

Communication: The Trajectory from Cybernetics to Semiotics

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Abstract

‘Communication’ is a fluid and elusive term that resists precise definition, largely because numerous disciplines lay claim to it and intersect across its conceptual and practical domains. Human beings have communicated since antiquity, as their social nature requires; however, the scientific conceptualisation of communication and its establishment as a distinct object of study are relatively recent when compared with its long history as an interpersonal practice. The difficulty of defining the field and establishing stable, theoretically grounded research mechanisms arises from several factors, most notably the enormous technological expansion that has transformed the world into a space structured by virtual dimensions. In this world, the machine occupies a central position, while communication assumes an equally prominent role, a duality anticipated by the emergence of cybernetics in the 1940s. To clarify the considerable intellectual momentum surrounding the field, this study offers a concise diachronic survey of the principal stages through which communication studies have developed and seeks to explain their present configuration.

Keywords: semiotics; communication; cybernetics; communication semiotics.

Introduction

The concept of communication is difficult to encompass within a single comprehensive definition because of the multiplicity of the fields of knowledge that have addressed it and sought to confer scientific legitimacy upon it. Its study extends from machine-based transmission and encoding to the humanities, anthropology, psychology, literature, economics, political science, media studies, and communication studies. The concept is therefore flexible and acquires different definitions according to the disciplinary context in which it is used.

To clarify this point, several definitions of communication may be considered.¹ These definitions naturally vary according to the theoretical and disciplinary perspectives from which they are formulated. Manal Talaat Mahmoud defines communication, in its general scientific sense, as “the transmission of information, facts, ideas, opinions, and feelings. Communication is a vital human activity, and the need for it continues to grow.”² Didier Anzieu and Jacques-Yves Martin define it as “the totality of the physical and psychological processes through which one or more persons the sender or senders are brought into relation with one or more persons the receiver or receivers with a view to achieving particular objectives.”³ From a more mechanistic perspective, Joseph A. DeVito maintains that communication occurs when messages are sent and received or when meaning is assigned to

another person's signals; it is never entirely free from noise, takes place within a context, produces effects, and allows for feedback.⁴ Phillip K. Tompkins and Elaine Vanden Bout Anderson, by contrast, define communication in relation to the recognition of others: "Communication is a process that cannot occur or be realised without legitimising the actions of others and attributing meaning and purpose to them."⁵

Charles Horton Cooley offers a more comprehensive definition, describing communication as "the mechanism through which human relations exist and develop," including the symbols of the mind and the means of conveying them across space and preserving them through time, from facial expression, gesture, and tone of voice to words, writing, printing, railways, telegraphs, telephones, and subsequent media.⁶ His definition is distinguished by its breadth and by its departure from narrowly mechanistic accounts.

Human understandings of communication have evolved throughout history, and a diachronic approach helps to trace this development and to clarify both the expansion of the field and its earliest foundations. This study does not claim to encompass every dimension of communication; rather, it seeks to offer points of orientation that may prepare the ground for further research in this complex and multifaceted domain.

Communication: The Beginnings of Its Study and the Expansion of Its Scope

Communication studies developed through three principal stages. The first centred on mass communication and media influence; the second focused on interpersonal communication, information transmission, and the reliability of signals and messages; and the third turned towards linguistics and semiotics, treating communication as signifying behaviour organised through signs. Figure 1 traces this development and identifies several of its leading figures.

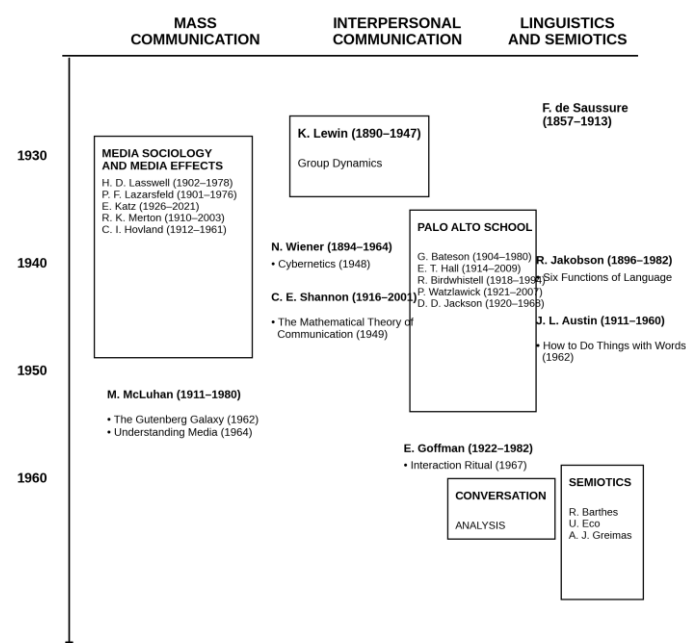


Figure 1. Development of the principal traditions in communication studies. Adapted from Cabin and Dortier.⁷

The Development of the Concept of Communication and Its Fields of Study

After a long and eventful trajectory, communication entered the domain of semiotic studies, where it came to be examined as a mechanism through which meaning is conveyed by means of particular media and codes and interpreted within a given referential context. How, then, did these two fields converge?

Semiotics occupies a central place in many disciplines because it provides a means of understanding the world. It is not limited to spoken language but encompasses the full range of human expression. Since human activity is grounded in communication, semiotics is closely associated with communication as a symbolic activity organised through signs. By describing and interpreting signs, semiotics deepens the understanding of meaning and thereby explains the close affinity between the two fields.

The preceding account explains why the fields touch, but it does not remove the need to trace the earliest stages of their encounter. Jean-Jacques Boutaud addresses this history in an article on the relationship between semiotics and communication, describing it as “a misunderstanding that turned out well.”⁸ The relationship was initially uneasy, but the two fields gradually opened towards one another. By the mid-twentieth century, communication research had developed principally along two overlapping lines.

The first followed a critical orientation centred on the concept of mass culture, whereas the second examined mass media quantitatively and as autonomous objects of analysis.⁹ The medium united these two currents: both approached communication through the Shannon–Weaver model, information theory, and the effects of the media on audiences. Their approaches were therefore predominantly mathematical and mechanistic.

The neglect of meaning limited these approaches. As Boutaud observes, semiotics enabled the shift from a “signal paradigm” to a “meaning paradigm.” During the 1950s and much of the 1960s, communication studies struggled to free themselves from information theory, which reduced communication to the mechanical transmission of information.¹⁰ Earlier models described the principal elements of transmission and the communicative process in considerable detail. Still, they lacked an account of “the modes through which meaning is produced and understood by analysing the message, where exchanges and oppositions take shape. The semiotic approach makes such analysis possible by providing tools for examining the form and meaning of messages and their environment.”¹¹ Through work conducted under the “meaning paradigm,” that is, the study of communication from the perspective of content communication studies, borrowed concepts from semiotics and acknowledged the originality of semiotic inquiry into communicative messages.

Developments within semiotics followed a comparable path. Derived from linguistics, early semiotics sought to locate itself within a world in which “it was natural for semiotics initially to return to linguistics, where it always perceived signs, but only within linguistic systems. Consequently, semiotics remained confined for a long time to the study of linguistic corpora; it was necessary to await communication before the latter could become ‘an indispensable point of reference for a more open and pragmatic conception of meaning.’”¹² Because semiotics is concerned with meaning, it cannot confine itself to describing or

understanding meaning in and for itself. It must also examine the production of meaning, its source and its reception, without neglecting the social and cultural contexts of signification. Such pragmatic openness is inconceivable without communication. The convergence of semiotics and communication therefore resulted from the internal development of both fields, as well as from the broader development of human inquiry and its aspiration to understand emerging phenomena.

Communication: Intersecting Fields and the Definition of the Concept

Communication has acquired increasing importance as both a practice and a term. Its meaning varies according to the context in which it is used, raising a fundamental question concerning its nature. As Philippe Breton and Serge Proulx argue, the study of communication has therefore become unavoidable.¹³

Although the term has long been in use, its modern meanings did not become clear until approximately the middle of the twentieth century. The fact that communication did not emerge as a distinct field of study until the twentieth century does not mean that communicative practices and phenomena were absent earlier; human beings have always communicated. Defining this domain of knowledge consequently requires the resources of more than one discipline, and semiotics is not merely present among them but may be one of the most prominent.

The various disciplines that intersect with communication studies converge upon communication itself as their object of inquiry. Research into this object is therefore “multidisciplinary research characterised by diverse and branching paths.”¹⁴

Scientific knowledge is founded upon the definition of an object of inquiry, while its procedural dimension depends upon the selection of an appropriate methodology. The pioneers of communication studies adopted diverse methods shaped by their disciplinary backgrounds, including sociology, linguistics, mathematics, and psychology. This produced a plurality of methodologies. Moreover, “the specificity of the questions that make it possible to interpret the complex developments of communication presupposes recourse to a plurality of methods generally employed by disciplines that scientific classification has distinguished and bounded.”¹⁵

Because communication is a field in which numerous branches of knowledge intersect, it can apply diverse methodologies to the study of its problems and pursue a measure of comprehensiveness by drawing selectively upon a large body of knowledge. Given the prominence attained by communication studies and the breadth of their intellectual ambition, it is legitimate to ask whether a general theory of communication is possible, where such a theory might be located, and whether a multidisciplinary perspective is genuinely beneficial.

The intersection of the human sciences within communication studies may be expressed through the concept of interdisciplinarity (*interdisciplinarité*). This approach has become established among many communication scholars because it enables methods from different fields to be connected and brought into interaction around specific lines of inquiry.¹⁶ Its purpose is to investigate signs across a variety of paths and contexts.

“Communication opened a broad horizon for the questions scholars raise concerning the sign, creating a favourable environment in which those questions could intersect and the scope of inquiry could expand.”¹⁷ This perspective, however, is neither the only possible one nor sufficient to answer every question posed by scholars. It is therefore necessary to return to the emergence of communication as a distinct field of study.

Dominique Wolton maintains that the field of communication emerged at the intersection of three groups of disciplines. The first comprises the cognitive sciences, psycholinguistics, logic, and computer science and examines communication in relation to the mind. The second brings together cognitive and engineering sciences; within this group, cybernetics studies communication between human beings and machines. The third comprises the humanities and social sciences and focuses on the modes and media of communication, especially mass communication, and on their relationships with society and its members.¹⁸

Towards a Definition of Communication

First: The Limitations of Linguistic Meaning and the Technical Nature of Definition

Defining communication is difficult because of the frequency with which the term is used and the variety of meanings it bears in everyday life. However, these usages retain a shared general core. French dictionaries trace the term to meanings that include conveying an opinion, message, or item of information to another person; establishing a link between two points; making something common; informing; transmitting; entering into communicative relations with another person; and establishing relations with a person or thing.¹⁹

This general meaning is insufficient when communication is examined as a scientific field. Such an inquiry requires a return to the foundational texts of the discipline, particularly the work of Claude Shannon, Norbert Wiener, and Gregory Bateson.

Communication According to Mathematical Theory

The mathematical theory of communication developed by Claude E. Shannon and contextualised by Warren Weaver was among the earliest systematic theoretical formulations in the field. It shaped both research questions and research methods and established a model comprising an information source, transmitter or encoder, channel, receiver or decoder, and destination. The model treats communication as the transmission of a signal between two points. In his introductory essay, Weaver used the term in a broader sense to include “all of the procedures by which one mind may affect another,” encompassing written and spoken language, music, the visual arts, theatre, dance, and expressive human behaviour.²⁰

1. Communication from an Anthropological Perspective

Communication may also be understood as a relation among sender, message, and receiver.²¹ Dominique Wolton distinguishes three meanings of communication: an anthropological meaning, according to which communication underlies human and social existence; a technical meaning, concerning communication technologies, their uses, and their effects; and a social meaning, according to which communication sustains collective life, exchange, the circulation of information, and the formation of human relationships.²²

Wolton further brings together the phenomena and representations associated with communication. He understands it as the expression of opinion and the exchange of individual and collective experience, thereby reinforcing democratic values grounded in the freedom and equality of individuals. Communication is also manifested in mass media and modern technologies and constitutes a system of values, symbols, and representations that organises the public sphere in democratic societies.²³

Wolton's account emphasises the political and social dimensions of communication. Philippe Breton, by contrast, argues that the concept can be understood only by returning to the emergence of cybernetics. Between 1942 and 1948, scholars from different disciplines convened to establish an interdisciplinary field devoted to the scientific study of communication phenomena. This marked the beginning of systematic scientific reflection on communication before the field expanded into the humanities from 1948 onwards.²⁴

2. Communication and Cybernetics

Philippe Breton regards the publication of Norbert Wiener's *Cybernetics: Or Control and Communication in the Animal and the Machine* in 1948 as the true beginning of communication theory. Wiener sought to formulate general laws of communication applicable to natural and artificial phenomena in machines, animals, human beings, and societies. For the first time, a science emerged that treated communication and its phenomena as an object of inquiry, thereby preparing the ground for communication to become an independent field.²⁵

Why Do We Communicate? Psychology and the Challenge of Explanation

The purpose of communication posed a pressing question for the sociologist Edgar Morin. In an essay entitled "L'enjeu humain de la communication" ("The Human Stakes of Communication"), he sought to explain why human beings communicate.²⁶ His answer was precise and direct: we communicate "to inform, to obtain information, to know, to know ourselves, to explain, to explain ourselves, to understand, and to understand ourselves."²⁷

Communication may therefore be understood as operating on three levels. In its simplest form, it performs the functions of informing and obtaining information through the transmission of knowledge or news. This level is represented by Shannon's model, which treats communication as the transfer of information between individuals or groups.

A sender may use one or several channels to disseminate a message to the largest possible number of people, as occurs in mass communication and its characteristic diffusion. Communication also enables self-expression. Psychological studies emphasise that human beings disclose their thoughts, inner states, hopes, and suffering through communication, whether or not a receiver is present to receive the resulting messages.

1. The Palo Alto School and the Constructivist Perspective

Questions concerning the purpose of communication contributed to the emergence of the Palo Alto School, whose principal figures included Gregory Bateson, Edward T. Hall, Ray Birdwhistell, Don D. Jackson, and Paul Watzlawick. Influenced by cybernetics, the school regarded communication as a relationship arising between individuals and made

relationships, rather than isolated individuals, the primary object of analysis. Its scholars sought to construct a comprehensive theory of interpersonal communication.

Convinced that psychological and anthropological dimensions were indispensable to communication studies, Watzlawick and Jackson argued that communication is inescapable. Because behaviour has no opposite, “one cannot behave,” and therefore one cannot communicate.²⁸ In *Une logique de la communication*,²⁹ they maintain that every form of behaviour has the value of a message and hence constitutes communication: “Activity or inactivity, words or silence all have message value.”³⁰ Communication thus encompasses virtually all human activity. We communicate out of biological and social necessity and cannot simply opt out of communicating.

Second: Communication beyond the Mechanistic Perspective

Communication is a dynamic process involving an addresser, a message, and an addressee elements that have accompanied human interaction since antiquity. To represent this process, scholars have relied upon diagrams or models, which Jean-Jacques Boutaud defines as schematic descriptions and representations that organise, model, and consciously simplify part of reality. Communication models vary according to their disciplinary foundations; no single model has achieved universal acceptance. Mathematics, anthropology, political science, and semiotics have all shaped these models. In contrast, semiotics contributed to the gradual movement of communication studies from technical and engineering approaches towards the analysis of meaning.³¹

A. Jakobson: The Most Comprehensive Model

Drawing on the mathematical model, Roman Jakobson developed a functional model of message exchange grounded in linguistics. He retained the addresser, message, and addressee and added three elements essential to human communication: context, code, and contact. These additions permitted a more comprehensive account of interpersonal communication.³² He formulated the model in *Essais de linguistique générale*.³³

The addresser sends a message to the addressee. To be operative, the message requires a context to which it refers, a context comprehensible to the addressee and either verbal or capable of being verbalised; a code fully, or at least partially, shared by the addresser and addressee; and, finally, contact, a physical channel and psychological connection between the two enabling them to establish and maintain communication.³⁴

Jakobson’s model retains the linearity of the communication process while extending the mathematical model through the addition of essential components. Chief among these are context, or the referent, which encompasses the cultural and psychological knowledge shared by addresser and addressee, and code, which consists of a system of signs and presupposes “a minimum degree of commonality between the addresser and the addressee.”³⁵

Jakobson’s linguistic background also shaped the terminology of the model. The labels assigned to communicative roles are not fully standardised across languages and theoretical traditions.³⁶ He assigns the emotive or expressive function to the addresser, through whom attitudes towards what is said are manifested; the conative function to the

addressee; and the poetic function to the message. In Jakobson's account, the poetic function is not confined to poetry but is an essential dimension of language. The phatic function belongs to contact, whereas the metalingual function belongs to the code used in communication.³⁷

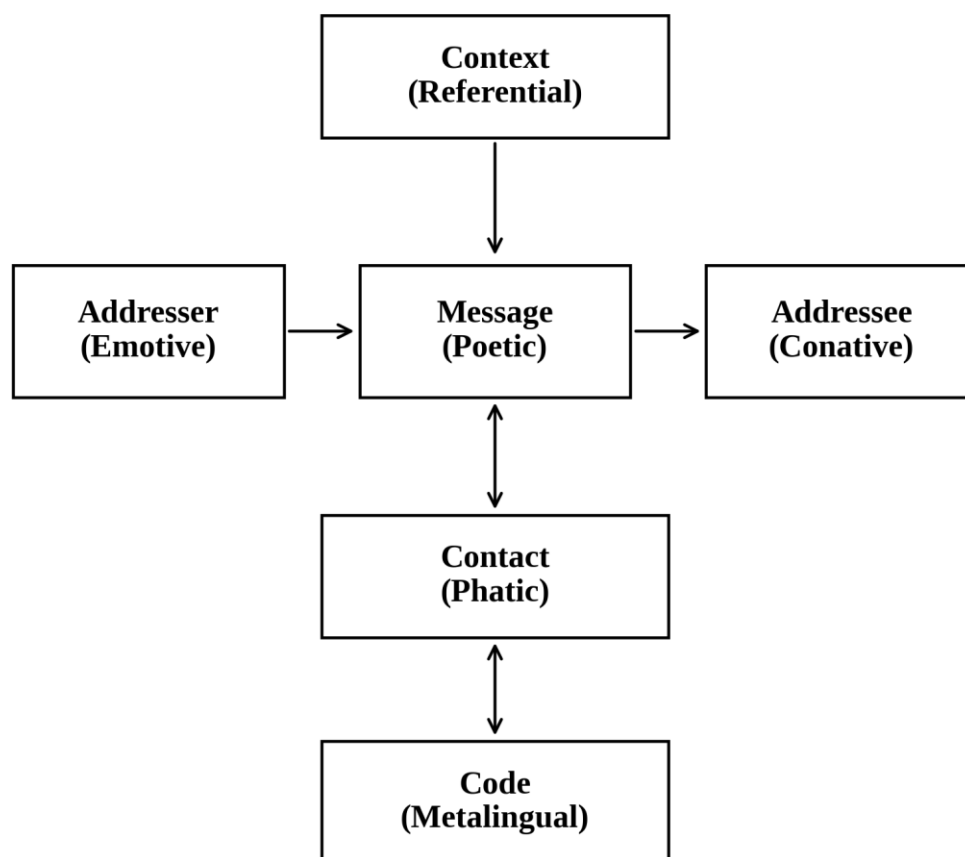


Figure 2. Roman Jakobson's model of communication.³⁸

By restoring the centrality of meaning, Jakobson's model moved beyond the mechanistic conception of communication. His linguistic background enabled him to broaden the concept of code to include metalanguage, that is, the language used to explain the language of communication. The model dominated communication studies for a considerable period, replacing the signal model with a meaning-centred framework and serving as a general model within the field.

Conclusion

The interaction between semiotics and communication gave rise to communication semiotics, grounded in the relationship between the message as perceptual data and intentionality as an orientation of perception. Boutaud characterises this convergence as a misunderstanding that ultimately produced a fruitful result. It contributed to the movement of communication studies away from cybernetics and mathematical models towards semiotics, while retaining insights from psychology, sociology, and linguistics. Yet reducing the

message to intentionality prompted meaning-centred approaches to emphasise slippage, interpretive plurality, and multiple readings. Semiotics accordingly expanded to examine cultural systems, pluralism, acculturation, and hybridity. The transition from mechanistic models to semiotic approaches thus reflected the maturation of human thought and prepared the ground for theories better able to interpret and analyse communicative activity in the humanities and social sciences.

Endnotes

Unless otherwise indicated, translations from Arabic and French are the author's.

1. The Arabic terms *ittiṣāl* and *tawāṣul* have been the subject of considerable debate in Arabic-language scholarship. Some scholars treat them as two designations for the same concept; see Mustafa Hamida, *Niẓām al-irtibāṭ wa-al-rabṭ fī tarkīb al-jumlah al-ʿArabiyyah* [The System of Correlation and Linking in Arabic Sentence Structure], and Samia Bin Yamina, *Al-ittiṣāl al-lisānī wa-āliyyātuḥu al-tadāwuliyyah fī Kitāb al-Ṣināʿatayn li-Abī Hilāl al-ʿAskarī* [Linguistic Communication and Its Pragmatic Mechanisms in Abū Hilāl al-ʿAskarī's *Kitāb al-Ṣināʿatayn*], respectively. The more common position, however, distinguishes between them: *tawāṣul* denotes interaction, whereas *ittiṣāl* denotes one-way transmission.
2. Manal Talaat Mahmoud, *Madkhal ilā ʿilm al-ittiṣāl* [Introduction to Communication Studies] (Alexandria: Higher Institute of Social Work, Alexandria University, 2001), 18.
3. Didier Anzieu and Jacques-Yves Martin, *La dynamique des groupes restreints* (Paris: Presses Universitaires de France, 1986), 189.
4. Joseph A. DeVito, *Les fondements de la communication humaine*, adapted by Robert Tremblay, trans. Johanne L. Massé and Louise Rousselle (Boucherville, QC: Gaëtan Morin, 1993), 5.
5. Phillip K. Tompkins and Elaine Vanden Bout Anderson, *Communication Crisis at Kent State: A Case Study* (New York: Gordon and Breach, 1971), 38.
6. Charles Horton Cooley, quoted in Roger Mucchielli, *Communication et réseaux de communications: Connaissance du problème, applications pratiques*, 5th ed. (Paris: ESF, 1988), 33.
7. Philippe Cabin and Jean-François Dortier, eds., *La communication: État des savoirs*, 3rd ed. (Auxerre: Sciences Humaines Éditions, 2008), 17.
8. Jean-Jacques Boutaud, "Sémiotique et communication: Un malentendu qui a bien tourné," *Hermès, La Revue* 38, no. 1 (2004): 96–102, <https://doi.org/10.4267/2042/9431>.
9. Philippe Breton and Serge Proulx, *L'explosion de la communication*, 2nd ed. (Paris: La Découverte, 1996), 144.
10. Jean-Jacques Boutaud, *Sémiotique et communication: Du signe au sens* (Paris: L'Harmattan, 1998), 13.
11. Boutaud, *Sémiotique et communication*, 10.
12. Boutaud, *Sémiotique et communication*, 13.
13. Breton and Proulx, *L'explosion de la communication*.

14. Dominique Wolton, *Penser la communication* (Paris: Flammarion, 1997), 362.
15. Bernard Miège, *L'information-communication, objet de connaissance* (Bruxelles: De Boeck, 2004), 225.
16. Miège, *L'information-communication*, 225.
17. Daniel Bounoux, *Introduction aux sciences de la communication* (Paris: La Découverte and Syros, 1998), 116.
18. Wolton, *Penser la communication*, 361–72.
19. *Hachette: Le dictionnaire du français* (Algiers: ENAG, 1993), 327; and *Petit Larousse: Dictionnaire encyclopédique pour tous*, 17th ed. (Paris: Librairie Larousse, 1964), 232.
20. Warren Weaver, “Recent Contributions to the Mathematical Theory of Communication,” in Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois Press, 1949), 3.
21. Dominique Wolton, *Il faut sauver la communication* (Paris: Flammarion, 2005), 215.
22. Dominique Wolton, *Al-i ‘lām laysa tawāṣulan* [Information Is Not Communication], trans. Faris Ghassoub, 1st ed. (Beirut: Dar al-Farabi, 2012), 25–26.
23. Wolton, *Al-i ‘lām laysa tawāṣulan*, 26–29.
24. Sa‘id Yaqtin, *Min al-naṣṣ ilā al-naṣṣ al-mutarābiṭ: Madkhal ilā jamāliyyāt al-ibdā‘ al-tafā‘ulī* [From Text to Hypertext: An Introduction to the Aesthetics of Interactive Creativity], 1st ed. (Casablanca: Arab Cultural Centre, 2005), 88ff.
25. Philippe Breton, *L’utopie de la communication: Le mythe du “village planétaire”* (Paris: La Découverte, 1995), 19.
26. Edgar Morin, “L’enjeu humain de la communication,” in *La communication: État des savoirs*, ed. Philippe Cabin (Auxerre: Sciences Humaines Éditions, 2002), 33–41.
27. Cabin and Dortier, *La communication*, 33.
28. Cabin and Dortier, *La communication*, 46.
29. Paul Watzlawick, Janet Helmick Beavin, and Don D. Jackson, *Une logique de la communication*, trans. Janine Morche (Paris: Éditions du Seuil, 1972).
30. Watzlawick, Beavin, et Jackson, *Une logique de la communication*, 46.
31. Boutaud, *Sémiotique et communication*, 20.
32. Éric Maigret, *Sociologie de la communication et des médias* (Paris: Armand Colin, 2003), 115.
33. Roman Jakobson, *Essais de linguistique générale*, trans. and pref. Nicolas Ruwet (Paris: Les Éditions de Minuit, 1963).
34. Fatima al-Tabbal Baraka, *Al-naẓariyyah al-alsuniyyah ‘inda Roman Jakobson: Dirāsah wa-nuṣūṣ* [Roman Jakobson’s Linguistic Theory: A Study and Texts], 1st ed. (Beirut: University Foundation for Studies, Publishing, and Distribution, 1993), 65.
35. Marc Lits, *Du récit au récit médiatique* (Bruxelles: De Boeck, 2008), 59.
36. The labels assigned to the elements of communication are not fully standardised, even in French-language scholarship. The originator of a message may be designated as *émetteur*, *destinateur*, *encodeur*, or *locuteur*; Arabic equivalents include *mursil*, *mutakallim*, *nāṭiq*, *murammiz*, *bāthth*, and *qā’il*.

37. Maigret, *Sociologie de la communication et des médias*, 115–16.

38. Al-Tabbal Baraka, *Al-naẓariyyah al-alsuniyyah*, 65.

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