the first slot refers to the nature of intelligence; placing "real" or "virtual" in the second slot refers to the operational domain of intelligence; and the third slot concerns the interconnection between intelligence in the virtual and physical worlds.

Table 1. Triple classification system of dual-spatial intelligence

Binary	Slot 1	Slot 2	Slot 3
Real	Intelligence perceived as real through sensory experience and producing real effects in the physical world	Intelligence operating in the physical world	Performance similarity between artificial and natural intelligence
Virtual	Intelligence understood as a mental or symbolic construct	Intelligence operating in the virtual world	Performance difference between artificial and natural intelligence

Since intelligence is defined as a "simple relationship between what we want, what we perceive, and what we do" (Russell, 2019, p. 21), the similarities and differences between natural and artificial intelligence are also understood within this framework. Goal formation is considered within the framework of Russell and Norvig's matrix (2022), encompassing systems that think/act like humans as well as systems that think/act rationally. World perception and computational and processing capacities are similarly considered core functions of intelligence. However, this article focuses on perception. Since world perception occurs in both natural and artificial cognitive systems during the process of representation, Stuart Hall's theory of representation has been employed within a socio-organizational approach.

Hall (2003, p. 15) defines representation as "the use of language to say something meaningful about, or to represent, the world meaningfully, to other people [within a culture]." He identifies three major approaches to how representation works through language (cited in Ameli & Merali, 2004): 1) Reflective, where language mirrors the inherent meaning of an object; 2) Intentional, where language imposes the speaker's intended meaning onto the world; and 3) Constructionist, where meaning is socially constructed or produced[1] through language and shared among members of a culture.

Hall (2003, p. 1) emphasizes the constructionist approach, viewing representation as the process that "connects meaning and language to culture". His framework centers on three key questions: Where is meaning constructed? How is meaning constructed and circulated? And Who determines and fixes meaning?

1. We use the terms construct and produce interchangeably when reffering to meaning

To address the first question, Hall (2003, pp. 3–4) introduces the "circuit of culture", explaining that meaning is produced and circulated at multiple sites—representation, identity, production, consumption, and regulation. Regarding the second question, he argues that members of a culture share common cultural codes, expressed through linguistic codes, enabling similar interpretations. These linguistic codes consist of material elements (such as sounds and words) that function as signs representing concepts, thereby enabling participants to encode and decode meaning. Hall draws on Saussure's sign–signifier–signified triad and Barthes' concept of second-order semiological systems, arguing that these relations are culturally, historically, and socially constructed (Nothias, 2020).

For the final question, Hall—drawing on Foucault's discourse theory—argues that discourses determine how people produce meaning and stabilize it (Hall, 1997). In Foucault's conceptualization, discourses are understood as modes of referring to or "constructing knowledge about a specific domain of practice: they constitute a cluster, or formation, of ideas, images, and practices that establish ways of speaking about, forms of knowledge concerning, and modes of conduct associated with a given topic, social activity, or institutional site within society" (cited in Hall, 2003, p. 6). Such statements collectively form a discursive formation that sustains particular institutional or political trajectories within a "system of dispersion." Importantly, discursive statements can only be produced by actors who possess the requisite positional authority to generate meaning (Hall, 1992, p. 202). Such formations ultimately establish a regime of truth, determining "… what knowledge is considered useful, relevant, and true in that context, and what sort of persons or subjects embody its characteristics" (Hall, 2003, p. 6). In media studies, Hall (1997, p. 20) argues that stereotypes function as mechanisms for fixing meaning. A stereotype is "a powerful way of circulating in the world a very limited range of definitions of who people can be, of what they can do, what are the possibilities in life, what are the natures of the constraints on them". Thus, the effort to break stereotypes means expanding the diversity of identities that individuals can experience or encounter.

In this article, the theoretical retroductive approach (Bygstad & Munkvold, 2011) is employed to address the research question. This approach, a qualitative and interpretive research strategy, aims at providing a "theoretical explanation that proceeds by description of significant features,

retroduction to possible causes, elimination of alternatives and identification of the generative mechanism or causal structure at work" (Bhaskar, 1998: xvii). Conducting research based on this approach typically unfolds in six steps: "1) description of the event; 2) identification of key components; 3) theoretical re-description (abduction); 4) retroduction (identification of candidate mechanisms); 5) analysis of selected mechanisms and outcomes; and 6) validation of explanatory power" (Bygstad & Munkvold, 2011, p. 5).

4. Findings

Before defining socialized AI, it is necessary to determine the function and meaning of socialness within a cognitive system. Researchers argue that the function of socialness in artificial intelligence is social order (Couldry, 2021). In classical studies, despite different approaches (Silver and Clark, 2008), two basic dimensions are typically proposed as pathways toward achieving social order: "coordination of actions", and "cooperation to attain common goals" (Hechter & Horne, 2009, p. 1). Additionally, conformity is proposed as "a solution to the problem of social order," emerging through socialization (Rydgren, 2008, p. 71).

The socialness of a natural cognitive system, drawing on a reinterpretation of Collins's (1998, p. 479) classical definition within the theoretical framework of this article, is defined as the capacity of a cognitive system to attain "social fluency" within one or more institutional discourses. Social fluency is further conceptualized, in alignment with Ludwig Wittgenstein's perspective (Magee, 2019; Collins, 2025), as the ability of a natural cognitive system to learn—through everyday life—the language and its practical applications for meaning-making in accordance with the role it occupies within the institutional division of labor. This learning process occurs through interactions both with members of a culture and with the "Originators" and "Speakers" of a given discourse (Hall, as cited in Griffin, 2012, p. 347). Accordingly, the socialization of a natural cognitive system refers to the processes through which it achieves social fluency. On the basis of this definition, two key propositions follow: 1) socialness pertains to collective tacit knowledge, that is, knowledge acquired through social experience; and 2) socialness is defined in relation to actors' social roles within institutional divisions of labor (Berger & Luckmann, 1966).

Within this perspective, a cognitive system does not become social merely by learning linguistic sign systems; rather, it must also learn how to use language as a tool in various social roles. Therefore, in this article, language is considered in two analytical dimensions: language as a tool and language as a sign. Learning language as a sign system enables members of a culture to share a common understanding of correctness and appropriateness within discursive formations and to engage in meaningful communication. Learning language as a tool, in turn, expands the range of activities that individuals can perform in different social roles. Moreover, language as a tool is not solely experiential; in educational processes, specialized terminologies emerge in the form of metaphors, images, humor, rumors, and other communicative devices that individuals acquire while learning professional skills (Breed, 1955; Berger & Luckmann, 1966; Talebi Tadi & Rastegar Khaled, 2025). Accordingly, the nature of socialized AI is articulated within the socio-organizational approach of the dual-spatial intelligence model.

4.1. Socialization of natural intelligence in the shared real world / socialization of AI in the possible datafied world

In the dual-spatial intelligence model, the cognitive resources of artificial and natural intelligence are intertwined. However, the worlds within which they become socialized are different. The socialization of natural intelligence takes place in a single physical world commonly shared by all members of the human species. By contrast, the socialization of artificial intelligence takes place within a datafied possible world that is constructed and regulated by humans through the selective extraction of data from the real world. Decisions concerning which data are selected are shaped by data acquisition processes that are, in turn, conditioned by factors such as data availability (IBM, n.d.), the technical, legal, security, political, and economic dimensions of data accessibility (Mohseni Ahooei, 2024; Salehi et al., 2026), algorithmic mechanisms that extract data from users on the basis of legibility (Gillespie, 2014), and socio-cultural patterns of participation as well as the representativeness of target populations (Ade-Ibijola & Okonkwo, 2023).

4.2. The applied contexts and operational domain of AI and Dual-spatial structural capacities of AI socialization

According to the dual-spatial intelligence model, the applied contexts and operational domains that guide the socialization of an artificial cognitive system toward social order are as follows:

Moral codes: An artificial intelligence model is socialized into a culture when it acquires that culture's moral codes at societal, institutional, and content levels. Moral codes establish what is true or false—or what is considered reality—in the real world (Collins, 2025). They correspond to the second-order semiotic system of that culture and, in accordance with representation theory, are produced and fixed through discourses and stereotypes.

Institutional considerations in the integration of AI into the value chain: The capacities of a public, private, or governmental institution that deploys an AI model within its value chain include: 1) procedures—structured patterns of recurrent processes within the institution; 2) principles of professional ethics—globally standardized normative statements about proper conduct within a profession, defined by professional bodies to safeguard public trust and credibility (Mackenroth, 2025); 3) corporate social responsibility—institutional commitments to society and the public interest, regulated by national legal frameworks.

Structural capacities regulating AI socialization in virtual space: Structural capacities include the hardware, software, and data that shape the social structure of the datafied world and define the applied contexts of socialized AI. Hardware capacities, the technical substrate of AI, include both immaterial elements such as protocols, standards, and security (Ameli, 2025), and material infrastructures such as digital connectivity, GPUs, semiconductors, and AI supercomputers (Tortoise, 2024). Software and data capacities are treated jointly because algorithms derive meaning only insofar as they are paired with databases; without such pairing, they remain "meaningless machines" (Gillespie, 2014: 4). Data must be gathered and prepared before algorithms can operate. Social considerations in data gathering were discussed earlier. Two social considerations arise in the context of data preparation: A) The logic of data categorization in databases based on the relational ontology of the datafied world: The ability to mentally categorize the world is a genetic capacity in humans, one with a long intellectual history (Hall, 1997; Shahghasemi, 2025). Moreover, societies have categorized data for millennia—for instance, through censuses—whose social implications for constructing reality and enabling state control have been recognized since the late twentieth century (Scott, 1998). It is also argued that in artificial cognitive systems, data categorization has the capacity to construct reality according to algorithmic logic (Cox, 2022). Scholars show

that relational database architectures produce a "relational ontology that understands data as atomized, regular, uniform and only loosely connected objects that can be ordered in a potentially unlimited number of ways at the time of retrieval" (Rieder, 2012; cited in Gillespie, 2014, p. 6). These data have no inherent meaning and only acquire significance when algorithms retrieve them through queries based on co-occurrence patterns. Here, in addition to algorithms, the ways in which databases are categorized, which data are placed in each category, and who decides how these categorizations are implemented all constitute powerful claims about truth in the world (Gillespie, 2014). B) soft and hard filtering of data: A second consideration involves integrating principles of professional ethics and corporate social responsibility into explicit "if–then" rule-based structures within the code. The two primary mechanisms of data preparation are: exclusion, which excludes certain data from training sets (hard filtering), and demotion, which reduces weights within neural networks (soft filtering) (Gillespie, 2014). The social dimension here concerns the engineers developing AI models. They become part of institutional work routines despite not necessarily possessing the specialized language, skills, or professional ethical knowledge of that institution. Consequently, cooperative goal-oriented work may rely on various forms of negotiated social agreement.

4.3. Dual-spatial processes of AI socialization in relation to natural intelligence

The socialness of a natural cognitive system can be understood a the aggregate learning of 1) language as natural signs and second-order signs, and 2) language as a tool. In a socio-organizational approach, this equation depends on the social distribution of knowledge and the social division of labor, where, at the intersection with social order, the social distribution of knowledge is linked to coordinative action, and the division of labor is connected to cooperation to attain common goals. Following Collins (2025), we designate language as natural signs as natural language, language as second-order signs as moral codes, and language as a tool as experience.

Accordingly, we define the relationship between natural and artificial socialization across three levels: primary, secondary, and tertiary socialization (Collins, 2025). The socialization processes are explained through three classical theories: Vygotsky's (1978) theory of cognitive

development at the individual level; Berger and Luckmann's (1966) theory of the social construction of reality at the institutional level; and Breed's (1955) model of newsroom socialization. These theories align with the conceptual foundation of this article by emphasizing the social origins of socialization.

It is also necessary, across all stages of socialization, to identify the assemblage that orients a natural or artificial cognitive system toward social order. Within the dual-spatial intelligence model, this assemblage consists of people, processes, things, and data (Ameli, 2025). Actor–Network Theory proposes a comparable configuration, comprising actors, actants, activities, and audiences (Lewis & Westlund, 2014). Table 4 illustrates the correspondence between these elements in the contexts of natural and artificial intelligence.

Table 4. Assemblage guiding the socialization of natural and artificial intelligence toward social order

<table>
<tr><th></th><th colspan="2">Natural Intelligence</th><th colspan="3">Artificial Intelligence</th></tr>
<tr><td rowspan="4">People</td><td>Society</td><td>dual-spatial societal members</td><td>Actors at societal level</td><td colspan="2">Audiences</td></tr>
<tr><td rowspan="3">Institutions</td><td>Responsible others/ Originators (e.g., news publishers)</td><td rowspan="3">Actors at institutional level</td><td colspan="2">Responsible others/ Originators</td></tr>
<tr><td rowspan="2">Significant others (e.g., newsroom staff)</td><td rowspan="3">Significant others</td><td>Speakers</td></tr>
<tr><td>AI specialists (intra/extra-institutional)</td></tr>
<tr><td></td><td>business professionals</td></tr>
<tr><td>Processes</td><td colspan="2">Job roles</td><td colspan="3">tasks of an AI model within institutional workflows</td></tr>
<tr><td>Things</td><td colspan="2">Things whose meaning is constructed through everyday dual-spatial interactions</td><td colspan="3" rowspan="2">Actants (algorithms, code, CMS, etc.)</td></tr>
<tr><td>Data</td><td colspan="2">Knowledge about the world and its stereotypes, mediated through language</td></tr>
</table>

4.4. The three stages of socialization of natural intelligence

This section outlines the three stages of natural intelligence socialization based on the dual-spacization of intelligence theory and a re-reading of representation theory.

Primary socialization of natural intelligence in the dual-spatial family: The socialization process of the natural cognitive system begins at birth and continues until the child enters school. In this stage, parents function as responsible others, drawing on the authority they derive from the discourse of the family institution. Based on various factors—including their social position, embodied hereditary social attributes, and their personal beliefs and experiences—they select and interpret aspects of the world for the child (Berger & Luckmann, 1966). According to social theories of intelligence, although the child is born with biological capacities for adapting to the social world, they cannot initially use linguistic signs and rely instead on biological eidetic imagery. Gradually, through interaction with parents, the child begins to use external action signs (Vygotsky, 1978). In the process of identification, the child subsequently internalizes the mental meanings of those external signs as interpreted by the parents (Tomasello, 1999). As development continues, the child learns the "native language" through repeatedly hearing stable descriptions of things by parents in various contexts. In this way, the child comes to believe in a stable world in which things are always described in the same way. This generates a sense of truth about the world, and later these "moral concepts" constitute the individual's "moral compass" throughout life (Collins, 2025: 1256). As a result, the truth-world internalized during primary socialization becomes highly resistant to collapse. Through identification with parents, the child likewise adopts their beliefs concerning social roles and thereby develops a coherent sense of self. Ultimately, the child becomes capable of co-creating new shared meanings with parents, marking the completion of primary socialization. As development continues and the child interacts with other significant figures, such as grandparents, consciousness progressively abstracts from truths tied to particular objects and role expectations toward more generalized societal truths and roles (Berger & Luckmann, 1966).

At this stage, what is crucial is that with the dual-spacization of the world, we now encounter the dual-spatial family (Ameli, 2011). In this new condition, two major transformations have occurred in the communicative system of the family: "the transformation of interactional space and social communication with the outside world; and the transformation of accessibility to the outside world on a global scale" (Ameli, 2011: 161). These shifts have produced cultural multiplicity within families, plurality of

culture-shaping sources inside the home, transformations in sources of personal self-understanding, the loss of wide shared cultural domains with the broader society, value relativization, individualization, and the expansion of independent personal spheres (Ameli, 2011). Together, they have three major implications for child socialization: 1) moral concepts within the family may no longer align with societal moral codes; 2) members of a dual-spatial society may hold heterogeneous moral concept systems; and 3) the expansion of independent personal spheres has shifted parent–child communication toward "communicative interactions" (Ameli, 2011: 162–163). In such a situation, the family's capacity to produce conformity is significantly challenged.

Secondary socialization of natural intelligence under conditions of global access: Secondary socialization begins when the individual enters school and continues until the end of the schooling period. During this stage, the individual acquires "written language" and "early technical concepts" (Collins, 2025: 1253). According to the cognitive development theory, some mental functions develop in school through collaboration with more capable peers and under the guidance of teachers. On this basis, learning the early technical concepts of any subject provides the foundation for more complex mental processes. Furthermore, through acquiring written language, the student masters linguistic symbols and meanings at the societal level (Vygotsky, 1987). Importantly, the foundational reality is what the individual internalized during childhood, and every subsequent content that becomes internalized is built upon this pre-existing reality (Berger & Luckmann, 1966). Students further acquire social stereotypes associated with their roles, along with the requisite social skills, through normative components, mechanisms of reward and punishment, and institutional rituals. These are transmitted through the ways teachers address them, their interactions with classmates and other students in the school, and their membership in various groups, all of which contribute to the construction of their identity (Collins, 2025).

At this stage, the dual-spacization of social structures has resulted in the global expansion of human development, worldwide pathways of access, human connectivity to all global capacities, networked linkage to all phenomena, and the translocalization of all levels of communication (Ameli, 2011). In such a world, on the one hand, various social institutions constantly compete to define the "truth" of the world from their own perspectives,

cultivating in the individual a heightened sense of the instability of meanings (Collins, 2025). On the other hand, individuals may join online subgroups outside their own society—or marginal subgroups within it—that operate with different moral codes. This can give rise to identity and cultural heterogeneity and hybrid identities (Ameli, 2011).

Tertiary socialization of natural intelligence in virtual work: Tertiary socialization begins when an individual enters university and continues until they attain a position in which they participate in meaning-construction within a specialized profession in an institutional subworld such as a news agency. In this stage, the individual first learns the "specialized language" and "professional skills" of a profession at the university from responsible others (academic instructors) and internalizes them through interaction with classmates (significant others). During the acquisition of professional skills, the student also learns the idioms, metaphors, and affective tones associated with that occupational role. Subsequently, upon entering an institutional subworld and interacting with responsible others (managers, senior staff) and significant others (colleagues), the individual learns—through various mechanisms—what counts as valid world knowledge and acceptable social stereotypes within that institutional discourse (Breed, 1955; Collins, 2025: 1253).

As noted earlier, in a dual-spatial world, social structures themselves have become dual-spatialized; thus, we encounter "virtual work". The concept of virtual work was first introduced in the paradigm of the dual-spacization of the world by Saeid Reza Ameli (2006a). In this paradigm, work in the virtual world transforms from an activity tied to a specific physical location into one detached from place, giving rise to the notion of remote work (Ameli, 2011: 293). In such a context, conformity may emerge in a "compliance" form—behavioral conformity (Rydgren, 2009: 85)—which we refer to as second-order conformity. Here, the individual adapts to certain discursive meanings in order to benefit from the advantages of belonging to an institutional subworld, such as income or occupational status.

4.5. Three stages of AI socialization

This section outlines the three stages of AI socialization based on the dual-spacization of intelligence theory and a re-reading of representation theory.

Primary socialization of AI and task- and goal-oriented prior configuration: Currently, the primary socialization of AI occurs in the form of prior configurations, that is, before a model is even constructed, its initial settings are established. Temporally, this process spans from the design phase for developing a model to the commencement of model learning. At this stage, institutional speakers, AI specialists, and business professionals (Lewis & Westlund, 2014) engage, prior to model construction, in agreements regarding the creation of a potential data world and the engineering of work processes, based on technological, legal, security, economic, political, and socio-cultural considerations, as well as on the intended tasks and objectives. At this stage, AI specialists, within the framework of a given proposal, construct a data world and configure actants. Since AI models are not inherently capable of directly understanding human natural language, they instead rely on a set of formal and computational languages. These languages function in a manner analogous to experimentation in human intelligence, serving as a means for the system to process and interpret information in a structured, computationally defined manner. At this stage, the professional ethical principles and organizational codes of social responsibility of the model developer and of the institutional sub-world in which the model is intended to perform a task are incorporated into the system in the form of explicit if…then instructions. The choice of learning paradigm is also crucial for embedding ethical codes. In a general typology, four kinds of data-driven learning exist: Supervised learning, unsupervised learning, semi-supervised learning and reinforcement learning (Sutton & Barto, 2014; Collins, 2025; Russell & Norvig, 2022; Danks, 2014).

Secondary Socialization of AI and Translocal Socialization: The second stage of AI socialization concerns model learning—when a model learns language (natural language and moral codes / syntax and semantics) and its uses in the real world from data so that it can produce meaning. At this stage, data enter the artificial neural network. For the network to process the input data must be converted into numerical form, a process carried out in the embedding layer. In this layer, textual, audio, or visual data are first broken into smaller meaningful units—such as words (or tokens) in textual data (Salehi et al., 2026). Each word is then represented as a numerical vector in a continuous vector space, where each number in the vector denotes a semantic feature corresponding to some dimension of knowledge about that data

(Keikha & Rahgozar, 2018; Babić et al., 2020). These vectors initially contain random numerical values; thus, they are arrays of meaningless numbers. Gradually, during model learning, their values are adjusted to become meaningful numerical representations (Yadav, 2024). This numerical adjustment is collective in nature, meaning that all elements of a data-world participate in the socialization of an artificial cognitive system. Other layers of the neural network are similarly constructed with randomly initialized weights among artificial neurons arranged in successive layers. Input data, in vector form, pass through these layers sequentially, and at each layer more complex patterns—such as syntactic structures or sentiment—are extracted. At the end of this process, the network produces an output, which is evaluated and accepted or rejected through direct, implicit, or reinforcement-based supervision (Collins, 2025). From this perspective, through weight adjustment and progressive pattern extraction, an artificial cognitive system learns human linguistic signs within the discursive configuration of the broader society from which the training data are derived. It is at this point that we may say the system has become socialized.

Accordingly, secondary socialization in AI is described as "translocal socialization" (Ameli, 2021)—meaning that the model begins to learn about the world based on training data from all societies that use the internet. Two points arise here: If the training data come from multiple societies and the learning paradigm is semi-supervised or unsupervised, then, because societies have different regimes of truth, what is considered acceptable about the world becomes entangled. Such entanglement is further intensified by structural epistemic asymmetries within global knowledge production. Drawing on interviews with Iranian sociologists, Hosseini and Sakhaei (2025) argue that AI systems are often experienced as carriers of dominant epistemologies while simultaneously functioning as sites of local reinterpretation and strategic agency. This tension between decontextualization and cultural specificity illustrates how AI socialization unfolds within hierarchically structured epistemic orders shaped by power, institutional infrastructures, and governance regimes. Additionally, Within each society, "core" and "Outliers" actors differ. Individuals with marginal behaviors or values may not be socially rewarded; however, on the internet it is often non-typical or unconventional views that gain traction. Hence, a model may statistically misclassify central versus marginal moral codes (Collins, 2025).

Tertiary socialization of AI and attaining an institutional position for meaning-construction: In the third stage, an artificial cognitive system is optimized or tuned to produce meaning within an institutional sub-world, such as a news organization, through learning institution-specific moral codes. Technically, during this process, the model's internal weights and parameters are re-adjusted based on the specialized data and textual content of that institutional sub-world. If the model is pre-trained, the professional ethical principles and organizational responsibility codes of that institutional domain—explicit knowledge—are incorporated into the computational framework. As a result, the model learns the institutional language and its specific applications within a distinct discursive sub-world. With the emergence of large language models, prompt engineering—alongside fine-tuning—has gained increasing attention as a key approach for the socialization of artificial intelligence models.

5. Discussion: Dual-spatialized representation within the circuit of culture

As noted, the relationship between natural and artificial intelligence is determined based on the similarities and differences in their performance in achieving social order, and conformity is proposed as the solution to the problem of social order. In the socio-organizational approach, conformity is defined as the reproduction of meanings within a discursive configuration through representational processes by all members of a culture who hold institutional positions in meaning production. With regard to the socialness of a natural cognitive system that occupies a position of institutional authority in meaning-making within a discourse, social order is defined as the representation of the world—or the act of giving meaning to the world—through language, in a manner aligned with the originators and speakers of that discourse who, within a particular historical moment and institutional location, possess the authority to construct meaning.

Thus far, the nature of socialized artificial intelligence has been explained, and its components are shown in the figure below.

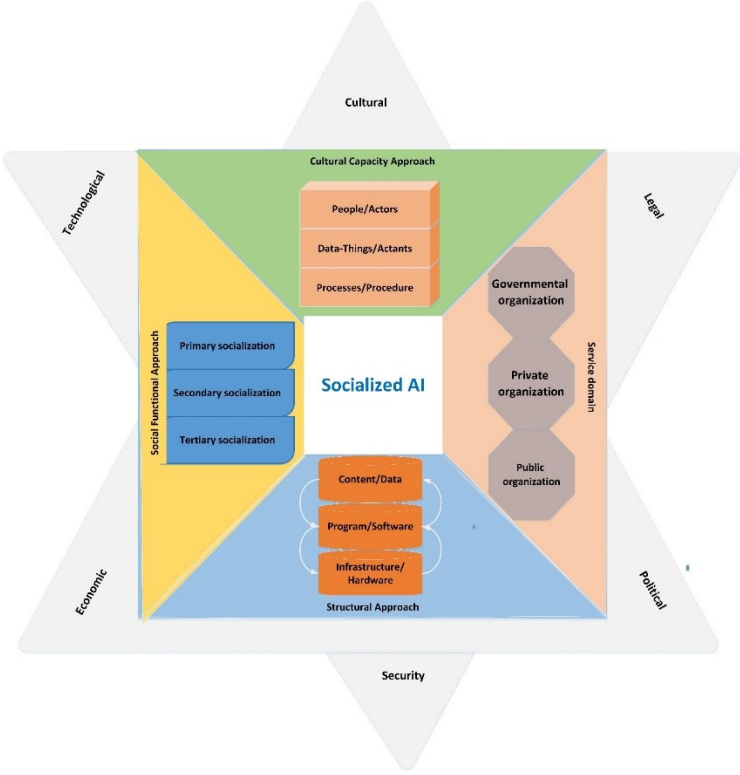

Figure 1. An integrated model of the socialization of AI

As previously stated, the representation of the world occurs through language. Given that language, according to representation theory, consists of practices and circulates meaning within the circuit of a culture through meaning-circulation systems—such as the media (Hall, 2003)—and since language serves a mediating role that, based on its philosophical foundations, is related to behavioral change (Vygotsky, 1978), it is thus a means by which the social actions of members of a culture can be coordinated around shared meanings oriented toward attaining common goals.

On the other hand, several scholars have demonstrated how governments and corporations attempt to reconstruct social reality through engineered processes of datafication, aligning it with their own interests and naturalizing these constructions (Couldry, 2021, pp. 11 & 13). Within the theoretical framework of this article, we also show that world-representation is not

confined to natural language within natural cognitive systems; rather, AI algorithms are new actants that become socialized in order to produce meaning in ways that resemble human meaning-making. The relationship between these two meaning-producing systems is articulated at the intersection of the two axes of social order shown in the table below.

Table 6. Relationships in the socialization of natural and artificial intelligence across the intersecting axes of social order

Axes of social order	Functional Relationships of the Socialization of Natural and Artificial Intelligence
Coordination of actions concerning the social distribution of knowledge through language	Gradual bio-cultural learning of natural language / task-oriented initial selection and configuration of formal-computational languages in artificial intelligence
	Gradual learning of moral codes/ Initial integration of professional ethics and corporate social responsibility into the computational codes
	Hard internalization of moral norms/ Soft integration of ethical codes through computational configurations
	Gradual learning of written and instrumental language/ Gradual adjustment of numerical codings of linguistic signs and neural network weights
	Local secondary socialization/ Translocal secondary socialization
	Learning specialized institutional language and skills/ Institutional fine-tuning based on re-adjusting numerical vectors and weights
Cooperation to attain common goals regarding algorithmic social division of labor	Early-life selection from the shared real world/ Prior, consensual selection from possible data worlds

This table confirms that we are dealing with a dual-spatialized social order, meaning that within a given institutional discourse and under specific historical conditions, the construction of meaning through AI algorithms resembles the construction of meaning through natural language by human actors who hold institutional authority in producing meaning.

Coordination of actions: Regarding language as a tool, since algorithms are developed and employed for "action and transformation" (Burgin, 2007: 2), they consist of practices and possess the power to shape behavior. They produce meaning and circulate it within the circuit of culture, thereby fixing

shared meanings about the proper and natural discursive use of things in the world—whether persons, objects, or events—across everyday life situations. Consequently, they exert real effects on the actions of members of a culture. Accordingly, within representation theory, algorithms have entered the circuit of culture and have acquired a position within the representational processes of this circuit. Since representational processes involve meaning-construction through both natural language and engineered algorithms, and since the sources of knowledge for both natural and artificial cognitive systems have become interwoven, representational processes within the circuit of culture have thus become dual-spatialized. On the other hand, the embedding of affective nuances in algorithms—such as emotions, commitments, concerns, and other culturally human considerations—depends on advances in software domains. Many scholars argue that current AI models still lack these human aspects, though substantial efforts are underway (Denning & Rousse, 2024; Janhonen, 2025). With language understood as a system of signs, the table above demonstrates that artificial cognitive systems, through numerical representation and the adjustment of weights in neural networks, are able to learn linguistic signs and their uses from data produced by members of society or institutional sub-worlds, thereby simulating human understanding. Nevertheless, the table also indicates that the socialization of AI does not depend exclusively on tacit knowledge. In defining the socialness of natural intelligence, we showed that socialness is fundamentally linked to tacit knowledge. However, artificial cognitive systems, which are developed and operate primarily within domains of engineered intentionality and lack lived social experience in the real world, require explicit knowledge in addition to tacit knowledge to perform in ways comparable to humans.

Accordingly, the socialness of an artificial cognitive system is defined as the system's capacity to acquire social fluency within an institutional discourse. Social fluency refers to the ability of an artificial cognitive system to learn linguistic signs and their uses from the data of societal members and from the data of originators and speakers within that institutional discourse, and to have its algorithms adjusted in accordance with the professional ethical codes and organizational social responsibility norms of that institutional sub-world.

Cooperation to attain common goals: Artificial cognitive systems constitute new speakers who have acquired institutional positions in meaning production within a sub-world. Since their design, development, and optimization occur collectively through the contributions of multiple actors, each possessing different specialized languages and technical skills, the agreements established among these actors can orient the performance of an artificial cognitive system in directions analogous to the performance of a natural cognitive system.

6. Conclusion: Socialized AI as a Provider of the Common Good and a Stable and Just Social Order

In this article, within the framework of the dual-spatial intelligence model and through a re-reading of representation theory in the socio-organizational approach, we examined the nature of socialized AI. Ultimately, we define this concept within the theoretical system of dual-spatial intelligence. Within this theoretical system: a) In the first slot, since AI algorithms, as tools, exert real effects on society, we focus primarily on the "real" within the real–virtual binary. b) In the second slot, because the practical domain in which AI becomes socialized is the virtual domain, the "virtual" side of the real–virtual binary takes center stage. c) In the third slot, since AI socialization occurs through the tacit knowledge of the society affected by AI and the explicit knowledge of institutions, one dimension of "socialness"—i.e., learning language as sign—is based on the performance similarity between natural and artificial intelligence. The other dimension—language as tool—is based on their performance difference. Accordingly, in the first case, we select "real" from the real–virtual binary, and in the second case, we select "virtual" dimension. Thus, socialized AI, in its sign-based linguistic dimension, is real–virtual–real, whereas in its tool-based linguistic dimension, it is real–virtual–virtual— half social and half regulatory.

On this basis, the socialness of AI is equivalent to the combination of: 1) social learning of language as both natural signs and second-order signs, and 2) the technical regulation of language as a tool, which is shaped by the division of labor (both), society's tacit knowledge (first), and institutions' explicit knowledge (second). Based on this, the application of current large language models at the level of institutions, without socialization in the third stage, would disrupt the social order of institutional discourse.

Within this framework, it appears that the most consequential decision in developing any AI model—whether deep learning-based or large-language-model-based—concerns its purpose. We must answer whether an artificial cognitive system should be socialized and regulated in a way that reproduces world knowledge and existing stereotypes in the traditional manner, thereby performing similarly to humans; or whether it should be socialized and regulated in a manner that delivers a form of rationality oriented toward the common good, and a sustainable and just social order. On this basis, a sustainable and just social order is grounded in algorithmic rationality, which enables the opening of the practice of dual-spatial representation. This process requires entering into social stereotypes themselves, subverting, opening up, and exposing them from within, which can influence the transformation of representational practices along the path of identity diversity. Indeed, AI is developed by the cultural and social ecosystems of societies. Certainly, many governments seek a civilizational, ethical, and perfectionist orientation in the quality of using emerging technologies, and many have succeeded in creating ethically regulated structures for the use of new technologies in general and AI in particular.

Furthermore, given the intertwining cognitive resources between natural and artificial intelligence and the continuous interaction between the two, human intelligence is evolving through its engagement with artificial intelligence, which possesses a high capacity for leveraging encoded variables. This trend has produced a new trajectory of hybrid human–machine capabilities. Accordingly, it seems that social institutions such as news media, in order to preserve institutional social order, should shift toward hybrid approaches that combine symbolic AI with data-driven AI.

Given the focus of this study on representational processes and the rules and regulations within the cultural circuit, other research avenues are suggested for the theoretical and practical development of this field. These include investigating the role of social artificial intelligence in other points of the cultural circuit, such as production, consumption, and identity. Furthermore, conducting an analysis aimed at assessing whether the meaning construction within meaning-making institutions is moving toward rationality or merely reproducing the status quo in the representation of social stereotypes can provide a realistic picture of the current state.

Bibliography

Ade-Ibijola, A., & Okonkwo, C. (2023). Artificial intelligence in Africa: Emerging challenges. In D. O. Eke et al. (Eds.), *Responsible AI in Africa. Social and Cultural Studies of Robots and AI* (pp. 101–117). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-08215-3_5

Ameli, S. R. (2003a). Two globalizations and the future of the world. *Ketāb-e Māh-e Oloume Ejtemā'i*,(69–70), 15–28. [In Persian]

Ameli, S. R. (2003b). Two globalizations and an international community of anxiety. *Journal of Social Science,* 21, 143–174. [In Persian]

Ameli, S. R. (2011). *Globalization studies, dual spacitizations, & dual globalization*. Tehran, Iran: The R&D Research Center of SAMT. [In Persian]

Ameli, S. R. (2017). *Philosophy of virtual space*. Amir Kabir Publishers. [In Persian]

Ameli, S. R. (2021). Artificial intelligence: Its nature, philosophy, and significance. *Rāhavard-e Noor*, 20(77), 15–22. [In Persian]

Ameli, S. R. (2023, February 27). Dual-spacization of communications, artificial intelligence, and the emergence of new computational diplomacy. Paper presented at *the Artificial Intelligence and New Diplomacies Conference*, Iranian World Studies Association and University of Tehran.

Ameli, S. R. (2025). *Strategic studies of Islamic Republic of Iran's cyberspace*. Amir Kabir Publishers. [In Persian]

Ameli, S. R., & Merali, A. (2004). *British Muslims' expectations of the government: Dual citizenship – British, Islamic or both; obligation, recognition, respect, and belonging*. Islamic Human Rights Commission.

Ameli, S. R., Nazemi, S., & Sabbār, S. (2024). Dual-spacization and the representation of national identity on Instagram. *Journal of Iranian Cultural Research*, 17(4), 5–30. https://doi.org/10.22035/jicr.2024.3367.3632 [In Persian]

Anderson, C. W. (2013). *Rebuilding the news: Metropolitan journalism in the digital age*. Temple University Press.

Babić, K., et al. (2020). Survey of neural text representation models. *Information*, 11(11), 511. https://doi.org/10.3390/info11110511

Beckett, C., & Yaseen, M. (2023). *Generating change: A global survey of what news organisations are doing with AI.* The London School of Economics and Political Science.

Belair-Gagnon, V. (2019). Sociology of news work. In T. P. Vos & F. Hanusch (Eds.), *The international encyclopedia of journalism studies.* John Wiley & Sons, Inc.

Berger, P. L., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Anchor Books.

Bhaskar, R. (1998). General introduction. In M. S. Archer et al. (Eds.), *Critical Realism: Essential Readings* (pp. ix–xxiv). Routledge.

Boczkowski, P. (2005). *Digitizing the news: Innovation in online newspapers*. The MIT Press.

Bourdieu, P. (1998). *On television and journalism*. Pluto Press.

Breed, W. (1955). Social control in the newsroom: A functional analysis. *Social Forces*, 33(4), 326–335. https://doi.org/10.2307/2573002

Burgin, M. (2007). Languages, algorithms, procedures, calculi, and metalogic. *arXiv*. https://arxiv.org/abs/math/0701121

Bygstad, B., & Munkvold, B. E. (2011). In search of mechanisms: Conducting a critical realist data analysis. In *Proceedings of the Thirty-Second International Conference on Information Systems*, Shanghai.

Bytiak, Y. P., Danilyan, O. G., Dzeban, A. P., Kalinovsky, Y. Y., & Chalapko, V. V. (2020). Information society: the interaction of tradition and innovation in communicative processes. *Amazonia Investiga*, *9*(27), 217-226. https://doi.org/10.34069/AI/2020.27.03.23

Collins, H. (1998). Socialness and the undersocialised conception of society. *Science, Technology, & Human Values*, 23(4), 494–516. https://doi.org/10.1177/0162243998023004

Collins, H. (2025). Why artificial intelligence needs sociology of knowledge: Parts I and II. *AI & Society*, 40, 1249–1263. https://doi.org/10.1007/s00146-024-01954-8

Couldry, N. (2021). The social construction of reality—really! In D. Herbert & S. Fisher-Høyrem (Eds.), *Social Media and Social Order* (pp. 10–16). De Gruyter.

Cox, J. B. (2022). Black Lives Matter to media (finally): A content analysis of news coverage during summer 2020. *Newspaper Research Journal*, 43(2), 155–175. https://doi.org/10.1177/07395329221092719

Danks, D. (2014). Learning. In K. Frankish & W. M. Ramsey (Eds.), *The Cambridge handbook of artificial intelligence* (pp. 151–167). Cambridge University Press.

Denning, P., & Rousse, B. (2024). Can machines be in language? *Communications of the ACM*, 67(3), 32–35. https://doi.org/10.1145/3637629

Dodds, T., et al. (2025). On controlled change: Generative AI's impact on professional authority in journalism. *arXiv*. https://arxiv.org/abs/2510.19792

Ferrucci, P., et al. (2022). *The institutions changing journalism: Barbarians inside the gate*. Routledge.

Fin, E. (2017). *What algorithms want: Imagination in the age of computing*. The MIT Press.

Gans, H. (1979). *Deciding what's news*. Pantheon Books.

Gillespie, T. (2014). The relevance of algorithms. In T. Gillespie et al. (Eds.), *Media technologies: Essays on Communication, Materiality, and Society* (pp. 167–193). MIT Press.

Goffey, A. (2008). Algorithm. In M. Fuller (Ed.), *Software studies: A lexicon* (pp. 15–20). MIT Press.

Gravengaard, G., & Rimestad, L. (2014). Socializing journalist trainees in the newsroom: On how to capture the intangible parts of the process. *Nordicom Review*, 35(Special Issue), 81–95. http://hdl.handle.net/2077/37339

Griffin, E. M. (2012). *A first look at communication theory* (8th ed.). McGraw Hill.

Groves, J., & Brown, C. (2015). *Transforming newsrooms: Connecting organizational culture, strategy, and innovation*. Routledge.

Hall, S. (1992). The West and the rest: Discourse and power. In *Essential Essays* (Vol. 2, pp. 185–224). Duke University Press.

Hall, S. (1997). *Representation & the media*. Media Education Foundation.

Hall, S. (2003). The work of representation. In S. Hall (Ed.), *Representation: Cultural representations and signifying practices* (pp. 13–74). SAGE.

Hallin, D. C., & Mancini, P. (2012). *Comparing media systems: Three models of media and politics*. Cambridge University Press.

Halpin, H. (2025). Artificial intelligence versus collective intelligence. *AI & Society*, 40, 4589–4604. https://doi.org/10.1007/s00146-025-02240-x

Hechter, M., & Horne, C. (2009). *Theories of social order* (2nd ed.). Stanford University Press.

Herman, E., & Chomsky, N. (1988). *A propaganda model*. https://chomsky.info/consent01/

Hohenstein, J., Kizilcec, R. F., DiFranzo, D., Aghajari, Z., Mieczkowski, H., Levy, K., ... & Jung, M. F. (2023). Artificial intelligence in communication impacts language and social relationships. *Scientific Reports*, 13(1), 5487. https://doi.org/10.1038/s41598-023-30938-9

Hosseini, S. H., & Sakhaei, S. (2025). Educating intelligence, producing power: Iranian sociologists on AI, knowledge production, and global hierarchies. *Journal of World Sociopolitical Studies*, *9*(4), 887-921.

Hughes, H. M. (1940). *News and the human interest story*. The University of Chicago Press.

Huh, M., Cheung, B., Wang, T., & Isola, P. (2024). The Platonic Representation Hypothesis. In *Proceedings of the 41st International Conference on Machine Learning* (Vol. 235, pp. 20617–20642). PMLR. https://doi.org/10.48550/arXiv.2405.07987

IBM. (n.d.). *What is AI agent perception*. https://www.ibm.com/think/topics/ai-agent-perception

Janhonen, J. (2025). Socialisation approach to AI value acquisition: Enabling flexible ethical navigation with built-in receptiveness to social influence. *AI Ethics*, 5, 527–553. https://doi.org/10.1007/s43681-023-00372-8

Keikha, A. A., & Rahgozar, M. (2018). Link prediction on social networks based on deep learning. In *Proceedings of the 4th International Conference on Web Research (ICWR).*

Kubin, E., & Von Sikorski, C. (2021). The role of (social) media in political polarization: a systematic review. *Annals of the International Communication Association*, *45*(3), 188-206. https://doi.org/10.1080/23808985.2021.1976070

Lewin, K. (1947). Frontiers in group dynamics: Concept, method and reality in social science; social equilibria and social change. *Human Relations*, 1(1), 5–41. https://doi.org/10.1177/001872674700100103

Lewis, S. C., & Westlund, O. (2015). Actors, actants, audiences, and activities in cross-media news work: A matrix and a research agenda. *Digital Journalism, 3*(1), 19–37. https://doi.org/10.1080/21670811.2014.927986

Mackenroth, K. S. (2025). *Ethics, morals and the professional*. Professional Landmen's Association of New Orleans.

Magee, B. (2019). *The story of philosophy* (H. Kamshad, Trans.). Tehran: Nashreney. [In Persian]

Mohseni Ahooei, E. (2024). The datafied society: Challenges and strategies in big data research for social sciences and humanities. *Journal of Cyberspace Studies*, 8(2), 177–207. https://doi.org/10.22059/jcss.2024.378294.1106

Nothias, T. (2020). Representation and journalism. In J. F. Nussbaum & M. Powers (Eds.), *Oxford research encyclopedia of communication.* Oxford University Press. https://oxfordre.com/communication/view/10.1093/acrefore/9780190228613.001.0001/acrefore-9780190228613-e-868

Nourbakhsh, Y., & nemati, S. F. (2020). Educational Impacts and Outcomes of Cyberspace in the Realization of New Islamic Civilization. *Scientific Journal Of New Islamic Civilization Fundamental Studies*, 3(2), (Serial 6), 12-376. https://doi.org/10.22070/nic.2021.14018.1079

Oliveira, N., Li, J., Khalvati, K., Barragan, R. C., Reinecke, K., Meltzoff, A. N., … Rao, R. P. N. (2025). Culturally-attuned AI: Implicit learning of altruistic cultural values through inverse reinforcement learning. *PLOS ONE*, 20(12), Article e0337914. https://doi.org/10.1371/journal.pone.0337914

Revers, M. (2017). *Contemporary journalism in the US and Germany*. Palgrave Macmillan US.

Rohlinger, D. A. (2022). *Society and new media* (M. Pourrajabi & H. R. Bijani, Trans.). Tehran: Naqd-i Farhang. [In Persian]

Russell, S. (2019). *Human compatible: Artificial intelligence and the problem of control*. Viking.

Russell, S. J., & Norvig, P. (2022). *Artificial intelligence: A modern approach* (4th ed., Global edition). Pearson.

Rydgren, J. (2008). Conformity. In W. A. Darity (Ed.), *International encyclopedia of the social sciences* (pp. 71–73). Macmillan.

Sabbar, S. and Matheson, D. (2019). Mass Media vs. the Mass of Media: A Study on the Human Nodes in a Social Network and their Chosen Messages. *Journal of Cyberspace Studies*, *3*(1), 23-42. https://doi.org/10.22059/jcss.2019.271467.1031

Salehi, K., Habib Zadeh Khiyaban, S., Sabbar S. (2026). Artificial Intelligence and Crime Detection: A Critical Review. *Cyberspace Studies. 10*(1), 181-197. https://doi.org/10.22059/jcss.2025.402206.1179

Schatzki, T. R. (2025). The Changing Forms of Social Phenomena Today. *Philosophy & Technology*, *38*(1), 19. https://doi.org/10.1007/s13347-025-00853-0

Scott, J. C. (1998). *Seeing like a state: How certain schemes to improve the human condition have failed*. Yale University Press.

Shahghasemi, E. (2025). 'Woke' in translation: Persian perspectives on Platform X. *Discover Global Society*, *3*(104). https://doi.org/10.1007/s44282-025-00253-x

Shahghasemi, E. (2025). AI: A human future. *Journal of Cyberspace Studies*, 9(1), 145–173. https://doi.org/10.22059/jcss.2025.389027.1123

Shahghasemi, E., Gholami, F., & Alikhani, Z. (2025). Global patterns of social media use and political sentiment. *Discover Global Society, 3*(1), 36. https://doi.org/10.1007/s44282-025-00171-y

Shokrkhah, Y. (2018). *Cyber journalism: Newsroom versus traditional journalism* [In Persian]. Tehran: Sanieh Press.

Silver, D., & Clark, T. N. (2008). Social theory. In W. A. Darity Jr. (Ed.), *International Encyclopedia of the Social Sciences* (2nd ed.). Course Technology Cengage Learning.

Singer, J. B. (2004). More than ink-stained wretches: The resocialization of print journalists in converged newsrooms. *Journalism & Mass Communication Quarterly*, 81(4), 838–856. https://doi.org/10.1177/107769900408100408

Sissons, H., & Smith, P. (2026). *The "socially networked" newsroom: Journalists and their discourses of digital communication*. Bloomsbury Academic.

Sokol, K., & Flach, P. (2024). Interpretable representations in explainable AI: From theory to practice. *Data Mining and Knowledge Discovery*, 38, 3102–3140. https://doi.org/10.1007/s10618-024-01010-5

Sutton, R. S., & Barto, A. G. (2014). *Reinforcement learning: An introduction* (1st ed.). MIT Press.

Sylvie, G. (2018). *Reshaping the news, community, engagement, and editors*. Peter Lang.

Talebi Tadi, M., & Rastegar Khaled, A. (2025). A comparative study of the theory of social understanding of the text and discourse analysis theories. *Journal of Interdisciplinary Studies in the Humanities*, 17(3), 101-125. https://doi.org/10.22035/isih.2025.5261.5002

Tomasello, M. (1999). *The cultural origins of human cognition*. Harvard University Press.

Tortoise. (2024). *The global AI index*. https://www.tortoisemedia.com/data/global-ai#data

Tuchman, G. (1978). *Making news: A study in the construction of reality*. The University of Michigan Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Weber, M. (1976). Towards a sociology of the press. *Journal of Communication*, 26(3), 96–101. https://doi.org/10.1111/j.1460-2466.1976.tb01910.x

White, D. M. (1950). The "gate keeper": A case study in the selection of news. *Journalism Quarterly*, 27(4), 383–390. https://doi.org/10.1177/107769905002700403

Yadav, A. (2024). How does embedding layer work? *Medium*. https://medium.com/biased-algorithms/how-does-embedding-layer-work-eafb1c721302

Yıldız, D., & Nur, Z. (2024). Transformation of social interaction in the digital age: Impact, challenges, and prospects of technology in social relationships. *Bulletin of Science, Technology and Society*, *3*(3), 49-54. https://inti.ejournalmeta.com/index.php/inti/article/view/95