Susann Fischer | Ruben van de Vijver |
Ralf Vogel (eds.)

Experimental Studies in Linguistics 1

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Linguistics in Potsdam

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Linguistics in Potsdam 21

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Experimental Studies
in Linguistics 1

Introduction

This is the first issue of a series in which affiliates of the Institute of Linguistics report the results of their experimental work. Generative linguists usually rely on the method of native speaker judgements in order to gather data with which they test their hypotheses. If a hypothesis rules out a set of sentences, linguistics can ask native speakers whether they feel these sentences are indeed ungrammatical in their language. There are, however, circumstances where this method is unreliable. In such cases more elaborate methods to test a hypothesis are called for. All papers in this series, and hence, all papers in this volume deal with issues that cannot be reliably tested with native speaker judgements.

This volume contains 7 papers, all using different methods and finding answers to very different questions. This heterogeneity, by the way, reflects the various interests and research programs of the institute. The first paper, by Kügler, deals with the realization of question intonation in two German dialects. The second and the third paper by Schlesewsky, Fanselow and Frisch and Schlesewsky and Frisch respectively, deal with the role of case in processing German sentences. The nature of partitive case is the topic of the paper by Fischer. The fifth paper, by Vogel and Frisch, deals with resolving case conflicts, as does the sixth paper by Vogel and Zugck. The final paper, by Trutkowski Zugck, Blaszczak, Fanselow, Fischer and Vogel deals with superiority in 10 Indo-European languages.

The methodology used in these papers ranges from phonetic measure-

ments (first paper) over Event Related Potentials (papers two and three), reaction time experiments (paper five), corpus studies (paper six) to using a questionnaire (the fourth and seventh paper).

We hope that you enjoy reading the papers!

Susann Fischer Ruben van de Vijver Ralf Vogel

Contents

Do we know the answer? – Variation in yes-no-question intonation[*]

Frank Kügler
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1. Introduction

It is generally assumed that a question intonationally is accompanied with a certain question tune, usually characterized by a final rise in pitch (e.g. Bolinger 1978). Haan (2001) in a production study of Dutch question intonation, for instance, has shown that in 86.6 % of the cases a question is realized with a final rise. In particular, yes-no-questions with declarative syntax are marked with this feature to a 100 % (cf. (1a)), whereas 94 % of the yes-no-questions with question syntax (cf. (1b)), and only 64 % of the wh-questions exhibit a final rise (cf. (1c)). Since Haan's aim is to compare several acoustic features generally associated with the intonation of questions with those of statements, her study is not concerned with the intonational variation *within* a certain question type. In other words, the study does not discuss why speakers do have an intonational choice with respect to the final rise. Yet, 6 % of the syntactically inverted yes-no-questions have *not* been produced with a final rise.

[*] The present study is part of the author's doctoral dissertation on comparative intonational phonology and phonetics in two German dialects – Swabian and Upper Saxon. The work here has been part of a paper presented at the Second International Conference on Language Variation in Europe (ICLaVE 2), June 2002, Uppsala, Sweden (Kügler (to appear)). The assistance of Kristina Vath is greatly acknowledged. For discussion and comments on this paper I am grateful to Caroline Féry, Peter Gilles, Andreas Haida, Jörg Mayer and Ruben van de Vijver.

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(1) A declarative question as a subtype of yes-no-questions (a), a yes-no-question, marked by inversion (b), and a wh-question (c) (examples from Haan 2001: 70).

a. Renée heeft nog vlees over?
"Does Renée have any meat left?"
b. Heeft Renée nog wat vlees over?
"Does Renée still have some meat left?"
c. Wat heeft Renée nog voor vlees over?
"What kind of meat has Renée still left?"

If we consider German question intonation, the tonal characteristics of yes-no-questions seem to match the general pattern of a final rise in pitch. According to the intonational accounts of Standard German yes-no-questions ending low in pitch have not been proved (e.g. von Essen 1964, Féry 1993, Grice & Baumann 2000).[1] Although carried out in different frameworks, the studies of von Essen (1964) and of Féry (1993) seem to agree on the basic intonational properties of question intonation in Standard German. Yes-no-questions are characterized by a final rise in pitch, and the accent pattern can either be falling (2a and 3a) or rising (2b and 3b). In the notation of the autosegmental metrical model of intonation (Pierrehumbert 1980, Ladd 1996) on which the present study is based, too, the final rise is expressed by a high boundary tone as in (2) and (3).

(2) Yes-no-question "Entscheidungsfragen" (von Essen 1964:45f.)[2]

a. **H*L** **H%**
b. **L*H** **H%**
Ist der Bote schon dagewesen?
"Has the messenger already been here?"

[1] But see Kohler (1977:199) who explicitly points to both rising and falling yes-no-questions as a consequence of his model of intonation.

[2] The tonal transcription in (1) is our adaptation of von Essen's pitch contours.

(3) A fall-rise in (a) and a simple rising tone in (b) (Féry 1993:91, 87)

a. **H* L H%**

Mögen Sie ROGGENbrötchen?

"Do you like ryebread rolls?"

b. **L* H**

Tauschen Sie auch BRIEFmarken?

"Do you also exchange stamps?"

In this model, a pitch contour is decomposed into the tonal levels low (L) and high (H). Additionally, two different categories of tones are assumed, i.e. pitch accents and boundary tones.[3] Boundary tones are associated with the end of an intonation phrase and the tonal symbol carries the percentage (%) as a diacritic. Pitch accents can either be monotonal (L or H) or bitonal (a combination of L and H). Pitch accents are associated with metrical strong syllables and are marked with an asterisk (*) as a diacritic.

In contrast to the intonational accounts of German mentioned above, yes-no-questions with *falling* intonation seem to occur in Standard German as well. In a corpus study of conversational data of Northern German, a variety closely related to the Standard, Selting (1995:234) observes 51 yes-no-questions with rising intonation but also 14 with falling intonation.[4] We make a similar

[3] A third category, phrase accents, is assumed as well. Since phrase accents are not relevant for the present study, we leave them aside here. For further discussion of phrase accents within the theory of intonational phonology, see the work of Pierrehumbert & Beckman (1988), Ladd (1996), and Grice, Ladd & Arvaniti (2000).

[4] Selting provides also a functional differentiation of falling and rising patterns: a falling tune is related to re-focussing of a conversational topic (p. 264ff), while rising tunes are related to new-focussing topics (p. 247ff).

observation in our corpus of Upper Saxon German that contains several hours of free conversations as well as map task dialogues (Anderson et al. 1991).[5]

In a recent study on Bari Italian, a variety spoken in the South of Italy, Grice and Savino (1997) analyzed yes-no-questions in map task dialogues. Since Italian uses no distinct question syntax, the authors are particularly interested in how speakers signal confirmation and information questions intonationally. The authors hypothesize that the information status of the answer may be related to the accent pattern of the question. A sentence as (4) can be interpreted in three ways: either as a statement (4a), or as an information question (4b), or as a confirmation question (4c).

(4) Vado a destra (Grice & Savino 1997:29)

a.	statement	"I go to the right."	
b.	QUERY	"Do I go to the right?"	L+H* L-L%
c.	CHECK	"So, I go to the right?"	H+L* L-L%
		and	L+H* L-L%

Following the notational conventions of map task speech, Grice and Savino distinguish between QUERIES, which can be referred to as ‘information questions’ (Bolinger 1989), and CHECKS, i.e. ‘confirmation questions’ (Bolinger 1989). They observe that QUERIES (4b) generally are realized with a rising pitch accent followed by a low phrase accent plus low boundary tone (L+H* L-L%). CHECKS (4c), on the other side, exhibit two distinct intonation patterns: a CHECK might either be realized like a QUERY or alternatively it can be realized with a falling pitch accent (H+L* L-L%). Grice and Savino conclude that the choice of accent pattern for CHECKS depends on information structure.

[5] Surprisingly, Grice & Baumann (2000) do not report any instances of yes-no-questions with falling intonation although the intonation system proposed (GToBI) is empirically based on map task dialogues as in the present study.

If a CHECK is realized by means of a rising pitch accent, the speaker is asking for *new* information – as it is the case for QUERIES –, while a falling pitch accent signals that the question refers to *given* information. In recent follow up studies, Grice and Savino (2003a, b) extend their notation of information structure in that they take the speaker's consciousness into account. Thus, a three-way distinction of information status arises: besides given and new information speakers are conscious about accessible information as well. The intonation pattern that speakers use to indicate information or confirmation questions depends on the speaker's degree of confidence in the information being asked.

Based on the Italian findings and on the observed intonational variation in yes-no-question intonation in our corpus, this paper addresses the question whether intonational variation is predictable. The hypothesis is that the choice of a certain question tune is related to the information being asked due to its contextual embedding. If a speaker has an expectation of the answer since it has been subject to the previous conversation, the intonational question tune differs from a question where the speaker has no clue to the answer. This is to be tested on a corpus of spontaneous conversational speech of Upper Saxon German (henceforth USG).

2. The corpus

2.1 Subjects

The speech data for the present study comes from recordings, which we have made in the city of Leipzig. A larger city is assumed to function as a center of a dialect and represents the regional variety.[6] Leipzig belongs to the central eastern

[6] See also the research project on German dialect intonation, which focuses on urban varieties from all geographical parts of Germany (Auer et al. 2000).

part of the German dialect area and is classified as “Upper Saxon” (e.g. König 1998, Bergmann 1998, Russ 1998). In order to analyse the regional variety of Leipzig, subjects have been selected fullfilling the criteria of being born and raised in the urban area of Leipzig. Four male speakers have participated in this study. The age of the subjects ranges from 25 to 65 years.

2.2 Recordings

The recordings have been made at the subjects’ homes in order to achieve maximal naturalness in conversation. Two subjects have participated in each conversation. The recordings have been made using a portable Sony DAT-recorder and two Sony tie-clip condenser microphones (ECM-TS125). A recording session consists of three parts: first, subjects have to summarize a story, which had been presented before on a video screen, and to discuss whether the story is fictional or based on actual events; second, the map task game (Anderson et al. 1991, Claßen 2000) has been carried out. Each subject functions as the instruction giver and the instruction receiver once, resulting in two map task conversations per session; third, a free conversation. The speech data chosen for the analysis here consist of four map task dialogues and two conversations (= four subjects).

The recording procedure for the map task is as follows. Two subjects are separated by a shield, thus, participants cannot see each other’s map. One of them, the instruction giver, has to describe as accurately as possible a route, which is painted on the map. The instruction receiver’s task is to draw the route on his map. Both maps contain a starting point and several different symbols, e.g. a caravan, a dragon fly, a fisherman. However, the two maps differ in three ways: (a) symbols are placed in a different order, (b) not every symbol occurring on one map is given on the other map, (c) symbols are labeled with different names. This procedure causes lively conversations and forces information and

confirmation questions. The participants have been informed that the experiment deals with how exactly information may be coded and transmitted. For that reason, they have been told, that deviations from the original route will be measured. Instructions have been not to gesture, but only to speak with each other.[7] No time limit for the task has been given. The map tasks chosen for this study are maps II and III taken from Claßen (2000).[8]

2.3 Data processing

Speech data have been digitized at a sampling rate of 16 kHz, 16 bit, mono format. The sound files have been transcribed and analyzed using Praat (© Boersma & Weenink 1992-2002). A total of four map task dialogues and two conversations have been analyzed in this study. The speech data have been transcribed according to GAT conventions (Selting et al. 1998), i.e. a system for transcribing conversational data. Phrases have been labeled intonationally using Pierrehumbert's (1980) tone-sequence model as a basis. Labeling has been based on auditory perception and visual inspection of F_0 traces.

2.4 Materials

In Standard German as well as in Upper Saxon German (USG), a yes-no-question may either have SVO or verb-subject-inversion syntax (cf. (5a) vs. (5b)). The syntactical construction of (5a) resembles a declarative while the verb initial position of (5b) syntactically marks a yes-no-question. For the present study questions of type (5b) have been chosen to avoid confusion with declarative intonation patterns. This might have been the case if we would have

[7] As a consequence of the task, subjects have in fact only been looking at their respective maps since they have been engaged with the task. Thus, no eye contact and almost no attempt to gesture have occurred.

[8] I am grateful to Kathrin Claßen at the IMS Stuttgart who provided me her map task files.

considered yes-no-questions with declarative syntax. In total, 38 yes-no-questions with verb initial position have been detected in the corpus.

(5) a. A yes-no-question with SVO syntax

Der Marko **weiß** das? – Ja / Nein

The Marko **know** it? – Yes / No

"Marko does know it?"

b. A yes-no-question with VSO syntax

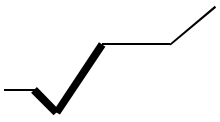
Weiß der Marko das? – Ja / Nein

Know the Marko it – Yes / No

"Does Marko know it?"

3. Intonation in Upper Saxon German yes-no-questions

The tonal analysis of yes-no-questions reveals two different intonation patterns which are shown schematically in (6a) and (6b). Both patterns contain a rising pitch accent, labeled as L*H. The starred tone (L*) is associated with the metrical strongest syllable, i.e. the syllable bearing word stress. The boundary tone, however, varies: speakers of Leipzig Upper Saxon exhibit both rising (6a) and falling patterns (6b). Out of 38 questions analyzed, the majority of cases, 74 % or 28 questions, are realized with a high boundary tone, thus with an overall rising intonation pattern. 26 % of the questions are realized with falling intonation.

(6) a. 

L* H H%

b. 

L* H L%

A typical example of a yes-no-question with rising intonation is given in Figure 1. The nuclear rising pitch accent is realized on the penultimate syllable of the phrase final word *Desperados* – a kind of beer (cf. (7)). The phrase contains a rising pitch accent, L*H as in (6), which is followed by a final rise on the last syllable. We analyze the final rise as a high boundary tone, H%. The tonal association with the text is given in (7).

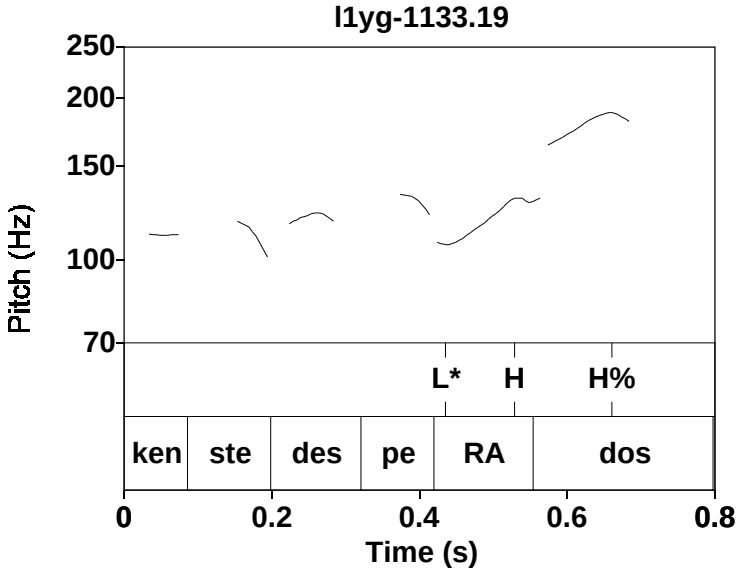


Figure 1: Pitch track of the phrase “Do you know Desperados?”.

(7) Kennst du Des.pe.ra.dos? “Do you know Desperados?”

| |

L*H H%

Figure 2 displays a typical yes-no-question with falling intonation. Again, the nuclear accent is a rising one (cf. (6)) realized on the penultimate syllable of the phrase final word. In contrast to (7), the pitch falls to the end of the phrase, exhibiting a low boundary tone. See (8) for the tune to text relation.

If we compare the USG tonal patterns with those of Standard German, we observe two kinds of differences. First, with respect to the nuclear pitch accents

which may occur in a yes-no-question, Standard German exhibits an intonational choice between a nuclear falling and rising pitch accent (cf. (2) and (3)). In USG, on the other side, we only observe a rising pitch accent in our corpus (cf. (6)). We find, thus, a distributional restriction concerning the type of pitch accent in USG as shown in Table 1.

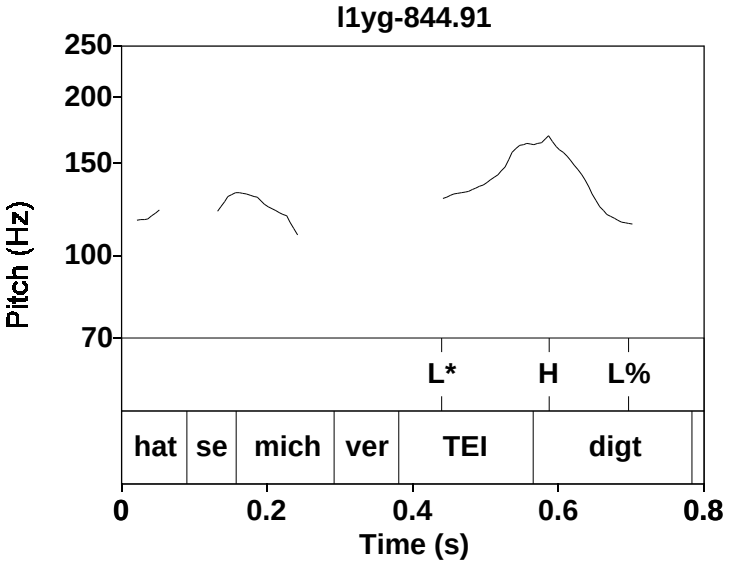


Figure 2: Pitch track of the phrase “Does she have defended me?”.

(8) Hat sie mich ver.tei.digt? “Does she have defended me? ”

| |

L*H L%

Table 1. Distribution of question tunes in USG and Standard German.

	USG	Standard German
Yes-no-question	L*H H%	L*H H%
tunes	-	H*L H%
	L*H L%	-

Second, with respect to the boundary tones, we find both a low and a high boundary tone in USG, while both von Essen (1964) and Féry (1993) do not report any low boundary tones for yes-no-questions (see Table 1). However, in conversational speech of Northern German, which is closely related to Standard German, yes-no-questions with falling intonation occur (Selting 1995). Since the speech materials of von Essen and of Féry are read speech and that of Selting and our study is spontaneous speech, the absence of yes-no-questions with falling intonation might be a characteristic of read speech.

4. Intonational variation and information structure

Our tonal analysis of USG yes-no-question intonation results in two distinct intonational patterns (cf. Table 1). This section is concerned with an attempt to relate these patterns to information structure. The hypothesis is that the observed intonational variation is related to the speakers' expectation of the information status of the information being asked for. This assumption is based on the work by Grice and Savino on Italian map task dialogues (1997, 2003a, b). Their results show that the choice of pitch accent type depends on the speaker's degree of confidence in the information status of the answer. In order to define the information status of the answer we have to consider the context. From the content of the conversation prior to the question we are able to discover whether the information being asked for has been subject of discussion or not. If the interlocutors have mentioned the topic of an answer before, we conclude that the speaker may have an expectation of the answer. The expectation is based on contextual and situational information. If the speaker does not know the answer, i.e. the information status of the answer is open, the information status of the answer has not been subject of the previous conversation.

A different interpretation of the variation between rising and falling intonation in questions is proposed by Bartels (1999). In her model, Bartels concentrates on interclausal dependencies to account for the observed intonational variation and leaves interactive attitudinal aspects aside due to their complex contextual interaction. In particular, Bartels does not consider the factor speaker expectation which has been shown to be valid by Grice & Savino. According to Bartels three distinct intonational patterns may accompany a yes-no-question in English (see Table 2). With respect to the main pattern *rise*, Bartels additionally distinguishes between a *low* and a *high* rise.

Table 2. Accent patterns in English yes-no-questions (from Bartels 1999:124ff)

	low rise	high rise	fall	fall-rise
Intonation pattern in yes-no-questions	L* H-H% (L*H-L%)	H* H-H%	H* L-L%	H* L-H%
Presence of ASSERT morpheme	[-ASS]	[-ASS]	[+ASS]	[+ASS]

In her analysis, Bartels develops a pragmatic concept of *assertiveness*. Any sentence, independent whether a statement or a question, may receive an abstract assertiveness morpheme. Then, a feature [+ASS] is attached to that sentence. In the other case this feature is absent. Further, she distinguishes two types of yes-no-questions, namely *whether-questions* and *if-questions*.[9] The former show a close relation to alternative questions in the sense that they are semantically and pragmatically equivalent. In this respect, *whether-questions* bear a two-way

[9] Bartels proposes the terms *whether-question* and *if-question* due to her analysis of a yes-no-question's capacitiy to be embedded in clauses with the conjunction *whether* or *if*. By conducting this kind of syntactic test, Bartels analyzes the underlying structure of direct yes-no-questions.

presupposition of the proposition itself, while *if-questions* show an absence of a sentential presupposition in that they put their surface proposition under discussion. Based on the categorical distinction of two types of yes-no-questions, Bartels argues that *whether-questions* bear the feature of *assertiveness* due to their presuppositional properties. On the other side, *if-questions* have no assertiveness-feature attached since they lack a sentential presupposition. Bartels' intonational analysis reveals a correlation between the assumed phrase tones and the assertiveness-feature: a low phrase tone (L-) represents the tonal implementation of the assertiveness morpheme attached to the utterance, while a high phrase tone (H-) signals the absence of that morpheme (cf. Table 2). What remains open, to my view, however, is the phonetic reality of the low phrase tone. In other words, the assumption of phrase tones and their meaning with respect to assertiveness seems to be motivated by theoretical concerns.

Since we are dealing with conversational speech we follow the approach by Grice and Savino considering the conversational background of the speakers as an analysis cue to the speaker's choice of intonational pattern. Thus, we assume that the conversational context provides evidence for the speaker's expectation about an answer.

Consider the context of (7) which is given in (9). In this passage of the conversation, speaker 1 (s1) is telling a story about a disco night that he has been to with some friends. At that place they have had a lot of different drinks. At that time of the conversation s1 is asking speaker 2 (s2) whether he knows Desperados, a kind of beer (line 3). s1 does not know whether s2 has been to that place, too, or whether he has had that kind of beer elsewhere since this has not been topic of the conversation before. s1 has, thus, no contextual or situational clue to know the answer. We may thus conclude that s1 has no expectation about the answer, i.e. he is asking for new information (=information question).

Intonationally, this phrase ends high. The rising pitch accent is followed by a high boundary tone (cf. Fig. 1).

(9) **l1yg-1133.19**

```
   1  s1:  wir ham (.) alles möglische getrunken
           we have been drinking everything
   2       wir ham
           we have
-> 3       kennst du desperados
                          L*H  H%
           do you know desperados
   4  s2:  ne
           no
   5  s1:  das is so n (.) so n komisches bier
           that's a a funny beer
```

The context of a typical example of a yes-no-question with falling intonation (cf. (8)) is given in (10). The two interlocutors (s1 and s2) are talking about a good friend of theirs. This person has had a conversation with another friend. Since s2 often behaves jokey, the friend of s1 and s2's friend believes that s2 can never be serious. The conversation passage here is about the person talking to s1's friend that s2 cannot be serious. From the previous context we know that s2 knows his friend very well and vice versa. Thus, he assumes that his friend has defended him. s2 is convinced that his friend must have defended him. So he expects the answer to be yes, which s1 is then confirming. In this example, s2 asks for given information due to his expectation of the answer. The question can be classified as a confirmation question. The question *Hat sie mich verteidigt?* "Does she have defended me?" in line 5 is realized with a nuclear rising pitch accent but falling intonation, i.e. a low boundary tone (cf. Fig. 2).

(10) **l1yg-844.91**

```
   1  s1:  er hat=s
           he has
   2       er hat=s ihr dann noch ma so (-) gesagt
           he has been saying it to her
   3  s2:  m=m
           m=m
```

```
    4        was hat se wie hat sie reagiert
             what does she how does she have responded
->  5        hat sie misch verteidigt
                                L*H  L%
             does she have defended me
    6        ey
             ey
    7   s1:  eh ja
             eh yes
```

To sum up, the analysis of the two contexts given above reveals that speakers tend to utter two different kinds of yes-no-questions. In fact, this is true for all of the 38 analyzed yes-no-questions in our study. We observe the distinction made by Bolinger (1989) between information and confirmation questions in our USG data as well. Moreover, we observe a correlation between these two kinds of questions and their intonational shape. A yes-no-question ending in high pitch is an information question, where the speaker has no expectation of the answer (cf. (9)). In this case, the information status of the answer has not been subject of the previous conversation. However, a yes-no-question may end in low pitch. A question like this we may classify as a confirmation question (cf. (10)). In this case, the speaker has an expectation of the answer. The conversational or situational context provides enough information so that the speaker has an idea of the information status of the answer.

5. Conclusions and discussion

For the present study, we have examined intonation patterns of yes-no-questions in Upper Saxon German (USG). With respect to the syntactical structure of the yes-no-questions we have chosen the VSO-type to avoid confusion with declarative patterns (SVO-type). The yes-no-questions have been extracted from a corpus of conversational speech containing both map-task dialogues and free conversations. Thus, every question is embedded in a natural conversational

context. The tonal analysis reveals that a yes-no-question in USG may be expressed by two distinct intonational patterns, i.e. an overall falling and an overall rising intonation pattern. In terms of a tone-sequence analysis (e.g. Pierrehumbert 1980), the former is indicated by a low, the latter by a high boundary tone. Concerning the pitch accents, a yes-no-question contains obligatorily a rising nuclear pitch accent (L*H). The overall falling pattern, however, occurs less frequently in the corpus than the overall rising pattern.

Based on the results of Grice & Savino (1997, 2003a, b) we have conducted a contextual analysis to relate the distinct intonation patterns to a different information status of the answer. As for pitch accents in Bari Italian, the intonational variation found in the boundary tones in USG is accompanied by the speaker's expectation of the information status of the answer. A low boundary tone signals that the speaker has an expectation of the answer, that is, he is asking for mutually shared information. This is a case of a confirmation question (Bolinger 1989). On the other side, a high boundary tone signals that the speaker is asking for new information that has not previously been mentioned in the conversation. The speaker has no expectation of the answer in this particular case. This is a true information question (Bolinger 1989). Our results indicate that the choice of the boundary tone depends on the degree of confidence of the speaker as to whether the answer contains given or new material. Thus, languages differ in the phonological entities, which signal the degree of the speaker's confidence.

The results presented here may also explain the intonational variation in Dutch yes-no-questions observed in Haan's (2001) data. Even if the production task that Haan carried out did not provide any further context to the subjects, it could be the case that the absence of the final rise in 6 % of the yes-no-questions is due to the fact that the speakers might have had an expectation of the answer

in that particular situation of the recording. However, this has to be left hypothetical since we by no means come to know what the speakers had in mind.

If we compare the results of USG question intonation with Standard German we observe that yes-no-questions with falling intonation seem not to occur in Standard German (e.g. von Essen 1964, Féry 1993, Grice & Baumann 2000). A first interpretation may lead us to assume that falling intonation in USG yes-no-questions is a dialect specific intonation pattern. However, Selting (1995) in her analysis of conversational data of North West German, a variety that is comparable to that of Standard German, also observes yes-no-questions ending low. The speech data of the present study and Selting's data consist of spontaneous conversational speech while the speech materials of von Essen (1964) and (Féry 1993) consist of isolated read sentences or read questions answer pairs without any further context. From that, we assume the intonational variation observed in USG yes-no-questions to be due to the type of data, i.e. spontaneous speech, rather than a dialect specific phenomenon.

The type of material of the present study has caused us to follow the approach of Grice and Savino (1997) rather that that of Bartels (1999) interpreting the intonational variation. We have shown that a contextual analysis provides information about the speakers' expectation of an answer to a yes-no-question. However, a further analysis of our data might even prove Bartels model although we have no phrase tones assumed for USG yet.

Further research on this topic has to consider yes-no-questions with declarative syntax (SVO-type). As mentioned before, we concentrated on yes-no-questions with verb initial position in order to avoid confusion with declarative intonational patterns. Considering yes-no-questions with declarative syntax, we have to be aware not analyzing simple declaratives. Using conversational data, however, provides us from this kind of error, since we may decide a declarative to be a yes-no-question on the basis of the context plus the

interlocutor's behavior. If a speaker in a *certain context* explicitly replies a *yes* or *no*, we may claim that the previous phrase must have been a yes-no-question.[10] An analysis that is based on the intonation phrase as a domain does not need to draw on the classical relation between syntax and sentence mood. A rather pragmatic approach leads to the desired results.

Indeed, preliminary analysis of declarative yes-no-questions reveal a similar behavior, that is, we can observe an interaction between boundary tones and information structure. This may even support Gunlogson (2001) who analyzed declaratives with rising and falling intonation in English. Her conclusion is that the interplay of sentence type, intonation and context makes a declarative function as a question. On the contrary, this might contradict Haan's (2001) analysis of the pragmatic function of sentence type. She proposed a correlation where only a declarative yes-no-question carries the pragmatic function of a confirmation question, and only a yes-no-question with question syntax corresponds to an information question. As far as the yes-no-questions with question syntax are concerned, this proposal has already been refuted by the present study.

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[10] We are aware of the fact that in conversational data a *yes* or *no* may have the status of a backchannel. However, analyzing the speakers' behavior plus additional context we may differentiate between backchannels and yes-no-questions. Still, we will certainly find ambiguous cases, which we then simply have to exclude from the materials. As an example of a successful conversational analysis of this kind of data see Selting (1995).

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Case as a trigger for reanalysis - Some arguments from the processing of double case ungrammaticalities in German*

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Abstract

In the recent literature there is a hypothesis that the human parser uses number and case information in different ways to resolve an initially incorrect case assignment. This paper investigates what role morphological case information plays during the parser's detection of an ungrammaticality or its recognition that a reanalysis is necessary. First, we compare double nominative with double accusative ungrammaticalities in a word by word, speeded grammaticality task and in this way show that only double nominatives lead to a so-called "illusion of grammaticality" (a low rate of ungrammaticality detection). This illusion was found to disappear when the second argument was realized by a pronoun rather than by a full definite determiner phrase, i.e. when the saliency of the second argument was increased. Thus, the accuracy in recognizing an ungrammaticality induced by the case feature of the second argument is dependent on the type of this argument. Furthermore, we found that the accuracy in detecting such case ungrammaticalities is distance sensitive insofar as a shorter distance leads to a higher accuracy. The results are taken as support for an "expectation-driven" parse strategy in which the way the parser uses the information of a current input item depends on the expectation resulting from the parse carried out so far. By contrast, "input-driven" parse strategies, such as the diagnosis model (Fodor & Inoue, 1999) are unable to explain the data presented here.

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1. Introduction

In the recent discussion on mechanisms of reanalysis there is a dispute about the relative influence of different syntactic features, such as number and case. German appears to be particularly well suited to examining this question as it allows disambiguation by case as well as by number information. Thus, it is possible to investigate the specific contribution of each of these features to the resolution of an ambiguity. The following sentences illustrate the different means of disambiguation.

(1a) Die Botschafterin besuchte der Minister.
The ambassador$_{amb}$ visited the minister$_{nom}$
'The minister visited the ambassador.'

(1b) Die Botschafterin besuchten die Minister.
The ambassador$_{sg}$ visited$_{pl}$ the minister$_{pl}$
'The ministers visited the ambassador.'

In (1), the initial determiner phrase (the functional projection including determiner and noun phrase; DP) *die Botschafterin* is ambiguous with regard to case and grammatical function. As specified by the German inflection paradigm, the DP could be a nominative subject or an accusative object of the clause. In (1a), the grammatical function and, consequently, the case of the initial element will become clear as soon as the second, morphologically specified DP is processed. By contrast, in (1b) the ambiguity is resolved by way of the obligatory number agreement between main verb and subject in German.

Following parsing principles such as the Syntactic Prediction Locality Theory (Gibson 1998) or the Active Filler Hypothesis (Clifton & Frazier 1989), we propose that the initial, ambiguous DP *die Botschafterin* will be analyzed as the subject of the sentence. Assuming that this false interpretation of (or preference for) the first phrase leads to an experimentally detectable reanalysis effect, we expect conspicuous changes in reading times, ERP-patterns or acceptability ratings when the second case marked DP in (1a) is encountered or

when the number mismatch between the main verb and the first DP in (1b) forces an object reading of the initial phrase.

The theoretically motivated subject preference for an initial case ambiguous phrase was confirmed by a number of experiments (Hemforth et al. 1994, Schriefers et al 1994., Friederici et al. 1996, Meng 1997, Schlesewsky et al. 1996, Schlesewsky et al. 1999a). All these studies show that German native speakers do indeed follow such subject-first strategies.

Various experimental techniques have shown reliable subject-first advantages for sentences disambiguated via number mismatch (Kühn 1994, Schriefers et al. 1994, Schlesewsky et al. 1999a, Schlesewsky et al. 1998a, Meng 1997). When taken together, these studies also provide evidence for the structural independence of the number mismatch effect. The following examples exemplify some of the sentence constructions that this effect has been demonstrated for.

(2a) relative clauses
Das ist die Botschafterin, die die Professorinnen besucht hat/haben.
This is the ambassador, who$_{amb;sg}$ the professor$_{pl}$ visited has/have
'This is the ambassador who visited the professors.'
'This is the ambassador whom the professors visited.'

(2b) verb second interrogatives
Welche Botschafterin besuchte/besuchten die Professorinnen?
Which ambassador$_{amb;sg}$ visited$_{sg}$ / visited$_{pl}$ the professor$_{pl}$
'Which ambassador visited the professors?'
'Which ambassador did the professors visit?'

(2c) indirect questions
Es war klar, welche Botschafterin die Professorinnen besucht hat/haben.
It was clear, which ambassador$_{amb;sg}$ the professor$_{pl}$ visited has/have
'It was clear which ambassador has visited the professors.'
'It was clear which ambassador the professors have visited.'

By contrast, Meng (1997) and Schlesewsky et al. (1999a) reported no or only a weak cost of reanalysis for constructions such as (3), in which the ambiguity is

resolved via the case information of the second DP.

(3a) verb second interrogatives

Welche Botschafterin besuchte der / den Professor.

which ambassador$_{amb}$ visited the$_{nom}$ / the$_{acc}$ professor

'Which ambassador visited the professor?'

'Which ambassador did the professor visit?'

(3b) long wh-movement

Welche Botschafterin glaubst Du besuchte der / den Professor.

which ambassador$_{amb}$ believe you visited the$_{nom}$ / the$_{acc}$ professor

'Which ambassador do you believe visited the professor?'

'Which ambassador do you believe the professor visited?"

The absence of a reanalysis cost for OS clauses compared to their SO counterparts was observable in reading times (Meng 1997, Schlesewsky et al. 1999a), ERP events (Schlesewsky et al 1998a) or in performance data of grammaticality judgements (Meng & Bader 1997).

Furthermore, Meng & Bader (1997) observed that there exists a correlation between the processing behavior for case ungrammatical and case ambiguous sentences[1], as shown in examples (4) /(5) and Table 1.

(4a) ambiguous

Jemand fragte, welche Studentin die Männer besucht haben.

someone asked which student$_{amb}$ the men visited have

'Someone asked which student the men have visited.'

(4b) unambiguous

Jemand fragte, welchen Studenten die Männer besucht haben.

someone asked which$_{acc}$ student the men visited have

(4c) ungrammatical

*Jemand fragte, welcher Student die Männer besucht haben.

someone asked which$_{nom}$ student the men visited have

[1] In addition, Meng (1997) showed an analogous dependency with regard to the corresponding reading times. The decisive implication of this will be discussed in the context of the experiments presented.

(5a) ambiguous
Welche Studentin glaubst du, besuchte der Mann?
which $student_{amb}$ believe you visited the_{nom} man
'Which student do you believe the man visited?'

(5b) unambiguous
Welchen Studenten glaubst du, besuchte der Mann?
$which_{acc}$ student believe you visited the_{nom} man

(5c) ungrammatical
*Welcher Student glaubst du, besuchte der Mann?
$which_{nom}$ student believe you visited the_{nom} man

As in example (1b), the ambiguity in (4) is resolved via number congruence. By contrast, the ambiguity resolution in (5) takes place via the case morphology of the second DP.

As Table 1 shows, a good performance in detecting that an utterance is ungrammatical correlates with a poor performance for the corresponding ambiguous construction.

Table 1. Percentages of correct answers for sentences disambiguated by agreement or by case (Meng & Bader 1997).

Condition	Agreement	Case
ambiguous	64 (4a)	90 (5a)
unambiguous	85 (4b)	93 (5b)
ungrammatical	84 (4c)	56 (5c)

Meng & Bader (1997) argue that these dependencies reflect a general strategy of the human parser, which is driven by the saliency of an unexpected event (e.g. an ungrammaticality or a false preference).

Mismatch Effect: The more salient a temporary ungrammaticality is, the stronger the resulting garden-path effect will be (Meng & Bader 1997).

While the *Mismatch Effect* is a descriptive characterization of the surface phenomenon, Fodor & Inoue's *Diagnosis Model* (Fodor & Inoue 1994, 1998, 1999; henceforth F&I) seeks to provide an explanation of the underlying mechanisms involved.

F&I argue that relative differences in garden path strength are not dependent on the difficulty of the repair process required, but rather reflect the transparency of diagnosis, i.e. to what extent the input item indicating that something is wrong also indicates where in the parsing process the wrong choice was made.

F&I assume that when the parser encounters a word that it cannot sensibly attach into the current phrase marker (the symptom of the garden path), it follows a principle which they call *Attach Anyway*. This principle states that in a situation where no acceptable attachment can be made, the parser should simply undertake the "least unacceptable attachment". As a consequence, the structure already built must be made to fit the current input and not vice versa, i.e. once *Attach Anyway* has applied, the grammar must determine what is wrong with the tree as it stands so that the parser can apply changes to it that will hopefully render it acceptable.

The Diagnosis Model thus focuses not on structural rebuilding processes, but on how the parsing error is diagnosed. The authors argue that different restructuring operations are not associated with differing costs. Rather, it is the transparency or opacity of the symptom which determines how easy or difficult recovery from a garden path will be. This means that if the symptom is able to provide the parser with a clear indication of where the error took place, recovery from the garden path will be relatively problem-free. On the other hand, if it is not possible at all to decide where the problem lies on the basis of the symptom, the parser will be forced to proceed virtually by trial and error in attempting to effect a satisfactory alteration of the tree. Thus, it will either require

considerably more effort to recover from the garden path or no recovery will be possible at all, seeing that the right path to follow may not even occur to the parser as a feasible option.

F&I attempt to account for the findings of Meng & Bader in terms of the diagnosis model in the following way: They argue that number information (e.g. in 4) is "negative" evidence because it is non-specific. This is due to the fact that a number mismatch only signals to the parser that the initial subject preference is incorrect, without giving any hint at what the correct analysis could look like, i.e. it does not specify which is the correct attachment site for the DP initially taken to be the subject of the clause. The case information in (5), by contrast, is "positive" evidence because it does not only show that the initial preference was incorrect, but also specifies the correct interpretation. This is because case is directly connected to structural position whereas number is not. Therefore, in the ambiguous constructions, the parser not only knows that its initial assumption (i.e. that the ambiguous DP is nominative) is wrong, but also what the correct structural position for this DP must be, namely the position of the direct object. In short, case information helps to find the structural alternative whereas number does not.

As far as the ungrammatical sentences are concerned, F&I are able to explain why ungrammaticalities based on number information (6) are much easier to detect than ungrammaticalities based on case information (7).

(6) *..., welcher Politiker die Minister getroffen haben.
..., which$_{nom;sg}$ politician the ministers$_{amb;pl}$ met have
'... which politician the ministers have met.'

(7) *Welcher Politiker glaubst Du, traf der Minister?
which$_{nom}$ politician believe you met the$_{nom}$ minister
'Which politician do you believe the minister met?'

In (6), the parser is faced with a number mismatch between both DPs and the final auxiliary. Due to the opacity of the symptom, there is no series of steps

that the parser might undertake in order to save the structure. Thus, the ungrammaticality of the sentence is reliably detected. In (7), by contrast, the second DP is attached by the parser to the structural position of a subject, seeing that the morphological case information unequivocally associates the DP with this position. With regard to the question of what then happens to the first DP (which is also unambiguously specified for nominative case), F&I (1999) propose that the parser does not have the case of this DP available. Rather, it is assumed that this case feature has been ”overlooked” and that the case of the first DP was thus assigned *per default*. As a consequence of this default assignment, the case feature of the initial DP may be reassigned unproblematically. In this way, the Diagnosis Model accounts for the mismatch effect, i.e. for the acceptability differences between case and number-induced ungrammaticalities as well as the (in)visibility of a reanalysis in the corresponding ambiguous structures.

Note, however, that F&I's argumentation with regard to the case effects is exclusively based on structures with a linear order of first argument-verb-second argument. Thus, the ambiguous argument (or the trace in long movement constructions) is always followed by a verb. The second argument then disambiguates the structure or makes it ungrammatical. If the whole range of German constructions is considered, however, the above generalization of case-induced reanalysis effects, i.e. that they are weak or even invisible, cannot be maintained.

First evidence for a costly reanalysis via Case was reported by Schlesewsky et al. (1995) Brück (1996) and Macketanz (1996). These studies reported higher reading times for the nominative specified determiner of the second DP in sentences where the initial wh-phrase is extracted from a that-clause, as illustrated in (8).

(8a) Welche Botschafterin glaubst Du daß der Richter besuchte?
which ambassador$_{amb}$ believe you that the$_{nom}$ judge visited
'Which ambassador do you believe the judge to have visited?'

(8b) Welche Botschafterin glaubst Du daß den Richter besuchte?
which ambassador$_{amb}$ believe you that the$_{acc}$ judge visited
'Which ambassador do you believe to have visited the judge?'

Further evidence for a costly case-induced reanalysis was presented by Fanselow & Schlesewsky (1998) and Schlesewsky et al. (1999a). For embedded whether-clauses (9) and embedded wh-questions (10), several self paced reading studies showed a reanalysis effect from the point of processing the second DP to the end of the clause.

(9) Die Sekretärin wusste nicht,...
The secretary didn't know
(9a) ...ob wahrscheinlich unglücklicherweise die Ärztin den Staatssekretär belog.
if probably unfortunately the doctor$_{amb}$ the$_{acc}$ secretary lied
' ... if the doctor probably unfortunately lied to the secretary.'
(9b) ...ob wahrscheinlich unglücklicherweise die Ärztin der Staatssekretär belog.
if probably unfortunately the doctor$_{amb}$ the$_{nom}$ secretary lied
' ... if the secretary probably unfortunately lied to the doctor.'

(10) Die Sekretärin wusste nicht,...
The secretary didn't know
(10a) ...welche Frau wahrscheinlich unglücklicherweise den Staatssekretär belog.
which woman$_{amb}$ probably unfortunately the$_{acc}$ secretary lied
' ... which woman probably unfortunately lied to the secretary'
(10b) ...welche Frau wahrscheinlich unglücklicherweise der Staatssekretär belog.
which woman$_{amb}$ probably unfortunately the$_{nom}$ secretary lied
' ... which woman the secretary probably unfortunately lied to.'

As in the sentences used by Brück (1996) and Macketanz (1996), the embedded verb appears after the arguments have been processed. Therefore, the case information of the second DP is the first available disambiguating information.

The following example, which was reported by Schlesewsky (1997), illustrates the problems that must be addressed by a potential explanation of case-induced disambiguation in an especially illuminating way. In sentences

such as (11), an initial ambiguous declarative DP is modified by a restrictive relative clause. Within this clause a morphologically underspecified relative pronoun confronts the parser with a second ambiguity. While the relative clause is disambiguated via number, the ambiguity in the main clause is resolved by the case marking of the second DP.

(11a) Die Botschafterin, die die Minister besucht hat, sah den Reporter.
the ambassador$_{amb}$ who$_{amb;sg}$ the minister$_{amb;pl}$ visited has saw the$_{acc}$ reporter
'The ambassador who has visited the ministers saw the reporter."

(11b) Die Botschafterin, die die Minister besucht hat, sah der Reporter.
the ambassador$_{amb}$ who$_{amb;sg}$ the minister$_{amb;pl}$ visited has saw the$_{nom}$ reporter
'The reporter saw the ambassador who has visited the ministers.'

(11c) Die Botschafterin, die die Minister besucht haben, sah den Reporter.
the ambassador$_{amb}$ who$_{amb;sg}$ the minister$_{amb;pl}$ visited have saw the$_{acc}$ reporter
'The ambassador whom the ministers have visited saw the reporter.'

(11d) Die Botschafterin, die die Minister besucht haben, sah der Reporter.
the ambassador$_{amb}$ who$_{amb;sg}$ the minister$_{amb;pl}$ visited have saw the$_{nom}$ reporter
'The reporter saw the ambassador whom the ministers have visited.'

In a self paced reading study, the reading time for the sentence-final nominative DP is higher than that for its accusative counterpart only in sentences with an object reading of the relative pronoun (11c vs. 11d), i.e. where the initial preference for a subject interpretation of the relative pronoun must be revised. In the constructions where no reanalysis takes place within the relative clause, there are no reading time differences between the sentence-final nominative and accusative DPs (11a vs. 11b).

Thus, we are faced with a peculiar visibility condition for case-induced reanalyses (or diagnoses), namely that a reanalysis is visible and not weak if an unexpected event (an earlier reanalysis in our case) occurs before the disambiguating second argument appears. Otherwise a reanalysis appears, but it is invisible. How the Diagnosis Model could explain this is not at all clear.

A further problem arises with the assumption that the case of the first DP in an ungrammatical double nominative construction is "overlooked". It is not

really clear what ”overlooked” means in this context and how this default assignment is supposed to work. There are at least the following two possibilities:

(I) The parser overlooks the case marking of the first DP upon first encountering it. Consequently, the initial assignment of the grammatical function of subject to this DP is effected via a default rule (e.g. Active Filler Hypothesis). If this were the case, there should be no difference in processing measures between unambiguous nominative and accusative sentence-initial DPs, e.g. ”der/welcher Mann” vs. ”den/welchen Mann” which is clearly not the case (cf. Friederici et al. (1998), Schlesewky et al. (1999a), Rösler et al. (1998)). Secondly, we would predict that in sentences with two accusative marked DPs such as (12),

(12) * Welchen Politiker glaubst Du traf den Minister?
which$_{acc}$ politician believe you met the$_{acc}$ minister

an accusative marked second DP should *confirm* a default subject reading of the first DP. Therefore, we would expect subjects to judge sentences such as (12) as highly acceptable, that is, subjects should perform *below* chance in a grammaticality judgement task. This prediction will be tested in Experiment 1.

(II) The case of the first DP is not overlooked *initially*, but it is no longer available to the parser when the second DP is encountered. Thus, the parser attaches the second DP to the structural position of subject and *then* assigns the first DP to the object position (assignment of default object case [+ACC]; Gorrell 1996). In this way, the empirical findings of processing differences between nominative vs. accusative marked initial DPs in German may be accounted for. Furthermore, it would predict –in contrast to possibility (I)- that there should not be any difference between double nominatives such as (7) and double accusatives such as (12), seeing that it should be equally easy to find the default case that has to be assigned to the first DP. The prediction that subjects should

judge double nominatives and double accusatives with similar accuracies is also tested in Experiment 1 of the present study.

2. Experiment 1

As we have shown in the introduction, we cannot hope to truly understand how case information is processed by considering only constructions which are disambiguated or rendered ungrammatical by an DP specified for nominative, for in this way we will never be able to decide whether the results obtained are a consequence of the specific ”positive” properties of structural case (as suggested by F&I) or whether they rather reflect the special status of nominative case (default case; cf. Bittner & Hale 1996).

In our first experiment we will therefore compare ungrammatical double nominative constructions with ungrammatical double accusatives. We will not use ambiguous structures, as Meng and Bader (1997) did, seeing that it makes no sense to compare an ungrammatical double accusative clause with an ambiguous sentence that contains a final accusative phrase, e.g. *welche Lehrerin traf den Rektor- which teacher met the principal*. The latter follows the normal word order and meets the expectations of the preferred reading induced by the interpretation of the initial ambiguous phrase. Thus we cannot expect an influence of reanalysis costs, since there is no reanalysis.

In order to avoid an uncontrolled influence of word order variation and morphological specification, we will test the ungrammatical constructions against their unambiguous counterparts.

The following sentences exemplify the entire set of conditions used in the first experiment.

(13a) SO unambiguous
Welcher Botschafter besuchte den Richter ?
which$_{nom}$ ambassador visited the$_{acc}$ judge
'Which ambassador visited the judge?'

(13b) OS unambiguous
Welchen Botschafter besuchte der Richter ?
which$_{acc}$ ambassador visited the$_{nom}$ judge
'Which ambassador did the judge visit?'

(13c) double nominative ungrammatical
*Welcher Botschafter besuchte der Richter ?
which$_{nom}$ ambassador visited the$_{nom}$ judge

(13d) double accusative ungrammatical
*Welchen Botschafter besuchte den Richter ?
which$_{acc}$ ambassador visited the$_{acc}$ judge

If F&I's approach is correct, we would expect double accusatives to be judged with an accuracy rate that is equal to (prediction II) or lower than (prediction I) that found for double nominatives. However, there is also a number of theoretical and experimental arguments for a higher complexity of object initial structures in comparison to their subject initial counterparts (Travis 1984, Gibson 1998, King & Just 1991, Schlesewsky et al. 1998b), which might influence the saliency of the ungrammaticality in accusative initial constructions.

2.1 Method

2.1.1 Participants Twenty-four native German speakers from the Potsdam University participated, for 10 DM each.

2.1.2 Materials Seventy-two data blocks each containing the four different forms exemplified in the sentences presented in (13) were constructed. All experimental sentences contained an initial DP (ambiguous or morphologically specified) followed by a transitive verb and an additional DP that was

morphologically marked for nominative or accusative case. Probands decided upon the grammaticality of the sentence or the validity of the initial preference at the position of the determiner of the second DP. In order to avoid influence from additional case information we controlled the degree of inflection of the second noun. This is possible insofar as the inflection paradigm of German shows different patterns for nominative and accusative Case, for example *Richter- Richter* (judge Nom-Acc) versus *Junge-Jungen* (boy Nom- Acc). The actual stimuli are available upon request.

48 experimental items (12 sentences per condition) were combined with 168 fillers. The fillers consisted of approximately the same number of phrases and were counterbalanced concerning the degree of ungrammaticality and the number of topicalized phrases in analogy to the experimental material. A chance function chose 12 sentences per condition and constructed a list only as the participant started the experimental program. After six subjects all experimental sentences had been presented in a counterbalanced way and a new trial was started automatically.

2.1.3 Procedure The sentences were presented word by word in a speeded grammaticality task. Every word appeared for 250 ms in the middle of a computer screen. The ISI was 100 ms. In order to fix the eyes in the center of the screen an asterisk was presented before the presentation of the first word of a sentence. After the last word a question mark appeared as a prompt for the probands to decide on the grammaticality of the analyzed clause as quickly as possible.

2.2 Results

The percentages of correct answers and the mean reaction times (for correct answers only) for each experimental condition are given in Table 2.

Table 2. Percentages of correct answers (in %) and mean reaction times (in ms) for correct answers in Experiment 1 (wh-DP-V-DP); corresponding examples are given in parentheses.

Condition	Subject-Object	Object-Subject
unambiguous	97/ 635 (13a)	95/ 618 (13b)
ungrammatical	64/ 863 (13c)	77/ 694 (13d)

All data with reaction times greater than 4000 ms were excluded from the analysis; these made up about 1% of the data in the experiment and were evenly distributed over all conditions. In addition, we used only the data with correct responses for the reaction times analysis[2].

An analysis of variance was performed on the means of correct responses and the means of reaction times, with both subjects, F_1, and items, F_2, as random variables.

For correct responses, the MANOVA revealed that there was a main effect of Grammaticality [$F_1(1,23)= 67.17$, $p<.01$, $F_2(1,71)= 172.14$, $p<.01$]. The main effect of Word order was marginally significant in the subject analysis, but significant in the item analysis [$F_1(1,23)= 3.42$, $p<.08$, $F_2(1,71)= 6.00$, $p<.02$].The interaction Word order by Grammaticality was significant in the subject analysis as well as in the item analysis[$F_1(1,23)= 6.11$, $p<.05$, $F_2(1,71)= 13.38$, $p<.01$].

Furthermore, the MANOVA gave the following results for the observed reaction time data: a significant main effect was found for Grammaticality [$F_1(1,23)= 11.02$, $p<.01$, $F_2(1,71)= 26.76$, $p<.01$] and for Word order [$F_1(1,23)= 12.83$, $p<.01$, $F_2(1,71)= 5.73$, $p<.05$]. The interaction Word order by Grammaticality was also significant in the subject as well as in the item analysis [$F_1(1,23)= 5.61$, $p<.05$, $F_2(1,71)= 10.07$, $p<.01$]. In addition, a single comparison showed that there is a significant difference between the double nominative and the double accusative ungrammaticalities with respect to correct

[2] Incorrect responses are not taken into account seeing that it is not possible to ascertain why a sentence is judged incorrectly, neither with regard to the processing taking place nor with regard to the source of such a judgement.

responses [$F_1(1,23)= 4.85$, $p<.05$, $F_2(1,71)= 11.09$, $p<.01$] as well as reaction times [$F_1(1,23)= 12.49$, $p<.01$, $F_2(1,71)= 11.25$, $p<.01$]. There is no significant contrast between both grammatical conditions.

2.3 Discussion

The results of Experiment 1 show an unequivocal distinction between the ungrammatical conditions. Subjects tend to judge double nominative sentences as more grammatical than their accusative counterparts. The judgements for the grammatical sentences show that the contrast between the ungrammatical conditions is not caused by word order or by differences in the recognition of the morphological specification. The former showed that the higher accuracy in double accusatives is not due to a non-canonical word order of accusative initial structures in general[3].

Furthermore, the mean response time is significantly higher for the double nominative construction than for all other relevant conditions (see Table 2), i.e. subjects need additional time to decide on the grammaticality of this construction. This will be discussed in more detail below.

In sum, the judgement results as well as the response time data confirm the exceptional status of the nominative construction. They show that we need a more fine grained analysis in order to understand the mechanisms involved in the identification of a nominative marked argument. From the perspective of the Diagnosis Model, the present data are problematic insofar as they are incompatible with the assumption that the case feature of the first DP is ”overlooked”, however one may choose to interpret this.

3. Experiment 2

Given that the results of Experiment 1 exclude the possibility of attributing the poor judgement performance for double nominatives to the fact that the

[3] Additional evidence that the case of the first DP does not affect the “visibility” of the case of the second argument is given in Schlesewsky & Fanselow (1998) and Schlesewsky et al. (1999).

morphological case information of the first DP is somehow overlooked, it seems plausible to assume that it might in fact be the processing of the second DP which causes the effect in question. Such an assumption is also supported by the various experimental studies discussed in the introduction. Recall that a case-induced reanalysis effect is visible in ambiguous structures only when the main verb does not intervene between both arguments, i.e. in those constructions where the second argument is the first possible disambiguating element. Thus, it seems that the visibility of a reanalysis effect depends upon the saliency of the information provided by the second argument.

In all the experiments reported above, the second DP was realized by a non-pronominal definite DP. Given that the properties of this definite DP and/or the circumstances under which it is processed are the reason for the observed phenomena, the simplest way to test this assumption is to change the properties of the final argument. Because we are unable to vary the morphological properties of the (nominative) case feature itself, we will use an indirect way of rendering the information provided by the second argument more salient. Following the studies of Kaan (1997), Osterhout & Mobley (1995) and Sanford et al. (1983), we will assume that pronouns differ from definite DPs with respect to saliency[4]. For example, pronouns refer to an entity that has already been introduced, whereas a definite DP may refer to a person in a previous context, but can also introduce a new entity into the discourse. Furthermore, definite DPs can refer to an entity that has not been explicitly mentioned in the preceding context, while pronouns cannot refer to such entities. This means that pronouns are used to refer to entities that have already been defined and that are explicitly mentioned (salient) in the discourse context. As Osterhout & Mobley (1995) showed, there is a strong demand to bind a pronoun to a possible antecedent even when the pronoun's gender information does not allow this[5].

These differences with respect to discourse saliency should have consequences for the way definite DPs and pronouns are processed. Whereas a

[4] Naturally, there is also a contrast to indefinite full DPs. We will not, however, consider such discourse relations in this paper, seeing that indefinites are in some ways similar to definites with respect to discourse properties.

[5] In the case of cataphoric pronouns or when the pronoun precedes its antecedent as the result

full definite DP fulfills the formal requirements of the second argument position (except the case information), a pronoun has additional needs of its own with respect to binding properties, i.e. the processing of pronouns should require additional cognitive cost. As a consequence, we assume that the saliency of the second argument may be stronger when this argument is realized by a pronoun than when it is realized by a full definite DP.

Experiment 2 used the same constructions as Experiment 1, save that the second argument was realized by a pronoun. As far as the results are concerned, there are essentially two possible outcomes. First, if the results of Experiment 2 show a similar pattern to that found in Experiment 1, this may be taken as an indication of the fact that the phenomenon under examination does not result from the saliency of the second argument. On the other hand, if the judgement data of Experiment 2 show similar accuracies for double nominative and double accusative sentences, we will be able to attribute the results of Experiment 1 to processing mechanisms of the second argument.

3.1 Method

3.1.1 Participants Twenty-four native German speakers from the Potsdam University participated, for 10 DM each.

3.1.2 Materials Seventy-two data sets with four different forms as in the sentences presented in (14) were constructed. Each sentence contained an initial DP (ambiguous or morphologically specified) followed by a transitive verb and a final pronoun that was morphologically distinctive between nominative and accusative case. As in Experiment 1, probands were asked to decide on the grammaticality at the position of the determiner of the second DP.

The 48 experimental sentences were combined with 168 fillers. The fillers consisted of approximately the same number of phrases and were counterbalanced concerning the degree of ungrammaticality and the number of

of a movement operation, there appears to be the tendency to bind the pronoun in a default context. This explains why sentences with such pronouns are interpretable.

topicalized phrases in analogy to the experimental material. A chance function chose 12 sentences per condition and constructed a list only when the proband ran the experimental program. After six subjects all experimental sentences had been presented in a counterbalanced way and a new trial was started automatically.

3.1.3 Procedure The sentences were presented word by word in a speeded grammaticality task. Every word appeared for 250 ms in the middle of a computer screen. In order to fix the eyes in the center of the screen, an asterisk was presented before the first word of a sentence. The ISI was 100 ms. After the last word a question mark appeared which signaled to probands that they should decide on the grammaticality of the analyzed clause as quickly as possible.

(14a) Welcher Botschafter besuchte ihn ?
which$_{nom}$ ambassador visited him
'Which ambassador visited him?'

(14b) Welchen Botschafter besuchte er ?
which$_{acc}$ ambassador visited he
'Which ambassador did he visit?'

(14c) *Welcher Botschafter besuchte er ?
which$_{nom}$ ambassador visited he

(14d)* Welchen Botschafter besuchte ihn ?
which$_{acc}$ ambassador visited him

3.2 Results

The percentages of correct answers and the mean reaction times (for correct answers only) for each experimental condition are given in Table 3.

Table 3. Percentages of correct answers (in %) and mean reaction times (in ms) for correct answers in Experiment 2 (wh-DP-V-Pronoun); corresponding examples are given in parentheses.

Condition	Subject-Object	Object-Subject
unambiguous	91/ 527 (14a)	97/ 509 (14b)
ungrammatical	79/ 726 (14c)	82/ 729 (14d)

As in Experiment 1, the data with reaction times greater than 4000 ms were excluded from the analysis (< 1% with an even distribution across conditions).

For all data with correct responses, the MANOVA revealed that there was a main effect for Grammaticality [$F_1(1,23)= 34.10$, $p<.01$, $F_2(1,71)= 67.33$, $p<.01$]. The main effect of word order and the interaction word order by Grammaticality was not significant.

Furthermore, the MANOVA gave the following results for the observed reaction time data: a significant main effect was found for Grammaticality [$F_1(1,23)= 22.58$, $p<.01$, $F_2(1,71)= 70.90$, $p<.01$]. Neither the condition Word order nor the interaction Word order by Grammaticality reached a significant level .

3.3 Discussion

The data of Experiment 2 show that there is a significant difference between grammatical and ungrammatical sentences in responses as well as in judgement times. Subjects tends to judge grammatical sentences more accurately than ungrammatical ones and the time required to decide on the grammaticality of these sentences is shorter than that required for the ungrammatical expressions.

If we are willing to accept a zero result, we see that there exists a clear contrast between the results of Experiment 1 and Experiment 2. Both the contrast in accuracy and the contrast in decision times found in the former

disappear if the second argument is a pronoun. Thus it seems that a more salient second argument leads to a better performance with regard to the recognition of the case information of this element. As a consequence, subjects are able to analyze an ungrammaticality independent of the type of case violation.

4. Experiment 3

Taking the results of the first experiments together, we see that the "illusion of grammaticality" in double nominative constructions varies as a function of the type of the second argument. However, in order to ensure that the differences between full DPs and pronouns visible in these experiments do indeed reflect variations in the saliency of the case feature, we will run a final experiment combining the sentences used in Experiments 1 and 2.

Furthermore, on the basis of the results obtained thus far, we cannot be sure that the effect is driven only by the processing of the second argument. Rather, there is an additional point that should be discussed in the context of the following experiment. In view of the results of Ferreira and Henderson (1991) who found that a longer ambiguous region leads to a stronger garden path effect, the linear proximity of the two DPs may be an additional factor potentially influencing the conflict resolution that must take place on the second argument. Thus, if the visibility of the first DP's case information does play a role (as suggested by F&I and by Meng & Bader 1997), increasing the distance between the two arguments should lead to a lower accuracy in all ungrammatical conditions.

The consequence for the experimental design is the inclusion of an additional phrase that intervenes between the arguments.

4.1 Method

4.1.1 Participants Twenty-four native German speakers from the Potsdam

University participated, for 10 DM each.

4.1.2 Materials The material and the total number of sentences were identical to those used in Experiments 1 and 2. In addition, we modified the first DP with a prepositional phrase in all conditions. The following sentences exemplify this extension for the double nominative condition.

(15) * Welcher Dichter aus der Vorstadt besuchte der Gärtner
which$_{nom}$ poet from the suburbs visited the$_{nom}$ gardener
(16) * Welcher Dichter aus der Vorstadt besuchte er
which$_{nom}$ poet from the suburbs visited he

The conditions "word order" and "grammaticality" were specified as within-subject-factors whereas "type of second argument" (pronoun vs. non-nominal definite DP) was specified as a between-subject-factor.

4.1.3 Procedure The procedure was identical to Experiments 1 and 2.

4.2 Results

The percentages of and mean reaction times for correct answers for each experimental condition are given in Table 4.

Table 4. Percentages of correct answers (in %) and mean reaction times (in ms) for correct answers in Experiment 3 (DP vs. Pronoun).

Condition	Subject-Object		Object-Subject
unambiguous	DP	94/ 541 (15a)	92/ 533 (15b)
	Pron.	88/ 551 (16a)	91/ 553 (16b)
ungrammatical	DP	50/ 762 (15c)	70/ 680 (15d)
	Pron.	67/ 783 (16c)	69/ 809 (16d)

As in Experiments 1 and 2, all data with reaction times greater than 4000 ms were excluded from the analysis; these made up about 1% of the data in the experiment and were evenly distributed across all conditions. In addition, we used only the data for correct responses in the reaction times analysis.

An analysis of variance was performed on the means of correct responses and the means of reaction times, with both subjects, F_1, and items, F_2, as random variables

For correct responses, the MANOVA revealed that there was an overall effect of Word order [$F_1(1,47)= 6.80$, $p<.05$, $F_2(1,143)= 11.41$, $p<.01$], of Grammaticality [$F_1(1,47)= 120.88$, $p<.01$, $F_2(1,143)= 257.42$, $p<.01$], a significant interaction Word order by Grammaticality [$F_1(1,47)= 5.55$, $p<.05$, $F_2(1,143)= 11.32$, $p<.01$] and a significant interaction Type by Grammaticality [$F_1(1,47)= 11.02$, $p<.01$, $F_2(1,143)= 26.76$, $p<.01$]. In addition, there was a three way interaction Word order by Grammaticality by Type [$F_1(1,46)= 5.91$, $p<.05$, $F_2(1,143)= 11.32$, $p<.01$].

Separate analyses for the different types (pronoun, definite DP) show that the Word order effect as well as the interaction Word order by Grammaticality is caused by the differences in the definite DP condition [word order: $F_1(1,23)= 17.31$, $p<.01$, $F_2(1,71)= 19.59$, $p<.01$; word order by grammaticality: $F_1(1,23)= 6.55$, $p<.05$, $F_2(1,71)= 16.76$, $p<.01$]. In the pronoun condition neither Word order nor the interaction Word order by Grammaticality were significant. By contrast, both conditions show a significant effect of Grammaticality [non-pronominal definite DP: $F_1(1,23)= 99.72$, $p<.01$, $F_2(1,71)= 244.19$, $p<.01$; pronoun : $F_1(1,23)= 40.83$, $p<.01$, $F_2(1,71)= 74.22$, $p<.01$].

The comparison of the ungrammatical conditions shows a significant interaction Word order by Type: $F_1(1,46)= 5.04$, $p<.05$, $F_2(1,142)= 10.10$, $p<.01$]. As can be seen in Table 4, this result is based on the different responses in the double nominative condition with respect to the Type.

With respect to response time, there is a significant overall effect of Grammaticality [$F_1(1,47)= 34.05$, $p<.01$, $F_2(1,143)= 82.37$, $p<.01$].

4.3 Discussion

The results of Experiment 3 confirm our interpretation of the preceding experiments. We found that subjects judge grammatical sentences more accurately than ungrammatical ones independent of whether the argument is a pronoun or a full DP. The Word order effect visible in the response analysis is caused by the performance in the double nominative condition involving a full DP. In the grammatical conditions neither the full DP nor the pronoun condition shows a tendency for a Word order effect. As we expected, the accuracy for ungrammatical double nominative sentences is better if the second argument is realized as a pronoun. Thus, these data provide further evidence for the assumption that the peculiar accuracy pattern in ungrammatical double nominative sentences is caused by the analysis of the second argument.

5. General Discussion

In this paper we have presented three grammaticality judgement experiments. The first experiment shows that judgement accuracy is significantly lower for ungrammatical sentences than for their grammatical counterparts. In addition, and more interestingly, the judgements for double accusative ungrammaticalities are more accurate than those for double nominatives.

The second experiment, using a pronoun instead of a definite non-pronominal DP as the second argument, confirms the lower accuracy for ungrammatical sentences, while the differences between the ungrammatical conditions found in Experiment 1 disappeared.

The third and final experiment confirms the contrast induced by varying the type of the second argument. It makes clear that double nominative sentences involving a pronoun as their second argument are judged more accurately than double nominatives in which the second argument is realized by a non-pronominal definite DP. In addition, the general accuracy for ungrammatical sentences is lower in Experiment 3 than in the previous experiments. This may tentatively be taken as evidence for a linear distance effect.

In sum, in view of the data presented in this paper, the assumption that case is a trigger for a relatively costless reanalysis or a cue for a temporarily easy repair of a locally detected ungrammaticality, as stipulated by F&I, seems to be untenable.

Rather, the data are more compatible with a parsing strategy that may be termed "expectation-driven". What does this mean? If we recall in which sentences a reanalysis or an ungrammaticality can be detected, we can recognize two different types. In the first type (e.g. embedded sentences or indirect questions) the second argument is the first available disambiguating element. The second type contains an element (a pronoun) that requires additional processing cost and thereby increases the saliency of the inherent feature.

The first construction only differs from main clauses with the verb in second position, e.g. *Welche Richterin besuchte den Gärtner* (which ambassador visited the gardener), with regard to the position of the second, morphologically specified argument. Seeing that no verb intervenes between the initial ambiguous item and the disambiguating word, the first available information is the case marking on the second DP. Therefore this case information is taken to support or disconfirm the initial subject preference.

In the main clauses, the parse mechanism can be explained in the following way: on encountering the verb there is no information that contradicts the initial preference. Therefore the number agreement on the verb is taken as evidence in support of the subject preference analysis. Since there is apparent number support for the preferred parse, the case information of the second DP is not attended to. The advantage is the possibility of an early, immediate semantic interpretation. This interpretation of the data clearly predicts that in main clauses, subjects interpret an ambiguous OVS sentence as SVO. This is a strong claim which must be tested in further experiments.

The expectation-driven view presented above is supported by the sentences in (11), i.e. sentences where the visibility of the reanalysis is dependent on the existence of an earlier reanalysis. Our explanation for this effect is as follows: at first, the subject reads an initial ambiguous argument and

associates this element with a subject (nominative) reading. The second element (the relative pronoun) is also ambiguous and is therefore subject to the same preference as the first argument in the matrix clause. After the final auxiliary in the relative clause has been processed, the interpretation of the relative pronoun will be confirmed or it must be revised. In the latter case the parser takes this reanalysis in the relative clause as a signal against its preferred reading strategy. The verb following the relative clause does not resolve the ambiguity; the expectation at the point of the second argument is low with respect to an object, but high with respect to a disambiguating element. As a consequence, the case marked DP is able to give the information required to confirm or disconfirm the initial preference. In the other case, the strategy of assignment of a preferred case is successful up to the point of processing the main clause verb. In this case, which is similar to the simple wh-sentences that we presented here, there is no negative evidence for using the information of this verb. This early integration leads to an interpretable partial clause (which may be an intransitive expression). This step is an indirect confirmation of the initial preference. The final DP, independent of the type of case marking, fills the expected position. The interpretation is clearly more driven by this expectation than by the analysis of the information given by the final element.

Returning now to the ungrammatical structures that we are concerned with in this paper, we must ask what role is played by the pronominal information during an expectation driven parse. The appearance of a pronoun as the sentence final argument interrupts the automatically preferred parse described above. The saliency of this argument is now higher and thus the visibility of its case information is stronger than the expectation to find a transitive object. Consequently, double nominative constructions are recognized as ungrammatical much more accurately. While our experiments have shown that the saliency of the case information is higher for pronouns than for full definite DPs, we cannot be sure which factors this higher saliency is to be attributed to. As we argued above, it might result from the obligatory search for an antecedent (cf. Osterhout & Mobley, 1995; van Berkum et al., 1999). On the

other hand, a further plausible interpretation could be that the saliency simply results from a higher case cue validity for pronouns. In the case of a pronoun, the case information is carried by a single element, while for full definite DPs there are two elements of which only one contains the relevant information.

The view outlined above, however, cannot account for the finding of a linear distance effect in Experiment 3. Recall that this effect was observable for all ungrammatical conditions. In this way, it appears that the processing of the first DP is somehow relevant to the detection of the ungrammaticality, i.e. the longer the distance between the first and the second argument, the more difficult it is to reactivate the fieatures of the former. The contrast between double nominatives and double accusatives would then result from the fact that an accusative-initial structure is more marked from the point of processing the first argument onwards, thus rendering the case feature of this initial argument more salient. In the case of the second argument being realized by a pronoun, we must again take into account that pronouns must inevitably initiate a search for an antecedent (e.g. Osterhout & Mobley, 1995). During the course of this search, the sentence-initial DP is also scrutinized, thus leading to a reactivation of this DP's case feature and, consequently, to a more reliable detection of the ungrammaticality. While this approach may at first glance appear similar to F&I's proposed alteration of the first DP, there are fundamental differences between the two. Thus, the approach proposed here neither assumes that the case feature of the first DP is somehow "overlooked" nor that the invisibility of a reanalysis in certain contexts is due to a specific property of case and thereby a systematic alteration of the first DP's case feature. On the other hand, this proposal cannot explain the reading time data with regard to those structures in which the two arguments are separated by intervening information such as a relative clause or sentences in which the verb follows its arguments.

Finally, we are sure that the view presented here constitutes a new aspect in the discussion on the nature of reanalysis. Thus, the data strongly suggest that both expectations and input must be taken into account in this regard. To what

extent the two interreact and how their relationship to one another should be characterized, however, must be examined in further research.

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Nominative case as a multidimensional default[*]

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Abstract

The present paper addresses a current view in the psycholinguistic literature that case exhibits processing properties distinct from those of other morphological features such as number (cf. Fodor & Inoue, 2000; Meng & Bader, 2000a/b). In a speeded-acceptability judgement experiment, we show that the low performance previously found for case in contrast to number violations is limited to nominative case, whereas violations involving accusative and dative are judged more accurately. The data thus do not support the proposal that case per se is associated with special properties (in contrast to other features such as number) in reanalysis processes. Rather, there are significant judgement differences between the object cases accusative and dative on the one hand and the subject nominative case on the other. This may be explained by the fact that nominative has a specific status in German (and many other languages) as a default case.

1. Introduction

A widely discussed problem in the psycholinguistic literature is based on the observation that, in a speeded-grammaticality judgement paradigm (i. e., under time pressure), the detection of ungrammaticalities induced by case apparently functions

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differently to that of ungrammaticalities induced by number. Consider the following examples given by Meng & Bader (2000b):

(1) * ..., **welcher Politiker** die Minister getroffen **haben**.
..., which politician (Nom, Sg) the ministers (Nom/Acc, Pl) met have (Pl)

(2) * **Welcher Politiker**, glaubst Du, traf **der Minister**?
which politician (Nom, Sg) do you believe met (Sg) the minister (Nom, Sg)

Both (1) and (2) are ungrammatical subject-initial constructions in which the initial NP is case marked for nominative. In (2), the ungrammaticality is induced by the second NP, which is unambiguously marked for nominative case. In (1), by contrast, ungrammaticality is effected by the verb, which shows person and number agreement with the second but not with the first NP in the clause. Meng & Bader (2000a/b) found a high accuracy in ungrammaticality detection for constructions such as (1). By contrast, violations such as (2) were detected with chance level accuracy. The fact that a clear effect of ungrammaticality is visible in only one of these constructions may therefore lead one to ask whether there is a fundamental difference between the detection of ungrammaticalities induced by number and those induced by case. This is exactly the conclusion that was drawn by Meng & Bader (2000a/b) and Fodor & Inoue (2000). The latter authors put forward a proposal to account for differences in the strength of garden-path effects. Their *diagnosis model* assumes that differences in reanalysis or repair effects should be explained in terms of differing diagnosis rather than revision costs, as the revision itself is assumed to be more or less costless. Cost of diagnosis is variable and depends on the transparency of the processing conflict. Evidence contrary to a preferred analysis that is detected in the ongoing parsing process is not always equally telling in that, in certain cases, the feature giving rise to the processing problem (the “symptom") also provides a possible solution. Under other circumstances, by contrast, the symptom will not provide any helpful information whatsoever.

Fodor & Inoue (1998) assume that the parser follows a principle referred

to as *Attach Anyway* when encountering a word that cannot be attached into the current phrase marker in accordance with the rules of the grammar. This principle states that the parser simply undertakes the "least unacceptable attachment" in a situation where no acceptable attachment can be made. As a consequence, the structure already built must be made to fit the current input and not vice versa. This means that, once *Attach Anyway* has applied, the grammar must determine what is wrong with the tree as it stands so that the parser can apply changes to it that will hopefully render it acceptable.

In the spirit of this approach, Fodor & Inoue (2000) proposed an interesting explanation for the findings of Meng & Bader (2000b) referred to above, that is for the accuracy differences between number and case violations. Fodor and Inoue propose that the high acceptability of ungrammatical double nominative structures arises as follows. The nominative case marking of the second NP leads to this phrase being attached into the subject position of the clause. As a consequence of this attachment, and because the parser is assumed to consider the current input more valid than the preceding parse, the case of the first NP must be modified by a repair process. The case information of the second argument is, according to Fodor & Inoue, a very informative symptom, as it directly signals the grammatical function (and, thereby, the syntactic position) of that argument to the parser. In other words, it is a type of *positive* evidence. For this reason, the structure is judged to be acceptable in so many instances and why the reanalysis of a preferred reading in an analogous ambiguous structure is more effortless when based on case than when based on number (cf. Meng & Bader, 2000a/b). A mismatch in number is negative evidence as it signals a problem but does not provide a direct way out of it. Accordingly, the ungrammaticality is detected more reliably and the revision of an ambiguity on the basis of number information is more difficult (cf. Meng & Bader, 2000b).[1]

Despite the initial appeal of this approach, there are several problems associated with it. The first concerns the assumption that it is the case of the first argument which is overlooked (revised) rather than that of the second (i. e. more

[1] For an alternative account see Schlesewsky & Bornkessel (2003).

recent). Although this assumption may appear intuitively plausible, it is difficult to reconcile with independent empirical evidence (see Schlesewsky, Fanselow & Frisch, this issue). Moreover, the categorical distinction between case and other (syntactic) features presupposes that case in general – and, consequently, its processing behaviour – may be conceived of in a unitary manner. As already shown in the Meng & Bader (2000a) study, violations involving accusative case are judged differently from those involving nominative case. Alternatively, though, it is also possible that the findings for sentences such as (2) are attributable to the specific properties of the nominative case. This tentative hypothesis does not appear unlikely in view of the fact that nominative case has an exceptional status in many languages – German being no exception. Consider, for example, left dislocations such as in (3).

(3) Dem Pfarrer / der Pfarrer / *den Pfarrer, dem helfen wir alle.
[the priest]$_{DAT/NOM/ACC}$*, [the one]*$_{DEMONSTR\text{-}PRON/DAT}$ *help [we all]*$_{NOM}$
'The priest is the one we all help.'

The left dislocated dative object NP in (3) may be realized with either dative or nominative case marking, but not with accusative. Thus, the nominative (and only the nominative) can be inserted as a default case even if a different case is required for grammatical reasons (e.g. Primus, 1999; Fanselow, 2000). Under the assumption that this special status of the nominative is also brought to bear during sentence comprehension, processing differences between the nominative and the two object cases (dative and accusative) appear quite likely. Thus, in analogy to the left dislocation phenomenon exemplified in (3), it may be easier to process a nominative in a position which it cannot occupy according to grammatical principles, thereby resulting in the 'illusion of grammaticality' described above.

In the following experiment, we directly compare speeded acceptability judgements for double case ungrammaticalities involving all three argument cases[2] in the German case system, i. e. nominative, accusative and dative.

2. The Present Study

In the present experiment, we are going to extend the paradigm used by Meng & Bader (2000b) as to compare ungrammatical sentences with two nominative arguments to comparable ungrammaticalities involving accusative and dative case. This will allow us to differentiate between an account assuming that the 'illusion of grammaticality' observed for nominative case generalizes to other cases and one which attributes this phenomenon to specific properties of the nominative case.

2.1 Method

2.1.1 Participants Twenty undergraduate students from the University of Potsdam participated. Participants were aged between 17 and 21 years (mean 19 years), were monolingual native speakers of German and had normal or corrected-to-normal vision.

2.1.2 Materials The four incorrect conditions and their correct counterparts are exemplified in (4a) to (4h).

(4a) NOMINATIVE-ACCUSATIVE (NOM-ACC)
Welcher Kommissar aus der Vorstadt lobte den Detektiv?
[which inspector]$_{NOM}$ from the suburbs commended [the detective]$_{ACC}$

[2] Note that object arguments in German may also be marked with genitive case. However, this case only marks the objects of a very limited number of verbs (e.g. *gedenken* / *to remember*), thereby precluding the experimental examination of similar ungrammaticalities involving genitive case.

(4b) ACCUSATIVE-NOMINATIVE (ACC-NOM)

Welchen Kommissar aus der Vorstadt lobte der Detektiv ?

[which inspector]$_{ACC}$ from the suburbs commended [the detective]$_{NOM}$

(4c) NOMINATIVE-NOMINATIVE (NOM-NOM)

*Welcher Kommissar aus der Vorstadt lobte der Detektiv ?

[which inspector]$_{NOM}$ from the suburbs commended [the detective]$_{NOM}$

(4d) ACCUSATIVE-ACCUSATIVE (ACC-ACC)

*Welchen Kommissar aus der Vorstadt lobte den Detektiv ?

[which inspector]$_{ACC}$ from the suburbs commended [the detective]$_{ACC}$

(4e) NOMINATIVE-DATIVE (NOM-DAT)

Welcher Kommissar aus der Vorstadt half dem Detektiv ?

[which inspector]$_{NOM}$ from the suburbs helped [the detective]$_{DAT}$

(4f) DATIVE-NOMINATIVE (DAT-NOM)

Welchem Kommissar aus der Vorstadt half der Detektiv ?

[which inspector]$_{DAT}$ from the suburbs helped [the detective]$_{NOM}$

(4g) NOMINATIVE-NOMINATIVE (NOM-NOM)

*Welcher Kommissar aus der Vorstadt half der Detektiv ?

[which inspector]$_{NOM}$ from the suburbs helped [the detective]$_{NOM}$

(4h) DATIVE-DATIVE (DAT-DAT)

*Welchem Kommissar aus der Vorstadt half dem Detektiv ?

[which inspector]$_{DAT}$ from the suburbs helped [the detective]$_{DAT}$

Seventy-two data blocks of the four different forms exemplified in the sentences presented in (4) were constructed. All experimental sentences contained an unambiguously case marked initial DP (nominative, accusative or dative) followed by a prepositional phrase, a transitive verb and a second DP that was also morphologically marked for nominative, accusative or dative case. Only masculine singular NPs were used, because only masculine determiners are unambiguously marked for case in German. In order to avoid influences of additional case information, we controlled the degree of inflection of the nouns. This is necessary since some German inflection paradigms require different noun forms for nominative vs. accusative/dative case, for example *Richter-Richter* (*judge* Nom-Acc/Dat) versus *Junge-Jungen* (*boy* Nom-Acc/Dat). Thus, only nouns which do not differ in form between nominative, dative and accusative

case were chosen, i.e. all case information was provided via the definite determiners *der* ('the$_{NOM}$'), *dem* ('the$_{DAT}$') and *den* ('the$_{ACC}$').

For each single experimental session, 80 experimental items (10 sentences per condition) were combined with 160 fillers. The fillers consisted of approximately the same number of phrases as the critical sentences and were counterbalanced concerning the degree of ungrammaticality and the number of object initial phrases in analogy to the experimental material. A chance function chose 10 sentences per condition and constructed a list only as the participant started the experimental program. After every six participants, all experimental sentences had been presented in a counterbalanced way.

2.1.3 Procedure The sentences were presented word by word in a speeded acceptability judgement task. Every word appeared in the middle of a computer screen for 250 ms with an inter-stimulus interval (ISI) of 100 ms. In order to fixate the eyes at the centre of the screen, an asterisk was presented before the presentation of the first word of a sentence. After the last word, a question mark appeared as a prompt for the participants to decide on the acceptability of the sentence as quickly as possible.

2.1.4 Data analysis All data with reaction times greater than 4000 ms were excluded from the analysis; these made up about 1% of the data in the experiment and were evenly distributed across conditions. In addition, only the data with correct responses were included in the analysis of the reaction times. An analysis of variance (ANOVA) was performed on the means of correct responses and the means of reaction times. The ANOVA design crossed the two factors *ORDER* (*nominative* versus *accusative* versus *dative*) and *CORRectness* (*correct* versus *incorrect*).

2.2 Results

The percentages of correct answers and the mean reaction times (for correct answers only) for each experimental condition are given in Table 1.

Table 1. Mean accuracies (in %) and mean response latencies (in ms) for each experimental condition.

Condition	Mean accuracies % (stdev)	Mean latency (stdev)
NOM-ACC	92.9 (8.2)	441 (380)
ACC-NOM	94.8 (7.1)	480 (274)
NOM-DAT	87.8 (9.6)	510 (410)
DAT-NOM	93.8 (7.8)	460 (294)
NOM-NOM	53.3 (19.9)	904 (581)
ACC-ACC	66.1 (26.0)	713 (487)
DAT-DAT	71.9 (23.2)	606 (371)

In the statistical analyses of the accuracies, we found a main effect of CORR ($F(1,19)=44.8$, $p<.01$) due to higher accuracies in the grammatical conditions. The NOM-NOM condition differed significantly from the other two incorrect conditions ($F(1,19)=11.8$, $p<.01$), but there was no difference between the DAT-DAT and the ACC-ACC condition ($F(1,19)=1.5$, $p=.23$). Within the correct conditions, sentences with nominative first were judged less accurately than sentences with nominative as the second argument ($F(1,19)=7.5$, $p< .05$).

The statistical analysis of the response latencies (correct answers only), also revealed a main effect of CORR ($F(1,19)= 20.7$, $p<.01$). Again, double nominatives differed from the two other incorrect conditions ($F(1,19)=15.6$, $p<.05$), but ACC-ACC and DAT-DAT did not differ from one another ($F(1,19)=2.7$, $p=.12$). No differences obtained between the correct conditions.

3. Discussion

The results of the experiment show a clear distinction between the three types of double case violations in acceptability judgements. Participants judge double nominative sentences as more grammatical than their accusative and dative counterparts. The analysis of the response times shows that this effect is not due to a speed-accuracy trade-off, seeing that participants not only make more errors in the double nominative condition, but also need more time for their judgement compared with the other two conditions.

Thus, the judgement results replicate the findings by Meng & Bader (2000a/b) in that double nominative constructions were judged to be ungrammatical very unreliably (i.e. with near chance performance). However, the finding that judgement accuracy differed between double nominative ungrammaticalities on the one hand and double accusatives and datives on the other, but not between accusative and dative, is difficult to reconcile with accounts assuming that case in German – as opposed to other linguistic features such as number - behaves in a uniform way (Fodor & Inoue, 2000).

Furthermore, the results appear problematic for any theoretically driven distinction between the three argument cases in German. Specifically, we will discuss two prominent accounts of case in German and show that neither of them is able to derive the present results in a straightforward manner. Firstly, consider the well-known distinction between structural and lexical case (den Dikken 2000, Gorrell 2000, Bader, Meng & Bayer 2000, Bayer, Bader & Meng 2001). It has often been argued that, at least in transitive constructions such as those examined here, nominative and accusative are structural cases (i.e. assigned in a particular structural configuration), whereas dative is a lexical case (i.e. assigned via the lexical requirements of a specific verb). Clearly, this distinction is unable to account for the differences found here, since it would predict similar processing patterns (and, hence, similar judgement accuracies) for nominative and accusative in comparison to dative. Insofar, the present data pattern is also not in line with assumptions based on general markedness hierarchies of case as assumed, for example, in certain optimality theoretic approaches (e.g. Woolford, 1997; Aissen, 2003, see Vogel, 2003, for an alternative OT perspective), since these would predict differences between all three cases[3].

[3] We must admit that it may be possible that the descriptive differences between accusative and dative in error percentages as well as response latencies might come out to be significant if the number of subject was raised considerably. If this was indeed the case, one might argue that the performance differences do reflect (at least among other things) differences in markedness. However, seeing that in transitive structures, nominative and accusative are default cases whereas dative is not, one would expect nominative and accusative to cluster against dative, which is not true in any case.

Secondly, it has been argued that morphological case in languages such as German is directly associated with thematic (interpretive) properties of the argument relations in a sentence (Primus, 1999; Neeleman & Weerman, 2001). From such a thematically based perspective, nominative and dative should be expected to cluster together against accusative, as only the former are thematically unmarked.[4] Again, it is apparent that the present results are difficult to derive under such a classification.

Thus, although both of the perspectives discussed above fail to capture the findings of the experiment on their own, a combination of both dimensions appears capable of doing so. If both dimensions are assumed to interact during online language comprehension, both should manifest themselves in the judgement ultimately given. In this way, the judgement results observed in our experiment, i.e. the fact that double nominative constructions are judged less accurately than double datives and double accusatives, may be viewed as resulting from the default status of the nominative case on both dimensions. Similarly, the higher judgement accuracies for the other two cases (though statistically indistinguishable amongst themselves) would result from a combination of a default status on one and non-default status on the other dimension. Despite this appealing account of the present grammaticality judgement data, the speeded grammaticality judgement method itself clearly cannot provide further insights with regard to the interaction of different influences during real-time processing, since it only provides a measure of the *outcome* of processing, rather than of its internal dynamics. Accordingly, subsequent investigations in this domain must draw upon an experimental technique that provides more fine-grained measures both in terms of temporal resolution and with regard to the dissociation between qualitatively different

[4] 'Thematically unmarked' in the sense used here refers to the fact that an argument may realize a (thematically) non-dependent participant in a transitive argument relation. This is the case for both the nominative and the dative case, since both may be associated with the feature [+control], which the accusative may not (Primus, 1999). Such a perspective is compatible with the recent proposal that, even in languages such as German, external arguments may be realized exclusively with either nominative or dative case marking (Fanselow, 2000; Wunderlich, 2003).

processes. First results from studies using event-related brain potentials (ERPs), a highly time sensitive measure, which may be used to continuously trace online language processes as they unfold in time, have found that the three types of ungrammaticalities tested in the present study do not elicit identical brain responses (Frisch & Schlesewsky, 2003). All three types of violations induce a biphasic ERP response of a N400 (indicating thematic hierarchizing problems) followed by a P600 component (reflecting illformedness of the construction) as expected on the basis o0,00cmf the findings of Frisch & Schlesewsky (2001).

However, double accusatives differ from double nominatives in that they elicit a larger N400 (but show no differences with regard to the P600), while double datives engender a larger P600 than double nominatives (but show no differences with regard to the N400). These results support an interpretation of the judgement accuracies in the present paper as resulting from a multidimensional interaction between thematic and general well-formedness requirements. While nominative case is unmarked on both dimensions and may therefore be integrated most easily even in an ungrammatical structure, dative case is syntactically marked and accusative case is thematically marked. An integrative view of both the behavioural and the neurophysiological findings therefore calls for a multidimensional perspective on the role of case in language processing.

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Partitive vs. Genitive in Russian and Polish: an empirical study on case alternation in the object domain[*]

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In all current theories a distinction is made between STRUCTURAL and INHERENT (or lexical) case (Chomsky 1981). Structural case is assumed to be assigned at S-structure in a purely configurational way, whereas inherent case is taken to be assigned at D-structure depending on the lexical properties of the predicate. It is a well known fact that not all cases fall into this typology. In particular, the partitive case is one of these cases that pattern syntactically with the structural cases but are semantically conditioned. During the last years a lot of researchers have tried to solve this puzzle and quite a lot of agreement has been achieved. With respect to the Slavic languages partitive case is taken to have at least two functions: on one side a NP-related function where it is assigned to quantitatively indeterminate NPs (indefinite bare plurals and mass nouns), and on the other side an aspectual function where it is assigned to the objects of perfective verbs and alternates with the accusative.

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In the analyses of Franks & Dziwirek (1993), Brown & Franks (1995), Neidle (1988) based on Pesetzky (1982) partitive case is assigned by a null quantifier which must be licensed like other null elements in syntax, i.e. a verb which allows a partitive complement must have a feature [+Qu] to identify the phonologically null quantifier. Verbs that do not allow partitive complements do not have such a feature. Nevertheless, even though some verbs bear a Q feature, that feature must itself be activated by being in the scope of perfective aspect, negation or quantifier like e.g. *mnogo* (kilo). However, the use of partitive is absolutely optional, i.e. also in negated perfective sentences one can use an accusative, instead of partitive. The alternation between partitive/genitive vs. accusative in negated sentences always depends on whether we have a sentence negation or not.

a) I know no reason
b) *I don't know the reason$_{Gen}$

Partitive case is also triggered by "exlamative intonation", e.g. *shegu vypalo*! (Snow.part fallen) "It's been snowing a lot". Additionally, it is claimed in the literature that whenever genitive morphology is allowed with a noun, partitive morphology can be used instead (Brown & Franks 1995).

One of the many problems one is confronted with when testing the partitive use among native speakers is the fact that partitive morphology is distinguished in Russian male mass-nouns only. All other nouns use genitive morphology in order to indicate partitive case. That is why partitive is often called genitive partitive (GP) with respect to the Slavic languages, and why partitive is often claimed to be identical to genitive.

The aim of this empirical study was thus twofold, on one side it is the attempt to summarize the claims that have been made with respect to partitive case in the Slavic languages and to see whether these claims hold when tested among native speakers. On the other side, I wanted to test

whether partitive and genitive is - as claimed in the literature - interchangeable within Russian. Looking at the other languages of the Slavic language family it looks as if diachronically the partitive morphology were lost in favour of the genitive morphology. Russian is the last language of the Slavic language family that still shows the distinctive morphology, but also in Russian "The distinctive partitive case morphology seems to be decreasing in frequency so that most partitives are marked with the 'standard' genitive" (King 1995:34). Knowing what we know about language change one could imagine a situation where the starting point with respect to the case system in the Slavic languages was marked by the different semantics of partitive and genitive case. After some time - maybe due to semantic bleaching - the function of the partitive morphology is lost, taken over by genitive morphology or taken over by something else in the sentence.

In order to clarify what might have happened in Polish and will happen to the partitive and genitive morphology in Russian all features that are claimed in the literature to trigger the use of partitive and genitive case were identified and according to these features a questionnaire was created that tested the features systematically (see Appendix 1 for the questionnaire in Russian). The coordination possibilities were imperfective/perfective aspect in negated/not negated sentences with mass nouns/countable nouns and frozen plurals. Secondly the structural positions in which partitives and genitives are able to appear were checked. Usually partitives and genitives are claimed to appear in the position of the direct object in transitive verbs were they alternate with accusative case and in the subject position of unaccusative verbs were they alternates with nominative case. In order to check these claims the same features as before were checked with respect to unaccusative and passive verbs.

The questionnaire was translated into Russian and Polish by native speakers (all linguists). Then, it was given to 9 native speakers of Russian (5 linguists, 4 others) and to 12 native speakers of Polish (6 linguists, 6 others). It is too early to make ultimate claims about the use of genitive vs. partitive vs. accusative in the languages studied, however, as will become clear in the following: what we see are tendencies that tell us on which aspect we should concentrate in future investigations.

The grammaticality scale according to which the speakers were asked to judge the sentences is the following:

*	definitely not grammatical
???	more ungrammatical than grammatical
??	absolutely unsure whether it is grammatical or ungrammatical
?	more grammatical than ungrammatical
ok	absolutely grammatical

1 Results with respect to Russian

1.1 Genitive morphology

1.1.1 Triggers

Genitive is clearly triggered by negation and/or perfective aspect[1]. However as is obvious from the examples in (1) it can be used with an imperfective as soon as the sentence is negated.

(1) a. Ja dobavil saxar / saxara v čaj
I added.perf sugar-acc / gen in tea

b. Ja dobavljal saxar / *,??? saxara v čaj[2]
I added.imp sugar-acc / sugar-gen in tea

[1] Partitive and genitive in contrast to accusative NPs receive an indefinite reading. I added some sugar to the tea vs. I added the sugar to the tea.

[2] Where not marked differently all 9 speakers found the sentences grammatical (ok).

c. Ja ne dobavil saxar / saxara v čaj
I didn't add.perf sugar-acc/sugar-gen in tea

d. Ja ne dobavljal saxar / saxara v caj
I didn't add.imp sugar-acc / sugar-gen in tea

Additionally, genitive can be used in sentences with an imperfective / iterative reading without the negation (2), and also with those verbs which 'Aktionsart' is atelic/iterative in the imperfective (3).

(2) Ja dobavljal saxar / ? saxara v čaj kazdyj den
I added.imp sugar-acc / sugar-gen in tea every day

(3) podlivat' masla/maslo v ogon
pour.on.imp oil-gen/oil-acc in fire

However, perfective aspect in contrast to imperfective aspect means "singular achievement" whereas iterative should be interpreted as "several following achievements". In so far these iterative readings could be interpreted as being perfective too.

1.1.2 Position in the sentence

Genitive NPs without an overt quantifier (e.g. some/kilo etc.) are bad in initial position in a sentence. The reason for this is to be seen in the fact that in Russian initial NPs need to be interpreted - per default - as definite specific, and this is not possible with a Genitive NP (for Russian information structure see Brun 2000, 2001, Junghanns & Zybatow 1997, Szucsich 2002)

(4) a. *Jablok bylo nabrano v korzinu
Apples-gen was picked-perf in basket

(5) a. *Drov bylo[3] podbrošeno v koster
Logs.gen was-sg.neutr thrown out in bonfire

b. Drova byli podbrošeny v koster
logs.nom were.pl thrown out in bonfire

c. v koster bylo podbrošeno drov
in bonfire was.sg.neut thrown out logs.gen

d. v koster byli podbrošeno drova
in bonfire were.pl thrown out logs.nom

None of the 9 speakers accepted the genitive marked NP in initial position. The only possibility to license a genitive marked NP in initial position is by adding the particle *vse-taki* (however, still). With this particle they somehow become "specific" (in the sense of von Heusinger 2002) and are thus more acceptable. 7 of the 9 speakers marked the following sentence (6a) with (?) and 2 with (o.k.)

(6) a. ?Saxara vse-taki bylo dobavleno v sok.
Sugur-gen however was.sg.neut. added.sg.neut in juice

b. Saxar vse-taki byl dobavlen v sok
Sugar.nom however was.sg.mask added.sg.mask. in juice

There is a somewhat surprising effect with unaccusative verbs. Respecting agreement genitive NPs are not totally out in initial position with perfective (7c) and negation (7d), whereas with perfective aspect they are totally out (*) in final position (7a) and (o.k.) with negation (7b).

(7) a. Razlilos' *kleja
Spilled-pf.sg.neutr glue-gen

[3] The genitive subject (like quirky subjects) does not agree with the verb. They get only a sg.neut. marking, i.e. so called impersonal sentences.

b. Da ne razlilos’ kleja
But not spilled-pf.sg.neutr glue-gen

c. ???/*kleja razlilos’
glue-gen spilled-pf.sg.neutr

d. ???/*kleja ne razlilos’
glue-gen not spilled-pf.sg.neutr

1.2 Partitive morphology

1.2.1 Triggers

Partitive case is also triggered by perfective aspect. However, with negation it is not as acceptable as is genitive case and additionally it is never allowed with imperfective aspect, neither with iterative, nor with a durative reading.

(8) a. Ja dobavil saxaru / saxar v čaj
I added.perf sugar-part / sugar-acc in tea

b. Ja dobavljal *saxaru / saxar v čaj medlenno
I added.imp sugar-part/sugar-acc in tea slowly

c. Ja dobavljal *saxaru / saxar v čaj každyj den’
I added.imp sugar-part/sugar-acc in tea every day

d. Ja ne dobavil ?saxaru / saxar v čaj
I didn’t add.perf sugar-part/sugar-acc in tea

e Ja ne dobavljal ??saxaru / saxar v caj
I didn’t add.imp sugar-part / sugar-acc in tea

None of the 9 speakers allowed partitive case for sentence (8b) and (8c), 6 speakers marked sentence (8d) with a question mark, and none of the 9 speakers allowed the negated imperfective partitive in (8e).

1.2.2 Position in the sentence

Partitive seem to be allowed only following the verb. Not even the particles that saved the genitive marked NPs in initial position saved the partitive marked NPs. In initial position partitive for all speakers is always worse than the genitive.

(9) a. *Saxaru bylo dobavleno v čaj
Sugar.part was added in tea

b. ??? saxaru ne bylo dobavleno v caj
sugar.part not was added in tea

c. *Saxaru vse-takie bylo dobavleno v čaj.
sugar.part however was added in tea

d. v caj bylo dobavleno saxaru
in tea was added sugar.part

In unaccusative sentences partitives are excluded altogether. Not even the negation that saved the genitive can save the partitive.

(10) a. Razlilos’ *kleju.
Spilled-pf.sg.neutr glue-part

b. Da ne razlilos’ ???kleju.
But not spilled-pf.sg. neutr glue-part

c. *kleju razlilos’
glue-part spilled-pf.sg.neutr

d. *kleju ne razlilos’
glue-part not spilled-pf.sg.neutr

There is an obvious difference between Partitive and Genitive which is not mentioned in the literature (on the contrary see Steven & Brown 1995). Partitives are never allowed in initial position they are much better following the verb which can be explained by existential closure. Genitives

are clearly preferred with negation, and genitive marked NPs are always better in initial position, and even get evaluated with (o.k.) together with the particle *vse-takie* than the partitive marked NPs. To explain this difference in appearance I propose that - respecting all other peculiarities – genitives allow to be interpreted as being specific (von Heusinger 2001, to appear, submitted), whereas partitives never under no circumstances may be interpreted as specific. Under this assumption one would get the following scale: accusative is used to mark definite specific NPs, genitive marks indefinite specific NPs, and partitive marks indefinite unspecific NPs.

2 Results for Polish

2.1 Triggers

In Polish there is only one case marking for genitive and partitive. For a lot of verbs - as in Russian - the use of the partitive/genitive (PG) case marking instead of the accusative is totally optional and indicates a difference in meaning.

(11) a. Nalej sobie mleka
pour yourself some milk-gen

b. Nalej sobie mleko
pour yourself the milk.acc

For other verbs however it is obligatory (12).

(12) Wody przybywa
Water-Gen rises

With respect to negation, we get a clear picture of Genitive of Negation. Whenever there is a negation in the sentence, all 12 speakers used PG

marking for mass nouns (13a-d) and countable nouns (13e-h). 11 speaker excluded accusative in those sentences and 2 allowed accusative but only for contrastive negation.

(13) a. Nie dodałam *cukier do herbaty.
not (I) added-perf sugar-acc to tea

b. Nie dodałam cukru do herbaty.
not (I) added-perf suger-gen to tea

c. Nie dodawałam *cukier do herbaty.
not (I) added-imperf sugar-acc to tea

d. Nie dodawałam cukru do herbaty.
not (I) added-imperf suger-gen to tea

e. Nie dokupiłam *nowe książki do mojej biblioteki.
not (I) bought-perf new books-acc to my library

f. Nie dokupiłam nowych książek do mojej biblioteki.
not (I) bought-perf new books-gen to my library

g. Nie dokupowałam *nowe książki do mojej biblioteki.
not (I) bought-imperf new books-acc to my library

h. Nie dokupowałam nowych książek do mojej biblioteki.
not (I) bought-imperf new books-gen to my library

With respect to the perfective and imperfective aspect holds that all speaker allowed accusative next to GP in perfective sentences, with respect to imperfective sentences, all allowed accusative morphology, 9 speakers allowed PG with mass nouns and 3 marked PG case with a question mark. And for countable nouns there were 4 speakers that excluded PG marking, and 3 who marked it with two question marks.

(14) a. Dorzuciłam trawę do ogniska.
(I) added-perf grass-acc to bonfire

b. Dorzuciłam trawy do ogniska.
(I) added-perf grass-gen to bonfire

c. Dorzuciłam trawę do ogniska.
(I) added-imperf grass-acc to bonfire

d. Dorzuciłam ? trawy do ogniska.
(I) added-imperf grass-gen to bonfire

e. Dokupiłam nowe książki do mojej biblioteki.
(I) bought-perf new books-acc to my library

f. Dokupiłam nowych książek do mojej biblioteki.
(I) bought-perf new books-gen to my library

g. Dokupowałam nowe.książki do mojej biblioteki.
(I) bought-imperf new books-acc to my library

h. Dokupowałam ??/*nowych książek do mojej biblioteki.
(I) bought-imperf new books-gen to my library

2.2 Position in the sentence

The pattern with respect to the position in the sentence is not as clear cut as in Russian. In Polish 6 speaker don't allow the PG marked NP in initial position, not even with a negation, 1 speaker marked it with two question marks and 2 marked it with one question mark. Following the verb almost all speaker allowed it.

(15) a. */??/?Cukru był dodane do herbaty
sugar.gen was added to tea

b. Cukier było dodane do herbaty
sugar-nom was added to tea

c. Do herbaty było dodane cukier
in tea was added sugar.nom

d. Do herbaty był dodane cukru

in teas was added sugar.gen

With respect to unaccusative verbs the results are even worse. Nominative is allowed in all positions in the clause with or without negation. Genitive marked NPs don't seem to be allowed in first position 9 didn't allow it at all, 2 marked it with a question mark. Together with a negation three more allowed it. Following the verb PG is almost perfect 10 allowed it, two marked it with a question mark.

(16) a. Rozlało się kleju
spilled-perf-sg.neutr refl glue-gen

b. Rozlał się klej
spilled-perf-sg.masc refl glue-nom

c. Nie rozlało się kleju
not spilled-perf-sg.neutr refl glue-gen

d. Nie rozlał się klej
not spilled-perf-sg.masc refl glue-nom

e. *kleju rozlało się
glue-gen spilled-perf-sg.neutr refl

f. Klej rozlał się
glue-nom spilled-perf-sg.masc refl

g. ?kleju nie rozlało się
glue-gen not spilled-perf-sg.neutr refl

h. Klej nie rozlał się
glue-nom not spilled-perf-sg.masc refl

With respect to PG in Polish it was attested that in contrast to Russian PG is obligatory with sentence negation and therefore can be said to be licensed almost exclusively in syntax. All 12 speakers accepted sentences with negation and PG whereas negated sentences with accusative were only accepted with an additional semantic trigger (contrastive negation). In

Polish there is according to Buttler et.al. (1971), Brown & Franks (1995) and others a strong tendency that complements of perfective verbs are marked with PG whereas imperfective aspect should block PG. This was not confirmed. Perfective verbs with *do-* and *na-* allow with mass-nouns and with countable nouns accusative (12/12) next to PG (9/12) always depending on what needs to be expressed, a definite vs. indefinite NP. If we see Polish in contrast to Russian it seems plausible to say that PG in Polish is more grammaticalised than in Russian, with respect to negation, but also with respect to aspect. The aspectual function seems to be reduced and only the NP-related function where it is assigned to quantitatively indeterminate NPs is still fully in use.

In Russian a clear difference between the uses of partitive vs. genitive could be attested. All results show that the use of partitive vs. genitive vs. accusative is highly dependent on the semantic trigger, i.e. what needs to be expressed. This holds for negated sentences and as well for perfective sentences. The different semantic interpretation can also be seen in the difference with respect to imperfective sentences and in what is allowed in initial position. In Russian there is a lot of variety in interpreting the partitive, genitive or accusative marked NPs, whereas in Polish first of all genitive took over all of the functions of partitive case and furthermore it seems to have less semantic interpretation possibilities, it is clearly semantically bleached and more syntactically licensed. The question to ask at this point and – most of all – for further research is what took over the semantic variety of the partitive vs. genitive alternation in Polish, and will something similar happen to Russian?

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Appendix

(1)	a. Ja dobavil	saxaru / saxar / saxara	v čaj	mass masculin	
	b. Ja dobavljal	saxaru / saxar / saxara	v čaj		
	c. Ja ne dobavil	saxaru / saxar / saxara	v čaj		
	d. Ja ne dobavljal	saxaru / saxar / saxara	v čaj		
	e. Ja dobavljal	saxaru / saxar / saxara	v čaj	kazdyj den	
(2).	a. Ja dobavil	kleju / klej / kleja	v rastvor	mass masculin	
	b. Ja dobavljal	kleju / klej / kleja	v rastvor		
	c. Ja ne dobavil	kleju / klej / kleja	v rastvor		
	d. Ja ne dobavljal	kleju / klej / kleja	v rastvor		
	e. Ja dobavljal	kleju / klej / kleja	v rastvor	kazdyj den	
(3)	a. Ja dobavil	travy / travu /	v koster	mass feminin	
	b. Ja dobavljal	travy / travu /	v koster		
	c. Ja ne dobavil	travy / travu	v koster		
	d. Ja ne dobovljal	travy / travu	v koster		
(4)	a. Ja dobavil	novye knigi /novyx knig	v moju biblioteku	countable nouns	
	b. Ja dobavljal	novye knigi /novyx knig	v moju biblioteku		
	c. Ja ne dobavil	novye knigi /novyx knig	v moju biblioteku		
	d. Ja ne dobavljal	novye knigi / novyx knig	v moju biblioteku		
(5)	a. On otnes	kamni / kamnej	vo dvor.		

b On otnes vo dvor kamni / kamnej.
c. On otnosil kamni/kamnej vo dvor.
d. On ne otnes kamni/ kamnej vo dvor
e. On ne otnosil kamni/kamnej vo dvor.

(6) a Ja dobavil *jadovituju* jagodu / jadovitoj jagody v varen'e sing inanimate
b Ja dobavil arbuz / arbuza v varen'je.
c. Ja dobavljal *jadovituju* jagodu / *jadovitoj* jagody v varen'e
d Ja dobavil arbuza v vare
e Ja ne dobavil *jadovituju* jagodu / jadovitoj jagody v varen'e
f. Ja ne dobavljal *jadovituju* jagodu / jadovitoj jagody v varen'e

(7) a Ja položila ogurec / ogurca v salat.
b. ' Ja položila v salat ogurca.
c. Ja klala ogurec /ogurca v salat.
d. Ja ne položila ogurec / ogurca v salat.
e. Ja ne klala ogurec / ogurca v salat.

(8) a. Ja vytaščil saxar / saxaru / saxara iz čaški mass masculin
b. Ja vytaskival saxar / saxaru / saxara iz čaški
c. Ja ne vytaščil saxar / saxaru/ saxara iz čaški
d. Ja ne vytaskival saxar / saxaru / saxara iz čaški

(9) a. On vyter klej / kleju /kleja
b. On vytiral klej / kleju / kleja
c. On ne vyter klej / kleju / kleja
d. On ne vytiral klej / kleju / kleja.

(10) a. On vylil čaj/ čaju / čaja
b. On vylival čaj / čaju / čaja
c. On ne vylil čaj / čaju / čaja
d. On ne vylival čaj / čaju / čaja

(11) a. Ja vybrosil travu / travy iz kostra mass feminin
b. Ja vybrasyval travu / travy iz kostra
c. Ja ne vybrosil travu / travy iz kostra
d. Ja ne vybrasyval travu / travy iz kostra

(12) a. Ja podbrosil drov /drova v koster frozen plural
b. Ja podbrasyval drov / drova v koster
c. Ja ne podbrosil drov / drova v koster
d. Ja ne podbrasyval drov /drova v koster

(13) a. Ja dal sena / seno korovam mass neuter
b. Ja daval sena / seno korovam
c. Ja ne dal sena / seno korovam
d. Ja ne daval sena / seno korovam

(14) a. Ja nabral jablok v korzinu countable plural

b. Ja sobiral griby / gribov v lesu
c. Ja ne sobral griby / gribov v lesu
d. Ja ne sobiral griby / gribov v lesu

PASSIVES

(15) a. Saxaru/ Saxar/ Saxara bylo dobavleno v čaj
b. Saxaru / Saxar / Saxara ne bylo dobavleno v čaj
c. v caj ne bylo dobavleno saxaru /saxar /saxara
d. v caj bylo dobavleno saxaru / saxar / saxara
e. Saxaru, saxar / saxara byl dobavlen v čaj.
f. V stakane byl saxar / saxaru / saxara

(16) a. Saxaru / Saxar / Saxara v čaj dobavleno ne bylo.
b. Saxaru / Saxar / Saxara vse-taki bylo dobavleno v sok.
c. Saxaru / Saxar / Saxara tak i ne bylo dobavleno v čaj.

(17) a. V čaj dobavljaetsja saxar / saxaru / saxara
b. V vino ne dobavljaetsja saxar / saxaru / saxara.
b' V vino saxar/ saxaru/ saxara ne dobavljaetsja.

(18) a. Drov / drova bylo podbrošeno v koster
b. Drov / drova ne bylo podbrošeno v koster
c. Drov / drova byl podbrošeno v koster
d. Drov / drova ne byl podbrošeno v koster
e. Drova / drov byli podbrošeny v koster.
f. Drova / drov ne byli podbrošen v koster.

(19) a. v koster bylo podbrošeno drov / drova
b. v koster ne bylo podbrošeno drov / drova
c. v koster byli podbrošeny drov / drova
d. v koster ne byli podbrošeny drov / drova

(20) a) Jablok bylo nabrano v korzinu
b) V korzinu bylo nabrano jablok.

UNACCUSATIVES / ERGATIVES

(21) a. Mjačej / Mjači s gory ne skatilis'
b. Mjačej / Mjači s gory ne skatilos'
c. mjačej / mjači skatilis' s goray
d. Mjačej/ Mjači skatilos s gory

(22) a. S gory skatilos' mjačej / mjači
b. S gory skatilis' mjačej / mjači

c. S gory ne skatilis’ mjačej / mjači
d. S gory ne skatilos’ mjačej /mjači

(23) a. Razlilos’ klej / kleja/*kleju.
b. Razlilsja klej / kleja/kleju.
c. Klej / kleja/ kleju ne razlilos’
d. Klej / kleja / kleju ne razlilsja

(24) a. Saxar vse-taki byl dobavlen v sok
b. Saxara vse-taki bylo dobavleno v sok
c. Saxaru vse-taki bylo dobavleno v sok.

The resolution of case conflicts. A pilot study*

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This paper reports the results of a pilot study on the resolution of case conflicts in German free relative constructions. Section 1 gives a brief introduction into the phenomenon, section 2 presents the experiment and its results, section 3 ends the paper with a brief more general discussion.

1 Introduction

The syntactic construction that we are exploring is exemplified by the clauses in (1):

(1) a. Wer einmal lügt, der lügt auch ein zweites Mal
b. Wer einmal lügt, lügt auch ein zweites Mal
who-NOM once lies the-NOM lies also a second time

The subjects of the matrix clauses in these examples are underlined. The sentence in (1-b) has a free relative clause in the subject position of the matrix clause. (1-a) differs from (1-b) in the use of a resumptive d-pronoun in the subject position of the matrix clause. The relative clause is dislocated. (1-a) is clas-

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sified as a kind of *correlative* construction in Vogel (2002), while only (1-b) counts as an example of a free relative (FR) construction in the relevant sense.

The interesting feature of FRs is that there is only *one* element, the FR pronoun, '*wer*' in (1-b), that could fulfil the case requirements of *both* the matrix verb and the verb within the FR. In (1), both verbs require nominative on the FR pronoun. No conflict arises, the clause is well-formed. Many languages allow for FRs only under such circumstances. Other languages do not even allow for constructions like (1-b). They obligatorily require a resumptive pronoun as exemplified in (1-a).[1] It seems that languages that allow for the pattern in (1-b) also have a construction like (1-a), but not necessarily vice versa. From a typological perspective, the FR construction is marked as such.

FRs lead to complications whenever the case requirements of the two verbs differ: the FR pronoun has to 'decide' which of the two cases it surfaces with. Vogel (2001) shows that the solutions for this case conflict vary a lot cross-linguistically, but in a systematic way. For the majority of German speakers, the grammaticality contrast in (2) holds.[2] In both clauses, the FR functions as object of the matrix verb. The two verbs chosen in these examples differ in the case they require on their object: '*vertrauen*' requires dative, and '*einladen*' accusative:

(2) a. Ich lade ein, wem ich vertraue
I invite who-DAT I trust

[1] Languages that Vogel (2002) classifies as non-FR languages are Korean, Hindi and Tok Pisin.

[2] The properties of German FRs have been discussed by Groos and van Riemsdijk (1981), Pittner (1991), Vogel (2001, 2002), Müller (2002) and others.

b. *Ich vertraue, wen ich einlade
I trust who-ACC I invite

In German FRs, the FR pronoun must realise the case assigned within the relative clause. Hence, (2-b) is also ungrammatical with the FR pronoun in the dative case required by the matrix verb:

(3) *Ich vertraue, wem ich einlade
I trust who-DAT I invite

(3) would be grammatical in Modern Greek, Romanian, Gothic, and Icelandic (See Vogel, 2002, for discussion and references). Romanian and Gothic would also display the contrast in (2), while both examples in (2) would be ungrammatical in Icelandic which obligatorily requires the FR pronoun to realise the case required by the matrix verb. The interesting details of the cross-linguistic typology are presented in Vogel (2002). In what follows, we will use the abbreviations '`m-case`' (for the case required by the matrix verb) and '`r-case`' (for the case required by the relative clause internal verb), as introduced in Vogel (2001).

Let us return to our examples in (2). The important observation about situations where the two required cases conflict is that some of these conflicts lead to ungrammaticality while others do not – accusative can be *suppressed* in favour of dative, but not vice versa.

Vogel (2001) found that German seems to be divided into three 'variants' that differ in which case conflicts they tolerate.

Example (1) is judged grammatical in all reported variants. A dialect called 'German A' in Vogel (2001) also considers both clauses in (4) as well-formed,

Vogel's (2001) 'German B' only allows for (4-a) and Vogel's (2001) 'German C' disallows both:

(4) a. Mich läd ein, wen ich nett finde
me-ACC invites who-ACC I nice find

b. Ich lade ein, wer nett zu mir ist
I-NOM invite who-NOM nice to me is

Here the case conflict is between nominative (`m-case` in (4-a), `r-case` in (4-b)) and accusative (`r-case` in (4-a), `m-case` in (4-b)). But note that the speakers from each of the three variants accept the following examples:

(5) a. Es wurde zerstört was sie fanden
It was destroyed what-NOM/ACC they found

b. Er zerstörte was ihm begegnete
he destroyed what-NOM/ACC him-DAT met

From an abstract syntactic perspective, the situation in (4) and (5) is the same: in (4-a) and (5-a), `m-case` is nominative, and `r-case` is accusative; and vice versa for (4-b) and (5-b). The difference is that the inanimate *wh*-pronoun '*was*' is the same for both cases, and this seems to be sufficient to resolve the otherwise un-resolvable case conflict in German B and C. FR clauses where the FR pronoun fulfils both case requirements are called *matching* FRs. Another example of a matching FR is (1). German C only allows for matching FRs.

Non-matching FRs where dative case is involved (or any other oblique form) are treated alike in German A and B, in the way indicated in (2). Dative case may never be suppressed, and the FR pronoun must surface with `r-case`. There is

no way to satisfy these two constraints in the situation exemplified by (2-b). Pittner (1991) was the first to argue that a case hierarchy is at work in these examples. For the variant of German that she describes, Vogel's (2001) German B, a case in a non-matching FR can only be suppressed if it is suppressed in favour of a case that is higher on the following case hierarchy:

(6) Case hierarchy for German B: (following Pittner (1991))
nominative $\prec$ accusative $\prec$ oblique (dative, genitive, PP)

Vogel's German A is 'blind' for the difference between the two structural cases nominative and accusative:

(7) Case hierarchy for German A: (following Vogel (2001))
structural (nominative, accusative) $\prec$ oblique (dative, genitive, PP)

The observed variants of German can be ranked according to their 'tolerance' of case conflicts. German A is the most tolerant, followed by German B, and German C, which allows for no FRs in case of case conflicts. This ranking of the variants in terms of 'tolerance' is interesting insofar as it mirrors the *markedness* of the different FR types, in the way indicated in Table 1. Matching FRs are the least marked ones, and non-matching FRs with suppression of oblique case are most marked.

The source of the three 'variants' is unclear. No dialectal or sociolectal factor could be discovered so far. It might very well be the case that they are an instance of inter-speaker variation along a general markedness metric that can be observed and should also be manifest in other constructions, and should in fact be expected within any language community.

	Matching FRs	possible in German A, B, C
$\prec$	Non-matching FRs that suppress a lower case	possible in German A, B
$\prec$	Non-matching FRs that suppress a higher structural case	possible in German A
$\prec$	Non-matching FRs that suppress oblique case	impossible in German

Tab. 1: Markedness scale of FRs with case conflicts and how they relate to the observed variants of German

2 The present study

The experiment that we want to present focuses on the difference between matching and non-matching FRs, and acceptable and non-acceptable non-matching FRs. Our expectation is that increased markedness in terms of Table 1 should go along with decreased acceptability rates. We are first of all interested in the difference between German C on the one hand, and German A and B on the other. For this reason, we examine a case conflict that is treated uniformly in German A and B, the conflict between accusative and dative. Our expectations are:

1. Constructions with matching FRs should be judged as grammatical with a higher probability than constructions with non-matching FRs.

2. Constructions with non-matching FRs that suppress accusative should be

judged as grammatical with a higher probability than constructions with non-matching FRs that suppress dative.

2.1 Methods

Participants 24 students[3] participated in the experiment for course credits. They were all monolingual native speakers of German and had normal or corrected-to-normal vision. They were naive with respect to the goals of the study.

Materials All sentences used consisted of a matrix clause followed by a free relative clause. Examples for each of the critical experimental conditions are given in (8) to (11) in the following (with literal English translations):

(8) `m-case` = accusative, `r-case` = accusative (AA):

Maria besuchte, wen sie mochte.
Maria visited-[$\_\_{acc}$] who-ACC she liked-[$\_\_{acc}$]

(9) `m-case` = dative, `r-case` = dative (DD):

Maria half, wem sie vertraute.
Maria helped-[$\_\_{dat}$] who-DAT she trusted-[$\_\_{dat}$]

(10) `m-case` = accusative, `r-case` = dative (AD):

Maria besuchte, wem sie vertraute.
Maria visited-[$\_\_{acc}$] who-DAT she trusted-[$\_\_{dat}$]

(11) `m-case` = dative, `r-case` = accusative (DA):

Maria half, wen sie mochte.
Maria helped-[$\_\_{dat}$] who-ACC she liked-[$\_\_{acc}$]

[3] The total number of participants in the experiment was 36. We excluded 12 participants for the reason that they rejected nearly all of the test sentences, or acted at chance level.

The verb in the matrix clause subcategorized its object either for accusative (as in 1 and 3) or for dative (as in 2 and 4). The relative pronoun was unambiguously marked for either accusative (as in 1 and 4) or for dative case (as in 2 and 3). There were 8 sentences in each condition which were created out of 8 sets with a proper name and four verbs (two accusative and two dative verbs) in each set. The 32 experimental sentences were intermixed with 144 non-related filler sentences.

2.2 Procedure

The total of 176 sentences were randomly assigned to four blocks of 44 sentences in each block with the constraint that each condition should occur one to three times per block. Within the blocks, a randomised order was generated with the constraints that two sentences of one condition should not occur in immediate succession. All sentences were presented word-by-word with 250 ms presentation for each word. Each sentence was preceded by a star-shaped cue. 500 ms after the last word subjects were asked to judge the acceptability of the sentence.

2.3 Data analysis

Trials with response latencies longer than 3000 ms were excluded as timeouts (12.0% across critical conditions).[4] We then computed the mean percentages of rejections as well as the corresponding mean response latencies for each of

[4] Subjects had significantly more timeouts in the mismatching conditions (16.4%) compared to the matching ones (7.6%) ($F1(1,23)=6.45$, $p < .05$; $F2(1,23)=23.25$, $p < .01$). No other comparisons were significant.

the critical conditions accumulated over subjects as well as over items. Differences between conditions were analysed statistically with a repeated measures ANOVA with the two factors MATCH (matching versus mismatching verb and relative pronoun) and MATRIX VERB (matrix verb accusative versus dative). An interaction was resolved by computing single comparisons between the two matching and mismatching conditions, respectively. All analyses were done separately for subjects (F1) and items (F2).

2.4 Results

Table 2 and figure 1 display the mean error percentages of rejected sentences for all 24 subjects in each of the four critical conditions. As can be seen, rejection percentages in the two matching conditions look rather similar, but subjects seem to have accepted such sentences more often than the sentences in which the verbs in matrix and relative clause mismatch. Comparing the two mismatching conditions, a dative verb in the matrix clause seems to induce more rejections compared to an accusative verb in matrix clause.

	MATRIX VERB	
MATCH	*accusative*	*dative*
match	28.1 (32.8)	26.0 (31.0)
mismatch	37.0 (32.7)	49.0 (23.6)

Tab. 2: Mean rejections (in %, with standard deviations in parentheses) in each of the four conditions (n = 24).

The statistical analysis for the mean rejections revealed a main effect of

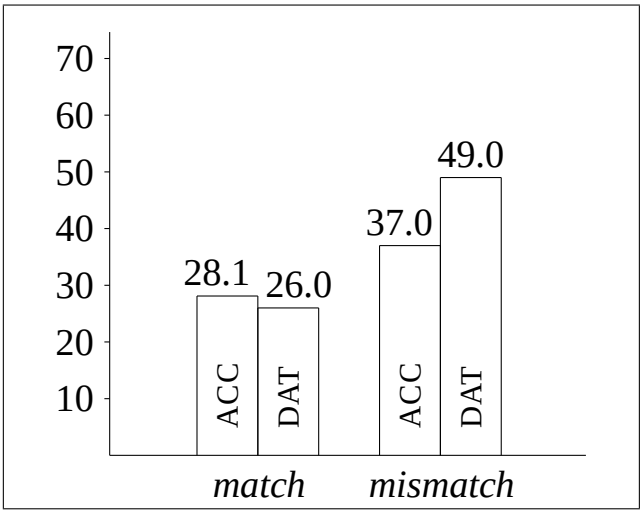

Fig. 1: Mean rejections in %. (Non-)Matching FRs relative to the case required by the matrix verb

MATCH (F1(1,23) = 17.83, $p < .001$, F2(1,7) = 102.15, $p < .001$), due to more rejections in the mismatching (43.0%) compared to the matching conditions (27.1%). There was no main effect of MATRIX VERB (F1(1,23) = 2.79, p = .10, F2(1,7) = 2.03, p = .20), but we found an interaction between both factors (F1(1,23) = 5.79, $p < .05$, only marginal in the item analysis: F2(1,7) = 3.85, p = .09). Resolving this interaction revealed that there was no difference between the two matching conditions ($F1 < 1$, $F2 < 1$), but that subjects rejected mismatching sentences with a dative matrix verb significantly more often than mismatching sentences with an accusative verb in the matrix clause (F1(1,23) = 5.57, $p < .05$, F2(1,7) = 6.72, $p<.05$).

In order to exclude possible speed-accuracy trade-off effects, we also analysed the mean response latencies for the rejections in each critical condition which are displayed in Table 3 for all 24 subjects.

The statistical analysis for the mean latencies revealed neither a main effect

	MATRIX VERB	
MATCH	*accusative*	*dative*
match	1115 (545)	1107 (565)
mismatch	973 (400)	1125 (512)

Tab. 3: Mean response latencies (in ms, with standard deviations in parentheses) for the rejections in each of the four conditions (n = 24).

of Match ($F1 < 1$, $F2 < 1$), nor of Matrix verb ($F1 < 1$, $F2(1,7) = 1.28$, $p = .30$), nor did we find an interaction between both factors ($F1 < 1$, $F2(1,7) = 1.18$, $p = .31$).

Taken together, the results clearly show that free relative clauses in which the case assigned by the matrix verb and the case of the relative pronoun mismatch are more probably rejected compared to sentences matching in this respect. Furthermore, such a mismatch is more often judged as being unacceptable when the matrix verb assigns dative and the relative pronoun bears accusative case than vice versa.

3 Discussion

The significant differences in the relative probabilities of acceptance can be interpreted as a direct reflection of the markedness scale that we introduced in the first section. Having a case conflict is more marked than not having one, and suppressing dative is more marked than suppressing accusative.

In footnote 4 we briefly mentioned that the mismatching conditions pro-

duced significantly more timeouts among the participants. This result also reflects the relative markedness of the case conflict conditions. A natural explanation would be that case conflicts make the decision on the grammaticality of the example more difficult.

The relatively high number of rejections even for the matching conditions (27.1%), as well as the need to exclude one third of the initial participants (cf. footnote 3), might also be due to the overall markedness of the construction itself.

An open question is how our results relate to the concept of grammaticality. We found two significant differences between types of free relative clauses. Which of these, one might ask, reflects the threshold for grammaticality? Trying to answer such a question would force one to decide whether German either does not allow for non-matching FRs or only for FRs that suppress accusative, but not dative. Such a decision would appear purely normative, and might be impossible to justify on independent grounds.

But there is an alternative line of reasoning. The grammar of German might be designed in such a way that it *produces* this variation which is not arbitrary, but reflects the relative markedness of the constructions under examination. German A, B and C could be seen as *altogether* constituting the reality of the *single* German grammar. We would then need a theory of grammar that *predicts* such variation. A conception of grammaticality that is based on markedness, as it is used prominently in Optimality Theory, could presumably be (made) compatible with such a perspective on the empirical reality of grammars.

Future work will explore the nature of German A, B and C in more detail, with case conflicts both in FRs and in other syntactic constructions. An

attempt to answer the question whether the variants could have a sociological background will also be part of these studies.

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Counting Markedness.
A corpus investigation on German free relative constructions

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This paper reports the results of a corpus investigation on case conflicts in German argument free relative constructions. We investigate how corpus frequencies reflect the relative markedness of free relative and correlative constructions, the relative markedness of different case conflict configurations, and the relative markedness of different conflict resolution strategies. Section 1 introduces the conception of markedness as used in Optimality Theory. Section 2 introduces the facts about German free relative clauses, and section 3 presents the results of the corpus study. By and large, markedness and frequency go hand in hand. However, configurations at the highest end of the markedness scale rarely show up in corpus data, and for the configuration at the lowest end we found an unexpected outcome: the more marked structure is preferred.

1 Markedness in OT

In Optimality Theory, grammaticality is derived from markedness in the sense that it is the relative ranking of markedness constraints that determines whether a structure is grammatical or not. Consider the following simple system of two

[*] The division of labour among the authors was as follows: Zugck carried out the low-level work on the corpus, data sample extraction, counting, systematising the numerical results, some calculations. The higher level linguistic analysis was done by Vogel.

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markedness constraints **M1** and **M2**, one faithfulness constraint **F**, and two candidates *cand1* and *cand2*:

(1)

	M1	**M2**	**F**
cand1		∗	
cand2	∗		

The input either conforms to *cand1* or *cand2*. Constraint **F** favours the candidate referred to in the input. Assume further that the relative ranking of **M1** and **M2** is universally fixed, which is typical for two markedness constraints that express a markedness scale. Under these circumstances, *cand1* is grammatical (i.e., the winner of at least one OT competition) under any possible ranking, while the grammaticality of *cand2* depends on the relative ranking of **F**. The four tables in (2) show this:

(2) a. *A grammar with low-ranked faithfulness*

cand1	**M1**	**M2**	**F**
☞*cand1*		∗	
cand2	∗!		∗

	cand2	**M1**	**M2**	**F**
☞	*cand1*		∗	∗
	cand2	∗!		

b. *A grammar with high-ranked faithfulness*

cand1	**F**	**M1**	**M2**
☞*cand1*			∗
cand2	∗!	∗	

cand2	**F**	**M1**	**M2**
cand1	∗!		∗
☞*cand2*		∗	

The following observations concerning the relative markedness of *cand1* and *cand2* can be made:

- the set of languages where *cand2* is grammatical, is a subset of those where *cand1* is grammatical
- In order to be grammatical, *cand2* needs highly ranked faithfulness

These observations are indicative of the higher markedness of *cand2*. A third observation that can often be made is that for those languages where the more marked *cand2* is possible, the set of contexts in which it occurs is a subset of the contexts where *cand1* is possible.

What are the empirical predictions of such a model of markedness? In grammaticality judgement tasks, we expect that *cand2* is more likely to be judged as ungrammatical than *cand1*, at best as equal, but never better. For research on corpora, we expect higher frequencies of the less marked expressions. Section 2 introduces the case of German free relative clauses that realise an argument of the verb. The relation of free relative clauses and correlative clauses in German is an instructive example for the kind of markedness relation just discussed. Section 3 reports the results of a corpus investigation on this construction.

2 German Argument Free Relative Constructions

Vogel (2001, 2002) showed that argument free relative (FR) constructions in German display tendencies of markedness in various ways. The first observation is that FR constructions are marked as such. The FR pronoun has to serve two case assigners at the same time:

(3) Wer sich nicht wehrt, lebt verkehrt
Who-NOM SELF not defends lives wrongly

In this example, '*wer*' is the subject of the underlined FR clause, and the whole FR is the subject of the matrix clause. Both finite verbs assign nominative case to their subject, but there is only one element, the FR pronoun, that realises nominative case. FRs as such are marked syntactic constructions. There are languages that do not have FR constructions in the way exemplified in (3), for instance, Hindi (Dayal, 1996) and Korean (Vogel, 2000). In those languages, a FR is typically left dislocated and 'doubled' by a correlate pronoun. This 'correlative' construction (CORR) is also always possible in languages with FRs. The correlative counterpart of (3) is (4):

(4) Wer sich nicht wehrt, der lebt verkehrt
Who-NOM SELF not defends that-one-NOM lives wrongly

Vogel (2000) suggested a markedness constraint 'case uniqueness' (CU) that requires a one-to-one relation between case assigners and case assignees. FRs violate this constraint. Hence, they only survive, if faithfulness is ranked higher than this constraint:

(5) a. *Languages without FRs*

	FR	CU	F
	FR	∗!	
☞	CORR		∗

	CORR	CU	F
	FR	∗!	∗
☞	CORR		

b. *Languages with FRs*

	FR	F	CU
☞	FR		∗
	CORR	∗!	

	CORR	F	CU
	FR	∗!	∗
☞	CORR		

Languages with FRs further differ in the way they realise FRs, in particular, we find three different kinds of strategies that differ in which case is realised, the case assigned by the matrix verb (`m-case`) or by the relative clause internal verb (`r-case`), and how:

Strategy M: The FR pronoun realises `m-case`

Strategy R: The FR pronoun realises `r-case`

Strategy RES: The FR pronoun realises `m-case`, and is accompanied by a resumptive pronoun realising `r-case`

German FRs always use strategy R, Icelandic ones strategy M (Vogel, 2000), Gothic (Harbert, 1983) and Romanian (Grosu, 1994) shift between the two options depending on which case is more prominent on the language's case hierarchy. Modern Greek (Alexiadou and Varlokosta, 1995) uses strategy M, and strategy RES, if `m-case` is structural, and `r-case` oblique. See (Vogel, 2000,

2002) for a detailed discussion of the typology of case conflicts in argument FR constructions.

Given the fact that pronouns can realise only one case, this configuration becomes problematic, whenever the two cases differ. English (Bresnan and Grimshaw, 1978) and Dutch (Groos and van Riemsdijk, 1981) are reported to be 'matching' languages – they only allow for FRs if the two cases match.

German has also been reported to be a matching language (Groos and van Riemsdijk, 1981). But this claim has been contradicted by Pittner (1991) and Vogel (2001, 2002). Vogel reports the observation of a split among German speakers. They can be divided into three different groups of speakers. The variants are called German A, B, and C. German A is the most liberal and most frequent one, German C the most strict and least frequent. German C is a matching variant, no FRs are possible, if the two cases conflict.

The difference between German A and B can only be seen with one particular conflict, namely, where `m-case` is accusative and `r-case` is nominative. Many German speakers accept both (6-a,b):

(6) a. Ich lade ein wer mir begegnet
I invite(+ACC) who-NOM me-DAT meets(+NOM)

b. Ich lade ein wem ich begegne
I invite(+ACC) who-DAT I-NOM meet(+DAT)

But there is a not too small minority that rejects (6-a). Only very rarely, one can find speakers who even reject (6-b). Pittner (1991) describes the variant that Vogel calls 'German B' (those who do not accept (6-a)) as a variant that allows for FRs if the suppressed case is not higher than the realised case on the

following case hierarchy:

(7) Case hierarchy for German B: (following Pittner, 1991)
nominative $\prec$ accusative $\prec$ oblique (dative, genitive, PP)

German A is 'blind' for the difference between the two structural cases nominative and accusative. For the purpose of our discussion, we might assume the following three constraints (cf., a.o., Vogel, 2002):

(8) **Realise Case**(RC): An assigned case requires a morphological instantiation. (can only be fulfilled by matching FRs)

Realise Case (relativised)(RCr): An assigned case requires a morphological instantiation of itself or a case that is higher on the case hierarchy. (can also be fulfilled by non-matching German FRs, if `r-case` is higher than `m-case`)

Realise Oblique (RO): Oblique Case must be morphologically realised. (this constraint cannot be violated by German FRs)

The ranking of these constraints in German is:

(9) RO $\gg$ RCr $\gg$ RC

Different rankings of faithfulness now yield the three variants, in the following way:[1]

[1] Further constraints are left out here, which are necessary to exclude the strategies M and RES. See (Vogel, 2002) for the full picture and detailed discussion.

(10) *German A*: RO $\gg$ **F** $\gg$ RCr $\gg$ RC
German B: RO $\gg$ RCr $\gg$ **F** $\gg$ RC
German C: RO $\gg$ RCr $\gg$ RC $\gg$ **F**

Table 1 illustrates that the three variants differ in the contexts where they allow for FRs. These contexts themselves can be ordered in terms of markedness. The rankings in (10) predict this finding.

	Matching FRs	possible in German A, B, C
$\prec$	Non-matching FRs that suppress a lower case	possible in German A, B
$\prec$	Non-matching FRs that suppress a higher structural case	possible in German A
$\prec$	Non-matching FRs that suppress oblique case	impossible in German

Tab. 1: Markedness scale of FRs with case conflicts and how they relate to the observed variants of German

Language internal variation, according to the preceding discussion, is variation in terms of ‘tolerance’. There are more liberal and more strict speakers. However, this tolerance is not arbitrary. The relative ranking of the markedness constraints is the same for all of these speakers, they only differ in the rank of faithfulness.

In corpora, we expect differences in the relative frequencies that mirror the scale of FR types in table 1. The less marked, the more frequent a FR should be. In particular:

- For all contexts, correlatives should be more frequent than FRs
- Less marked contexts should occur more frequently than more marked ones
- FRs should occur in less marked contexts relatively more frequently than in more marked ones

3 A corpus investigation

We searched the COSMAS-II corpora[2] of the IDS Mannheim for the three animate *wh*-pronouns *wer* (nominative), *wen* (accusative) and *wem* (dative). The total numbers of instances of sentences with these pronouns in the corpus is given in table 2.

Pronoun	*Total*
wer	166.927
wen	6.327
wem	17.522

Tab. 2: Total number of occurences in the COSMAS-II corpus of written language

[2] We used the largest available corpus, a collection of several corpora of written German, first of all newspaper and magazine articles, prose and scientific literature. According to the IDS homepage, the corpus of 'written language' that we used contains 5.160.576 texts.

Note the extraordinary difference between subject and non-subject *wh*-pronouns. This seems to be due to two independent factors which are both met by *wer*: the tendency of *wh*-pronouns to occur clause-initially, and the tendency of clauses to start with the subject.

We then let the COSMAS-II system select random samples of 500 instances of each of the three pronouns. Animate *Wh*-pronouns have three semantically different usages in German, as FR pronoun, as interrogative pronoun, and as indefinite:

(11) a. *Wer* es glaubt, wird selig (FR)
who it believes becomes blessed

b. Interrogative:

(i) Wer glaubt es ? (main clause)
Who believes it

(ii) Ich weiss wer es glaubt (subordinate clause)
I know who it believes

c. Glaubt es wer ? (indefinite)
believes it someone
'Does someone believe it?'

The distribution of these usages for the three pronouns is given in table 3.[3]

Each of these distributions is highly significant: *wer* is predominantly used as FR pronoun ($\chi^2 = 65.92; p < 0.001$), while *wen* ($\chi^2 = 328.07; p < 0.001$) and *wem* ($\chi^2 = 69.95; p < 0.001$) are predominantly used as interrogatives. Indefinite usages are extremely rare in general. This might be due to the fact that this usage is colloquial, and we are investigating a corpus of written German.

[3] We excluded 3 instances of *wer*, 20 of *wen* and 13 of *wem* because of multiple occurence, listing usages, and other similar reasons.

Pronoun	*FR*	*Interrog.*	*Indef.*
wer	339 (68.20%)	158 (31.80%)	0 (0.00%)
wen	41 (8.54%)	437 (91.04%)	2 (0.42%)
wem	150 (30.80%)	334 (68.58%)	3 (0.62%)

Tab. 3: Distribution of three different usages of *wh*-pronouns

The object pronouns *wen* and *wem* occur both as objects of verbs and as objects of prepositions. As we are only interested in the former, not the latter, we have to tear these usages apart. Table 4 lists the distributions that we found in our sample.

Clause type	*wen*		*wem*	
	Obj. of V	Obj. of P	Obj. of V	Obj. of P
FR	39 (95.1%)	2 (4.9%)	140 (93.3%)	10 (6.7%)
Interrogative	293 (67.0%)	144 (33.0%)	168 (50.3%)	166 (49.7%)

Tab. 4: Usage of *wen* and *wem* as object of verb and preposition

While the distributions for FRs are similar, PPs are relatively rare here, the distribution of PP usages differs largely between *wen* and *wem*. However, the correlation is very small (-0.065), and the χ^2 value of 3.257 is slightly below the level of significance ($.1 > p > .05$). Another difference shows up, when we look at the distribution with respect to main and subordinate clauses. Table 5 shows the relevant figures.[4]

[4] For *wen* we had to take 24 instances out, which were in clausal fragments (14 verbal, 10 prepositional object). With *wem*, it was 26 instances (6 verbal, 20 prepositional object).

	wen		*wem*	
clause type	Obj. of V	Obj. of P	Obj. of V	Obj. of P
matrix	166 (82%)	37 (18%)	83	36
subordinate	113 (54%)	97 (46%)	77 (41%)	112 (59%)

Tab. 5: Distribution of interrogative uses of *wen* and *wem*

For *wem*, we find a weak ($r = 0.28$), but significant ($\chi^2 = 6.08$; $p < .05$) correlation between clause type and more frequent case assigner, such that *wem* is preferably object of a verb in matrix clauses. This finding is highly significant ($\chi^2 = 19.36; p < .001$).We find a weak correlation between *wen* as verbal complement ($r = -0.10$) and its occurrence in a matrix clause, which is also statistically significant ($\chi^2 = 4.53; p < .05$).

Table 6 lists the frequencies of FR and CORR versions of clause-initial FRs in case matching and conflicting configurations. Clause-final FRs are not counted in here, because they cannot have a correlative counterpart. The final column in the table indicates the degree to which a found preference for FR or CORR is statistically significant.

We found FRs in clause-initial and in clause-final position. FRs that stand for the subject of the clause prefer clause-initial position, those that stand for an object, clause-final position. This is expected, as these are the default positions for these grammatical functions. Table 7 lists the distributions.

The crucial findings that are displayed in table 6 are the following:

1. Only matching FRs and non-matching FRs replacing nominative have been found.

r-case	m-case	FR	CORR	Significance
NOM	NOM	274 (89.8%)	31 (10.2%)	***
NOM	AKK	0	2	
NOM	DAT	0	5	
NOM	PP	0	2	
Σ(NOM)		274	40	
AKK	NOM	5 (25%)	15 (75%)	*
AKK	AKK	1 (20%)	4 (80%)	
AKK	DAT	0	3	
AKK	PP	0	0	
Σ(AKK)		6	22	
DAT	NOM	33 (34.4%)	63 (65.4%)	*
DAT	AKK	0	0	
DAT	DAT	1 (5.6%)	17 (94.4%)	***
DAT	PP	0	4	
Σ(DAT)		34	84	

Tab. 6: Frequencies of clause-initial argument FR and CORR clauses relative to case configurations

r-case	m-case	initial	final
NOM	NOM	274 (93.5%)	19 (6.5%)
ACC	NOM	5 (83.3%)	1 (16.7%)
ACC	ACC	1 (12.5%)	7 (87.5 %)
DAT	NOM	33 (84.6%)	6 (15.4%)
DAT	DAT	1 (12.5%)	7 (87.5%)

Tab. 7: Syntactic position of FRs

2. For matching subject FRs, FR is preferred over CORR. This contradicts our expectations. CORR should be more frequent under all conditions.

3. Each of the 5 (ACC) + 33 (DAT) = 38 non-matching FRs use strategy R, strategies M and RES do not occur at all.

4. The overall number of FR and CORR for each of the three cases mirrors well-known preferences for the occurrence of cases in first position, NOM is most likely to occur initially, and ACC dislikes that position most.

5. The relative ranking of contexts given in table 8 displays a highly significant difference between the least marked context NOM-NOM and the rest which can be seen in the exceptional *strong preference for FRs*.

For both dative and accusative matching FRs, 7 out of 8 are clause-final, only 1 is clause-initial. These never occur with a resumptive pronoun anyway. If we exclude these, then the picture changes.

Table 8 shows those environments where FRs have been found at all, and to what degree. The context NOM-NOM is the only one that prefers FR over CORR.

r-case	m-case	FR	CORR
NOM	NOM	274 (89.8%)	31 (10.2%)
DAT	NOM	33 (34.4%)	63 (65.6%)
ACC	NOM	5 (25%)	15 (75%)
ACC	ACC	1 (20%)	4 (80%)
DAT	DAT	1 (5.6%)	17 (94.4%)

Tab. 8: Clause-initial FR and CORR in contexts

This is statistically highly significant for all comparisons. For the context DAT-NOM we also find a statistically significant ($\chi^2 = 6.015; .05 > p > .01$) weak correlation ($r = 0.23; .2 < r < .5$) in comparison with the context DAT-DAT such that the latter context is less likely to occur with an FR than the former. No other comparisons are significant.

Why is FR preferred in NOM-NOM? The theory predicts that CORR should be preferred even here. However, the resumptive pronoun appears to be redundant in those cases:

(12) Wer-NOM es weiss, der gewinnt
who it knows the-NOM wins

This redundancy might be related to the fact that the FR, in addition to realising nominative case, is also located in the correct clause-initial position. Hence, there are already two cues that signal that the FR is subject. The resumptive can serve no additional function.

We compared the NOM-NOM FR and CORR instances in their length, and

found a statistically highly significant ($t = 3.8266; p < .001$) weak correlation ($r = .22; .2 < r < .5$) between FR length and choice of CORR: The longer the FR, the more likely it is doubled by a main clause initial resumptive pronoun.

FR	6.02	
KORR	12.04	***

Tab. 9: Mean number of words between FR pronoun and the first word after the FR in NOM-NOM contexts

The preference for FR in the least marked context, NOM-NOM, can be seen as the exception that proves the rule, namely, that markedness is the driving force behind frequency distributions. The resumptive pronoun becomes redundant in those instances where the FR pronoun bears nominative and the clause-initial FR is the subject of the main clause. The grammatical function 'subject', hence the case of the FR, is already signalled by syntactic position.

4 Conclusion

The corpus study mainly confirmed our expectations about the occurrence of FRs. The interesting exception of NOM-NOM contexts is also driven by markedness. However, the study also shows that structures which are highly marked, but still grammatical, like, for instance, FRs where `r-case` is dative and `m-case` accusative, did not show up at all. There is no difference in frequency between such highly marked structures and clearly ungrammatical structures like, e.g.,

FRs following strategy M.[5] This exemplifies one of the limits of this emprical method.

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Superiorität in europäischen Sprachen. Zwischenbericht zu einer Datenerhebung

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Dies ist eine erste Zusammenfassung der Ergebnisse einer empirischen Untersuchung zum Grammatikalitäts-Status von sogenannten Superioritäts-Verletzungen in europäischen Sprachen. Für das Englische gilt der Grammatikalitätskontrast in (i) gemeinhin als empirisch gesichert:

i. a. Who said what?
   b. *What did who say?

In anderen Sprachen besteht für äquivalente Satzpaare eine viel grössere Unsicherheit. Die Literatur finden sich oft widersprüchliche Angaben. Ein detaillierter Literaturvergleich, der die ausserordentlich disparate Situation in der Literaur zu den slawischen Sprachen diskutiert, ist in (Blaszczak & Fischer 2001) nachzulesen.

Mehr Klarheit über die Datenlage in anderen Sprachen als dem Englischen zu erreichen, ist das Anliegen der hier vorgestellten Untersuchung. Es wurde eine Liste erstellt von für das Phänomen einschlägigen Beispielsätzen, bestehend aus insgesamt 37 multiplen W-Fragen in unterschiedlichen syntaktischen Konstellationen. Die Liste ist aufgeführt im Appendix I.

Systematisch werden darin die Abfolgen der W-Phrasen in verschiedenen Kontexten variiert. Insbesondere werden Subjekt-Objekt-Abfolgen (SO) mit Objekt-

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Subjekt-Abfolgen (OS) kontrastiert. In (1) wird ein belebtes Subjekt mit einem unbelebten Akkusativ-Objekt kombiniert, in (2a,b) sind beide belebt, in (2c,d) das Subjekt unbelebt. In (3) sind beide belebt, aber das Objekt steht im Dativ. In (4) haben wir ein Psych-Verb, bei dem die Belebtheit der Nominativ-NP variiert werden kann. In (5) wurde ein dreistelliges Verb verwendet. Hier wurden nicht alle Permutationen betrachtet. Es kam uns darauf an, zu prüfen, inwiefern das Auftreten eines dritten W-Elements die Grammatikalität der (Akkusativ-)O-S-Abfolge positiv oder negativ beeinflusst. Analog wurde in (7) eine dritte, diesmal adverbiale, W-Phrase bei einem transitiven Verb hinzugenommen. In (13) tritt eine komplexere W-Phrase der Form *welcher Mann* an die Stelle der einfachen W-Phrase *wer*. In (6) wird das Objekt durch eine PP ersetzt.[1]

Bei den Beispielen in (8), (9), (12), (14) handelt es sich um verschiedene Varianten von Superioritätskonstellationen über Satzgrenzen hinweg. (10) und (11) sollen die Effekte von bestimmten Adverbien, nämlich warum *und* wie, *näh*er beleuchten, die gemeinhin dafür bekannt sind, Superioritäts-ähnliche Effekte auszulösen.[2]

Die Liste wurde zunächst einmal von MuttersprachlerInnen, allesamt LinguistInnen, in verschiedene Sprachen übersetzt und dann weiteren MuttersprachlerInnen zur Beurteilung vorgelegt. Bislang haben wir Urteile aus folgenden Sprachen und Sprachfamilien gesammelt (in Klammern dahinter die Zahl der ausgewerteten InformantInnen):

Germanisch	Romanisch	Slawisch
Deutsch (18)	Katalanisch (5)	Bulgarisch (3)
Isländisch (7)	Französisch (4)	Polnisch (21)

[1] Da wir diesen Fall im Folgenden nicht weiter diskutieren, hier nur kurz das Ergebnis: Es zeigen sich in keiner Sprache Grammatikalitäts-Kontraste, allerdings eine deutliche Präferenz für die Subjekt-Erst-Abfolge.

[2] Die Fälle (8)-(14) werden in dieser ersten Zusammenfassung ausgespart und bleiben einer zukünftigen detaillierten Befassung vorbehalten.

Italienisch (7)	Russisch (12)
Spanisch (7)	Ukrainisch (8)

Man sieht, dass die Zahl der InformantInnen stark variiert. Auch wenn es sicherlich zu früh ist, um definitive, mit statistischen Methoden abgesicherte Aussagen zu treffen, lassen sich doch einige Tendenzen feststellen, die wir im folgenden darstellen wollen. Die Daten sind vielleicht als eine Art „Probebohrung“ zu verstehen, die uns zunächst einmal Hinweise darüber gibt, wo es genauer nachzuforschen gilt.

Die bei den Befragungen verwendete Grammatikalitätsskala war nicht immer einheitlich, was daran lag, dass wir den InformantInnen zunächst keine Skala vorgegeben hatten. Eine Schwierigkeit, die bei der Auswertung dann natürlich auftrat, war es, die verschiedenen verwendeten Skalen zu vereinheitlichen. Für den uns hauptsächlich interessierenden Kontrast zwischen Sätzen innerhalb einer Sprache ist dies allerdings weniger von Belang, da hier ja dieselben Skalen Anwendung fanden. Allerdings beeinträchtigt es die Vergleichbarkeit zwischen den Sprachen. Die Skala, auf die hin wir die Ergebnisse vereinheitlicht haben, ist fünfstufig und umfasst die Urteile:

ok	(mit Sicherheit grammatisch, = 4)
?	(eher grammatisch als ungrammatisch, = 3)
??	(absolut unsicher, „Grammatikalitätsgrenze“, =2)
?*	(eher ungrammatisch als grammatisch, =1)
*	(mit Sicherheit ungrammatisch, =0)

In der Auswertung wurden den Urteilen numerische Werte von 4,00 (ok) bis 0,00 (*) zugewiesen. Die Grammatikalitätsschwelle wurde bei 2,00 festgesetzt. Wenn für eine Sprache etwa nur eine drei-wertige Skala (also: „ok, ?,

“) verwendet wurde, dann wurde ein Fragezeichen, „?“, in „??“ in unserer Skala übersetzt. Dies ist insofern eine Idealisierung, als hier unter „?“ mit Sicherheit auch Urteile mit abgedeckt sind, die auf einer 5-wertigen Skala als „?“ oder „?“ symbolisiert würden. Angesichts der ohnehin bestehenden Unsicherheiten mit gradienten Urteilen, auch bezüglich der Frage, wie sehr für verschiedene InformantInnen ein „??“ für dieselbe Art von Urteil steht, ist überhaupt nicht abzuschätzen, ob dies wirklich ein Problem darstellt oder nicht. Bedeutsam sollten bei der Betrachtung deshalb im Grunde nur relativ eindeutige Kontraste sein. Wir bitten, dies im Folgenden zu beachten. Eine statistisch abgesicherte Erhebung kann unseres Erachtens nur auf einer grossen Zahl an InformantInnen beruhen. In den Erhebungen, die wir im Moment und in Zukunft durchführen, verwenden wir, im Gegensatz zu den ersten Erhebungen, ein Internet-basiertes Verfahren, um eine grössere Zahl an InformantInnen einbeziehen zu können. Beispiele sind unter http://www.ling.uni-potsdam.de/fogra3 einsehbar.

1. Superiorität in einfachen Sätzen

Die unmarkierte Abfolge „wer - was“ in Satz (1a) wurde von den Sprechern aller Sprachen als zweifelsfrei grammatisch eingestuft. Die markierte Abfolge OS („was hat wer gekauft“) in Satz (1b) dagegen wurde für die slawischen Sprachen am besten bewertet, gefolgt von den germanischen. Am schlechtesten wurden die romanischen Beispielsätze eingestuft: Ausser Spanisch blieben hier alle unterhalb der von uns angesetzten Grammatikalitätsschwelle. Wenn also Superioritätseffekte zu beobachten sind, dann allenfalls im Katalanischen, Französischen und Italienischen.

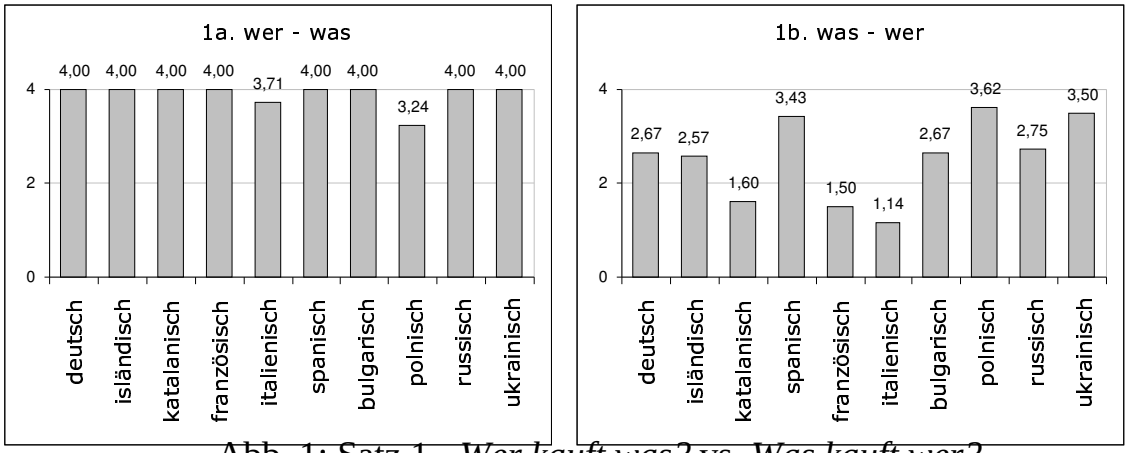

Abb. 1: Satz 1 - *Wer kauft was?* vs. *Was kauft wer?*

Zu beachten ist für (1a) zunächst einmal, dass sechs unserer sieben InformantInnen aus verschiedenen Regionen Italiens den Satz „chi ha comprato che (cosa)“ als zweifelsfrei wohlgeformt betrachten - nur einer gab ein „??“.[3] Dies ist insofern verwunderlich, als Italienisch in der Literatur gerne als Paradebeispiel für eine Sprache genannt wird, die multiple W-Fragen überhaupt nicht zulässt. Bedeutsam ist aber insbesondere der Kontrast zwischen (1a) und (1b), der darauf hindeutet, dass Italienisch eine Superioritätssprache ist. Nur zwei der sieben fanden (1b) „ok“. Die anderen fünf verteilten einen „*“. Der Kontrast zwischen den InformantInnen soll hier aber auch nicht unerwähnt bleiben: zwei der sieben fanden beide Sätze perfekt, eine.r vergab für (1a) bereits ein „?“ und für (1b) einen „*“. Vier folgten dem Superioritätsmuster: „ok“ für (1a), „*“ für (1b). Analoges lässt sich für Französisch beobachten. Alle vier InformantInnen vergaben ein „ok“ für (1a). Drei der vier vergaben ein „??“ für (1b), eine.r ein „*“. Auch hier wurde allerdings mit einer drei-wertigen Skala gearbeitet, so dass die Abwertung von (1b) im Grunde nur auf dem Urteil eine.r InformantIn beruht. Zieht man die Unsicherheit bezüglich der Auswertung eines „?“-Urteils in einer dreiwertigen Skala in Betracht, ist es durchaus offen, ob der Kontrast zwischen

[3] Die italienischen wie auch die französischen InformantInnen haben eine dreiwertige Skala verwendet. Wir haben das dort zum Glück relativ selten angegebene „?“ als „??“ in unserer Skala ausgewertet.

(1a) und (1b) im Französischen als Grammatikalitätskontrast zu bewerten ist, wie im Italienischen, oder als schwächerer Effekt einer SO-Präferenz, wie er eigentlich in allen betrachteten Sprachen zu beobachten ist, und somit eigentlich nicht als Ungrammatikalität bewertet wird.

Ein klareres Bild liefern die Satz-Paare in (5a,b) und (7a,b). Hier wurde derselbe Kontrast im Kontext eines dritten W-Elements getestet. Und hier verhält sich nun auch Französisch[4] wie eine Superioritätssprache, und unterscheidet sich relativ deutlich von den anderen getesteten Sprachen.

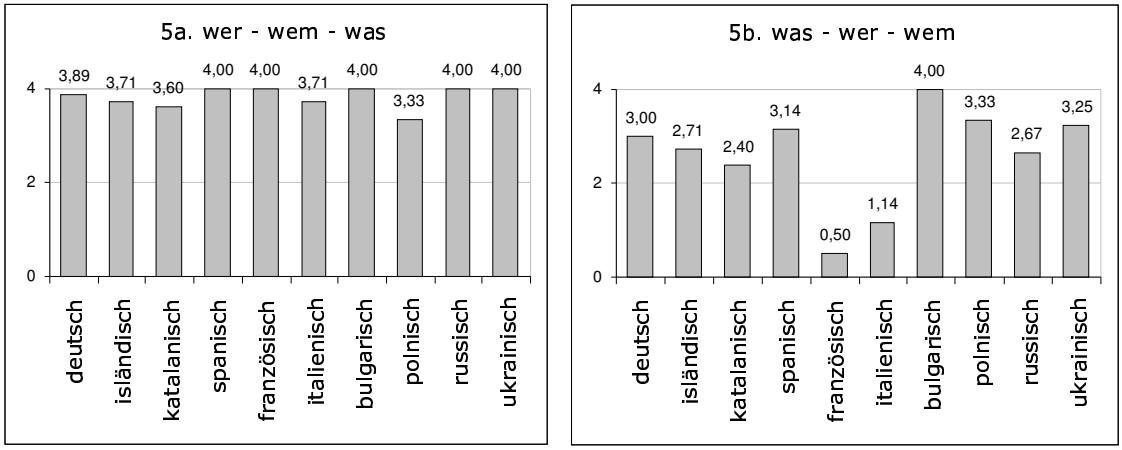

Abb. 2: Satz 5 - *Wer hat wem was gegeben?* vs *Was hat wer wem gegeben?*

Auch der Kontrast zwischen (7a) und (7b) spricht dafür, dass Französisch Superioritätseffekte aufweist.[5] Für Italienisch lässt sich hier keine Aussage treffen, da sowohl (7a) als auch (7b) einhellig als ungrammatisch bewertet werden. Wenn auch Italienisch Mehrfachfragen an sich erlaubt, so ist die Sprache darin vielleicht trotzdem eingeschränkter als andere Sprachen. Für Katalanisch ist das Bild uneinheitlich: der Kontrast zwischen (5a) und (5b) ist relativ gering, und eher kein Grammatikalitätskontrast, (7b) wird allerdings ein gutes Stück schlechter bewertet als (5b), und gravierend schlechter als (7a).

[4] Da im Französischen, wie auch dem Spanischen und Katalanischen, die Normalabfolge Subjekt-Objekt-Dativ ist, wurde diese Abfolge in (5a,b) verwendet.
[5] Auch hier ist das Adverb „ou“ am rechten Satzrand platziert.

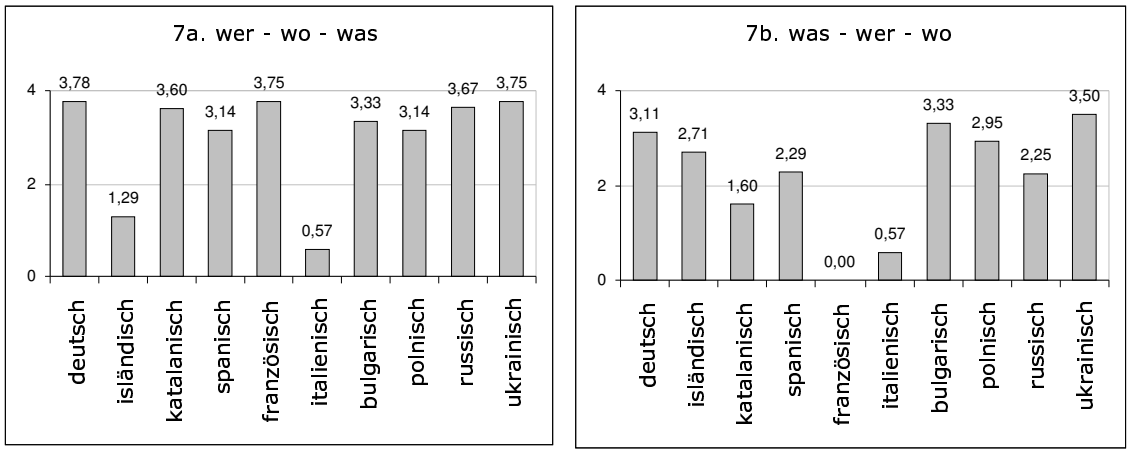

Abb. 3 - Satz 7 - *Wer hatte wo was gekauft?* vs *Was hatte wer wo gekauft?*

Mit aller Vorsicht könnte man nun die im Italienischen und Französischen besonders ausgeprägte Abneigung gegen OS-Abfolgen bei multiplen Fragen mit einer lexikalisch-morphologischen Besonderheit korrelieren, die diese beiden Sprachen von den anderen untersuchten unterscheidet: Nur in diesen beiden Sprachen sind die W-Pronomen für belebte Subjekte und direkte Objekte formidentisch, im Französischen „qui“ und im Italienischen „chi“. Satz (2b) ist folglich in diesen Sprachen nicht testbar. Die Sätze in (ii) wurden von unseren InformantInnen ausschliesslich mit SO-Abfolge verstanden.

ii. a. (=2a,b) Qui a rencontró qui? Französisch
b. (=2a,b) Chi ha incontrato chi? Italienisch
(ok: Wer traf wen? ; *: Wen traf wer?)

Man könnte dieses Szenario vielleicht wie folgt beschreiben: Da grundsätzlich in den beiden Sprachen für W-Pronomen der Subjekt/Objekt-Kontrast nicht markiert wird, sind SO-Abfolgen in der Regel nicht von OS-Abfolgen unterscheidbar. Letztere sind mithin nicht „rekonstruierbar“, wenn man die Standardannahme zugrundelegt, dass die SO-Abfolge die unmarkierte

ist, und deshalb diese Interpretation die OS-Interpretation für Sätze wie (ii) blockiert. Eine OS-Abfolge ist nun aber auch dann nicht lizensiert, wenn sie aus konzeptuellen Gründen rekonstruierbar *wäre*, etwa bei einem Belebtheitsunterschied, wie für die Sätze in (1), (5) oder (7) – da die OS-Abfolge im Allgemeinen ausgeschlossen ist, wird sie offenbar auch in solchen besonderen (Ausnahme-) Fällen nicht zugelassen, in denen sie das Kriterium der Rekonstruierbarkeit erfüllen würde.

Ob es sich hier um idiosynkratische Eigenarten der besprochenen Sprachen handelt oder nicht, lässt sich daran überprüfen, ob Sprachen mit einer vergleichbaren morphologischen Ausgangsbasis dasselbe Verhalten zeigen. Eine Reihe von germanischen Sprachen, wie Holländisch, Schwedisch, Norwegisch und nicht zuletzt Englisch sind hier einschlägig. Die empirischen Erhebungen zu diesen Sprachen laufen bereits beziehungsweise sind in Vorbereitung.

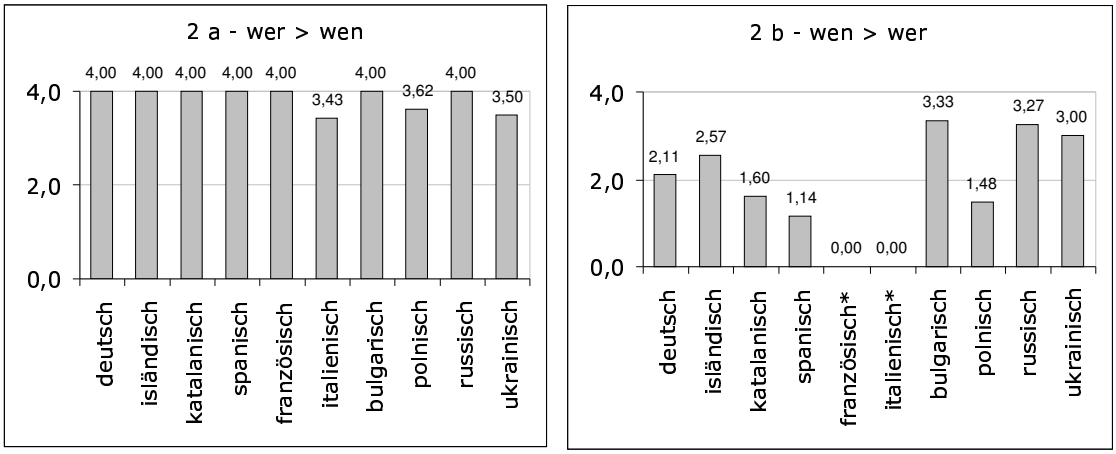

Abb. 4 - Satz 2 - *Wer hatte wen getroffen?* vs *Wen hatte wer getroffen?*

Betrachtet man (1), (5) und (7), dann fällt auf, dass sich die slawischen Sprachen recht ähnlich verhalten und auch die beiden untersuchten germanischen Sprachen meist recht dicht beieinander liegen, und nur innerhalb der romanischen Sprachen zwei Gruppen auszumachen sind, von denen die eine, Spanisch, vom Verhaltensmuster her eher zu den slawischen Sprachen passt als zu den anderen

romanischen Sprachen. Katalanisch ist zum Teil näher an Französisch und Italienisch dran, oft aber auch sehr ähnlich zu Spanisch. Eine Ausnahme könnte der Kontrast in (2a,b) sein, wo auch Spanisch Superioritätseffekte zeigt, was dafür spricht, dass Superioritätseffekte belebtheitssensitiv sind. Man betrachte dazu etwa den Kontrast im Spanischen zwischen (1b) und (2b). Auffällig ist hier aber auch, dass auch Polnisch in (2b) einen Grammatikalitätskontrast zeigt, der von uns in ähnlicher Weise als „Übertreibung“ eingeschätzt wird wie das nur wenig bessere Urteil zum Deutschen. Hier zeigt sich das eigentliche Problem solcher Erhebungen, nämlich die Frage des richtigen Setzens einer „Grammatikalitätsschwelle“. Der Bezug auf eine feste Skala schafft hier eine eher trügerische Sicherheit, da ihre Verwendung durch die InformantInnen nach wie vor noch interpretationsbedürftig ist, und sich von Fall zu Fall unterscheidet.

2. Transitive Sätze mit Dativ-Objekten

Die Sätze (3) und (4) unterscheiden sich nur in der Wahl des Verbs: Satz (4) weist gegenüber (3) ein Psych-Verb auf. Für beide Sätze lässt sich die folgende Tendenz festhalten: Die unmarkierte Abfolge „wer - wem“ ist in (fast[6]) allen Sprachen als grammatisch eingestuft worden.

[6] Für das Italienische wurden mangels guter Übersetzungsmöglichkeiten hier keine Daten erhoben.

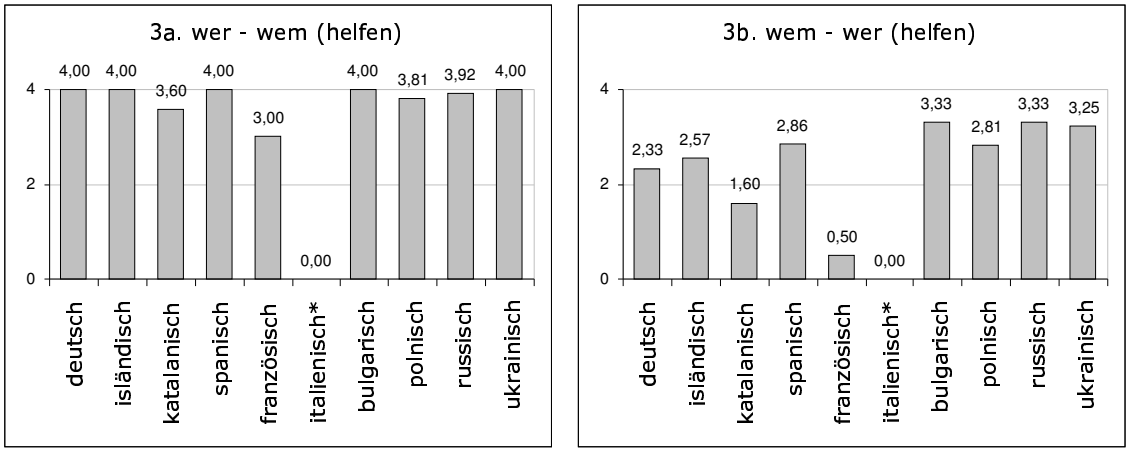

Abb. 5: Satz 3 - *Wer hat wem geholfen?* vs *Wem hat wer geholfen?*

Die markierte Abfolge „wem - wer“ dagegen führt bei den slawischen Sprachen zu besseren Urteilen als bei den germanischen. Für beide Sprachfamilien ergeben sich allerdings allenfalls Präferenzkontraste, denn alle Bewertungen liegen oberhalb der Grammatikalitätsschwelle. Die romanischen Sprachen dagegen reagieren ablehnend auf die Abfolge (3b), wobei wiederum Spanisch die Ausnahme bildet, und Katalanisch etwas schlechter als Spanisch rangiert, so wie wir das oben schon an anderen Beispielen sahen. Französisch zeigt auch hier einen recht klaren Superioritätseffekt, vergleichbar mit den Beispielsätzen (5) und (7).

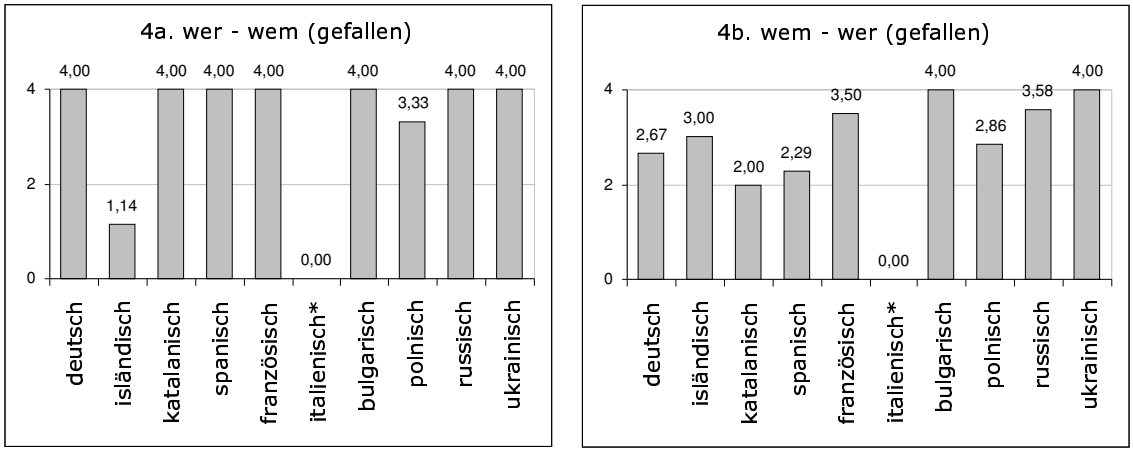

Abb. 6: Satz 4 - *Wer hat wem gefallen?* vs *Wem hat wer gefallen?*

Die Verwendung eines Psych-Verbs wie in (4) führt bei den Sprechern germanischer und slawischer Sprachen zu leicht besseren Ergebnissen für den (b)-Satz. Während die übrigen romanischen Sprachen vergleichsweise konstant bleiben, erreicht der französische Satz (4b) hier einen Spitzenwert von 3,50 gegenüber 0,50 für den Satz mit „normalem“ Verb (3b). Ansonsten auftretende Superioritätseffekte scheinen also im Französischen durch Verwendung eines Psych-Verbs neutralisiert zu werden. Ein komplementäres Bild liefert Isländisch: hier treten zwar ansonsten keine Superioritätseffekte auf, der Kontrast zwischen der markierten und der unmarkierten Abfolge bei einem Psych-Verb wie „gefallen“ ist allerdings so stark, dass man hier von einem Superioritätseffekt sprechen müsste: dass die Abfolge (4b) die unmarkierte ist, ist der bekannten Tatsache geschuldet, dass hier der Dativ Subjekt-Eigenschaften hat (also ein sogenanntes „quirky subject“ darstellt), und die nominativisch markierte NP als Objekt zu interpretieren ist. Im Gegensatz zu den oben betrachteten Fällen im Isländischen, wird hier eine OS-Abfolge allerdings als ungrammatisch bewertet.

3. Effekte durch extrem markierte Abfolgen?

Eine Schlussbemerkung sei noch im Hinblick auf Satz (5c) gestattet. Es zeigt sich, dass selbst diese höchst markierte Struktur in den slawischen Sprachen noch möglich ist. Man gewinnt den Eindruck, dass in dieser Sprachfamilie keine Abfolge wirklich ausgeschlossen wird. Auch dies ist ein Resultat, das so in der Literatur bislang nicht berichtet wurde. Selbst das ansonsten liberale Deutsche scheint, wie das Isländische, diese Abfolge nicht zu erlauben. Erstaunlich ist allerdings auch die relativ positive Bewertung dieses Satzes im Französischen, verglichen mit den oben gewonnenen Erkenntnissen. Hier stehen wir vor einem Rätsel.

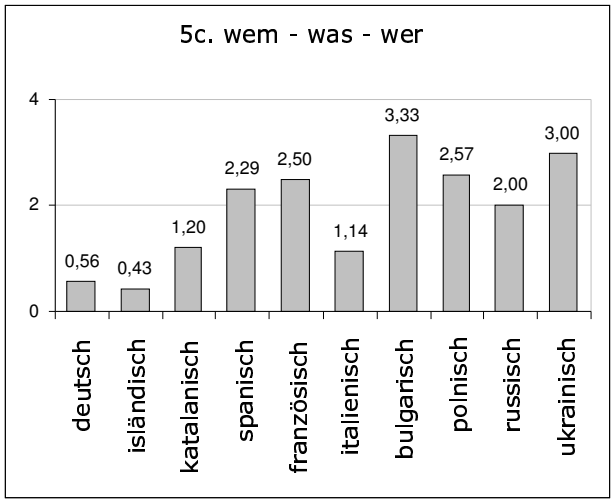

Abb. 7: Satz 5c - *Wem hat was wer gegeben?*

Grundsätzlich gilt es bei der Beurteilung der Fakten auch, Besonderheiten der jeweiligen Grammatiken mit zu berücksichtigen, die primär nicht mit dem Superioritäts-Problem zusammenhängen. So gewinnt man insbesondere bei einem ersten Überblick über die Daten, die Extraktion aus eingebetteten Sätzen betreffen, den Eindruck, dass hier die spezielle Syntax der Subordination einer Sprache wichtiger sein könnte für die Beurteilung der Daten als der Superioritätskontrast. Aufgrund damit zusammenhängender Unklarheiten wollen wir eine detailliertere Betrachtung der hier gewonnenen Daten zurückstellen und insbesondere durch weitere Studien ergänzen. Festzuhalten gilt als vorläufiges Fazit, dass wir Superioritätseffekte in einfachen Sätzen unter bestimmten „markierten“ Bedingungen beobachten:

- Wegfall der Nom-Akk-Distinktion im Italienischen und Französischen (1,5,7)
- mangelnder Belebtheitskontrast im Spanischen (2a,b)
- Verben mit quirky Subjekten im Isländischen (4)
- extrem markierte Abfolge im Deutschen und Isländischen (5c)

Wir beobachten solche Effekte nicht, oder eben nur in sehr schwacher Form in den slawischen Sprachen, wo solche Faktoren entweder nicht vorliegen, oder nicht als gravierend bewertet werden – aus Gründen, die zum Teil noch im Dunkeln liegen.

Ein anderer Aspekt, der für weitere Untersuchungen im methodischen Interesse Anlass gibt, ist der Kontrast zwischen den polnischen und den russischen Urteilen. Bei den InformantInnen handelt es sich hier um recht homogene Gruppen, Studierende der Informatik (Polnisch) bzw. (mehrheitlich) Geisteswissenschaften (Russisch). Da die slawischen Sprachen sich ja insgesamt recht einheitlich verhalten, wäre es möglicherweise lohnenswert, eine zweite Studie mit russischen Informatik-Studierenden und polnischen Philologie-Studierenden zu machen, und die Gruppen zu vergleichen. Es könnte sich herausstellen, dass der soziologische Unterschied zwischen den Gruppen einen viel grösseren Einfluss hat auf die Urteile, als der Unterschied zwischen den beiden Sprachen. Eine weitere Frage ist dabei, ob sich dieser Unterschied wirklich darin manifestiert, dass sprachliche Ausdrücke unterschiedlich beurteilt werden, oder bloss darin, dass *Bewertungsskalen* unterschiedlich verwendet werden. Letzteres ist ein Problem, das uns bei der Interpretation der Ergebnisse doch sehr im Wege steht. Wir haben keinerlei Anlass, davon auszugehen, dass der von uns verwendete Wert von 2,0 als Grammatikalitätsgrenze angemessen ist, oder dass die Skalen in allen Fällen so verwendet wurden, wie wir sie hier verwenden. Diese Unsicherheit betrifft nun aber den Kern linguistischer Theoriebildung: Grammatik-theoretische Modelle beruhen auf einem Begriff der Grammatikalität, der in der empirischen Realität so nicht ohne weiteres direkt aufzufinden ist. Das Superioritäts-Phänomen ist dafür ein hervorragendes Beispiel.

Appendix I: Liste von Beispielsätzen

(1) a. Wer kauft was?
b. Was kauft wer?

(2) a. Wer hatte wen getroffen?
b. Wen hatte wer getroffen?
c. Was hat wen getroffen?
d. Wen hat was getroffen?

(3) a. Wer hat wem geholfen?
b. Wem hat wer geholfen?

(4) a. Wer hat wem gefallen?
b. Wem hat wer gefallen?
c. Was hat wem gefallen?
d. Wem hat was gefallen?

(5) a. Wer hat wem was gegeben?
b. Was hat wer wem gegeben?
c. Wem hat was wer gegeben?

(6) a. Wer vertraute auf was?
b. Auf was vertraute wer?

(7) a. Wer hatte wo was gekauft?
b. Was hatte wer wo gekauft?
c. Wo hatte was wer gekauft?

(8) a. Wer weigert sich was zu tun?
b. Was weigert sich wer zu tun?

(9) a. Was glaubst du tat wer?
b. Was glaubst du daß wer tat?
c. Wer glaubst du tat was?
d. Wer glaubst du daß was tat?

(10) a. Warum lachte wer?
b. Wer lachte warum?

(11) a. Warum benahmen sich die Kinder wie?
b. Wie benahmen sich die Kinder warum?

(12) a. Welche Frau wundert sich wer was schrieb?
b. Welche Frau wundert sich was wer schrieb?

(13) a. Was hat welcher Mann gelesen?
b. Was hat welcher Mann wem gegeben?
c. Wem hat welcher Mann was gegeben?

(14) a. Wen weißt du nicht zu überzeugen was zu lesen?
b. Was weißt du nicht wen zu überzeugen zu lesen?

Literatur

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