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A Construction-based Approach to the Lexicalization of Interjections

Abstract

So far there is no unified treatment of interjections with respect to both their cognitive or emotional content and to their discourse functions. Furthermore, the various contributions interjections can make to automatic speech processing systems have not been exploited at all. An approach to the description of interjections on the basis of general constructions will be presented which accounts for the productivity of the word class. Finally, means for lexicalization in a lexical knowledge base will be suggested which guarantee efficient processing of actual and potential interjections.

0. Outline

Interjections are a characteristic phenomenon of spoken language discourse. They are neither inflectable nor integratable into sentences, and usually they make up independent intonational units. They fulfil important interactive and discourse structuring functions and display a certain emotional content. All these features have to be accounted for in a lexical representation, and so far there is no approach to the description of interjections which could offer a unified treatment of these aspects. This paper will be an attempt to provide an approach which fulfils this requirement.

1. The Cognitive and Emotional Features of Interjections

The meaning ranges of interjections which can be found in dictionaries often cover all sorts of different, even contrary emotions ranging from, for example, pain, terror, shame to astonishment or disapprobation (for *oh*, according to OED, 2nd ed). However, it has long been recognized that emotional terms like those mentioned are complex and language specific. To account for this, Wierzbicka (1986, 1991) developed a semantic metalanguage by means of which emotional expressions can be semantically decomposed and described. Furthermore, Wierzbicka analyzed several interjections and assigned a single, highly schematic meaning to each of them. Although her analyses are generally very convincing, so

far there were no means to prove the appropriateness of a certain analysis and to reject another. For this reason, testframes have been built up which directly employ the analyses formulated in natural language and test them on examples from spoken language corpora (Fischer forthcoming). The testframes were developed in analogy with Cruse (1986) but with consideration of the special purposes of spoken language and the interactivity of meanings of interjections. In particular, the tests rely on the creation of redundancy between the cognitive or emotional content of the interjection in an attested utterance and the supposed meaning so that correctly analyzed features would produce anomalous sentences. To make sure that the second sentence with the postulated feature refers to the utterance from the corpus, the testframes contain the connective *but in fact*. For example, *m* in the following dialogue is supposed to display the features *I understand what you are saying* and *I want you to say more about it*:

(1) A: no, it was a gift
B: *m (Svartvik & Quirk 1980:182)*

The analysis is taken to be correct if the test sentences are rendered odd because of redundancy, whereas the negation of features is supposed to result in contradictions.

(2) A: no, it was a gift
B: *m* but in fact I understand what you are saying
(3) A: no, it was a gift
B: *m* but in fact I don't understand what you are saying
(4) A: no, it was a gift
B: *m* but in fact I want you to say more
(5) A: no, it was a gift
B: *m* but in fact I don't want you to say more

So Wierzbicka's natural semantic metalanguage (NSM) and the testframes allow us a reference to the symbolic features of interjections in a dictionary. Therefore they are, as it is obvious from the analysis just given, not considered as spontaneous expressions of emotional states (e.g. Quirk et al. 1972) but as conventionalized means to express an established meaning with emotional or cognitive aspects. Interjections are therefore taken to participate in the conventional inventory of language.

2. Pragmatic Features of Interjections

Functional analyses of interjections have shown that they fulfil the same tasks in spoken language discourse as most discourse particles. For automatic speech processing this means that interjections, as well as discourse particles, can help to identify the macro structure of dialogues, that they provide means to automatically segment turns into utterances, that their description of occurrence, combination, and phonetic realization may help to improve the results of speech recognition systems, and that they allow predictions about phenomena like speech repairs (Fischer & Johanntokrax 1995). Most of these features are desirable for all speech processing systems and do not depend on specific tasks.

Apart from these properties, discourse particles and interjections fulfil certain functions with respect to the speaker-hearer-interaction system (Ehlich 1986). These functions can be treated on different levels of analysis (Allwood et al. 1992). For example, turn-initial interjections often fulfil a function labelled *take-up*. At the level of speech management it gives the speaker time to plan and formulate her utterance and the hearer to get accustomed to the speaker's voice quality, at the level of the turn-taking system it symbolizes "I want to speak now", and at the level of interactive function it means: "I have heard what you said" and "I want to say something similar to that", i.e. signalling contact, perception, and understanding plus the wish to assert something which is related to the issue under consideration. Analyses of a large amount of data (Verbmobil TP 14 1994, Sagerer et al. 1994) have shown that these different aspects, involving features on the levels speech management, interactive function and turn-taking as well as syntactic and prosodic properties, usually co-occur. Complex functions, such as take-up, framer, repair marker, have a long tradition in discourse analysis (cf. Stenström 1994). In the representation here chosen, these features are lexicalized explicitly as part of a larger construction representing the discourse function.

3. A Construction-based Approach to the Lexicalization of Interjections

An approach to grammar which views form and meaning as correlated entities, as, for instance, Fillmore & Kay's Construction Gammar (1995), Langacker's Cognitive Grammar (1991), or Gibbon's ILEX-Model for integrative lexica (1992), can account for the generalizations about the behavior of interjections and discourse particles. Such an approach does

not treat lexicon and grammar as two distinct moduls but views lexemes and constructions, meaningful structures, as basically similar.

In the treatment of interjections here proposed, the pragmatic functions interjections can fulfil are viewed as constructions which might be instantiated by certain types of interjections. So the generalizations about the functional behavior of interjections is taken here as a form-function construction with structural, prosodic and pragmatic information. Having represented all general information in the constructions, the description can account for actual as well as potential interjections. Especially imprecatory interjections and, as a result of this, repair markers and self-comments, are highly productive. By means of general form-function descriptions like the constructions here proposed, potential interjections can be accounted for.

The lexicalization here developed uses the ILEX lexicon model (Gibbon 1992), based on DATR (Evans & Gazdar 1990), since it guarantees all properties demanded. Its structure is solely motivated by a generalization hierarchy.

The notations used in this lexicon model are attribute-value matrixes. On the top left before the colon, the node name can be found. In angle brackets the attributes are noted, and the values are coded to the right hand side of the equation signs. ILEX is an inheritance lexicon where the information is passed through the generalization hierarchy in both directions: The specific nodes inherit more general information, and the very general nodes become specified by values from the idiosyncratic lemma nodes. These mechanisms are called local and global inheritance respectively.

The example for which a lexical entry will be developed here is German *ach.* The invariant conceptual meaning of *ach* which has been tested on several occurrences in spontaneous spoken language dialogues (Fischer forthc.), will be: "I now know something I didn't think of before". Usually, turn-initial *ach* functions as a *take-up*, i.e. as a reaction to the informational content of the other speaker's utterance. However, *ach* is not restricted to being a reaction on someone else's utterances. It might also be an expression of a new idea which came up to the speaker herself. However, in all cases which I have found so far, this framing function was supported by further remarks like "da fällt mir etwas ein" (I just realize something). Medial *ach* on the other hand usually functions as a repair marker because of its semantic content. The conceptual meaning of *ach* detected motivates the pragmatic functions it can fulfil.

In the approach here followed for the description of interjections, constructions, meaning-form-pairs, are taken to be the basic building blocks of language. Lexical items as well as larger, more abstract con-

structions, such as the discourse functions here proposed, therefore carry form and meaning components, which are tied to a network of inheritance and specification relations, for *ach* for instance:

Ach:

<>	==	Interjection
<orth>	==	ach
<phon>	==	('/Ax/')
<emot>	==	(I now know something I did not think of before).

The empty path refers to the next higher node in the inheritance hierarchy where those features are coded which are generally true for all interjections, e.g. sententiality, independent intonational unit, syntactic category (cf. Willkop 1988).

More general constructions are described in essentially the same way (cf. Langacker 1991, Fillmore & Kay 1995). The constructions which interjections are taken to participate in are discourse functions like *take-up, backchannel, frame, repair marker.* These belong to a descriptive inventory that was developed in hypotheses-test-cycles on the basis of two large corpora (Schmitz & Fischer 1995). They will be modelled as independent nodes which carry general pragmatic meanings, prosodic and syntactic information, for instance *take-up*:

Take-up:

<>	==	Prag function
<syn>	==	turn_initial
<pros>	==	fall
<speech management>	==	(provides time for speech planning and perceptual orientation)
<turn-taking>	==	(turn-taking signal)
<interactive function>	==	(I hear what you say, I want to say sth similar).

This information is inherited into the lemma nodes by means of local and global inheritance mechanisms. Since the pragmatic function of discourse particles and interjections depends largely on the syntactic position, only the syntactically disambiguated node *Ach_init*, which otherwise inherits all information from the more general *Ach,* holds a pointer to the node *Take-up* which might be weighted. The quotation marks around the pointer to the node *Take-up* temporarily create a new global environment.

Ach_init:
<> == Ach
<prag function> == ('93.75%' "Take-up").

An even more general node *Pragfunction* will provide the relevant attributes which name the levels of description: turn-taking, speech-management, interactive function. Each template node will then instantiate the attributes of the respective discourse function.

Also the intonation contour is dependent on the discourse function:

Prag function:
<prag function> == ("<speech management>" "<turn-taking>" "<interactive function>" "<pros>").

The theory here proposed is easily extendable in all directions. For instance, not only *ach* but also *ja, oh, ähm, äh, also* can fulfil the discourse function *take-up* and will therefore inherit the template information.

4. Conclusion

The representation here proposed offers a framework in which the productivity of functional classes is accounted for by means of schematic templates, and in which the choice of pragmatic functions can be motivated from the meaning descriptions. The latter have been furthermore shown to be verifiable by means of testframes.

The representation chosen is a computer accessible lexicon which can be automatically converted into a lexical database (Gibbon 1993). Therefore, the theory developed here is not only descriptively and explanatorily adequate, it might also be directly used in automatic speech processing systems.

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