Information As Sign:
semiotics and Information Science

By **Douglas Raber & John M. Budd**

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Information as sign:
semiotics and information science

❑ *By Douglas Raber*

  ❑ *School of Information Sciences, University of Tennessee, Knoxville, Tennessee, USA*

❑ *John M. Budd*

  ❑ *School of Information Science and Learning Technologies, University of Missouri, Columbia, Missouri, USA*

Abstract

❑ From the perspective of semiotics, "information" is an ambiguous theoretical concept because the word is used to represent both signifier and signified, both text and content.

❑ Using the work of Fernand de Saussure, this paper explores theoretical possibilities that open by virtue of understanding information as sign.

❑ Of particular interest is the way semiotics suggests ways to bridge the theoretical gap between information as thing and information as cognitive phenomenon by positing information as a cultural phenomenon.

Introduction: Sign

❑ A list of illustration of **sign**

   ❑ a garment, an automobile, a dish of cooked food, a gesture, a film, a piece of music, a piece of furniture, a newspaper headline…

      ❑ By Roland Barthes 【 1994, p. 157 】

Introduction: Sign

❑ The informative nature of a sign is complicated by the dual form of communication that is comprised of mimesis and semiosis.

   ❑ mimesis is the effort at representing something as accurately as possible

   ❑ semiosis is the processes and effects of the production and reproduction, reception and circulation of meaning in all forms, used by all kinds of agent of communication" (Hodge & Kress, p. 261).

   ❑ Of interest here is semiosis, the dialogic process between the components of the sign that give meaning to the sign (Peirce, 1931-1958, Vol. 5, p. 484).

Introduction: Sign

❑Barthes argues that we routinely accept many of the signs we encounter at face value and that "we take them for `natural' information" (Barthes, 1994, p. 158). This aspect of signs, however, disguises the way signification provides the principles by and through which meaning is determined, and social reality is created and shared.

Introduction: Sign

❏ 『To decipher the world's signs always means to struggle with a certain innocence of objects. We all understand our language so "naturally" that it never occurs to us that it is an extremely complicated system, one anything but "natural" in its signs and rules: in the same way, it requires an incessant shock of observation in order to deal not with the content of messages, but with their making … 』

❏ **Roland Barthes 1994, P.158**

Introduction: Sign

❑ Neither the sign nor the informative object is ever as innocent at it appears.

❑ It is never simply what it is because of its role in a system of signification and meaning that includes a great many other signs.

  ❑ In addition, the relation between signifier and signified can be complex, as is the case in the relation between a text and its content.

    ❑ An article in a scientific journal, for example, may be informative on its own, but it is only a part of an ongoing discourse regarding a given subject. Its full meaning depends not only on what it has to say, but its place relative to other statements in the discourse.

  ❑ The rules that govern that discourse are likely to be complex, and perhaps contested in ways that allow alternative readings of the article in question.

❑ Understanding what the article signifies, what it is about, and its relevance to its reader, may not be an easy or straightforward task. A surplus of meaning can intrude upon interpretation (Foucault 1972, pp. 31-9).

Introduction: Sign

❑Information science and semiotics share another important characteristic; the central theoretical object of each discipline bears an unmistakable indeterminacy.

❑ In semiotics, for example, there are important differences between Peirce's and Saussure's concept of the sign that contribute to theoretical ambiguities regarding the relations between the components that constitute signs (Lyons,1977, p. 99).

❑ Nevertheless, Chandler's discussion of Peirce and Saussure reveals that their models of the sign may not be as different as they first appear (Chandler, 2002, pp. 17-54).

❑ Peirce's pragmatic approach is certainly of interest, but in this essay we turn to Saussure to examine information as a theoretical object because of his observation that unlike other sciences, whose theoretical objects are given in advance and then examined from a variety of viewpoints, the theoretical objects of linguistics are of a nature "that it is the viewpoint that creates the object" (de Saussure, 1959, p. 8) While keeping in mind Eco's (1992) warning against "overinterpretation", and his insistence that there must always be an object to be interpreted, taking a Saussurean "viewpoint" approach to information as a theoretical object offers rich possibilities for understanding its nature and its indeterminacy.

Introduction: Language

❑ The study of language engages a number of dualities that necessarily reflect certain unities.

- ❑ There can be no speech, for example, without thought.

- ❑ Yet without speech thought will find no articulation.

- ❑ Speech inevitably has both an individual and a social side.
    - ❑ Individuals use a language to speak, and so to think, yet speech has no meaning unless language is itself a social institution.
    - ❑ Saussure argues that to fix attention on one side of these dualities would lose a consideration of the other.
    - ❑ This contention is reminiscent of Neill's(1987) assertion that the study of "information" has the same problem.

❑ To focus exclusively on either information's material or cognitive aspects risks overlooking an important part of its reality.

❑ Saussure concludes by saying that speech is a matter of combining

  ❑ the physiological production of sound-images,

  ❑ their physical transmission, and

  ❑ their psychological association with concepts or ideas.

❑ This combination occurs in the context of a social process that associates the same sound-images with the same concepts for most speakers (de Saussure, 1959, pp. 9, 11-13).

❑Speaking (*parole*) is individual, willful, and intellectual.

   ❑Speakers use language as a code to express their own ideas, but

❑language (*langue*) is a social phenomenon, with a history and existence independent of any given speaker, passively assimilated by speakers who share the same culture (de Saussure, 1959,p. 14).

❑ Meaning, which is a contingent social as well as psychological phenomenon, is created in the moment of speaking a language, an act which itself unites *parole* and *langue*.

❑ This unification, in the ideal, achieves Bakhtin's goal of dialogic communication, which itself depends on the particular communicative ability of individuals to share a signified from a given signifier (Bakhtin, 1986).

language and information

❑ The parallels between language and information are striking.

   ❑ Saussure's work suggests that text can be regarded as something akin to *parole*.

      ❑ Texts are willfully created by individuals who wish to communicate with others.

      ❑ They are unique products of choice, and almost unlimited with regard to what they might be.

      ❑ The actual number of ways in which words, musical notes, or images can be put together in order to express an idea has not been counted, and likely is not countable.

language and information

❑The content of a text, on the other hand, is much like *langue*.

  ❑It is a social phenomenon, constrained by history and culture, and manifests shared concepts and meanings from which texts are constructed.

    ❑ A text, for example, composed from "information" that is not shared by writer and reader will be incomprehensible to the reader.

language and information

❑ Unfortunately, information science does not have anything like Saussure's distinction between *parole* and *langue*, and the word "information" is forced to do double duty, signifying both speech (regardless of its medium) and thought, both text and content.

   ❑ *This contributes to theoretical confusion in information science.*

   ❑ And is at the heart of Faithorne's frustration with the word (1975).

❑There are many concepts of information, and they are embedded in more or less explicit theoretical structures. In studying information it is easy to lose one's orientation. Therefore, it is important to state the pragmatic question: "What difference does it make if we use one or another theory, or concept of information?" This task is difficult because many approaches involve implicit or vague concepts, which must be clarified.

❑Capurro and Hjorland (2002, p. 396)

❑ But what is the nature of the sign, and how can the answer to this question help us to understand the nature of information as a theoretical object?

❑Saussure's answer begins with the notion that definition is inadequate as a means of relating things to words.

  ❑ Merely a process of naming does not constitute language, each word corresponding to the thing it names.

  ❑Such an approach, for example, assumes a one-to-one correspondence between the subject of a text and a word that names that names that subject,

  ❑and its inadequacies are immediately revealed by such subject-naming words as "democracy", or "love".

❑ If ready-made ideas existed in the world simply waiting to be named, this approach might make sense, but the linking of name to thing is not that simple. According to (de Saussure, 1959,p. 65), the linguistic sign is a "double entity", uniting not a thing and a name, but a concept and a sound-image.

❑ The sound-image takes the physical form of a spoken or written word, but these forms are entirely arbitrary, and by themselves without meaning. They stand in for a sound-image that psychologically realizes a concept.

Signified and Signifier

❑ *Figure 1 The sign*

> Signifier (Sound or Visual Image)
>
> Signified (Mental Concept or Idea)
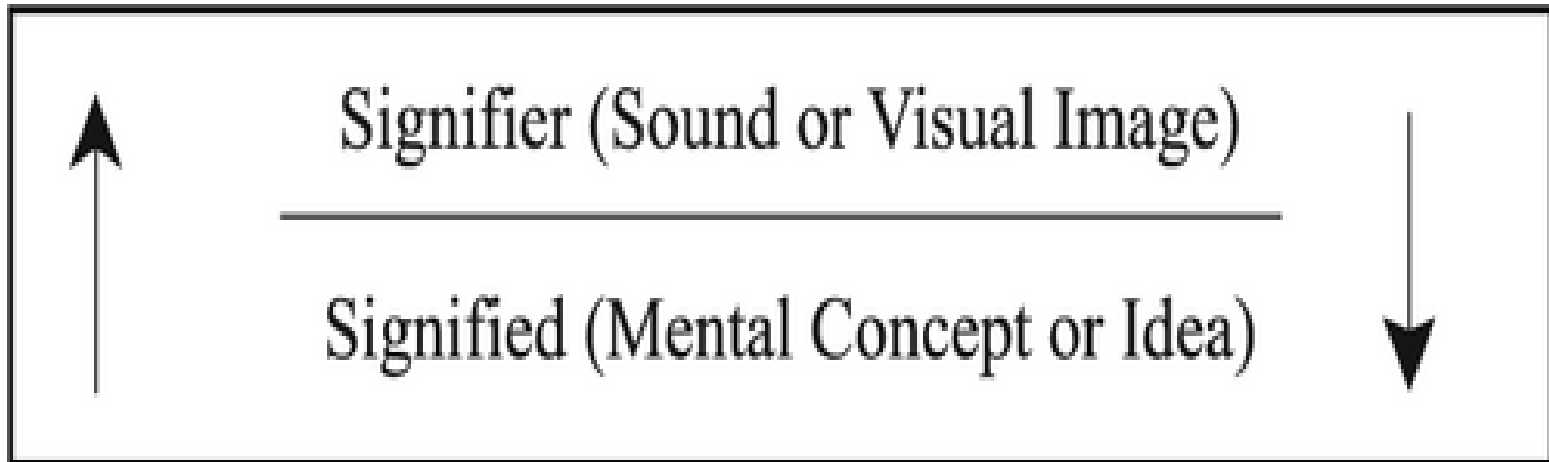
❑The arrows indicate the unity between signifier and signified.

Signified and Signifier

❑ The signified is an idea or mental entity grounded on a referent in the social or material world.

❑ The signifier is a pointer, signaling the presence of the idea and its deployment in discourse and communication (de Saussure, 1959,p.67).

- According to Saussure, the sign displays two "primordial characteristics".
  - First, it is an absolutely arbitrary construction. The signified is not linked to the signifier by any inherent relation between the two.
    - There is no reason why "a tree" should not be named "*un arbre*", as indeed it is in French.
    - There is nothing about the idea or the reality of a tree that determines the way in which it is signified.
  - Second, the signifier is linear in nature.
    - It unfolds in time, as sound in speech, and as a spatial line in writing. To receive the communicative message of the signifier, we must wait for it to unfold the signified (de Saussure, 1959,p.67-70)

mutability and immutability

❏ Saussure's insight regarding the simultaneous mutability and immutability of the sign provides a deeper understanding of the sign.

   ❏ Signs are arbitrary creations, yet they are also fixed in a way that makes them relatively immutable.

   ❏ The sign, however, "is exposed to alteration because it perpetuates itself". The kind of change that can and does occur over time is "a shift in the relationship between the signified and signifier" (de Saussure, 1959,p74-5).

❑ Like any social institution, language admits the possibility of change, but this kind of change is likely to be slow, and more likely to occur to signs whose association with regard to a referent is culturally contested, as opposed to those whose meaning in this regard is conventional and secure.

❑ Information, like the sign, is relatively immutable. Although arbitrary in the sense that the signs used to compose a text are essentially arbitrary in nature, once the selections are made and the text composed, it remains fixed, and will not re-compose itself.

❑As a signifier, the text remains constant, but as a signified the content changes as the viewpoint brought to bear on the informative object changes. This changing relation between text and content, and between signifier and signified constitutes a change in the meaning of the informative object, as new meanings are assigned to existing objects.

❑ This simultaneous immutable and mutable quality of informative objects allows the possibility of their second order representation for the purpose of organization and access. It means that while indexing languages must necessarily change over time if they are to adapt to the way information changes, the change will occur slowly enough to allow the ordering and control of information in much the same way a culture orders and controls the meaning of signs which allow it, by means of communication, to exist and reproduce itself as a culture.

❑Information, like language then, is constituted by signs.

    ❑ Both are social institutions subject to historical change that can and does result in changes of meaning that reflect changing realities.

    ❑ Still, each also displays a relative stability that offers the possibility of its control.

The role of time regarding meaning and value

❑ Time has another role to play in signification, and this role reveals another essential attribute of the sign and its affinity with the informative object. In order to create and express meaning signs engage value as well as signification. The meaning of a sign as an instrument of communication depends simultaneously on signification and value, on the relations between signifier and signified within the sign, and on relations between signs.

❑In Figure-2, modified from Saussure, AB represents the axis of simultaneities and it manifests the relations of co-existing things. The intervention of time is excluded from this axis of reality.

❑CD represents the axis of successions. Along this axis of reality only one thing at a time can be considered, but it is the axis on "which are located all the things on the first axis together with their changes" (de Saussure, 1959, p.80).

❑ Taken together, the axes describe a dual reality constituted first by a system of values that can be substituted for one another (AB axis), and then by a system of values that relates different values to one another with respect to time (CD axis).

❑ Thus, language has both synchronic and diachronic aspects. In order to understand the given state of a language, one must ignore its diachronic aspects. In order to understand how a language is changing and has changed, one must ignore its synchronic aspects. Both of these tasks cannot be undertaken at the same time.

❑ Intertextuality is also at play in two ways.

❑ We cannot anticipate changes in the value and meaning of content, and so, to apprehend information as an object of control for access we must engage the synchronous aspects of information. On the other hand, to understand why a text relevant at one time and from one perspective may not be relevant at another time or when viewed from another perspective, we must ignore the synchronous aspects of information and instead engage the diachronous and intertextual relations of content.

❑ In this temporal context, Saussure's point regarding how the value of a sign is established offers a powerful insight about information as a theoretical object. To begin with, we have to recall that a sign is not an abstraction. It is a real object whose existence is determined by a material as well as psychological association between signifier and signified. If only one of these two linguistic elements is retained, the entity of the sign vanishes (de Saussure, 1959, pp. 102-3).

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❑ Both the sign and informative object consist of two intimately and inextricably linked elements, but this link alone cannot define their reality. Both must be delimited and related to others of their kind to be defined and understood. Both unfold their role and meaning in a sequential order.

- ❑ ... just as the game of chess is entirely in the combination of the different chesspieces, language is characterized as a system based entirely on the opposition of its concrete units... Language then has the strange, striking characteristic of not having entities that are perceptible at the outset and yet of not permitting us to doubt that they exist and that their functioning constitutes it. Doubtless we have here a trait that distinguishes language from all other semiological institutions.

  - ❑ (de Saussure, 1959, p. 107)

- ❑ There is reason to believe that information may also be such a semiological institution.

Information and the sign

❑The affinity between the informative object and the sign, and between information and language as theoretical objects, is based on the fact that all informative objects are necessarily signs, ultimately expressive of a relationship between a signifier and a signified.

❑ Douglas Raber & John M. Budd, *Information as Sign*, *Journal of Documentation Volume 59 Number 5 2003 pp. 507-522*

sign

❑ The sign, although a material object, is always much more than this. It is also a psychological and cultural entity. (de Saussure, 1959, p. 113, italics in original) makes this point when he writes, "linguistics then works in the borderland where the elements of sound and thought combine; *their combination produces a form, not a substance*".

❑Information science, like linguistics, works in the borderland of two elements; text and content. This borderland is the terrain of aboutness, representation, relevance, and their relations in the construction of organization of and access to information.

❑ In this borderland a text, its content, and its meaning meet as a necessary step in the determination of its relevance to an information user's need. Like the linguistic situation, this situation engages an exchange of values. With regard to access to information, content is exchanged for text, and then text is exchanged for representation. This process represents the signification of aboutness. Access, however, is complete only when need is satisfied. To accomplish this a need must be exchanged for a query, which signifies a need, and then a query is exchanged for representation to produce retrieval of information.

❏This recalls the notion that meaning is a product of signification and value.

❏ Information science implicitly addresses this condition, but tends not to fully grasp it. Within information science, a physical paradigm (Ellis, 1992) emphasizes the materiality and immutable characteristics of the informative object as both a theoretical construction and an object of control.

?

❑ It turns away from cognition, and the meaning of information, on the grounds that these phenomena are neither consistent nor observable. The tendency here is to focus on text, which is somewhat like treating the signifier alone as the sign. The cognitive paradigm (Ellis,1992), on the other hand, embraces the arbitrariness and mutability of the text, and recognizes that aboutness, and as a result relevance, must be constructed from extra-textual imports. Texts cannot really fix thought, as much as they might and do try. This tendency to focus on the content of texts, however, is somewhat like treating the signified alone as the sign. Each paradigm, in its own way, mistakes the part for the whole.

❑Information is more than either of these paradigms convey on their own. It is rather the product of the relation between them, and it is inevitably a social institution. Information, like language, is a system of signs whose values owe their existence and measure "to usage and general acceptance" (de Saussure, 1959, p. 113).

- Information, like language, is a system of signs whose values owe their existence and measure "to usage and general acceptance" (de Saussure, 1959, p. 113).

- Language, speech, and meaning are constructed from relations between the signifiers and signifieds that constitute signs, and the relations between signs.

❑Both paradigmatic and syntagmatic relations are at play as illustrated below in Figure 3. The relations that constitute *langue* and *parole* as communication, and assign values to each sign deployed in a discourse are the syntagmatic relations that exist between A, B, and C, the paradigmatic relations that exist between A and A*, B and B*, and C and C*, and their interaction with one another.

❑ From a conceptual viewpoint then, value and signification although intimately related, are not at all the same thing. The value of a word, functioning as a signifier within the system of language, depends not only on its signification, but on its opposition to other words. "Its content is really fixed only by the concurrence of everything that exists outside it" (de Saussure, 1959, p. 115). The fullness and essence of the sign, and the meaning it expresses, depend as much on opposition as affinity, as much on difference as on similarity, and finally on the reciprocally determining relations between signs.

Conclusion

❑ As implied earlier, semiotics is not a unified discipline that is well represented by discrete departments in universities. Instead, it manifests a variety of theoretical perspectives and methodologies (Chandler, 2002, p. 2).

❑ It appears as an investigative approach in both the humanities and the social sciences, and within these disciplines there are marked contests between linguistic, psychoanalytic, Marxist, behaviorist, cognitive, and post-structuralist approaches (Sebeok, 1994)

❑ Information is clearly a matter of relations between thing and thought, but the discursive formations that sustain and reproduce thought occur in a social context within which systems of information organization and retrieval, categories of aboutness, and a priori assumptions regarding relevance are established and constructed, like language, in a manner not free of historical, cultural, and ideological contingency.

❑ This does not mean that the phenomena of language and information are determined products of a dominant culture. It does not mean that with regard to the production, distribution, and use of information that rationality and choice are subverted, precluded or denied. It does not preclude the scientific investigation of the relations between text and content, and means by which these relations constitute information. It does not mean that such investigation cannot yield progressive development of the means of control of information that allow for the advance of knowledge and the solution of human problems.

❑ It does mean, however, that what is legitimately and conventionally determined to be information and informative is constrained and contingent on particular historical and cultural conditions, and that rationality and choice, while governed by rules that may indeed be objective, begin from premises that may be derived from and imposed by desires and self-interest arising from the need to maintain power and sustain certain social relations.

❑ Information is undoubtedly a social institution, but the control of this institution may not be evenly distributed across all segments of society.

❑Its production, distribution, and use is determined by markets which are notorious for both their efficiency at distributing social goods and their discrimination against certain goods and needs that fail to find or create a large enough market.

❑ "Information" as a theoretical object is in an unenviable position. It must somehow embrace information as a material object, as an individual cognitive effect, and as a social institution. It is applied to signifier and signified, and to the cultural processes and conventions that condition the relations between the two and between the signs they constitute. As a result of the latter, it must also be accounted for as a commodity that exchanges for other commodities in formal and informal markets.

❑ Information exists in a borderland between text and content, between consistency and contingency, between social convention and social conflict, between synchrony and diachrony, between message and meaning.