

Exhaustiveness of Hungarian Focus. Experimental Evidence from Hungarian and German

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Abstract

Preverbal focus in Hungarian has been argued to be more exhaustive or exhaustive in a distinguished way as compared to what has been generally called prosodic focus in languages like English or German. In virtually all analysis it has been assumed that the reason for this property of Hungarian focus is related to its immediately preverbal syntactic position. This effect has thus been derived compositionally at the syntax-semantics interface as part of the truth conditional content of the respective sentences. In this paper I present new data from a pilot experiment that suggests that exhaustiveness is not part of the truth conditional content of sentences containing preverbal focus in Hungarian. The data also shows, however, that Hungarian focus is indeed somewhat more exhaustive than prosodic focus in German. Hence there is definitely something to say about exhaustiveness in Hungarian. Finally I present a new empirical puzzle emerging from the experimental data.

1 Introduction

In the literature about information structure it is widely known and accepted that Hungarian (and probably other languages as well) has a special kind of focus. The observation is this: if a focused expression appears in the immediately preverbal position as in (1) it is interpreted exhaustively, i.e. as if it were in the scope of ‘only’, while if it appears somewhere else as in (2) this exhaustiveness effect is not available (Szabolcsi, 1981).

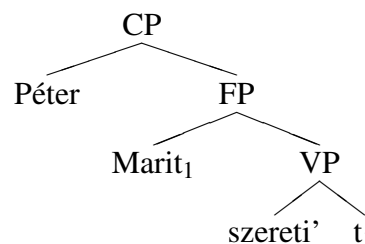
- (1) Péter [Marit]_F szereti.
Peter Mary.ACC loves
‘Peter loves Mary (and no one else).’
- (2) Péter szereti [Marit]_F.
Peter loves Mary.ACC
‘Peter loves Mary (and possibly someone else as well).’

Since arguably the immediate preverbal position is a specific focus projection and the focused expression appears in this position by virtue of focus-movement as roughly exemplified in (4), one can view preverbal focus in Hungarian as *structural focus* and may expect a generalization of the kind given in (3).

(3) **Generalization about structural focus:**

Structural focus is generally/always/context independently interpreted exhaustively while prosodic focus is not or not always exhaustive.

(4)



Since this generalization may not hold as solidly as one would expect, the somewhat looser notions of *identificational focus* vs. *information focus* have been introduced that capture this intuition but leave languages a bit more freedom in what exactly is coded by these different types of foci and how they are syntactically coded in languages. This way, English *it*-clefts have been argued to be instances of identificational focus while prosodic focus in English is probably thought of as an instance of information focus. This argument can be found most prominently and most influentially in É. Kiss (1998, 267):

Whereas languages with structural focus appear to be uniform in distinguishing between a preposed identificational focus and an in situ information focus, they differ with respect to the actual feature content of their identificational focus. [...] the identificational foci of different languages are specified for the positive value of either or both of the features [\pm exhaustive] and [\pm contrastive]. Furthermore, the feature complex associated with the identificational focus can be strong [...], triggering obligatory focus movement in syntax, or can be optionally strong or weak, allowing focus movement either in syntax or in LF.

In the literature on Hungarian focus, virtually every aspect of the argument sketched above has been criticized. It has been argued, that in fact only preverbal focus is focus in Hungarian while there is no such thing as ‘information focus’ which would appear post-verbally. It has been argued that identificational focus in Hungarian is indeed exhaustive but it appears preverbally not by virtue of focus movement but because of other specific features of the left periphery of Hungarian; namely a so called exhaustive-identificational projection (Horváth, 2006). It has been argued that identificational focus in Hungarian is indeed exhaustive, but only pragmatically and not semantically, as originally proposed (Wedgwood, 2005). It has been argued that exhaustiveness is rather irrelevant for

the discussion of the Hungarian data: the crucial point is rather that Hungarian focus-movement is driven by stress and not by some specific semantic feature (Szendrői, 2003). It has been argued that the major problem is not to derive exhaustiveness for preverbal focus (which would pragmatically follow anyway) but to understand what is going on with post-verbal focus (Onea, 2007) etc. Nevertheless, the classical view is still the most influential.

In effect, there is some agreement about the fact that Hungarian focus is *special* in some way that is clearly related to exhaustiveness but scholars are divided about the question how one could semantically and syntactically model this special feature of Hungarian focus.

What has not happened yet is a careful empirical discussion of the data. Instead linguistic introspection or information elicited from informants is generally used as primary piece of evidence.¹ However, this is not quite as straightforward as it may appear at the first glance. There are two reasons for this that are closely connected to the type of argument used. The way in which it has been argued that Hungarian focus differs from, say, English focus is that some test-sentences are acceptable in Hungarian which are not acceptable in English, or that some sentences are not acceptable in Hungarian whereas they are in English. But at the same time the following must also be considered:

1. such acceptability judgements (especially involving pragmatic phenomena) are mostly anything but clear yes/no issues and exhibit a large variance both within and between subjects.
2. independently of its alleged exhaustive interpretation, focus quite generally plays a role in discourse. Hence, viewing focus-examples in isolation may be misleading because discourse effects may interact with exhaustiveness effects.

Especially since we are dealing with a phenomenon intensely discussed over the past twenty years and more without any consensus, it is important to have a clear data background, so as to have a better view on what actually needs to be modelled. This paper is not an attempt to settle the data question once and for all but rather presents a first step. As such it is a part of a larger ongoing enterprise of experimental studies, cf. Onea and Beaver (2009) for further developments.

In this paper I will present some experimental data about the exhaustive feature of Hungarian focus. The experiment attempts to measure the degree of exhaustiveness of preverbal focus in Hungarian and compares the results with the results of the very same experiment run in German. The results are as expected to the extent that they confirm that Hungarian preverbal focus is more exhaustive than German prosodic focus. Unfortunately, '*more* exhaustive' does not mean 'exhaustive', since the results clearly show that in Hungarian preverbal focus is significantly less exhaustive than examples in which *only* overtly marks exhaustiveness. Moreover, it turns out that the degree of exhaustiveness is correlated to the presence of verbal prefixes. The results, hence, suggest

¹The only study (to my knowledge) that attempts an empirical discussion of the data is a corpus study in Wedgwood et al. (2006) which presents a number of examples that are not quite in line with the theoretical expectations of former studies. And, indeed, as one looks even at brief sequences of real, natural occurring text in Hungarian, exhaustiveness is not the kind of thing one could extract from these data as a characteristic feature of the focus occurrences.

that more needs to be said about Hungarian focus than has been said before. In particular, a more fine grained analysis is apparently needed that can account for effects like a possible interaction between the presence of verbal prefixes and focus interpretation, as suggested by the experimental data.

The structure of this paper is as follows: In the first section I will present the general exhaustiveness argument and the kinds of tests that have been used to show that Hungarian focus is exhaustive. Nevertheless, I will not enter the details of any particular analysis here. In this chapter I will also point out some shortcomings of these tests. In the second part I will present the experimental design and the results of the experiment that I have conducted and finally I will wrap up and discuss the new questions opened up by the results.

2 The exhaustivity argument

Preverbal focus in Hungarian has been argued to be exhaustive, i.e. the focused expression is interpreted as if it would be in the scope of an exhaustification operator roughly paraphrased as *only*. Hence, for (1) it is predicted that the hearer understands that Peter loves Mary and no one else. As mentioned above, the reason for this is that focus in the immediate preverbal position occupies a specific syntactic projection that provides the necessary exhaustiveness feature. Unfortunately, the argument is a bit more complicated. In order to illustrate this complication, let us consider the examples given in (5). These examples are interesting because they show the behavior of focused preverbal quantified noun phrases. We know that not all quantifiers support exhaustification as not all of them can be combined with ‘only’. For (5-a) it seems reasonable to assume that the focused quantifier phrase is interpreted exhaustively, for (5-b) this may make sense in particular contexts, although it is not easy to combine ‘many’ with ‘only’ even in contexts in which ‘many’ is contrasted to ‘all’. Finally, exhaustification simply does not make any sense for (5-c).

- (5) a. Péter [kevés lányt]_F szeret.
 Peter few girl.ACC loves
 ‘Peter loves few girls’.
- b. Péter [sok lányt]_F szeret.
 Peter many girl.ACC loves
 ‘Peter loves many girls’.
- c. Péter [minden lányt]_F szeret.
 Peter every girl.ACC loves
 ‘Peter loves every girl’.

As such this would suggest that preverbal focus cannot be exhaustive after all. But on a closer look it turns out that this observation about exhaustiveness correlates to hard distributional facts about these quantifiers. These distributional contrasts can be observed if the verbal predicate is complex. Verbal predicates in Hungarian can be simple as in

(5) or complex. Complex verbal predicates involve verbal particles used as prefixes or incorporated bare nouns. The particles that can be used as verbal prefixes are generally local prepositions that combined with a verb form a phonological word and give rise to often transparent complex meanings as in *ki* ('out') + *dob* ('throw') = *kidob* ('throw out'). There are two important facts to keep in mind about verbal prefixes in Hungarian:

1. Verbal prefixes mostly have an impact on the aspectual properties of verbal predicates in that simple verbs are mostly imperfective while verbs with prefixes are mostly perfective (non-eventive verbs are excepted from this generalization, see Kiefer (2006) for a very detailed overview). This aspectual effect is most clearly available for the prefix *meg* which has no spatial meaning at all and has the sole function of turning verbs perfective (and telic).
2. Verbal prefixes may appear post verbally under specific conditions as well. Incorporated bare nouns behave syntactically exactly like verbal prefixes but do not change the aspectual properties of the verbal predicates (cf. Farkas and de Swart (2003) for details and a semantic analysis).

After this short introduction to complex verbs in Hungarian the distributional differences between different focused preverbal quantifier phrases can be captured with the generalization given in (6). Hence, as shown in (7) verbal prefixes appear post-verbally with 'few' and preverbally with 'every' while they can appear both pre- and post-verbally with 'many' depending on the appropriate interpretation.

(6) **Generalization: Verbal prefixes and exhaustiveness**

If a preverbally focussed quantifier phrase is interpreted exhaustively and the verbal predicate contains a verbal prefix (or a bare noun) the prefix (or the bare noun) will appear post-verbally. If a preverbally focussed quantifier phrase is not interpreted exhaustively the verbal prefix (or bare noun) remains in its default preverbal position.

- (7)
- a. Péter [kevés lányt]_F (***meg**-)csókolt **meg**.
Peter few girl.ACC kissed meg
'Peter kissed few girls'.
 - b. Péter [sok lányt]_F (**meg**-)csókolt (**meg**).
Peter many girl.ACC kissed meg
'Peter kissed many girls'.
 - c. Péter [minden lányt]_F **meg**-csókolt(***meg**).
Peter every girl.ACC meg-kissed
'Peter kissed every girl'.

The generalization in (6) has usually been treated as a test in the literature. The distribution of the verbal prefixes has been taken to show whether the focused expression appears in the focus-position or some other quantifier position. Crucially, the reason why

a focused quantifier phrase appears in these positions is different: if it is in the focus position the reason for the movement that results in this overt structure is exhaustiveness whereas in other cases we have a case of quantifier raising which is independent of focus movement, and hence a case of *in situ* focus. When speaking about preverbal focus in Hungarian I will not refer to these cases and simply ignore them for the rest of this paper.

This specific observation about the related distribution of quantifiers and verbal prefixes is the most powerful argument for the semantic exhaustiveness of preverbal focus in Hungarian, but at a closer look, the argument is not as clear as it may seem. It turns out, for instance, that it is not a trivial task to state the difference between exhaustive and non-exhaustive readings of ‘many’. In Onea (2008) I proposed an alternative analysis that moves the focus of attention away from exhaustiveness feature as such and rather concentrates on the discourse function of the focused expressions. The explanation of the contrast in (7) proposed there is as follows: if ‘many girls’ is used to answer a *wh*-question (‘How many?’) directly, the prefix appears post-verbally, while if the quantifier phrase is an indirect answer to the same question, the prefix appears preverbally. The direct answer could be paraphrased such that ‘many’ is actually perceived as the answering constituent and with this answer the question is no longer open. An indirect answer could be understood as a hint that there were too many girls Peter kissed for the question to be reasonable. A direct answer to a *wh*-question is often understood exhaustively, hence, in a way this observation still fits the generalization stated above, although the notion of exhaustiveness must be understood in somewhat looser terms that would need to be made precise by any theory claiming that preverbal focus in Hungarian is exhaustive. A more convenient way would be to leave the notion of exhaustiveness as strong as usually but to assume that it is something Hungarian focus is only associated with pragmatically, crucially in a defeasible way.

But then again, there are some other exhaustiveness arguments to handle. For instance Szabolcsi (1981) argues that the sentence in (8), which is perfectly fine in Hungarian, would be a contradiction and hence infelicitous if the focused element ‘Peter’ was not interpreted exhaustively. As with the previous one, this argument has also been challenged in the literature.

- (8) Nem [Péter]_F aludt a padlón, hanem Péter és Pál
 Not Peter slept the floor-on but Peter and Paul
 ‘It wasn’t Peter who slept on the floor, but Peter and Paul.’

In Onea (2007) I have argued that under specific conditions such a sentence is also felicitous in languages in which a strict exhaustive focus interpretation has never been claimed: in particular I have claimed that such sentences are acceptable in German exactly if they refer to a singular event in which Peter and Paul are participating together. In these cases exhaustiveness would be coded independently of focus. Such event related features have recently been argued to be responsible for exhaustiveness inferences in Kratzer (2009) as well. Moreover, in Onea (2007) I argue that such sentences are only acceptable in Hungarian under such readings as well, hence (8) means that Peter and Paul are the participants of the same sleeping event. This intuition has been challenged by Anna Szabolcsi (p.c.). This is an important data question, which should be experimentally tested, but this goes beyond the scope of this paper.

While every single argument for semantic exhaustiveness of preverbal focus in Hungarian is controversial in my view, it is generally beyond controversy that Hungarian focus is exhaustive in some way or another. The controversy starts with the question of how this effect should be modelled. Without entering the details of the derivations proposed by different scholars, two possible positions can be distinguished: a) either the exhaustiveness effect is part of the truth conditional content of the respective sentences or b) it is a pragmatic effect. In the first case the exhaustiveness effect must be derived at the level of semantic composition. There are several ways of doing this including an exhaustiveness operator as originally proposed in Szabolcsi (1981) or an operator of exhaustive identification as recently proposed by É.Kiss (this volume). In the second case exhaustiveness does not need to be derived at the level of truth conditional content. However, if the intuition that exhaustiveness is a systematic effect associated with Hungarian focus is correct even a pragmatic account of exhaustiveness may need to derive a property *X* of sentences containing preverbal foci such that this property can trigger a systematic exhaustiveness effect in most if not all contexts. Such a property would need to be either some discourse property that could be described e.g. in terms of a question-answer paradigm, some event structure related property as proposed in Onea (2007) and Onea (2008) or an information processing related property of sentence meaning such as being the main predicate and hence the most relevant predication with respect to the conversational tasks, as argued in Wedgwood (2005). Note that the only fully explicit pragmatic account at this point is the latter.

This controversy can be understood in quite different ways but one fairly natural way to see it is that the question at issue is whether exhaustiveness is part of the context dependent or context independent meaning of sentences. Or put in another way, whether the exhaustiveness inference is an entailment of the semantic value of sentences containing preverbal focus or an entailment of the semantic value of sentences containing preverbal focus and some additional contextually given premises and possibly even more general conversational principles.

Another way to understand the issue is to draw the distinction not between context dependent and context independent meanings but rather between different ways of interaction with context. This way of thinking could have two reasons. The first one is that there are reasons to assume that truth conditions are not something that sentences generally have *per se* but rather some kind of contextual enrichment is mostly necessary in order to get actual truth conditions from the semantic value of sentences, e.g. in the sense that a number of implicit variables must be bound by context for the sentence to actually arrive at type *t*. The second one is more specific to exhaustiveness: even in the first case, if exhaustiveness is semantic in nature, exhaustiveness is still context dependent since it is to be understood as quantification over context dependent sets. Crucially, however, in the second case, if exhaustiveness is pragmatic, exhaustiveness is a defeasible, context dependent inference in a way in which the first one is not. Hence, an exhaustive interpretation may be facilitated but not determined by the linguistic form.

Put in more standard terms of truth conditional semantics the theoretical decision problem is this: either the exhaustiveness inference is an entailment (or a presupposition) or it is an implicature. In the next section I will present experimental data supporting the latter view.

3 The experimental results

Experimentally testing exhaustiveness involves some difficulties. The main difficulty is that as argued in Grice (1967) according to the principles of rational communication people will say neither more nor less than is necessary for achieving their communicative tasks. This means that the hearer can generally conclude that there is no relevant information that the speaker withholds and that everything the speaker says is relevant. But then this also means that generally the information will be understood as exhaustive whenever being non-exhaustive would mean that the speaker withholds relevant information. If this is correct, testing any exhaustiveness effect that goes beyond this general tendency must be a nontrivial task, because we expect people to interpret utterances as exhaustive relevant to the task of the conversation anyway. Hence, if a subject hears that Peter has two children he is expected to assume that he has no more and no less than two children regardless of focus.

Moreover, focus plays a role in indicating the communicative task in the sense that it indicates what the question under discussion is (Beaver and Clark, 2008) or, put in less functional terms, intonation is at least sensitive to the communicative task, hence it is expected to interact with exhaustiveness inferences. As such it has been argued by van Kuppevelt (1998) that even scalar implicatures only arise if the scalar item is an answer to a question, and to a certain degree experimental evidence for this claim has been presented e.g. in Zondervan (2007). Hence, regardless of any particular theory of focus interpretation some pragmatic tendency to interpret focused expressions as exhaustive is expected simply because a non exhaustive relevant (since potentially an answer to a question) information is less likely to be used in successful communication.

The task of the pilot experiment I present in this paper is therefore not to show whether there are any exhaustiveness effects associated with preverbal focus in Hungarian but rather to decide whether these effects are truth conditional or not.

3.1 The theoretical background

In the literature it is an open question whether it makes sense to assume that sentences generally have truth conditions. The intuitive argument for assuming that sentences have truth conditions is that people are generally able to decide whether a sentence is true or false in a given situation and that people use language to communicate content, i.e. information, which is most naturally modelled in terms of propositions. The major argument against the assumption that sentences have truth conditions is that the intuitive answer to the question whether a sentence is true or not in a given situation is often context dependent. See Cappelen and Lepore (2005) for a detailed discussion of the controversy.

In this paper I will assume that truth conditions are useful to determine the linguistic meaning of sentences, in particular I will assume that sentences have at least truth conditional content (if not fully specified truth conditions) and whether or not hearers contradict a sentence given a particular situation which at the same time is also the extra-linguistic context of the utterance can be used as a test to decide whether some particular (alleged) inference that is contradicted by the situation is part of the truth conditional content of a sentence or not.

Put in another way: if people tend to contradict a sentence and in a particular situation without further context, there is reason to doubt that in that particular situation the sentence is true.

Of course, this is not a matter of necessity, since people may contradict certain utterances for quite different reasons. In addition, we may assume that context plays a role in establishing the truth conditions of sentences, in the sense that whatever is missing from the sentence meaning but is needed to get a proposition is given by the context. If so, it may also be the case that the fact that people contradict a sentence merely signals that they construct contexts in which the sentence is not true given the particular situation. But let us assume that context plays only a partial role in establishing the truth conditions of a sentence, i.e. not everything depends on the context. Let us also assume that people do not have a default tendency to construct contexts in which a sentence is not true given a particular situation: i.e. if it does not cost 'too' much they will rather construct contexts in which the sentence is true. For instance assume that someone is given the sentence in (9) and he knows that Peter actually weighs 87 kg. Of course a context could be imagined in which this sentence is true, namely if the topic of discussion is the weight of people on a distant planet slightly smaller than the Earth such that on this planet Peter actually would weigh exactly 70 kg. But imagining such a context is not something we can expect from a hearer of (9), because such a context is not a usual one. Hence the hearer would rather contradict (9).

(9) Peter weighs 70 kg.

Under these two assumptions, if speakers of a language tend to contradict a sentence given a particular situation, one can conclude that there is some kind of *inherent incompatibility* between the meaning of the sentence and the situation. This kind of inherent incompatibility can be seen as an incompatibility between the truth conditional content of the sentence and the situation.

The same applies to the opposite. If speakers generally tend to accept a sentence given a particular situation, this in itself does not prove that the sentence is truth conditionally compatible with the situation, but it certainly gives us no reason to doubt this. Of course, the reasons not to contradict a sentence may be various, stretching from lack of interest in achieving a common ground to reasons of politeness, but if there is reason to believe that people do contradict false sentences regularly in a certain experimental setup then these considerations may be neglected.

In addition I assume that contradicting an utterance is an extreme measure in communication at least as far as social normative aspects for Hungarian and many other

languages are concerned. There may be a whole array of disagreement or misscontent regarding an utterance for which an overt contradiction may generally not be chosen. Assume for instance that an utterance is misleading or not relevant for the tasks of the communication. In this case the hearer may choose not to contradict the sentence but rather to choose a *yes, but* type of answer, which on the one hand signals his misscontent but on the other hand avoids contradiction. I further assume that overt contradiction (*no*) is reserved for more serious types of misscontent. If there is at least a kernel of truth in these assumptions, one can conclude, that in a 0-context contradiction is more likely to be a signal of falsity while *yes, but* answers generally signal some kind of pragmatic oddity with respect to the constructed context in which the hearer interprets the sentence.

Of course, one may still contradict a true utterance for being pragmatically odd and in fact one may also accept a false utterance, but if these assumptions are correct, I predict at least some statistically relevant correlation between falsity and the tendency to contradict, truthfulness and the tendency to accept and pragmatically misleading nature and *yes but* answers.

For the task at hand, i.e. experimentally testing whether exhaustiveness effects in Hungarian are truth conditional or not, I conclude that whether and how speakers contradict focus utterances given a situation in which the sentence is otherwise true but not exhaustive can be used as a test. If in such a situation speakers of Hungarian choose to systematically contradict sentences with preverbal focus the conclusion seems plausible that exhaustiveness is a truth conditional effect while if this is not the case this can be treated as counter evidence, if the experimental setup can rule out other reasons for not contradicting false utterances.

3.2 The experimental setup

In the pilot experiment that I conducted Hungarian speakers were confronted with pictorial stimuli² showing a number of 2-4 persons fulfilling some activity (e.g. running after a ball) or having some property (e.g. holding a banana) such that more than one person is involved as an agent in the activity or has the particular property. In addition, the participants were confronted with audio stimuli³ containing one spoken sentence in three different conditions:

- In the first condition the subject of the sentence is modified by *csak* ('only') and receives a focus intonation as in (10).
- In the second condition the subject of the sentence receives a focus intonation as in (11) and appears in the immediately preverbal position but there is no ('only').
- In the third condition the subject of the sentence has default intonation as in (12) and does not occupy the immediately preverbal position. If the verb is transitive the object appears post-verbally.

²The stimuli were kindly painted by Anna Volodina from the University of Frankfurt specially for this experiment, hence the availability of pictorial stimuli was not a criterion in the choice of the stimuli

³The audio stimuli were recorded in Audacity (<http://audacity.sourceforge.net/>) by myself as a native speaker of Hungarian and independently checked for the correct intonation by an additional native speaker

In all of these cases the pictorial stimulus shows that the subject of the spoken sentence has the property asserted by the sentence but there is always at least one additional person who has the same property. Hence, sentences in the first condition, which I will refer to as *only*-sentences are false, sentences in the third condition, which I will refer to as *normal* sentences are true but eventually pragmatically misleading and sentences in the second condition which I will refer to as *focus*-sentences are false or misleading depending on whether the exhaustiveness feature is part of the truth conditional content or not.

- (10) Csak PÉTER verte meg Jancsit.
Only Peter beat.PAST PRF John.ACC
'Only Peter has beaten up John.'
- (11) PÉTER verte meg Jancsit.
Peter beat.PAST PRF John.ACC
'It is Peter who has beaten up John.'
- (12) Péter meg-verte Jancsit.
Peter PRF beat.PAST John.ACC
'Peter has beaten up John.'

The task of the participants was to choose one answer to the spoken stimulus from three proposed alternatives. The alternatives asserted the missing information, namely that the other person on the picture also has the asserted property but differed in that the degree of acceptance of the spoken stimulus. The first alternative was a *yes, and* answer as in (13), the second alternative was a *yes, but* answer as in (14) and the last alternative was a *no* answer, i.e. a clear contradiction, as in (15). Note that the alternatives were always presented in the same order. The reason for the decision not to randomize the alternatives was twofold: on the one hand I wanted to avoid the possibility that because of the very high visual similarity of the alternatives subjects would make mistakes especially in the later stages of the experiment because of missreading the alternatives and on the other hand I wanted to avoid any kind bias towards *no*-answers and have a consequent bias towards *yes, and* answers. Hence, if someone has chosen a *no*-answer there must have been a good reason for this. Indeed, more *yes, and* answers were given than expected, but in the overall this eventual bias did not have any effect on the results, since people consequently have chosen no answer for the *only*-sentences.

- (13) Igen, és Misi is meg-verte Jancsit.
Yes and Misi too PRF beat.PAST John.ACC
'Yes, and Misi has beaten up John too.'
- (14) Igen, de Misi is meg-verte Jancsit.
Yes but Misi too PRF beat.PAST John.ACC
'Yes, but Misi has beaten up John too.'
- (15) Nem, Misi is meg-verte Jancsit.
No Misi too PRF beat.PAST John.ACC
'No, Misi has beaten up John too.'

In the experiment 8 lexicalizations for each condition were set up. The experimental software⁴ randomly chose 2 stimuli for each condition, that is a total number of 6 stimuli for each participant, as well 6 control sentences and 13 fillers. This total set of 25 stimuli was presented in a random order.

There were 22 participants aged 17-65 whereby 12 of them participated in the experiment under supervision in Budapest and 10 without supervision. There were no noticeable differences between the answers of these groups. 2 supervised and 1 unsupervised participant needed to be excluded from the results because of mistakes in the control stimuli, hence in the end the results are based on 19 participants. For this reason the experiment can only be considered a pilot study and is not supposed to give definitive clarity on the topic of investigation.

For purpose of comparison exactly the same experiment has been repeated in German with translated experimental items.⁵ The major difference was that in German there is no particular preverbal focus position. Instead focus intonation (A-accent) on the subject was used in analogy to the *focus* sentences in Hungarian, and default intonation without an A-accent on the subjects was used as analogon to the *normal* sentences in Hungarian. Hence, here preverbal focus in Hungarian has been compared to prosodic focus in German. For German the number of participants was even more restricted, in fact there were only 12 undergraduate students, but even with these low numbers a very clear difference to the Hungarian data could be achieved.

3.3 The results

The experimental results clearly show that a) preverbal focus in Hungarian is significantly less likely to be contradicted for not being exhaustive than only sentences and b) the exhaustiveness effect associated with preverbal focus in Hungarian is much clearer than the exhaustiveness effect associated with prosodic focus in German.

The detailed results of the experiment for Hungarian are shown in the following table. The given numbers are absolute numbers. The table clearly shows that there is a preverbal focus effect regarding the tendency of subjects to contradict sentences that are not exhaustive as compared to the normal case where there is no preverbal focus, but this effect is not comparable to the effect of an explicit *only*. If *only* is present nearly all answers were *no*-answers, while in the focus case most answers are *yes but* answers. A statistical analysis shows that these results are significant (provided that the chi-square test can be applied to such a low number of datapoints): ($\chi^2(2) = 20.17$ $p < 0.01$). Note that there is a very clearly observable effect of preverbal focus as well, since most people did not simply accept the sentences but gave *yes but* or *no* answers in the preverbal focus condition, while more than half of the subjects gave a *yes and* answer in the normal case. This effect is not statistically significant because of the low quantity of datapoints but confirms the expectation that preverbal focus has some effect on exhaustiveness.

⁴I have used a self programmed experimental software. The source code of the experimental software is available on www.ilg.uni-stuttgart.de/mitarbeiter/onea

⁵The audio stimuli for German were kindly recorded by Barbara Schlegel from Radio Regenbogen.

Experiment/condition	only	focus	normal
yes and	2	8	16
yes but	1	15	10
no	27	7	4

In the following table the analogous results for German are presented. The table shows that in German the difference between the *only* and the *focus* conditions is similarly clear as in Hungarian. Significantly less clear is the effect of focus on exhaustiveness. The very few data seem to suggest that in German such an effect is somewhat smaller than in Hungarian.

Experiment/condition	only	focus	normal
yes and	0	7	11
yes but	0	7	4
no	15	1	0

The results are summarized in a somewhat more intuitive way by means of an average number that I obtained by assigning *no*-answers the value 3, *yes but* answers the value 2 and *yes and* answers the numeric value 1. The average number gained this way can be considered a rough exhaustiveness measure, the higher the number, the more exhaustive the sentence seems to be judged by the experiment participants. Here, the difference in exhaustiveness between German and Hungarian focus sentences (where the Hungarian sentence has a preverbal focus) is much clearer, hence it seems that preverbal foci in Hungarian are interpreted more exhaustively than prosodic focus in German. Again, this is only a tendency observable from the few datapoints I have and needs to be proven in a follow up experiment.

Experiment/condition	only	focus	normal
Hungarian <i>no context</i>	2.7	1.97	1.6
German <i>no context</i>	3	1.6	1.27

While these results clearly indicate that Hungarian focus is not semantically exhaustive in the sense that exhaustiveness is not part of the assertion of a Hungarian sentence containing a preverbal focus, these results are compatible with the claim that structural, i.e. preverbal focus in Hungarian is indeed special as claimed by Szabolcsi and É. Kiss in a number of works, in that it is more exhaustive than prosodic focus in other languages like German and (presumably) English. But if the difference is not a semantic difference, the question arises, what could be the reason for the observed difference in exhaustiveness.

In Onea (2008) I have argued that the exhaustiveness feature of Hungarian sentences may be related to aspectual properties associated with verbal predicates although a complete analysis has not been presented. A closer look at the experimental data suggests that the hypothesis assumed there may be indeed on the right track, since for those stimuli in which verbal prefixes are present the exhaustiveness effect seems higher than for those in which no prefixes are available. In the following table the results for the second condition (the sentences containing preverbal focus) are split up depending on the presence [+prefix] or absence [-prefix] of verbal prefixes. Unfortunately the extremely low number of datapoints does not allow any safe generalization. However the fact that the data are in line with that hypothesis is interesting and needs further investigation.

Experiment/condition	preverbal focus [+prefix]	preverbal focus [-prefix]
yes and	5	1
yes but	7	6
no	3	4

4 Summary and open issues

In this paper I have presented experimental evidence from a pilot study that preverbal focus in Hungarian is not semantically exhaustive. The experimental results also show that preverbal focus in Hungarian is more exhaustive than prosodic focus in German. Hence, the intuition of a number of scholars working on Hungarian focus that preverbal focus in Hungarian is special i.e. exhaustive in a distinguished way as compared to prosodic foci in some other languages such as German or English is correct.

I interpreted the experimental results such that the exhaustiveness feature of preverbal focus in Hungarian is pragmatic for the simple reason that it is not strong enough to be part of the truth conditional content of the sentence. However the experimental results also show that there may be a structural factor involved as well, since in those cases in which verbal prefixes are present the exhaustiveness level of preverbal focus in Hungarian appears to rise. Whether this effect is really systematically available or whether it is a mere coincidence, remains to be clarified by further research. There are, however, at least two possible explanation for this effect: i) either it is due to the fact that in case the verbal prefix is present the participants more clearly observe that the expression is at a specific structural position due to the inversion in the word order between verb and prefix or ii) the aspectual properties of Hungarian semantically interacts with focus interpretation given rise to a stronger exhaustiveness effect.

In order to distinguish between these hypothesis a number of open questions must be clarified: Does this effect appear with incorporated bare nouns as well, which syntactically behave similar to prefixes but do not have any aspectual role? Does the effect appear with object foci as well? Is the effect constrained to eventive verbs or is it still observable in the case of stative verbs with prefixes as well? Only after these questions are empirically settled can a complete analysis of the focus effects in Hungarian be given.

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