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Vitalizing Semiotics

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Abstract. The goal of organizational semiotics is to enable a better understanding of organizations by means of an analysis of documents, texts and communications as signs. Its theory is based on Peirce's sign concept, the relation of the sign with itself, with its object, and interpretant. In our view, this restricted use of semiotics may explain some of the limitations of organizational semiotics in practice. A shift of focus from signs as a relation to sign aspects involved in signs may enable a more practical model of interpretation, including organizations as interpreting systems. This is illustrated with an application of semiotics to accounting narratives.

Keywords: Semiotics, Sign aspects, Process model, Accounting narratives

1 Introduction

An oft-cited example of a paradigmatic shift is the planetary system by Copernicus and Kepler. If we ask which one of the two views, Earth- or Sun-centered is more practical, our answer must be that does not matter. In current technology both can be computed efficiently. Why, then, that we may find Kepler's elliptic system more attractive? It is because his model enables a 'natural' representation of the properties of planetary motion such as revolution time and distance. Tycho Brache's system of cycloids does not have that potential.

Organization phenomena ask for natural modeling, analogously. As organizations are human and are subject to our perception, their models must be understandable. An approach complying with this condition is introduced by organizational semiotics [1], which considers organizations to be (sign) interpreting systems. In sign interpretation, the (potential) sign¹, e.g., a text document, is establishing a relation with itself, with its object, and interpretant. We call this a *sign-relation*. Although this relational view may enable to reveal the constituents of an interpreted sign², the practical use of this approach is limited, as it may not be able to explain how sign-relations arise, what process is involved.

¹ As the used concept of a sign involves interpretation, the terms, sign, interpreted, or meaningful sign, are synonymous.

² Signs, offered for interpretation, are called a potential sign.

According to [2], organizational semiotics can also make use of the more refined concept of a sign type, e.g., for the analysis of media. Although we were not able to find publications of this kind of an analysis, we suggest that a sign-typical interpretation of phenomena, including organizations, may not be beneficial in practice either. It too is unable to give an account of the process involved in interpretation.

Through analyzing his concept of a sign, Peirce introduced sign aspects [3]. Accordingly, signs can be defined by a relation of sign aspects involved in the relations of the (potential) sign with itself, with its object, and interpretant. Peirce called this a *sign type*. Bense [4] has shown that the Peircean sign aspects can be arranged in a hierarchy. Unfortunately, although all processes involve a partial ordering hence a hierarchy, a hierarchy is not a process.

Information processing is a process, trivially. However, contrary to signs, that are meaningful, information processing is computational (and meaningful from that perspective only). We suggest that this apparent contradiction between meaningful interpretation on the one hand, and computational information processing on the other, can be resolved by introducing a cognitively based model of human processing. Through mapping the events of this model to sign aspects, the involved computational process can be embedded in Peircean semiotics.

In business modeling there is little research which provides insight into how corporate narratives are actually interpreted apart from which signs are used. Corporate narratives in annual reports, press releases, and conference calls offer organizations the opportunity to communicate business messages with shareholders, analysts and media and to engage them in corporate narratives in a persuasive and compelling way. Top management collects stories from their everyday organizational life, and restructure and incorporate them into corporate reports. Stakeholders read these reports to decipher a deeper understanding of organizational life.

Top management views narratives as a powerful managerial tool to make sense of their decisions [5] whilst stakeholders convince themselves of organizational decisions through narratives [6]. From the perspective of organizations, corporate report is an effective management process, which transfers organizational ideology to society [7, 8]. If their stories are logically sound, stakeholders will be more easily persuaded and convinced. Everything established through reasons is in the realm of *logos* and it covers not just deductive reasoning but also inductive and abductive reasoning.

The persuasion process reflects whether audiences are able to read, comprehend and make judgment based on their understanding and interpretation of the narratives. The validity and plausibility of argumentation is key to appeal to audience's logos, which can be analyzed through the aspects of three types of reasoning: deductive being always plausible; inductive being probably plausible; and abductive being hypothetically plausible. As a result, the plausibility of arguments in the text can be identified, which influences the decision-making and sense-making process.

2 Process Model

A cognitively based model of human processing has been introduced in [9], amongst others. Below we restrict ourselves to an overview of the basic ideas (Fig. 1). The condition for human interpretation is an interaction between a stimulus or *effect* (q1),

on the one hand, and the brain or interpreting system occurring in some *state* (q_2), on the other. Interpretation makes use of memory or *context* information (C). The collection of uninterpreted qualities, $[q_1 \ q_2 \ C]$, is the *input* for information processing. The goal of interpretation, as a process, is to establish a relation between q_1 and q_2 , in the context of C . To this end, the qualities are sorted (cf. *sorting*: $[q_1]$, $[q_2]$, $[C]$), represented independently from one another (cf. *abstraction*: q_1 , q_2), completed with qualities from the context (cf. *complementation*: (q_1, C) , (q_2, C)), and merged in a single relation (cf. *predication*: $(q_1, C)-(q_2, C)$).

The above input representations can be assigned a Peircean sign aspect: $[q_1]$, representing the state as a constituent, the sign aspect *icon*; $[q_2]$, expressing the effect as a single occurrence, the sign aspect *sinsign*; $[C]$, pointing to background information corresponding to q_1 and q_2 , the sign aspect *index*. The abstract concept q_1 , standing for the state, as a possible for any effect, can be assigned the sign aspect *rHEME*; q_2 , representing the habitual rule involved in the input effect, the sign aspect *legisign*. Finally, (q_1, C) , the possible state in context, or the subject of the interaction can be assigned the sign aspect *dicent*; (q_2, C) , the rule-like effect in context, or the predicate of the interaction, the sign aspect *symbol*; and the relation between subject and predicate, representing the input by a proposition which is a premise, the sign aspect *argument*.

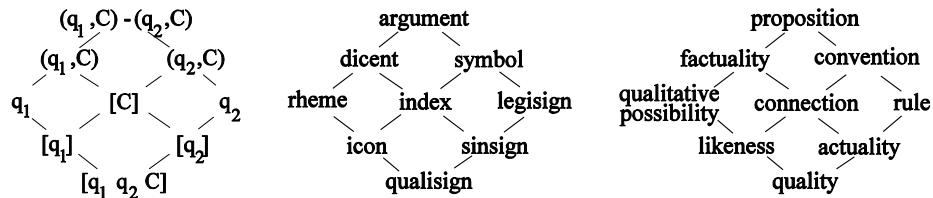


Fig. 1. Process model (left), Peircean sign aspects (middle) and their mundane terms (right). There is an isomorphic relation between the process model and the hierarchy of sign aspects. For instance, $[q_1]$ can be mapped to the sign aspect *icon*, and in turn, the term *likeness*

The events of the process model can be assigned an aspect of ‘naive’ reasoning³. An example is the interaction event between q_1 and $[C]$. The state, interpreted as a qualitative possibility (for an effect) is completed by an effect. As information about the effect is fetched from C , this interaction event has the aspect of *deduction*. Analogously, the event, in which, q_2 , expressing the input as a habitual effect, is tested for a state represented by C , has the aspect of *induction*. The interaction between q_1 , as an actual event or existent (cf. subject), and q_2 , as a conventional effect (cf. predicate), represented by a proposition which is hypothesis, has the aspect of *abduction*. The existence of the aspects of the three types of reasoning is an expression of the completeness of the process model, from the perspective of ‘naive’ reasoning.

³ The term ‘naive’ is used as a synonym for ‘inborn’.

3 Semiotic Analysis: a Case Study

In this section we offer a semiotic analysis to a sample text in three ways: from a sign-relational, a sign-typical and a sign-aspectual perspective, and compare the results. The text in question in Fig. 2 is a paragraph extracted from [10].

(**s₁**) Over the next three years we (**S**) will be making significant investment (**P**) in the infrastructure we need to make the customer experience fair, responsible, easy and personal for all our customers - whether face-to-face, by telephone or online. (**s₂**) The opportunities (**S**), both for our customers and our business, are outstanding (**P**); but (**s₃**) our growth strategy (**S**) will always be driven by (**P**) the desire to put the customer first in all things. (**s₄**) We (**S**) intend to grow (**P**) at a pace and in a way that guarantees our customers an uninterrupted, seamless service.

Fig. 2. A sample paragraph. Sentences are labelled by bold face symbols. For later analysis, syntactic subjects and predicates are marked by an (**S**) and (**P**) symbol, respectively

3.1 Sign-relational Analysis

For our text (sign), in Fig. 2, we are in search for an object and interpretant. By definition, the object of the sign is what it is standing for and replacing. Arguably, this is “the chairman’s intention to provide increasingly better customer services in the coming three years”. The interpretant of the sign is the meaning mediated by the sign, in the agent’s interpretation. There may be different interpretants (and interpretations), depending on the agent’s knowledge (cf. context), his/her mood, emotions, etc. By assuming an optimistic agent, the interpretant could be: “The hypothesis that through significant investment the customers will be more satisfied in the future, can be true”.

The concepts, (potential) sign, object, and interpretant, follow from a categorical analysis of Peirce’s notion of a sign. As part of the interpretation process, the (potential) sign determines an interpretant, and eventually, an object. Determination is always in this order, by virtue of the condition that interpretation is by an agent, as an interpreting system.

We conclude that a sign-relational analysis may enable a systematic approach to phenomena, including organizations. Inevitably, this is an important result by organizational semiotics, as opposed to the traditional approach by Artificial Intelligence, for example, enabling ad-hoc representations, typically. However, the potential to reveal the nature of the constituents involved in a sign-relation and the conditions of their process of determination is beyond the possibilities of this paradigm. Practical models of (meaningful) interpretation ask for a more refined concept of a sign, which is the subject of the next section.

3.2 Sign-typical Analysis

The Peircean sign aspects can be arranged in three up-right diagonals (cf. Fig. 1). In a right-to-left order, these diagonals are an expression of the sign aspects involved in

the sign's relation with itself, with its object, and interpretant. (Interpreted) signs can be characterized by a relation of sign aspects taken from each one of the three diagonals. Such a relation is called a *sign type*⁴. An example is a *dicensic indexical legisign*. The relation of the sign with itself, or simply the sign in itself, has the sign aspect *legisign*. This is when the sign is perceived as a rule. For instance, the perception of (the quality of) falling, during walking. The quality of falling is not perceived simply as a quality (cf. *qualisign* sign aspect), nor only as a quality occurring now (cf. *sinsign* sign aspect). We habitually know what we have to do and 'generate' motor reactions necessary for the next step in a rule-like fashion. The relation of the sign with its object is *indexical*. This is when the sign is not directly representing the object, except by telling where we may find information about it. The sign functions as a pointer. Finally, the relation of the sign with its interpretant is *dicensical*. This is when the agent is interpreting the sign as a statement, like an expression of an interaction as a (f) actual existence.

We suggest that the text, in Fig. 2, is an instance of the sign type explained above. Let us begin with the sign aspect of the text in itself. The phrases, such as making significant investment and outstanding opportunities, are an expression of an abstract, habitual activity or event (cf. *legisign* sign aspect). These phrases are more than an expression of temporal information characterizing single events (cf. *sinsign* sign aspect), or that of an appearing, yet uninterpreted quality (cf. *qualisign* sign aspect).

The relation of the text (sign) with its object is *indexical*. This is witnessed by the phrases such as opportunities and growth strategy, pointing at a set of possibilities without explicitly listing them (over the next three years is an indexical expression of temporal information). The readers – if interested – are invited to look into the list by themselves.

The relation of the text (sign) with its interpretant is *dicensical*. The phrases, desire to ... and intend to ..., amongst others, are statements of a future act, including its modality. There is no intention for these expressions to be used as an argument, e.g., a premise in a subsequent logical reasoning.

From a categorical stance, sign aspects amount to sub-classes of the constituents involved in a sign-relation. This way of sub-classification can be done recursively, which may explain why sign-types are 'maximal' from an informational stance. A sign-typical analysis of a sign can be complex, it may need proficiency. We are not aware of the existence of a systematic approach. Sign types themselves do not answer the question: how from (formal) relations between text-phrases, meaningful interpretation may arise. From this, we conclude that sign-typical analysis may not be practical for the goals of organizational semiotics either.

3.3 Sign-aspectual Analysis

Sign-relations are more than a collection of relations involved in the sign. According to Peirce, the sign is in an irreducible relation with its object, and interpretant, or in

⁴ Not all combinations of sign aspects may define a sign type [3]. A treatment of this part of Peircean theory lies outside of this paper.

mundane terms, there is a qualitative change involved in the sign. As we are interested in a semiotically inspired model of signs which suits a computational interpretation as well (cf. a process), we must realize that sign-relations and sign-types are beyond our reach. This holds for sign aspects too. They can be interpreted as signs that are in-the-making, which understanding complies with Peirce's theory of interpretants⁵.

We assume that, by virtue of their dependency, more complex sign aspects can be perceived through sign aspects that are simpler. For instance, an interpretation of a dicentic relation of the sign with its interpretant may arise 'bottom-up', from a rheumatic interpretation of the same relation, and an indexical interpretation of the relation of the sign with its object.

Although sign aspects are unfinished signs hence qualitatively more complex than mathematical relations, through focusing on the process involved in their interpretation we may get insight in its events, as *dyadic* relations. It is like making a cake using its receipt, but not having the possibility to taste the ingredients nor the cake itself. This restricted view on signs may not be useless nevertheless. Through formally analyzing their receipt we may be able to derive (formal) properties of meaningful interpretation and check their (formal) correctness. An example, in syntactic language processing, checking meaningfulness from a syntactic perspective, is testing whether a text complies with the SV(O) rule, in English.

Below we offer a sign-aspectual analysis to our running text. We assume that a syntactic analysis of the input sentences into subjects and predicates is already available. See Fig. 3. Modifiers are marked as context information (this is not indicated in this diagram). Our analysis is restricted to a 'naive' reasoning interpretation of the sample text. To this end, a pair of subsequent sentences are interpreted as a state and an effect that are in an interaction. Sentences, represented as a proposition, A 'IS' B (where A is short for (q1, C), B for (q2, C), and 'IS' is used as a linking term) are stored in memory as relations, (A,B). Information processing is sentence-wise. We assume that, in 'naive' reasoning processing, constituents of a relation are fetched from memory and represented as a state (A) or an effect (B) which is in focus, or as a state (\sim A) and an effect (\sim B) which is complementary.⁶

For completeness' sake we mention that our model enables three kinds of an analysis. The first one, 'summarization', merges a pair of sentences into a single sentence. Arising sentences are interpreted as a sign. As for a 'naive' reasoning analysis, summarization enables information involved in a conclusion to be represented explicitly. The second one, sequential processing, is a 'degenerate' version of the first one. Arising expressions, including conclusions, are represented by a sign aspect, e.g., a qualisign. Language processing is an example of this way of interpretation. The third one, considers input sentences to be qualities of a single phenomenon. Conclusions are not explicitly represented.

An analysis of our text, following the second approach above, is depicted in the diagrams Fig. 4 - Fig. 6. Interactions between sentences are referred to by their labels, e.g., $(s_{1,2})-(s_2)$ designates an interaction between $(s_{1,2})$, the result of an analysis of $(s_1)-(s_2)$, and (s_3) . That the conclusions of 'naive' inferences are not represented as a

⁵ This important result is an achievement by A.J.J. van Breemen [9].

⁶ This enables a proposition to be reversed. In language, this is known as passivation.

sign complies with actual language use, according to which, the reader is assumed to be able to draw conclusions by himself.

How in sentence processing, memory relations, (A, B), are represented by our model can be derived from a syllogistic interpretation of the sentence interactions. This is illustrated by Fig. 4. In this and later diagrams we can make use of the free order of premises enabled by Aristotelian syllogistic.

$\begin{array}{l} (\mathbf{s}_1)-(\mathbf{s}_2) \\ \text{we} \\ \text{opportunities} \\ \Rightarrow \text{we} \end{array}$ $\begin{array}{ll} \text{IS} & \text{invest} \\ \text{IS} & \text{outstanding} \\ \text{IS} & \text{(have) outstanding (opportunities)} \end{array}$	$\begin{array}{l} (\mathbf{s}_{1,2})-(\mathbf{s}_3) \\ \text{we} \\ \text{our growth ...} \\ \Rightarrow \text{opportunities} \end{array}$ $\begin{array}{ll} \text{IS} & \text{(have) outstanding (opportunities)} \\ \text{IS} & \text{put customers first} \\ \text{IS} & \text{(growth in) put customers first} \end{array}$	$\begin{array}{l} (\mathbf{s}_{1,2,3})-(\mathbf{s}_4) \\ \text{opportunities} \\ \text{we} \\ \Rightarrow \text{we} \end{array}$ $\begin{array}{ll} \text{IS} & \text{(growth in) put customers first} \\ \text{IS} & \text{intend to grow (at a pace ...)} \\ \text{IS} & \text{opportunities (intend to make growing investment, at a pace ...)} \end{array}$	figure-1 $\begin{array}{c} \text{C IS B} \\ \text{A IS C} \\ \hline \text{A IS B} \end{array}$ figure-3 $\begin{array}{c} \text{C IS B} \\ \text{C IS A} \\ \hline \text{A IS B} \end{array}$ figure-2 $\begin{array}{c} \text{B IS C} \\ \text{A IS C} \\ \hline \text{A IS B} \end{array}$
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Fig. 4. A syllogistic interpretation of sentence interactions (left) and corresponding Aristotelian figures (right). In this diagram, quantification is omitted. We assume that in an inference (left) the two expressions of the common term (in italics) can be unified

The analysis, depicted in Fig. 5, reveals that (\mathbf{s}_1) - (\mathbf{s}_2) has the aspect of deduction. There is an increase of information in the relation between q1 and C only. We learn that investment is also known as opportunity. All other events (relations) represent information already available in the premises. The process, displayed in Fig. 6, shows that $(\mathbf{s}_{1,2})$ - (\mathbf{s}_3) has the aspect of induction. There is an increase of information in the relation between C and q2 only. We inductively learn that the growth can be a measure of the effect put customers first. The analysis, in Fig. 7, illustrates that $(\mathbf{s}_{1,2,3})$ - (\mathbf{s}_4) has the aspect of abduction. There is an increase of information in the relation between (q1,C) and (q2,C) only. We learn that we can be the subject, and intend to invest ... the predicate of a hypothetical proposition of the input interaction.

In Fig. 5 - Fig. 7, because of their less important meaning, the positions [q1] and [q2] are left unspecified. The position [C] is used for a representation of ‘common terms’, separated by a comma symbol. Temporal information involved in predicates, and the aspect of negation involved in the coordinator symbol ‘but’, are omitted. Events involving an increase of information are designated by a horizontal line.



Fig. 5. A ‘naive’ reasoning analysis of (\mathbf{s}_1) - (\mathbf{s}_2) . The final representation can be paraphrased as ‘we have outstanding investment opportunities’

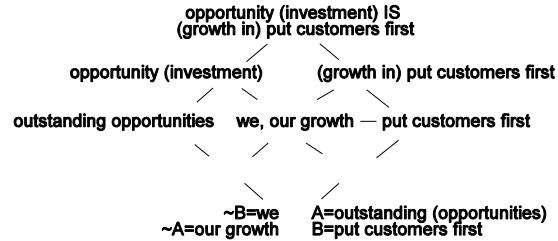


Fig. 6. A ‘naive’ reasoning analysis of $(s_{1,2})-(s_3)$. The final representation can be paraphrased as ‘through our investment (opportunities) customers will increasingly be put first’

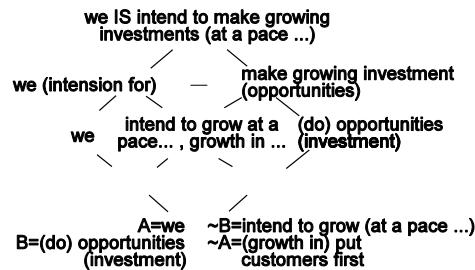


Fig. 7. A ‘naive’ reasoning analysis of $(s_{1,2,3})-(s_4)$

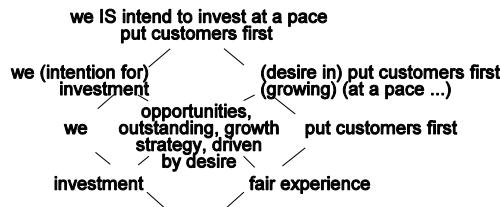


Fig. 8. Analysis of the entire text, in Fig. 2, as a single phenomenon. The position [C] is used for an expression of complementary information. We assume the existence of lexical information: desire~intention, investment~opportunity

We selected our running text in a random fashion, although under the condition that its content is clear and meaningful to us as a reader. Our analysis shows that meaningfulness of our text (from a naive reasoning perspective) can be a consequence of the aspects of deduction, induction and abduction that are involved. This illustrates what we may learn by making use of our process model and sign-aspectual approach.

The processes depicted in Fig. 5 - Fig. 7 can be combined into a single process, through considering the text to be a single phenomenon (cf. sentence), and the constituent sentences to be qualities (cf. words). The result of this, third type of an analysis, is displayed in Fig. 8.

4 Towards a Measure of Plausibility

Interpretation may terminate hence exist as a process, only if a propositional representation of the input is obtained. From this it follows that interpretation processes must involve all three types of ‘naive’ reasoning aspects. Note that representation of a reasoning aspect can be omitted, e.g., in the case of an incomplete sentence. More interesting is the case in which a reasoning aspect is represented repeatedly. This is when a text, consisting in a number of sentences, can be analyzed in a single instance of the process model. How is this related to plausibility?

Fig. 4 illustrates the three figures of syllogistic. According to Aristotle, inferences of the form of Fig. 1 are naturally truthful; those of Fig. 3 and Fig. 2 (in this order) are increasingly less plausible. This feature of syllogistic is respected by our theory as well. We assume that our model is capable of processing inputs (cf. premises) that conform to Fig. 1. Inputs corresponding to the other two figures need to be transformed into Fig. 1, through a conversion of the minor premise, in the case of Fig. 3, and that of the major premise in the case of Fig. 2.

According to Peirce, in a syllogism, the major premise stands for information that we already know, the minor premise must be an account of an observation. The representation of known information, such as habitual or rule-like knowledge, can be extensive. This means that conversion of the major premise can be difficult (it boils down to the definition of an inverse relation). This is opposed to conversion of the minor premise, which can be simple (e.g., a paraphrasing of a relation from active to passive). We assume that the complexity of the transformation required is negatively proportional to the truth perception or plausibility of an inference (cf. sentence interaction). Roughly, the more it takes to interpret, the less its plausibility will be. A consequence of the different transformations is an increase of information in different events of the process and a difference in the degree of plausibility of those events.

The relation between the truth of the syllogistic figures and the reasoning aspect of the events of our process model, depicted in Fig. 4, allows the definition of a measure of plausibility. Events expressive of the aspect of deduction can be assigned a high value of plausibility, those of the aspect of induction and abduction an increasingly lower value. Plausibility can be represented by a sum of those values. In a simpler approach, the input text is analyzed into relations that correspond to the structure of the three syllogistic figures. An experimental validation of the proposed measure of plausibility is on our current agenda.

5 Conclusion

Organizational semiotics recognizes the importance of sign theory and applies semiotics to real problems (this is an important element behind the successful research, e.g., at the University of Reading, UK). However its reach is limited by virtue of the restricted use of semiotic theory. We suggest that a process interpretation of the Peircean hierarchy of sign aspects may open new perspectives. We reinforce our hypothesis with an analysis of an extended example.

The potential of the proposed model for organizational semiotics, in particular, for an analysis of business documents, is discussed. This model is oriented toward the processes involved in the texts interpreted as signs. We conclude that organizational

semiotics could benefit from a shift of focus from signs as a relation to the sign aspects involved in signs.

In future research, there would be value in designing an experiment to investigate whether sign aspects affect plausibility and understandability. It contributes to business research by introducing a formal textual analysis approach and bringing corporate narrative research to pragmatic level.

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