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TOWARDS THE OPTIMAL LEXICON*

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Abstract

Defending the structuralist idea that one can only give an appropriate semantics for lexical items when also considering the alternative expressions in their respective semantic field, an optimality-theoretic approach to the lexicon is proposed. Within the framework of lexical pragmatics, where radical underspecification and a contextual meaning variant enrichment mechanism based on conversational implicature are of central interest, phenomena linked to (bidirectional) optimality such as blocking and deblocking are discussed. It is also argued that prototypes or strong candidates in a semantic field may delimit the possible use(s) of an underspecified lexical item.

1 Introduction

Optimality Theory (OT) is a general framework which involves constraint ranking as a means to resolve conflicts among principles of grammar. It has been applied widely in phonology and to some extent in syntax, and there is now also an increasing interest for it in the field of semantics and pragmatics. In this paper, I will emphasise the relevance of optimality for resarch in lexical-semantic phenomena.

I will propose an approach to lexicon design within optimality theory which I term the *optimal lexicon*. The ideas introduced here should only be taken to constitute some first steps towards establishing such a model of the lexicon. In the core of the optimal lexicon lies the idea that the semantics of a lexical item cannot be defined properly without referring to the semantics of other lexical items in the semantic field(s) in question. Items in a mental lexicon are seen as potential competitors.

The paper is organized as follows: first, data motivating the approach are presented in section 2. Second, principles central to an optimal lexicon are introduced along with some informal case studies of the data where it is suggested how the outlined principles apply to the identified lexical-pragmatic phenomena (section 3). Finally, there will be a short discussion of how some of the suggestions made in this paper might be related to OT in general (section 4).

2 The data: Causal, instrumental and agentive *durch*

The origin of the approach to a possible structure of an optimal lexicon is an event-semantic analysis of the German preposition *durch* (Eng. *through*). This analysis will be used to illustrate some of the basics of the optimal lexicon. In this section, the semantics of *durch* is described, including an informal event semantics analysis. The basic data can be found in

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subsection 2.1. In section 2.2, possible external support for some of the ideas put forward here is briefly discussed.

2.1 The semantics of *durch*

The main object of study is the German preposition *durch*, which like many prepositions is highly polysemous. It has spatial (1), temporal (2), instrumental (3), causal (4) and passive-agentive-like (5) uses as illustrated below (English equivalents boldfaced):

(1) Sie ging in fünf Minuten/stundenlang **durch** den Park.
*She went **through** the park in five minutes/for hours*.

(2) So sangen sie **durch** Jahrhunderte, bis zum Jahr 1808.
*Thus they sang **for** centuries, up till 1808.*

(3) Das Alter läßt sich **durch** Röntgenuntersuchungen bestimmen, doch das wird ein wenig dauern.
*The age can be determined **by** X-ray examinations, but that will take a while*.

(4) Als sie die Mutter danach fragte, sah Yvette an ihrem Gesichtsausdruck, daß sie **durch** die Erinnerung in eine kummervolle Zeit ihres Lebens zurückversetzt worden war.
*When she asked her mother about this she saw, from the expression on her face, that the older woman had been woken into grievous life **by** the reminiscence*.

(5) S. L. Washburn und Irven de Vore haben an freilebenden Pavianen beobachtet, daß die Horde nicht **durch** einen einzigen, sondern **durch** ein "Gremium" von mehreren uralten Männern geführt wird…
*S.L. Washburn and Irven de Vore observed that among free-living baboons the band was led not **by** a single animal but **by** a "senate" of several old males…*

Intuitively, one might want to say that the spatial and causal variants are ambiguous. This is not so clear in the case of the causal, instrumental and agentive ones. There are many cases where they seem to overlap and give an impression of vagueness. Consider the following sentence:

(6) Seine Dame war **durch** meinen Läufer gefesselt; meine Dame war **durch** seinen Läufer gefesselt.
My bishop pinned his queen; his bishop pinned my queen.

In (6), it doesn't seem quite obvious in the case of the *durch*-phrases if we are dealing with something which is purely a cause or if there is something instrument-like to them. It might be a coincidence that the bishops pin the queens, and it might be intentional, in which case one would claim them to have the quality of an instrument. In either case, they express a cause for the pinning. It might be said that the instrumental reading is **added** to an underlying or basic causal interpretation.

This does not mean, of course, that causes, instruments and agent-like participants can or should never be told apart, but the *durch*-phrase itself seems to have a meaning somewhere in between these categories.

An important limitation to the use of *durch* seems to be that although it has some aspect of causality, instrumentality and agentivity, it cannot be used in situations where prototypical instances of these categories are involved:

(7) Das Fenster wurde **mit≠durch** einem/n Hammer zerstört.
The window was broken with/by means of a hammer.

(8) Der Mann wurde **von≠durch** einem/n Freund benachrichtigt
The man was told by/through a friend

In (7), the use of *mit* designates an event where someone hits the window with a hammer with the effect of breaking it. If *durch* is used, however, the only interpretation one gets is one where the hammer is used in an indirect way to break the window. One might imagine a situation where someone hits the wall with the hammer, causing a piece of the wall to be thrown towards the window, with the effect of breaking it. This difference of directness may be observed in (8) as well: if *durch* is used, it is clear that the friend is not the source of information, but only a carrier of it. He is an agent of the event of telling, but is still conceived as an instrument, acting on behalf of someone else. In the case of *von*, transmitter and source may be identical (i.e. the friend is an agent in a prototypical sense, controlling the event as such). Thus one can conclude that there seems to be a difference in *directness* involved in the contrast between *durch* and *mit* on the one, and *durch* and *von* on the other hand. The use of *durch* seems to be limited to cases of instrumentality or agentivity where one would **not** use instrumental *mit* or agentive *von*, i.e. it is limited to those cases where **no** prototypical instrumentality, causality or agentivity is expressed.

A further possible use of *durch* seems to run against this observation: in some contexts where the prepositional phrase is adjoined to a noun phrase, among the only two prepositional candidates in sentences to express agentivity - *durch* and *von* - only *durch* may unambiguously be used to express the agent with a *nomen actionis*. It is not possible to use *von* here, though this is the clearly dominant mode of expressing agentivity in passive sentences. In these constructions, *durch* thus gets assigned an interpretation which is otherwise not available for it to have (preferred interpretations in subscripts):

(9) der Abtransport **durch**$_{\text{AGENT}}$/**von**$_{\text{PATIENT}}$ Vollstreckungsbeamte/n
the carrying-off by bailiffs' agents/the carrying-off of bailiffs' agents

(10) die Besteuerung **durch**$_{\text{AGENT}}$/**von**$_{\text{PATIENT}}$ die/den Gemeinden
the taxation by the municipality/the taxation of the municipality

(11) die Entdeckung Amerikas **durch**$_{\text{AGENT}}$/**von**$_{\text{POSSESSIVE/ASSOCIATIVE}}$ Columbus
Columbus' discovery of America/the discovery of Columbus' America

In (9)-(11), *von* cannot get assigned an agentive interpretation. To express prototypical agentivity, one has to use *durch*.

The picture is more complicated than it is presented here, cf. Ehrich/Rapp (2000). *durch* may not always be used to express agentivity adnominally and *von* may indeed have preferred agentive interpretations in other cases than *ung*-derived deverbal nominalizations as in

(12) die Kritik von$_{\text{AGENT/PATIENT}}$ dem Autor
the critique by/of the author

The important point is that it still has to be taken into account when describing the semantics of the prepositions in the semantic field of causality (in a broader sense) that *durch* has a different semantics when it is used adnominally than in sentences.

It should also be noted that *durch* does not lose its other meaning variants when being used adnominally, the above observed facts can thus not be explained through assuming two different *durch*s for varying contexts, cf. the instrumental-causal interpretation in (13):

(13) eine Verbesserung des Lebensstandards **durch** Hebung der Industrieproduktion
a raising of living standards through an increase in industrial activity

Concerning earlier reasearch on the abstract variants of *durch*, i.e. the causal, instrumental and passive-agentive ones, there have been isolated descriptions of these, but most have concentrated on the passive variant, contrasting it with the agentive *von*. There has - to the knowledge of the author - been no attempt to exploit this relation in analysing the semantics of *durch*. The attempts to unite the abstracts variants have been no more than superficial, and the relation between them is mostly suggested in an unordered list of meaning variants *durch* might have (Drosdowski 1984, p. 181; Zifonun 1997, p. 1831).

I will assume that *durch* has an underspecified meaning variant consisting of the three already mentioned causal, instrumental and agentive uses illustrated in the above examples. An ambiguity to the spatial variants will be taken to exist, but connections between the spatial and temporal variants on one hand and the more abstract ones on the other hand may be explained quite straighforwardly from a diachronic point of view. I will not go into this here, however.

Being a bit more specific about the semantics of the causal-instrumental-agentive *durch* without going much into details about what the underspecified semantics of this variant of *durch* might be, it seems to be a core function of the prepositional phrase to relate two eventualities in a causal chain of events. When these are not superficially expressed by the phrase modified by the the *durch*-phrase, the *durch*-phrase itself carries the presupposition that the state of affairs would not have stayed the way they were or would not have changed, respectively, had not the entity described by the *durch*-phrase been there. (14) and (15) might be used to illustrate this:

(14) der durch diese Haltung hohe Luftwiderstand
the air resistance is high due to this posture

(15) der hohe Luftwiderstand
the high air resistance

In (14), it is presupposed that, the air resistance would not have been high, had not the posture been of the specific kind referred to, *high* is thus interpreted as a result state. (15) makes no such requirements whatsoever in this direction.

The semantic characteristics of *durch* may be nicely illustrated in the light of the commonly assumed structure of causal verbs, with the predicate CAUSE as a relation between two eventualities, one being the causing one and the other the caused one. The former may be further decomposed as consisting of an agent inflicting some event, as in Dowty (1979, p. 110 ff.). An example:

(16) The boy broke the window

In this sentence, a CAUSE-relation exists between the boy doing something, and the window breaking. It is not specified what act the boy commited which lead to the window breaking. It could be a hitting act, for example. If an instrumental phrase like *with a hammer* is added, it would modify (or: provide details about) this act. The difference between the phrases *durch einen Hammer* and *mit einem Hammer* in German would be that in the latter case the instrument would be integrated in the causing event, whereas the *durch*-phrase would necessarily introduce a sub-event of its own as described in the case of example (7), where the sub-event would be the piece of the wall being hit loose from the wall and then flying towards the window. It is a difference of direct (*mit*) vs. indirect (*durch*) causality.

Another characteristics of the semantics of *durch* conntected to this introduction of a sub-event is that its complement in most cases where it is not already an event, gets an event reinterpretation, as in (7). A hammer does not by itself describe an event, but clearly gets an event reinterpretation here.

2.2 Motivating the underspecification assumption

Until now, it has only been said that *durch* has a causal, instrumental and agentive meaning component, and that there seems to be some limitation to these with regard to e.g. *von* or *mit Hilfe*. It has also been claimed that *durch* is underspecified with respect to these.

Traditionally in philosophy of language and semantics, instruments, agents and causes have been regarded as belonging to different, basic ontological types. According to this view, one might have to regard the causal-instrumental-agentive *durch* to be three-way ambiguous, because it would be unexpected for a lexical item to integrate three different basic ontological concepts. This also seems to be a common assumption in analyses of instruments, agents and causes. Confronted with the data on *durch*, however, it seems necessary to find a conceptualization of the three categories that allows a certain overlap between them: *durch* is not only underspecified in the lexicon with respect to them, but may also remain underspecified in specific contexts, suggesting a perspective on them as non-excluding, cf. the chess example in (6).

Independent support for this view might be drawn from Kamp/Rossdeutscher (1994, p. 144-145), where the category INSTRUMENT CAUSER is introduced. The authors hint at the possibility that causes and instruments belong to one category, but stress the fact that intuitions are quite fuzzy and that there exist no convincing examples. I believe *durch* to might provide these examples. Kamp and Rossdeutscher use the following examples:

(17) Der Arzt heilte den Patienten mit Kamille
The doctor healed the patient by means of camomile
Der Kamille heilte den Patienten
The camomile healed the patient

(18) Der Arzt heilte den Patienten mit einem Skalpell
The doctor healed the patient by means of a scalpel
*Ein Skalpell heilte den Patienten.
A scalpel healed the patient

Whereas both *camomile* and *scalpel* may occur in prepositional instrumental phrases with the verb *heilen* (Eng. *heal*), only *camomile* can occur as the subject of *heilen*. A difference between German and English is that (in geneal) no nouns with the semantic role of instrument, only causes can occur in subject position in German. Kamp und Rossdeutscher take the sentences in (17) and (18) to indicate that there is a difference also in the *mit*-phrases with regard to the quality of the instruments. The authors differentiate between two different types of instruments:

- "instruments which can be conceived as acting on their own, once the agent has applied or introduced them; and
- instruments whose action is conceived as strictly auxiliary to that of the agent by whom they are being employed"

This difference can be seen between camomile and scalpel, where only the former is thought to be "conceived as acting on [its] own", "it is natural to consider the [camomile]" as a "causal agent". This difference seems relevant to the relation between *durch* and *mit* as well. Typically, *durch* is used with instruments which can be conveived as to some extent acting on their own, while this is not the case with *mit*.

In this paper, the existence of some category which is more general than instruments, causes or agents is assumed. It will be termed *causal chain element.* The underspecified meaning of *durch* will belong to this category. I will not go into detail about the ontology of this category, but it is intended to include elements of causal chains which enter the chain in a conterfactual manner, cf. Lewis (1973b). It is thought to have a decomposition into dimensions such as *intentionality, directness, volition, control*.

3 The optimal lexicon

In this section, the theoretical basis of the optimal lexicon will be introduced. First, the OT version which is applied here is described (3.1). Then, two main features of the optimal lexicon are presented (3.2-3.3). The ideas put forward in this section are to be understood as constituting some first steps **towards** establishing a model of the mental lexicon which exploits principles central to (bidirectional) optimality theory. It is an attempt to integrate some ideas from OT and lexical pragmatics in describing possible lexicon-structuring principles.

3.1 Basic assumptions

The OT version which is used here, is called bidirectional OT and has been developed by Reinhard Blutner (2000). In the core of this approach lies a reductionist view of the Gricean conversational maxims (Grice 1989), as first developed by Jay Atlas and Steven Levinson (1981) and Laurence Horn (1984) and recently explored further by Blutner (1998) and Levinson (2000).

The main difference to other theories of OT semantics is that bidirectional OT is both production and interpretation attentive. Barbara Hendriks and Helen de Hoop originally claimed OT semantics to be hearer-/interpretation-based as opposed to for example OT syntax, which is thought to be only speaker-/production-based. This however, Blutner points out, could not account for blocking phenomena, an argument to which we will return shortly.

The reduced Gricean maxims are formulated as two principles, termed Quantity- and Informativity-principle, or in short Q- and I-principle. **The Q-principle**, which is a reduction of the first part of Grice's Maxim of Quantity (*Make your contribution as informative as required (for the current purposes of the exchange)*) is formulated as: **Say as much as you can** (given the I-principle), or: Do not make a statement which is less informative than your knowledge of the state of affairs allows you, as long as you don't violate the I-principle (Blutner 1998, p. 129).

The I-principle is based on the second maxim of quantity (*Do not make your contribution more informative than is required*), the maxim of relation (*Be relevant*), and maybe all of the maxims of manner (*1. Avoid obscurity of expression, 2. avoid ambiguity, 3. be brief (avoid unnecessary prolixity), 4. be orderly*): **Say no more than you must**, or: Produce as little linguistic material as possible in order to reach your communicative aims. Read as much into a linguistic utterance as possible, as long as it is consistent with your knowledge of the world (Blutner 1998, p. 129).

The two principles are needed to account for both the hearer- and the speaker-perspective. The I-principle is hearer-based, while the Q-principle is speaker-based. The I-principle seeks the most coherent interpretation, it compares different possible interpretations for the same syntactic expression. The Q-principle acts as a blocking mechanism, blocking all outputs that can be expressed more economically by means of another (alternative) linguistic output. It compares different syntactic expressions the speaker could have used to achieve the same context update, i.e. express the same meaning (Blutner 1998). Both principles have to be considered by both participants to ensure efficient communication.

The two perspectives may in many cases be in conflict, although they do not contradict each other, because the speaker will have different preferred ways of *expressing* an intended meaning, whereas the hearer will seek to find the most coherent *interpretation* of a given form.

Concerning lexical pragmatics, it should be noted that it is an approach to lexical semantics where underspecification and a contextual meaning variant enrichment mechanism based on conversational implicature are of primary interest (Blutner 1998; Blutner and Solstad 2001). It is a default assumption that every lexical item should be as underspecified as possible and that related meaning variants are to be summed up in underspecified lexical items. As a consequence of this, *durch* with its overlapping causal, agentive and instrumental meaning variants is assumed to be underspecified with respect to these three semantic dimensions. It will be suggested later how the contextual meaning variant enrichment mechanism operates on this underspecified lexical item. The term contextual meaning variant enrichment is to be understood as the semantic specification of an underspecified expression - in the case of *durch*, a lexical item - in a given context.

The optimal lexicon proposed here is to some extent a **structuralist** one: the meaning of a lexical item is in part also determined by the alternative expressions available to represent the same or a similar meaning. This does **not** amount to define meaning only privatively, but simply claims that the limitation of word meaning also in part is dependent on related alternative expressions.

The idea of competition between items which may refer to each other in combination with conversational implicature (Atlas and Levinson 1981; Horn 1984; Grice 1989; Blutner 1998; Levinson 2000) and blocking (McCawley 1978; Williams 1997; Blutner 2000) is thought to may deliver an appropriate limitation of the possible interpretations or meaning variants of a lexical item in many cases, while still leaving the basis for meaning extension and uses in new contexts to some extent open.

The idea that lexical items in the optimal lexicon are seen as **competitors in utterance and interpretation processes** is thought to make sense at least in the case of functional word classes, such as prepositions, subjunctions, (modal) particles and others. Their semantics can only in part be defined precisely considering the item alone. Very often **contrast classes** seem to be important. They are thought to delimit the contexts in which a lexical item can be used. Often it is not a matter of either or: *durch* has uses where it is very close to prototypical instrument phrases, so one cannot exclude instrumentality as being part of the meaning of *durch*. It seems to be a degree of *instrumentality* which part *mit* (*Hilfe*) and *durch* from each other.

In the case of *durch*, with both a causal, intstrumental and passiv-agentive-like meaning component, the competition criterion forces a comparison of lexical items such as: *wegen*, *infolge*, *dank aufgrund* (causal), *mit*, *mit Hilfe*, *anhand* (instrumental) and *von* (agentive), which all belong to the semantic field(s) of agentivity, instrumentality and causality. Although *durch* has some meaning component in common with all these lexical items, it cannot be replaced by them or replace any of them in all contexts. One has to take into consideration the other variants in the semantic field of the category to be expressed, i.e. if one wants to express that something is an instrument, one has to look for other lexical items (and also constructions) able to express instrument role. Thus for instrumental uses of *durch*, it has to be compared to - amongst others - *mit* and *mit Hilfe*.

It is imagined that in a semantic field (in the region of a concept, in this case) some words are assigned a central role with more strongly defined meanings (these would correspond to prototypes), whereas other words may take up some of the space in the semantic room which an item (or construction) doesn't reserve for itself, as in the case of partial blocking *informant* - *informer* (see section 3.3).

To illustrate how the above mentioned principles may be exploited in the optimal lexicon, it will be shown how they determine *durch*'s contextual meaning enrichment. Two aspects related to the competition between lexical items will be discussed, namely blocking and conversational implicatures.

3.2 Conversational implicatures

If one wants to describe some event but doesn't want to or cannot specify if something was done volitionally or controlled by someone, or just caused by something, *durch* seems to be a good alternative.

Imagine a situation for example, where a person observes that a hammer falls from a window on the sixth floor and hits some person standing below with the result of that person dying. If the person describing the situation doesn't know if the hammer fell as a result of an accident (say, some construction worker busy repairing the window sill lost the hammer) or on purpose (say, professor Y wanted to get rid of his annoying student, trying to make it look as an accident), he would perhaps utter something like:

(19) Er wurde **durch** einen Hammer getötet.
He was killed by a hammer.

This has exactly the effect of leaving open, if we are dealing with an accident or an act of will. Uttering something like

(20) Er wurde **mit** einem Hammer getötet.
He was killed by means of a hammer.

would make the claim that the hammer was used in a direct manner and intentionally to kill. The intuition behind this is that *durch* in some cases seems to make a **weaker** claim about events than *mit* (*Hilfe*). This presupposes a view of instruments as causes in some sense. Every instrument would be a cause, whereas the opposite needn't be the case, of course. From this perspective an instrument is (part of) a cause that is brought about volitionally/intentionally by some agent. It is at least a cause in the sense that it enters a causal chain of events counterfactually (Lewis 1973b, 1973a).

The same is true for agents: they make stronger claims about a causal chain of events than pure causes, since they also introduce a volitional aspect.

The above claims might be spelled out in some kind of (Horn) scales (Horn 1989; Levinson 2000), with the ordering: <instrument,cause> and <agent,cause>. These are scales from prototypical instruments or agents to causes in their narrower sense, where no volition is involved. As in the original Horn scales, the first element is the stronger one and the second the weaker one. What agents and instruments have in common, is that they differ from causes in having a volitional characteristic. Causes and instruments may make the same contribution to the event, but wheras instruments have to be externally directed (intentional), this needn't be the case for causes. In other words, an instrument is also always a cause (in the chain of events - if it hadn't been there, the outcome of the event would have been otherwise), but has an addition of an intentional element in comparison with causes in a narrower sense.

The scales involved in the case of *durch* and its semantic field would be <{mit,mit Hilfe…},durch> and <von,durch>, as elements on the scales introduced above.[1] When an utterance is made using the latter element of these scales, it might be inferred that the stronger statement involving the first element could not be uttered for some reason, be it due to lack of knowledge or just that it would include more information than the actual situation allows one to state.

Underspecified interpretations are assumed to be weaker than specified ones, although they *potentially* contain more possible interpretations than the stronger claim. Potential informational richness and strength in the above sense are not identical, whereas strength and informativity in the sense of van Rooy (2000) seem to be. The use of *mit* would provide a more informative statement than the use of *durch*.

There can be several motivations for the underspecified interpretations such as in (19) to be sought to be evoked:

[1] There may be elements ranking below *durch*. *mit* also has non-prototypical uses, but this will not concern us here. It might be noted that *mit* has a comitative meaning variant which is also vague with respect to the instrumental one.

i. The speaker doesn't know if we are dealing with a cause or an instrument

ii. The speaker doesn't see the need or want to specify the cause- or instrumenthood involved in the situation.

3.3 Blocking

Let us now turn to blocking, another mechanism involved in the limitation of a lexical item's meaning variant enrichment potential: **Blocking** has been viewed as a mechanism influencing the items in the lexicon. The phenomenon designated by the term blocking is that some lexical item cannot be formed (e.g. **furiousity*) because others with an identical meaning exist (*fury*). The idea (at least) goes back to Aronoff (1976: pp. 43-45). Aronoff defines it as a semantic phenomenon: "Blocking is the nonoccurrence of one form due to the simple existence of another. In the case at hand [Xous + ity], we find that whenever there exist in a given stem both an adjective of the form *Xous* and a semantically related abstract noun, then it is not possible to form the *+ity* derivative of the *Xous* adjective" (Aronoff 1976: p. 43) The form blocked is always the less specific form, the one formed by the most general rule. Blocking can be said to belong to the broader category of default inheritance mechanisms (Briscoe et al. 1995).

Of additional interest is the notion of **partial blocking**, used in cases such as the aforementioned *informant-informer*, the former being someone providing information in general, whereas the latter is someone denouncing somebody to the benefit of the police or authorities. In a case of partial blocking, one form is not completely ruled out as one would expect if Aronoffs formulation definition would always hold, but occupies some specialized part of the semantic field in question.

In the case of *durch*, this would mean that the region where *mit* is situated, is blocking the meaning of *durch* from taking on this specific semantics, such that only parts of the INSTRUMENTAL region can be occupied by *durch*. However, *durch* is only partially blocked, *durch* may indeed be used to express instrumentality, but just not what has been termed prototypical instrumentality here, which would involve similarily stated characteristics as in the case of Dowty's proto-agent and -patient (Dowty 1991, p. 572): it should involve an agent, volition, causation, etc. Prototypes may be seen as **constraints** blocking (partially) other lexical items from entering into the position in a semantic field or space which they occupy.

Things are more complicated, of course, there are other competing expression in this semantic field. A comparable situation exists in the case of *von* and *durch*.

There is more to the blocking phenomena related to *durch* than has just been presented: It was mentioned earlier that *von* as a marker of agency plays an important role in delimiting the meaning variation of *durch*. *durch* cannot be used to express a prototypical agent, as in the passive sentences:

(21) Die Stadt wurde **von** Columbus zerstört.
The city was destroyed by Columbus.

(22) Die Stadt wurde **durch**$_{\text{INDIRECT-CAUSE/WEAK-AGENT}}$ Columbus zerstört.
The city was destroyed "by means of" Columbus.

von is the preferred preposition for the marking of the agent phrase in passive constructions. *durch* may only be used where there is no prototypical agent, or where the agent of some

event is not in full control of the event, as we would expect from a prototypical agent, see Dowty's work on thematic proto-roles (1991).

Looking at examples with adnominal uses of *durch* however, the picture is quite different. In adnominal constructions, *von* has a possessive (or patient, see examples (9)- (10)) interpretation in the broadest sense, as in:

(23) die Zerstörung der Stadt **durch**$_{\text{AGENTIVE}}$ Columbus
the destruction of the city by Columbus

(24) die Zerstörung der Stadt **von**$_{\text{POSSESSIVE}}$ Columbus
the destruction of the city of Columbus

(25) die Entdeckung Amerikas **von**$_{\text{POSSESSIVE}}$ Columbus
the discovery of Columbus' America

This seems to be an example of simultaneous *blocking* and *deblocking*: Due to the blocking of *von* because of its patient-/possessive-like interpretation, the only other prepositional candidate in German remaining to express agentivity is *durch*. The blocking of *von* facilitates and necessitates a deblocking of *durch*. *durch* - having some agentive interpretation - gets assigned a full-flavoured agentive meaning aspect. Thus, it seems crucial to make reference to candidate sets in a semantic field. The semantics of *durch*, if we take as a starting point its semantics in sentential use, does not allow purely agentive readings, but a blocking mechanism ruling out *von* forces us to choose the only other candidate available.

von is probably blocked as a marker of agentivity because of the morphological or case-marking characteristics of the patient or possessive reading (it being an alternative to the genitive case). It is not unexpected that a case feature ranks above an adjunct one.

It was mentioned above that *mit* and *von* are considered to be constraints or (strong) prototypes blocking the possibility for *durch* of being used in expressions where prototypical instrumentality or agentivity is expressed. If *durch* is used instead in such contexts, it should be clear to the hearer - through conversational implicature - that an indirect cause (it being an instrument or an agent) is involved.

I would like to conclude this section with emphasising the fact that the above ideas are to be understood as some first steps towards establishing a model of the lexicon in optimality theory. The above descriptions need to be formalised, especially in order to grasp the influence of the numerous context factors which may play a part in the process of contextual meaning variant enrichment in general.

4 Possible constraints, underspecification and principles of OT

In the previous sections, there has been little reference to what the relevance of what is suggested here might be to other work in Optimality Theory. This is mainly due to the fact that there has been - to my knowledge - no work on this part of lexicon *structuring* within OT. In this last section, I will briefly discuss underspecification in OT as well as some constraints which seem to be involved, one in the case of the semantics of *causality* in particular, and two others which are assumed to quite general in OT semantics and pragmatics.

The above speculations concerning the relation between *mit* and *durch* on one hand, and *mit* and *von* on the other might follow from the assumption of some constraint of the kind MAX(INTENTIONALITY), which demands that one should always be as explicit as possible about the intentionality relations in event description. If a context seems to involve a high

degree of intentionality, for example including the verb *assassin*, the use of *durch* in an instrumental phrase will evoke the conversational implicatures described in the case of sentence (19), if it is not penalized altogether. Such constraints could delimit the semantic potential of lexical items in combination with blocking and conversational implicature.

The speculations about *durch* also fit well with Henk Zeevats (2000) observation that STRENGTH, demanding the informationally strongest possible interpretation to be made, must be ranked below *INVENT, forbidding the hearer to add semantic material not included in some expression without proper reason for this (Zeevat 2000). If this were not so, *durch* would always get the stronger instrumental interpretation through an adding of intentionalitys (and therefore always be blocked by *mit*).

One last point to be mentioned is the possiblity of assuming underspecification in OT. Ron Artstein does this in a paper (Artstein 1998), referring to three principles in a paper by Elliott Moreton (1999):

- Homogeneity: The set of inputs is the same as the set of possible outputs.
- Inclusivity: The candidate set for an input *a* always includes *a* itself.
- Conservativity: Every constraint is either a *markedness* constraint or a *faithfulness* constraint (…)

Due to inclusivity, Artstein states (1998, p. 8-9), the output must be **less marked** than the input, and the principle of homogeneity demands that there are no inputs that do not have corresponding outputs, i.e. an underspecified form (with no surface realiziation as such) should not be possible.

This might be reasonable in an OT approach to phonology, but in OT semantics or syntax, where some form is input to the generation of some interpretation of it or some interpretation is an input for the generation of forms, respectively, this does not make much sense. A input form would not be included among outputs being interpretations of the form. Regarding Artstein's argument, there seems to be no principled reason for not assuming underspecification in OT syntax, semantics and pragmatics.

5 Conclusion

In this paper, I have emphasised the relevance of optimality to lexical-pragmatic phenomena. I have also sketched important aspects of an approach to lexicon design which I term the *optimal lexicon*. Main arguments were:

- conversational implicature, blocking and deblocking are important in limiting word meaning with regard to some contextual meaning variant enrichment mechanism which builds on (radically) underspecified lexical items
- lexical items arranged in semantic fields are seen as competitors, the meaning of a lexical item is thus defined also in part through other members of the semantic field in question. It does seem to make sense - at least in the case of functional word classes - to build upon the semantics of other lexical items in a semantic field, when stating the semantics for a particular lexical item.

- prototypes are seen as constraints, blocking - partially or wholly - other lexical items from taking over their semantics.

Future work will include a formalisation of the presented ideas as well as a more precise statement of the relation of the present work to the foundations of Optimality Theory.

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