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DIMENSIONS OF CONTEXT. CLASSIFYING APPROACHES TO THE CONTEXT OF COMMUNICATION

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ABSTRACT

This paper analyzes the concept of context with a special focus on the context of communication. We suggest two ways of classifying approaches to the context of communication: (i) classifying approaches based on a number of relevant dimensions for analyzing context in social activities, (ii) classifying approaches, based on the dimensions of Peirce's semiotics. We also discuss the use of collected corpora of language, especially multimodal corpora of spoken interaction, as an aid in studying context. Finally, building on the two ways of classifying approaches to the context of communication, we present our own proposal for how to analyze the main relevant contextual dimensions influencing human interaction and communication

Keywords: Context, approaches to context, dimensions of context, syntactic context, semantic context, pragmatic context, semiotics, representamen, object, interpretant, relevant contexts.

1. WHY SHOULD WE STUDY CONTEXT AND WHAT IS CONTEXT?

1.1. Why should we study context?

Many theories of semiotics, communication, linguistics and cognition (as well as many other areas) presuppose and rely on some notion of context. However, the notions presupposed have been different. This paper is an attempt to clarify the notion of context in relation to the four areas mentioned above, concentrating especially on communication and linguistics with some consideration also of semiotics and cognition.

1.2. What is context?

The origins of the word "context" clearly go back to the production and interpretation of written text. The starting point is a particular linguistic expression in a text which requires access to the text preceding and/or following the expression to be fully understood or explained. A basic reason for

this is that linguistic expressions frequently have many possible uses and meanings, if taken in isolation out of their (con)text. So, the concept of a “context” was created to capture the surrounding text of a particular linguistic expression in focus.

This notion of context is the notion that is used, for example, in translation, when we need the context of a word to find a translation to another language. To translate “web,” we might need to know, depending on the language being translated to, if it is the “web” of “spider web” or the “web” of “web site.”

Over time, this linguistic use of the concept “context” has been generalized to cover events other than linguistic textual events. Usually the events in question have been social events. It is easier to speak of the context of a decision or a party than of the context of a snowstorm. However, as we shall see, like in the original linguistic cases, the concept of “context” still retains a relation to an understanding or explanation of whatever it is the context for.

Through the broadening of its meaning, the word “context” now belongs to a semantic field, which has other members like “environment,” “surrounding,” “milieu” and “background.” All the words have slightly different uses, but point to something that is embedding another entity, which is in focus. Usually, the foci are of fairly different types. Compare:

1. The context of a word
2. The environment of a city
3. The milieu of an artist
4. The surrounding of the house
5. The background of the investigation

Some foci might admit collocations with several members of the field. One possible candidate for this could be collocations with the word “conflict.”

1. The context of the conflict
2. The environment of the conflict
3. The milieu of the conflict
4. The surrounding of the conflict
5. The background of the conflict

In the above list, probably “the context of the conflict” comes closest in meaning to “the background of the conflict,” giving access to information that helps us to understand or explain the conflict. The expression “the environment of the conflict” could perhaps also be used in a similar way, but could also be used in a more external physical sense. This physical sense would probably be the main one for “the surrounding of the conflict.” The expression “the milieu of the conflict” has a more unclear status, perhaps pointing to the social milieu of the conflict.

In order to sharpen our intuitions about what a context is, we now propose a definition of “context.” Below is a suggestion of this definition.

Context = the surrounding of something in focus which needs more complete understanding or explanation. Often, what is in focus is an event (often an action or activity), especially a social, mostly communicative, (sometimes psychological) event; less often a property, object or relation.

Using this definition, we see that the “context” of a given focus of attention is something (usually in close proximity) we need to grasp in order to better understand or explain whatever is in focus. The focus is thus a particular aspect of an event, requiring an apprehension of its surrounding to be better understood or explained.

2. CONTEXT IS A RELATIONAL CONCEPT

As we have seen above, the original sense of “context” is that of a text accompanying a given textual element. If we investigate “context” in this sense, we consider how the element (phoneme, morpheme, word, sentence or even text) is influenced by the linguistic elements surrounding it.

Usually, the most straightforward kind of influence can be seen by relating the entity in focus to entities in the context that are of the same type as the focused entity. Thus, the context of a phoneme are other phonemes and the context of a morpheme are other morphemes; the context of a word consists of other words and the context of a sentence of other sentences. However, it is possible also to consider entities of another type than the entity in focus as context. In this way, the context of a phoneme could be a morpheme, a word or a sentence, leading to more complex types of understanding and explanation. Over time, the original sense of “context” has been generalized to mean the surrounding of anything being related to and often influenced by its surrounding.

In examples like (1) and (2) below, the context is not linguistic, but concerns historical social events and circumstances.

1. The context of the First World War.
2. The context of the great economic depression.

But, even if the term “context” today can be used in an increasingly abstract and wide sense, our main interest in this paper is a “context of interaction” involving somewhat intelligent beings (humans or other animals, computer programs) and especially a “communicative interaction,” involving such beings.

Given the above definition and discussion of “context” as surrounding factors which help us understand and explain some phenomenon, it follows that a reasonable manner of classifying context is to do it from the point of view of the phenomenon the context is influencing; in this case, communica-

tion. Below, we will now present two communication-related ways of classifying context

from the point of view of three central factors in communication

from the point of view of the Peircean analysis of the concept of a sign

We will then attempt to unify these two approaches in a combined proposal for analyzing the context of communication.

3. CLASSIFYING CONTEXT FROM THE POINT OF VIEW OF THREE CENTRAL FACTORS IN COMMUNICATION

3.1. Why and where is context important for communication?

Communication always involves at least three possible main contextual foci: (i) production of information (by at least one communicator), (ii) interpretation of information (by at least one other communicator) and (iii) interaction between the communicators. The context of communication includes factors that influence these three main foci; production, interpretation and interaction.

Thus, the notion of “context” overlaps very much with concepts such as situation, setting, background information or influencing factor, which have often also been used to better understand and/or explain communication.

Context is an essential feature of what is shared in communication and becomes especially important when communicators do not make the same contextual assumptions or do not have a sufficient contextual understanding to say or do the expected or appropriate things, or to interpret what is going on in an appropriate way. Each of these situations can occur, for example, in intercultural communication between communicators who have different (national-ethnic) or other different cultural backgrounds. The situations can also occur in constructing a dialog system, especially in trying to find appropriate ways of communicating and interacting with users.

Contextual information, as we shall see below, provides us with information, which is required for all the three suggested foci of communication; production, interpretation and interaction.

3.2. Contextual features connected with communication in different social activities

We have suggested above, that perhaps the most accessible way to classify approaches to context is to classify them with regard to what seems to be the presupposed focus of the context. Given the three suggested focal aspects of communication discussed above; production, interpretation and interaction, we can distinguish at least the following further possible context foci in both Human-Human communication and Human-Computer interaction:

- (i) The social activity in which the communication occurs
- (ii) The participants in the activity we are interested in (including the users of a computer supported system)
- (iii) The message(s)
- (iv) The artifacts used in communicating, e.g. a computer system
- (v) A particular contribution to communication
- (vi) A particular linguistic expression
- (vii) A particular gesture

Let us now briefly consider these possible foci one by one, starting with the overriding collective social activity and ending with particular expressions like words or gestures in individual contributions.

(i) The social activity

Often an interest in context is connected with a particular social activity like teaching, negotiating, auctioning or giving information. The context then has to provide relevant background information for this activity. This information can be activity internal, e.g. the purpose of the activity, the set of roles connected with the activity (and what characterizes these roles) and the instruments and procedures usually employed in the activity. The contextual information connected with the activity can also be external and concern the national-ethnic culture, the language, the social institution, the organization or the physical environment embedding the social activity.

(ii) The participants in an activity

If we focus on the participants in an activity, the relevant contextual information will include information about their cultures, their languages, their gender, their social class as well as information about their roles in the activity, an important aspect of which is whether they are in a sender role, producing information or in a recipient role, interpreting information. It might also include information about the beliefs and values of the participants in the activity.

A so-called virtual agent (a computer program) and the users of a computer system are a special case of participants in a social activity. However, most of the contextual information that might be relevant to understand or explain the actions and behavior of any participants in an activity could also be relevant to explain the actions of a virtual agent or the users of a system. The contextual information can here provide a resource that has both enabling and constraining effects on the agent, users and system.

(iii) The message(s)

The focus of contextual information can also be the message(s) (short or long), which is/are being communicated. Again, the context for the mes-

sage(s) will often be a social activity with a particular purpose, a particular set of roles, a particular set of instruments as well as the external influences on the activity (the culture, language, social institution, organization and physical environment).

(iv) The artifacts used in communicating

The context of communication also includes the constraints and enablements introduced by the means of communication, e.g. pens, paper, printing, radio, TV and various types of computer systems, where the role of the system can range from being merely auxiliary to being augmentative or even a fairly autonomous agent. If it is an agent, it will be a special case of being a participant in an activity. Thus, the system should also basically select stylistic communicative features with regard to culture, language, gender, age, social class and type of social activity and a role in this activity. Even if it is desirable to select stylistic features, which are as neutral as possible with regard to the mentioned contextual variables, this will not be possible in all cases. In addition to features determining its own role, the system has to have a range of user models to be able to handle different types of users. These user models should include modeling the contextual influence on the users, that is how their communicative behavior and ability to interpret is influenced by their culture, language, gender, age, social class and role in the type of activity engaged in (e.g. is the system in the role of teacher or student (speaker or listener) in relation to the role the user is in?)

(v) A particular contribution to interactive communication

Another possible focus is a particular contribution to communication, for example, an utterance or a gesture including both the behavior and the content of the contribution. Here, relevant contextual information would include aspects of the interaction like whether the contribution is part of an exchange type, like question—answer, greeting—greeting, granting a favor—expression of gratitude etc. It would also include information on what phase or sub-activity of an activity it is occurring in. For example, does it occur in the examination phase or in the diagnosis phase of a medical consultation? It would include information on what kind of social activity, sub-activities and exchange types the contribution(s) is/are a part of, providing information on the purpose, roles and instruments of the activity as well as information on external conditions like culture, language, institution, organization and physical environment.

(vi) A particular communicative expression

The focus could also be a particular linguistic expression, for example a phoneme, morpheme, word, phrase, sentence, gesture or gesture combina-

tion. The contextual information might here include information about the other expressions or gestures belonging to the same larger unit as well as contextual information relevant to the contribution and activity of which the expression is part.

All the seven context foci mentioned above give rise to different types of contextual information and approaches may be classified according to the features they include. We may ask, for example, is the approach to context mostly focused on the contextual dependencies of single linguistic expressions, like pronouns, tense morphemes or pointing gestures? Is the approach focused on the contextual needs of the participants, their beliefs and values or does it try to combine several different types of contextual information?

Let us now consider another possible way of classifying approaches to the context of communication. Using the types of contextual foci mentioned above and the idea that the type of context we see as relevant, depends on the type of contextual focus we have in mind, we will now turn to another source of contextual relevance in studying language and communication, namely the semiotic analysis of a sign proposed by Charles Sanders Peirce.

4. CLASSIFYING LINGUISTIC CONTEXT FROM A PEIRCEAN PERSPECTIVE

The appreciation of the role of context for language and communication can take several different routes. Above, we have used an analysis of some of the most significant factors in a communicative situation to suggest a number of possible contextual foci and accompanying contexts. As a second suggestion, we will take as our point of departure the semiotic analysis of a sign proposed by Charles Sanders Peirce (1931–1958), in combination with the characterization of the aspects of a sign system (syntax, semantics and pragmatics) suggested by Charles Morris (1938), to propose a different way of classifying approaches to what is seen as context.

4.1. The three-place characterization of a sign proposed by Charles Sanders Peirce

Peirce, during his long career, proposed several definitions and characterizations of a sign. The following description attempts to capture some features that reappear in most of his characterizations.

A sign carries information to an interpreter by linking a “representamen” (something that represents) to an “object” that it represents by virtue of an “interpretant,” linking the representamen and object in the mind of an interpreter.

Thus, the representamen (word) “horse” represents the object (animal) horse, by virtue of a “mental interpretant of a horse,” giving the word an interpretation (meaning) and reference to horses.

Using the three elements distinguished by Peirce (representamen, object and interpretant), we can now distinguish three different approaches to context and as before also open for the possibility of a combination of two or more of the approaches. In a sense, what we will be doing is to use the dependence of the constitution of a sign on a sign user (interpreter) to explore the more general context dimensions of a sign. In line with the characterization of the sign given above, we can now distinguish the following three types of context as well as a fourth type combining these three:

1. The context of the representamen—syntactic context
2. The context of the object—semantic context
3. The context of the interpretant—pragmatic context
4. Combinations of syntactic, semantic and pragmatic context

4.2. The context of the representamen—the syntactic context

This is the original notion of context—that of linguistic signs embedding other linguistic signs. As we have seen above, this notion, over time, has become broader and broader, eventually leading to the notion of “extra-linguistic context,” which clearly indicates that the relevant “context” is something non-textual. It is interesting to note that this development, in turn, has led some authors to reintroduce the original notion, by creating a distinction between “con-text” and “co-text,” where context is given a vaguer, wider and basically undefined sense and “co-text” reintroduces the original text-based notion (Catford, 1969).

Throughout the 20th century, the notion of context has gradually become more popular, first in linguistics, then in the various social sciences and finally in informatics and applied computer science. In linguistics, the text based notion of context probably reached its apex in the movement of “text linguistics,” which was popular in the 1970s and 1980s (van Dijk 1972; Enkvist, Kohonen, 1976; Halliday, Hasan, 1985, Petöfi, 1971).

A special and interesting case of the context of the representamen is constituted by the multimodal “syntactic” context. Here, the representamen is constituted by communication involving more than one sensory modality. Thus, in multimodal communication, we can, for example, regard body language and prosody as context for speech or pictures as context for text. The property that the different modalities have in common is that they are all features of representamens made up by complex communicative contributions to interaction. A multimodal contribution is a complex representamen where spoken words, gestures and prosody all are recognized as important dimensions. In line with a Peircean starting point, we are now considering

all accompanying representamens, and since gestures and prosody qualify as such representamens, this means that we abandon the notion of context as merely “accompanying text,” while still staying within the limits of a representamen based notion.

4.3. The context of the object—the semantic context

With the context of the “object,” we move from the signifiers (representamen) to what they signify (the signified). We move from the expression side of a sign, to its content side, from syntax to semantics. Semantic context is the notion of context that formal language philosophers deemed necessary to get around the limitations of purely syntactic approaches to language. Besides the meaning of the other representamens, several aspects of the situational context were introduced to make possible assignment of reference and truth conditions to the expressions of a language in a general way.

The languages considered in formal semantics were usually formal languages that were made more sophisticated by gradually incorporating more complex features from natural language. Examples of such incorporated, more complex features are deictic expressions, tense and temporal expression as well as modal expressions (in a different sense of modality than sensory modality). For example, in order to give an interpretation of the reference and truth conditions of a sentence, like *you are more tired than me*, we need information on who said it, to whom and when it was said. To do this, contextual information is needed, anchoring the sentence in a particular speech situation at a particular time, with a particular speaker and a particular listener. Without this information, we will not know what proposition was expressed and no inferences can then be drawn from the sentence.

In formal semantics, the approach to context was developed through the use of the notions of “possible worlds” and “index”. These notions were used by scholars like Yehoshua Bar-Hillel (1954), David Lewis (1970) and Richard Montague (1970 (1974)), to capture the interplay between propositional meaning and context. In a further development, also the notion of “presupposition” was analyzed, using the same tools (“presuppositions” are propositions that are implied both by an affirmative sentence and by its negation, e.g. both “I realized that he was here” and “I did not realize that he was here” imply that “he was here”). In this framework, propositions (the meaning of declarative sentences, assertions) were analyzed as functions from possible worlds to truth values, so that the meaning of a declarative sentence could be seen as the set of possible worlds in which it is true. In this vein, context could now be characterized as the set of propositions (possible worlds) believed by a particular language user to be true.

Thus, we can see that a semantic conception of context is fairly different from the syntactic concept of context, constituted by the representamens

accompanying a particular representamen. In the semantic approach conception, instead, context is conceptualized as objects seen as propositions dependent on indexes/indices and sets of possible worlds.

4.4. The context of the interpretant (the interpreter, the user) —the pragmatic context

The interpretant is the interpretation given by the user (interpreter) of a particular representamen. This interpretant (interpretation) links the representamen with the object it represents and with the interpreter. In this way, the users of a sign and a sign system are included in the analysis and create the context of the interpretant (and more generally user) and, by extension, also the context of the usage of the interpretant. This is the pragmatic notion of context, i.e. the notion of context that involves the study of a sign system, e.g. a language in use. We can now study the functions of language and other signs in use, irrespective of whether they involve other representamens (syntactic context) or truth conditions and reference (semantic context) or other factors, like the attitudes and emotions of a user.

The pragmatic context, thus, opens up for a consideration of any factors that influence the user of a sign, going beyond other linguistic expressions (signs), truth conditions, possible worlds and reference, determining indexes/indices and propositional beliefs. Now contextual factors can include all of the factors we discussed above in our first attempt at classifying approaches to context, as possible foci and contexts in a study of communication and interaction. Thus, factors like culture and social activity become relevant, since they can influence how a user interprets and in other ways uses language.

The pragmatic notion of context is the notion that was used in the Malinowski-Firthian tradition (Malinowski, 1922; Firth, 1957) and in Halliday, (1976), Levinson (1983), and Allwood (1976) and it is the notion which has been relevant in sociolinguistics, anthropological linguistics, intercultural communication, communication studies and computer based dialog systems.

The pragmatic notion of context is wider than the syntactic and semantic notions of context and thus, allows inclusion of the former two notions as dimensions of a more inclusive notion of context. As an aside, we might note that this means that the interests in communication that were most popular in ancient Greece; rhetoric and dialectics, are being reinstated and that dialog and communication increasingly are seen as central phenomena for an understanding of the nature of language.

5. SOME EMPIRICAL AIDS FOR STUDYING LANGUAGE IN CONTEXT

A very important empirical aid in understanding the role of context for language is to examine the actual use of language. This is increasingly possible through investigation of the linguistic/communicative corpora that have been built up since the 1960s. New technology concerning recording and digital storage and search has made possible collecting and establishing corpora of many different language and many different varieties of a language. Over the past fifty years, corpora for different registers and genres have been constructed. See, for example the corpora for English collected by Svartvik and Quirk (1980) or for Swedish by Allwood, Björnberg, Grönqvist, Ahlsén and Ottesjö (2000).

Most of the corpora have been only concerned with written language, but there are also corpora, which have included also spoken language, like the British National Corpus (BNC) (Leech, Smith, 2000) or only spoken language, like the Gothenburg Spoken Language Corpus (2000).

These corpora have made possible qualitative observation of language use in interactive communication, but also quantitative descriptive statistics, for example, of how different linguistic expressions are actually used in different contexts.

During the last decade, linguistic corpora have increasingly become multimodal, combining audio and video recordings, allowing for studies of the simultaneous interaction of gestures, prosody and vocal verbal utterances in many different types of social activity.

6. COMBINING THE TWO APPROACHES

Based on our discussion above of the two approaches to context, we will now combine them to make a suggestion of what we think are relevant contextual dimensions in the interpretation and production of contributions to communication, in most social activities

We start by dividing contextual information into two main types which both have subtypes:

1. Situation of communication—information concerning the external macro situation of communication. This information can often be seen as “influencing” the communication and is closely related to pragmatic context.
 - a. Individual information concerning the communicators (culture, language, region, age, gender, education, social class, personality type, beliefs, values)
 - b. The social activity (with purpose, roles, instruments and environment)
 - c. The current communication situation (speech, gesture, writing)

2. Other activated cognitive information, i.e. information activated by what is said and done in the interaction.

a. Information related to communicative behavior, e.g. content (vocabulary), communicative acts, exchange types

b. Information related to behavior, which is not primarily communicative, e.g. speed of work, type of tools and instruments etc.

In addition to the “influencing” types of contextual information, we will also consider what is being “influenced,” i.e. aspects of behavior which can be related to syntactic and semantic context.

Below, we will now present this idea in the form of a table. In Table 1, we can see that the influenced features that are dependent on the particular interaction also appear as influencing contextual features dependent on and activated by what is said and done in the interaction. This is due to the so called “reflexivity” of many types of social behavior. What A says triggers a question from B, which in turn triggers an answer from A and so on.

Table 1. A suggestion for contextual dimensions in communicative interaction

| Situation of communication (“influencing”) | Cognitive and Communicative behavior (“influenced”) | Other cognition and interactive behavior (“influenced”) |
|--|--|--|
| Macro parameters Age, culture, language, gender, organizational position | Features of cognition and communication dependent on the chosen macro parameters, like accent, dialect, individual style | Features of other cognition and behavior dependent on the chosen macro parameters, like working skills and competence etc. |
| The social activity | Communicative acts, exchange types, sub-activities | Other task related interactive patterns and actions |
| The current situation, time, space, persons | Deixis, tense, and other temporal expressions, spatial expressions | Spatio-temporal dependencies between actions |
| The current interactive situation | Preceding and simultaneous Communicative acts, exchange types, sub-activities and other features of communicative behavior | Preceding and simultaneous actions and interactions |
| Other activated cognitive information activated by what is said and done in the interaction; both factual beliefs and attitudes and values | For example, information activated by content (vocabulary), communicative acts, exchange types | For example, type of actions, speed of work, type of instrument |

Many of the influencing parameters are independent of the particular interaction represented in the table above and have often been described as background information, functioning as a resource in communication. This is also true for the effects of the influencing contextual features dependent on and activated by what is said and done in the interaction, since the information activated in this way often is part of the information that the communicators bring to the interaction.

On a fairly high level of abstraction, we can observe that much of the contextual information is culture dependent. This concerns both what the communicators believe to be factual information and other attitudes and values that they might have. A consequence of this is that an understanding and account of context is important for all types of communication but that it is particularly important in intercultural communication, where contextual background assumptions might be different.

7. CONCLUSION

In this paper, we have suggested two ways of classifying approaches to context in relation to human communication with other humans or with computer programs modeling some type of intelligent agent. In our account, we have contrasted an approach to communicative context based on a general communication perspective with an approach based on the three constituting elements in the Peircean analysis of what constitutes a sign (representamen, object and interpretant). Our analysis shows that the two approaches are compatible with each other and to a great extent overlap in the notion of “pragmatic context.”

Using the above analysis, we have finally made a suggestion for how to combine the two approaches to the analysis of communicative context by distinguishing between two main types of contextual information; (i) information given by the situation of communication and (ii) other activated cognitive information.

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