PRAGMATICS IN LANGUAGE TECHNOLOGY: INTRODUCTION

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The three sessions of the workshop are introduced in the following three paragraphs by the three editors respectively. These introductions have the twofold function of explaining the general theme of each session, thereby furnishing at the same time a frame for positioning the papers contributed to the session in question. As is done in editing each paper, the references are added at the end of this editorial introduction.

1. PRAGMATICS AND SEMIOTICS

The theme of the introductory session to this workshop on language technology presents the broadest possible frame for studies in the field of linguistic engineering. The latter, as must be noted from the start, is indissolubly connected with the problematic of 'knowledge and reality' in all its complications. For, any message that might be expressed, transmitted and processed in linguistic form is pregnant indeed with such cognitive associations as are inherent in presuppositions, expectations, contentions, conceptions, valuations and hypotheses. Note, that this is even the case for casual conversation, nonsense dialogues and poetry. Stressing this is for making the reader ready for realising that those approaches to linguistic engineering that are still in vigour today are reductionist in character. Wishful thinking may be accounted one of the main factors in determining the habit of framing knowledge simply as a semantic issue; viz., wishful thinking focused on the attainment of a well-organized operational research-territory. Actually, as will be explicit in this first session, knowledge and cognition are something of the order of a pragmatic structure or process.

As to pragmatics, since Peirce [1] who conceived it as a scientific version of traditional rhetorics, and since Morris [2] who coined the term, adapting it from Peirce, and who mediated its acceptance through Wiener Kreis circles, it is generally accorded the philosophical position of the comprehensive approach to a specific language- or communication-system.

The occasion of this workshop on pragmatics in language technology may be considered as an indication that the tide for reductionism is getting low at last. As is well known, the formal approach inherent in syntactics and grammar has since long been exclusively paradigmatic in linguistics and language technology. Gradually, however, semantic aspects have been added willy-nilly. The fruitfulness of such a mixed semantic-syntactic approach will be apparent where we may dispose of software, learning networks and robots, that prove competent enough in handling rather complex standard dialogues, e.g. processing lingual information within standard contexts. Note, however, that life-communication between human beings cannot properly be translated according to fixed standards, rendering it in the form of standard dialogues issued by standard speakers having standard purposes within standard contexts; and, that saying this has more to it than a mere trivially.

The triviality here might be that it applies - in a sense - to everything, to every standard and every model. Therefore, it is not properly characteristic of life-communication, that it cannot be standardized, as it is not to be identified with its models. What makes this note more than trivial, however, is that semantic standards cannot be fixed apart from their pragmatic contexts; worse, the fixation of pragmatic standards is in turn dependent on semantic issues (circularity). For short, pragmatics represents all those aspects of communication that are irreducibly relevant for a proper rendering of the functioning of language and that are not accounted for by semantics.

For the language engineer the practical side of all this is, that some minimal aspects of pragmatics will have to be dealt with in his technical design. As a first-order problem comes up here the question how to select the relevant minimal aspects connected with such diverse pragmatic characteristics as normativity, purposefulness, knowledge- or context-dependent meaning construction, and
intensional constrainedness or conceptual interrelatedness. This long-listed characterization of linguistic pragmatics could be abbreviated by using as a key-term functionality; if only the latter would not again be biased into reductionism, considering a tendency among functionalists to render the triadicity inherent in pragmatics in terms of (a concatenation of) bipolar relations that are again semantic in character. The structural differentiation between semantics and pragmatics may be explicated indeed (as is done to some more detail in the first paper) to be of the order of the difference between linear word-object relations and triadic word-object-conception relations. It is to be noted in this context, that Peirce has established as one of the main tenets of his pragmatism, that triadic interrelations cannot be rendered by a concatenation of binary relations without a considerable loss of structural quality; viz. without reducing circularity to linearity.

Here is where semiotics comes in. Underlying all relevant relating is the notion of semiosis. The word 'semiosis' (adopted from Greek, meaning sign-process) has been coined by Peirce to indicate the universal process in which something is functioning as a Sign. More specifically, as is outlined in the first paper, it indicates the omnipresent process in which an emergent First or information-vehicle, functioning as a Sign refers to an objective identity or fact (the referent or Second) through the intermediary of a law or norm by which the reference is guided (the Third). Semiosis, for short, is the process realizing the integration of Sign, Fact and Norm. Semiotics, then, is the all-embracing study of certain types of semiosis, such as symbol-semiosis, and of semiosis in general. More specifically, semiotics is the universal study of signs, sign systems (including as such linguistics), and their meaning-creating contexts. Thus it represents the comprehensive frame for integrating the syntaxics, the semantics, and the pragmatics of any specific sign-system and for interrelating communication phenomena of any kind with notions from epistemology and design methodology.

Finally, pragmatism as specified by Peirce, may be imagined now as semiotic pragmatism i.e. as the general, epistemology- and ontology- based, methodology of meaning. In Peirce's own terminology: pragmatism is the methodetic (i.e. methodico-hermeneutic) counterpart of semiotics. One of its maxims is relevant enough to be stated here. It is implied be the universal character of semiosis: as we are thinking and acting, we are thinking and acting in and through science, i.e. information vehicles ([3]).

The three papers of the first session may be positioned now as follows, fitting them in the above framework:

Van der Lubbe & Nauta treat to some detail what Peircean pragmatism as a general methodology is about, and how it relates to semiotics, pragmatics, and cognition. Semiosis is further explained as the process, studied by semiotics, that is at the basis of whatever might come to expression. Accordingly the authors declare the triadicity inherent in this process to be elucidative of Peirce's three universal categories that are at the basis of semiotic pragmatism. The use of this is illustrated by applying first-order and second-order categorical tripartitions to expert systems. In doing so, the cash-value of semiotic pragmatism is made explicit, especially with respect to the representation of expert inferencing under uncertainty. The relevance of introducing abduction as a complement to deduction and induction (thus obtaining circular inferencing) is considered more in particulars.

In the next two papers the theme of discussion is expanded to embrace culture and society. Focusing pragmatic analysis on the evaluation of institutionalized research (pure as well as applied) and the fabric of the legal state respectively, the discourse exemplifies culture and society as manifestations on the macro-level of ever the same semiotic process. Vandomme, considering the scope of discourse he is in charge of, differentiates between a short- and a long-term approach within the all-embracing field of meaning attribution. Thus partitioning what is called pragmatics by the other contributors to 'pragmatics' (short-term approach) and 'discourse theory' (long-term approach). In line with Vandomme's contentions, it is to be noted in this context that semiotic pragmatism is designed not to narrow down to propositionalism, i.e. taking the sentence as the ultimate unit of informational analysis. For, the (information-vehicle functioning as a) Sign is defined by Peirce to apply just as well to one gesture or word as to a whole discourse or encyclopaedia. The holistic approach inherent in semiotic pragmatism is affirmed by Vandomme, where he stresses the prevalence of the design - order over the presupposition - order. According to this prevalence, pragmatics comes first, semantics
next, and syntactics ends up as the finishing touch. Having explicated the interrelations between epistemology, semiotics and logic, and the place of scientific research and human action, c.q. communication, within it, Vandamme resumes an issue that has been left unsettled by Peirce due to his platonistic predilection for pure understanding, viz. the controversy between pure and applied research. This issue is elucidated by Vandamme's inventory of elements featured by the pragmatics of institutional communication between scientists.

De Jong & Werner expound the pragmatics of the legal state. In doing so they resume as a main theme an issue shortly referred to by Vandamme, viz. designing non-repressive, non-authoritarian, societal institutions. As this is understood as a task belonging to semiotic pragmatism as a scientific methodology, it is apt to remind here of two things. First, as is documented for instance in 'Peirce and Law' [4], pragmatism originated around 1872 from discussions in Cambridge's (Mass.) 'Metaphysical Club', where Peirce since 1863 formed his pragmatic ideas in debating most of all with juridical professionals like Holmes and Chauncey Wright. Peirce's pragmatism, especially as far as its futurism, its communalism, and its Thirdness-idea are concerned, has ever since been pregnant with interiorized juridical ideas, as appears from such pragmatist key-notions as 'law', 'reasonableness', and non-authoritarian 'self-control'. Second, realizing the methodic counterpart of semiotics it belongs to the very core of the tasks of Peircean pragmatism to realise methodologically the integration of signs, facts, and norms.

Clearly, this is a post-Kantian undertaking. Accordingly, de Jong & Werner start their discussion with Kant, adopting from him as a principle the normative design of institutions in view of the future. In the mean while the authoritarian and fixationist character of Kant's transcendentalist logicism is exposed. Subsequently the problem of ordering the trias politica, i.e. the separation of legal powers, is reinterpreted in terms of cybernetic (governmental) functions instead of in terms of reified, more or less autonomous, bureaucratic branches. This makes for a more semio-logical instead of onto-logical conception and constitution of legal powers and, accordingly, for a pragmatic analysis and a cybernetic design of the legal state as a system of signs [5].

Note, that the theme language technology as such is not treated in this session. This introductory session to the workshop is indeed designed to be an eye-opener for realising to what extent the scope of relevant language philosophical discussion is broadened and to what extent new complexities are introduced into the field of language engineering as soon as pragmatics is accounted indispensable for language technology.

2. Functional Approach in Linguistics

It is of central import to the whole undertaking of pragmatics in language technology to have a clear overview of functionality in language, and more specifically, of the functional approach in linguistics. The latter refers especially to the Prague-school of linguistic analysis. During the first half of this century the Prague school was rather dominant within the field of formal linguistic analysis, but later on this dominance faded by both the difficulty for Czech scholars to communicate with other scientists after World War II as well as the impact of Chomsky's structural approach in linguistics. Among others in western Europe the development of Simon Dik's Functional Grammar was inspired by notions of the Prague school. An overview of more recent developments in the Prague school itself can be found in [6]. What differentiates the functional from Chomsky's structural approach is that next to syntactic and semantic aspects attention is paid to pragmatic features as well.

In the field of verbal semiotics pragmatics may even be identified with the functional approach in linguistics. But, as De Groot points out, this correspondence does not mean that something like Dik's functional grammar may be identified with a pragmatical theory. On the contrary, one could say that functional grammar, and the functional approach in linguistics in general, is a formalism in which all three semiotic branches, syntax, semantics, and pragmatics have their own representation. Among others, this means that semantic properties do not depend on syntactic ones and vice versa. Syntactic, semantic, and pragmatic aspects are not derivable from each other by universal rules and they demand their own more or less mutual independent analyzing or parsing process.
The main terms in which functionality and pragmatic aspects overlap are informational topic and focus. That is, the pragmatic or functionalist analysis of a sentence has to distinguish given and new information in a sentence. It is not the case that this distinction can only be made by analyzing the mental states of speaker and hearer, as is supposed within the field of artificial intelligence (cf. [7,8,9]). Not only is discourse analysis a very helpful tool for topic-focus-distinction in sentences, but there are even features in the sentence surface which indicate whether a certain phrase contains given or new information. In [6] Sgall et al point out that the deviation of the word order in a sentence can indicate a topic-focus-distinction. And of course intonation and other ways to emphasize a certain phrase fulfills the same role.

In his contribution Steiner mentions the neglect of the functional approach in the fields of computational linguistics and language technology. This lack of interest was caused by the computational power demanded for by the functional linguistic formalisms. But given the current shape of computer technology this excuse is not valid any longer. Simultaneously with the growth of the abilities of computer machinery, the desires of scientists in computational linguistics increase (cf [10]). Watching this development of the Chomskyan formalisms used in computational linguistics, the difference between these and the formalisms of functional linguistics becomes one of degree, according to Steiner. But of course the difference between the approaches remains more fundamental and important, at least in the perspective of pragmatics.

As said before, in functional linguistics the focus of pragmatic analysis is mainly on topic-focus-distinction. Bartsch emphasizes that given and new information is not the only pragmatic role a concept can play. As a matter of fact, both roles presume the existence of the concept involved. A third pragmatic function, which is far more important and far more difficult, is concept formation. The addition of this, usually neglected third pragmatic function, is related to Peirce's addition of abstraction to the existing notions of intention and extension in the logic of terms. The consequence of this addition was that the logic of terms was no longer a theory of a fixed set of mutually related concepts, the one involved by or involving the other, but a living set containing rules for growth, change, and decrease.

3. Logic of Belief, Utterance, and Intention

Pragmatics is defined by Rudolf Carnap as the logic of belief, utterance, and intention and their interrelations (cf. [11]). According to this definition the distinction between semantical and pragmatic meaning has to be drawn between 'meaning' in terms of truth or truth preserving conditions in the so-called Fregean sense and 'meaning' in terms of effects upon the speaker, the hearer, or the discourse community in general, respectively. Where the semantical notion of meaning is formalized in model theoretic logic, many logicians are convinced that pragmatics has to be formalized in modal logic and a corresponding model or sets of models. Doing so, both kinds of meaning are at least interchangeable. In Situation Semantics Barwise and Perry [12] present a definition of meaning that more or less contains both the distinguished notions. In their opinion meaning is a relation between two situations: one situation serving as a sign, the other as the thing or the event assigned by the former situation. The situation of smoke assigns a situation of fire ("smoke means fire"); the situation of uttering "it is raining" assigns a situation in which it is raining ("it is raining' means that it is raining"). The main advantage of this definition is, according to Barwise, that semantical models no longer have to represent the whole world.

In Situation Semantics the (computationally) outraging possible worlds semantics, representing the total sets of possible worlds sustaining the truth of the utterance is replaced into a partial worlds semantics containing only the things explicitly assigned in the utterance. Where in traditional possible worlds semantics the sentences "Joe is eating" and "Joe is eating and Sarah is sleeping or Sarah isn't sleeping" have exactly the same semantic representation (they are true in exactly the same set of possible worlds), they have different semantical representations in Situation Semantics, the first only containing an eating Joe and the second an eating Joe and a certain Sarah of whom it is not known whether she is sleeping or not. Due to this and other examples of plausibility, situation semantics became a highly influential theory in computational linguistics and philosophy of language for the past decade.
Another example of plausibility is explored in Ginzburg's contribution to these proceedings. The constructed representation of states of affairs, which in combination with a spatiotemporal entity and a truth value, compose the representation of a situation, can serve very suitably as a tool modelling the way in which questions can be resolved. In this case the pragmatic meaning of a question (a situation containing unresolved states of affairs) is the relation between this question and the set of situations in which the assigned states of affairs are resolved.

Of course, in the case of language utterances the 'meaning' relation is more complex than it is in the case of the physical law governing the fact that smoke has to be produced by fire. Writing the utterance "it is raining" as done in an above example, obviously does not mean that it is raining here and now. Its meaning is in the presentation of an example. The different types of these meaning relations, of which Ginzburg's answer is just one, are not formalized by Barwise and Perry, and right in these variants of meaning pragmatics comes in vision. In the contribution of SchAAKE this omission in Situation Semantic is related to the ontological status of meaning and situation in Barwise's and Perry's theory. Recognizing that the distinguished components of the meaning relation (sign, reference, and meaning) have different ontological status will resolve this omission. The system of Existential Graphs, developed by C.S. Peirce, provides for this demand and, moreover, its syntax is recognized by Barwise & Cooper [13] and Sowa [14] to be isomorphic with the syntax of Situation Theory. Thus, its semantics can serve as an important extension of Situation Semantics.

The variety of different communicative functions we have to deal with, is presented in the contribution of Bunt. In this contribution the point is emphasized that these functions are not just a trivial extension of linguistic theories. Communicative functions do not operate on linguistic expressions themselves, but on their interpretations or pragmatically meanings. Moreover, communicative functions are not simply to be identified with single operations on belief, knowledge, intention, or the discourse process, but contain mostly a mixture of different operative aspects. Bunt's remarks lead to the conclusion that in order to deal with both situations and attitudes, the mainly semantically motivated formalisms need a thorough extension in the direction of representing attitudes as well.

References