USING FOCUS TO IMPROVE DEFINITION: WHAT COUNTS IN HUNGARIAN QUANTIFICATION*

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Abstract

Szabolcsi (1997a) proposes that some left-peripheral syntactic positions encode not compositional semantic information, but different *procedures* for the assessment of truth conditions. These procedures are said to be reflected in the range of quantified noun phrases that may appear in certain positions in the pre-verbal field in Hungarian. While one of Szabolcsi's proposed procedures correctly predicts a monotonicity-based constraint on the quantifiers appearing in certain positions, her other procedure is too vaguely defined to produce useful predictions. I argue that the appropriate procedure in this latter case is the same as the one that produces 'narrow focus' interpretations and that the related position that Szabolcsi proposes for quantificational processes is nothing other than the well-known 'focus position' of Hungarian. Apparent interpretive differences between the relevant quantificational phrases and other uses of syntactic focus follow naturally from an inferential pragmatic approach to this position. This has important theoretical implications: an inferential analysis of syntactic focus requires (1) a 'dynamic', parsing-based view of the relationship between syntax and semantics and (2) a re-alignment of the burden of explanation between linguistically encoded semantics and inferential pragmatics. An analysis of this nature proves to explain the quantifier distribution facts and a number of other syntactic phenomena in an extremely parsimonious fashion.

1 Background

The structure of the Hungarian sentence, as viewed by Szabolcsi (1997a), can be summarised as in the template in (1) (where an asterisk is the Kleene star, signifying the possibility of iteration). This article concentrates on the pre-verbal field, in particular on contrasts between TopP and QP, on the one hand, and PredOp and Focus, on the other[1]. In (2)–(5), an example of the use of each putative syntactic position is given.

(1) (Top[ic]P*) (Q[uantifier]P*) (PredOp) (Focus) V (XP*)

(2) **TopP:** [*Kati*] ***meg****ijedt*.
Kati VM-feared
'Kati was frightened.'

(3) **QP:** [*Minden gyerek*] ***meg****ijedt*.
every child VM-feared
'Every child was frightened.'

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[1]Szabolcsi (1997a) in fact refers to TopP and QP as 'RefP' and 'DistP', respectively. I employ the better known and more transparent terminology of É. Kiss (1987) for essentially the same positions. For the distinction between TopP and QP, which is beyond the scope of this article, see the above-cited works and É. Kiss (2002).

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(4) **PredOp:** [*Kevés gyerek*] *ijedt* ***meg***.
few child feared VM
'Few children were frightened.'

(5) **Focus:** [*Kati*] *ijedt* ***meg***.
Kati feared VM
'It's KATI that was frightened.'

It is immediately obvious that the four positions split into two groups, according to the position of any 'verbal modifier' (VM), such as the aspectual particle *meg*, shown in boldface in (2)–(5)[2]. VMs appear left-adjacent to the tensed verb except in the presence of a PredOp quantifier or a syntactically focused expression, when the VM appears post-verbally. This is line with the fact that foci and PredOp quantifiers are themselves strictly left-adjacent to the tensed verb[3]. Alongside strict adjacency and some prosodic cues, the position of any VM therefore provides a diagnostic for the use of PredOp or Focus. Below, in section 2, I argue that this structural indicator has a unique significance: PredOp and Focus are the same position.

Szabolcsi (1997a), discussing only quantificational issues, argues that the effect of moving a quantified noun phrase (QNP) to TopP/QP is to cause it to undergo a certain kind of semantic assessment procedure; moving a QNP to PredOp causes it to be interpreted by a different procedure (the procedures themselves are outlined below). Hence, Szabolcsi's proposal contrasts with the more common approach to semantics, which assumes that the lexical and syntactic elements of natural languages declaratively encode pieces of compositional semantic information. I believe that Szabolcsi's use of procedural encoding represents a very valuable insight, but one which she applies at an inappropriate level: the quantificational phenomena that she discusses are actually mere manifestations of much more fundamental procedures.

Szabolcsi's primary aim is to explain the existence of a number of restrictions on the kinds of QNP that can appear grammatically in the different syntactic positions in (2)–(5). Encoded semantic procedures potentially provide an explanation, because some QNPs are incompatible with semantic assessment by certain procedures. Szabolcsi is able to define some such incompatibilities by reference to standard Generalised Quantifier (GQ) theory. However, the set of QNPs appearing grammatically in the PredOp position appears to defy categorisation in terms of GQ theory and Szabolcsi resorts to classifying these as 'counting quantifiers', a classification that lacks any clear definition. Below, I argue that restrictions on appearance in PredOp can be defined in terms of GQ theory, as long as the structural properties of QNPs are also taken into account, and that this reflects a basic procedure which applies to *all* expressions that are left-adjacent to tense in Hungarian, including foci.

The nature of the Hungarian pre-verbal field is of interest far beyond the study of this one language. Beghelli and Stowell (1997) assume rich LF structure for languages like English (with associated covert QNP movement) partly on the basis of Szabolcsi's analysis of Hungarian. Meanwhile, the widespread analysis of the 'focus position' as a dedicated FocusP projection has led to highly influential theories of 'the fine structure of the left periphery' (e.g. Rizzi 1997, citing Hungarian as the primary evidence for such projections in universal grammar). Therefore, if the pre-verbal positions of Hungarian prove to require a quite different kind of analysis, significant elements of current approaches to the syntax-semantics interface must be called into question—indeed, my proposals point to a need for fundamental changes of perspective.

[2]In addition to a class of directional/aspectual particles, VMs include resultative secondary predicates, determinerless object nominals and certain adverbial phrases.

[3]More accurately, there are only two entities that can intervene between such expressions and the tensed verb: the negative particle *nem* and a clitic-like particle, *is*. These exceptions are explained in Wedgwood (2003).

2 Restrictions on QNP distribution and Szabolcsi's procedures

2.1 QNPs in TopP/QP

Szabolcsi (1997a) observes that only QNPs with monotone increasing (upward entailing) quantifiers are found in TopP and QP; QNPs with monotone decreasing (downward entailing) or non-monotonic quantifiers are ungrammatical in these positions. Some illustrative examples are given in (6) and (7).

(6) *Több, mint hat diákunk* ***félre****értette* *a kérdést.*
more than six student-1PL aside(VM)-understood the question-ACC
'More than six of our students misunderstood the question.'

(7) **Kevesebb, mint / *Pontosan hat diákunk* ***félre****értette* *a kérdést.*
fewer than precisely six student-1PL aside(VM)-understood the question-ACC
Intended: 'Fewer than six / Precisely six of our students misunderstood the question.'

Some QNPs can occur in either QP or PredOp. These have a distinct interpretation in each position. The difference seems to be based on whether or not the QNP is used to refer to a closed set of entities. This is demonstrated by Szabolcsi's 'others' test, as in (8) (I give speaker B's contributions only in English, as the meaning alone is at issue here).

(8) a. **A:** *Több, mint hat diákunk* ***félre****értette* *a kérdést.*
more than six student-1PL aside(VM)-understood the question-ACC
'[$_{QP}$ More than six of our students] misunderstood the question.'
B: …"Maybe you'll find others too."

b. **A:** *Több, mint hat diákunk* *értette* ***félre*** *a kérdést.*
more than six student-1PL understood aside(VM) the question-ACC
'[$_{PREDOP}$ More than six of our students] misunderstood the question.'
B: # …"Maybe you'll find others too."

Szabolcsi concludes from this evidence that the QNP contributes its semantics to the sentence in different ways, according to its syntactic position. A QNP in TopP or QP appears to introduce a set referent, with the rest of the sentence predicating something of this set. A PredOp QNP, on the other hand, seems merely to specify the cardinality of some set denoted by the rest of the sentence. It follows that if the quantifier, like *more than six*, has no upper bound, then no closed set is invoked in PredOp and reference to 'others' will be infelicitous, as in (8-b). The different positions thus encode two procedures, described in Szabolcsi's own words as follows:

(9) **TopP/QP**: "start out with a set determined by the quantifier and check its members for some property" (1997a, 125)
PredOp: "[perform] a counting operation on the property denoted by the rest of the sentence" (1997a, 122)

In more technical terms, the TopP/QP procedure involves predicating over a *witness* of the QNP. That is, in contrast to standard representations of GQs, the value of the quantifying determiner is not assessed with respect to the composite semantic contribution of the rest of the sentence. Rather, the QNP as a whole contributes a set as a logical subject of predication. In terms of the tripartite structure of quantification, this means that the quantifier combines with its restrictor to produce a witness set and the nuclear scope then predicates over this set.

As Szabolcsi notes, this explains the monotonicity-based constraint on appearance in TopP or QP, for the following reasons. With upward entailing quantifiers, predicating over a witness set produces the correct truth conditions, irrespective of the cardinality of the intersection of the restrictor and nuclear scope. With other quantifiers, however, the truth conditions of the sentence depend upon the cardinality of this intersection.

For example, the upward entailing QNP *at least two students* may have as a witness the set $\{kenny', henry'\}$, assuming that both Kenny and Henry are students. To assess the truth of the proposition 'At least two students smoke' with respect to this set one may simply check the set of smokers for Kenny and Henry. In contrast, the truth of the proposition 'Exactly two students smoke' cannot be established in this way, even though the set $\{kenny', henry'\}$ fulfils the criteria for a witness of the non-monotonic QNP *exactly two students*. In this case it also matters whether or not there exist other student smokers—that is, the cardinality of the intersection of the restrictor and the nuclear scope must be established—so the sentence cannot be assessed simply by predicating over a closed set.

Though Szabolcsi (1997a) concentrates on the formal properties of witness sets, there is a clear intuitive connection between predicating over a witness set presented as the denotation of a QNP and the notion of that QNP being the 'topic' of the sentence. This mode of semantic assessment amounts to investigating the properties of some identifiable set without regard to the rest of the model. The various characteristics of topics—'aboutness', 'discourse-linked' status, specificity—are all to some extent implied by some part of this description. As my primary aim is to explain the nature of PredOp/Focus, rather than TopP/QP, I shall not pursue this subject, beyond noting that the connection between the witness set mode of interpretation and the notion of topichood seems fairly direct[4]. It may well therefore be unnecessary to posit the encoding of any more detailed semantic information in TopP and QP in order to derive the essential properties of topics (especially given the likely addition of further information in use by inferential pragmatic means).

2.2 QNPs in PredOp/Focus

There is no monotonicity-based constraint on QNPs in PredOp (which I show below to be identical to Focus). Among the expressions that appear unproblematically in this position are QNPs with monotone increasing quantifiers, as seen already in (8-b), and with monotone decreasing and non-monotonic quantifiers, as shown in (10).

(10) *Kati kevesebb, mint öt / pontosan száz szavakat írt le.*
Kati fewer than five exactly hundred words-ACC wrote down(VM)
'Kati wrote down fewer than five / exactly a hundred words.'

QNPs that cannot appear in PredOp/Focus include those with universal quantifiers and *a legtöbb N* 'most N'. Such QNPs provide initial evidence in favour of treating PredOp and Focus as a single position: they are unable to appear in the immediately pre-verbal, VM-inverting position even under an explicitly contrastive focus reading, as shown in (11)—so the same constraints seem to apply to Focus and the putative PredOp.

(11) *Minden gyerek megijedt / #ijedt meg.*
every child VM-feared feared VM
For: 'EVERY child got frightened (e.g. not just the girls).'

[4] See Ebert and Endriss (this volume) for a technical development of the use of witness sets to capture the notion of topichood.

Universal quantifiers and 'most' belong to a well-known class within GQ theory: proportional (i.e. non-intersective) quantifiers. However, Szabolcsi (1997a) points out a number of examples which show that proportional QNPs are not barred from PredOp/Focus. For example, *kevés N* 'few N' may be found in this position. Szabolcsi also notes examples like (12).

(12) *A fiúknak több, mint 50 százaléka értette félre a kérdést.*
the boys-DAT more than 50 percent-3PL understood aside(VM) the question-ACC
'More than 50% of the boys misunderstood the question.'

The QNP here is not only proportional but also, by most definitions, denotationally equivalent to a QNP that cannot appear in PredOp/Focus: *a legtöbb N* 'most (of the) N'. This kind of example prompts Szabolcsi to conclude that we must look beyond denotational semantics in order to define the class of QNPs that may appear in PredOp (and thereby reveal the encoded procedure that, by hypothesis, underlies this class).

Szabolcsi in fact claims that only 'counting quantifiers' are permitted in PredOp. It is not clear how this category might be defined. It is difficult to see how any definition of 'counting' could distinguish between *kevés N* 'few N', which occurs grammatically in PredOp/Focus and *a legtöbb N* 'most (of the) N', which cannot. In any case, given the evidence presented below for the unification of Szabolcsi's PredOp and Focus, the nature of the position cannot be defined in purely quantificational terms.

3 PredOp and Focus unified as a procedure

In order to understand the class of QNPs that appear in Szabolcsi's putative PredOp position, it is instructive to take Szabolcsi's descriptions of her proposed procedures, (9), remove unhelpful references to 'counting' and re-phrase them so that they are expressed in a truly parallel fashion. This yields something like (13).

(13) **TopP/QP**: "start out with a set determined by the quantifier and check its members for some property"
PredOp: "start out with the rest of the sentence and evaluate the quantifier in terms of this"

Connections to the information-structural readings of the respective positions now begin to look quite direct. Just as there is an intuitive link between the procedure of predicating over a witness set and a simple 'topic-comment' reading, so the idea of 'starting out with the rest of the sentence' is suggestive of taking a 'focus frame' from the context.

This reduces Szabolcsi's PredOp position to a special use of Focus: narrow focus on a quantifier. Of course, two putative syntactic positions cannot be reduced to one on the basis of such intuitive reasoning alone. As Wedgwood (2002, 2003) shows, there is also clear syntactic evidence for identifying PredOp with Focus. In brief, there are certain phenomena in Hungarian that are generally recognised to be licensed only in a sentence that contains a pre-verbal focus; these include the post-verbal appearance of monotone decreasing QNPs, as in (14) and the use of a definite internal argument NP with so-called 'Definiteness Effect' verbs like *hoz* 'bring', as in (15)[5]. As (14-c) and (15-c) show, such phenomena are licensed straightforwardly by 'PredOp' QNPs (i.e. with the kind of relatively unmarked readings that Szabolcsi associates with PredOp; not requiring any special cleft-like reading).

[5]It is beyond the scope of this article to explain these phenomena; see Bende-Farkas 2002 for valuable discussion.

(14) a. **Jánosnak visszaadott legfeljebb három könyvet.*
János-DAT back(VM)-gave at.most three book-ACC
For: 'To János were given back at most three books.'
b. *Jánosnak MARI adott vissza legfeljebb három könyvet.*
János-DAT Mari gave back(VM) at.most three book-ACC
'It's Mari who gave at most three books back to János.'
c. *Jánosnak kevesebb, mint hat lány adott vissza legfeljebb három könyvet.*
János-DAT fewer than six girls gave back(VM) at.most three book-ACC
'To János, fewer than six girls gave back at most three books.'

(15) a. *#János hozta a székeket.*
János brought the chairs-ACC
For: 'János brought the chairs.'
b. *JÁNOS hozta a székeket.*
János brought the chairs-ACC
'It's János who brought the chairs.'
c. *Kevesebb, mint hat lány hozta a székeket.*
Fewer than three girl brought the chairs-ACC
'Fewer than three girls brought the chairs.'

PredOp being a special use of Focus, the second half of (13) should be generalised by replacing the phrase "the quantifier" with the "the pre-verbal expression" or "the focused expression". This 'procedure' is, as it stands, no more than a *post hoc* description of the effect a certain syntactic configuration produces (the reasons *why* the pre-verbal position relates to this form of interpretation are outlined below), but is sufficient to indicate the basis of an approach to Hungarian focus that differs significantly from current mainstream analyses.

Given the assumption of a procedure that always yields a broad 'focus frame' and a narrow focus, many of the properties associated with syntactic focus in Hungarian are explained without further stipulation. The commonly 'identificational' nature of pre-verbal foci (Kenesei 1986, É. Kiss 1998) follows for purely pragmatic reasons from their narrowness: a richly specified 'focus frame' sets up the expectation of a particular kind of expression playing a particular role in the eventuality in question, so that the item in focus appears simply to identify who or what fulfils this role. Relatedly, the well-known 'exhaustivity' (sometimes termed 'exclusivity' or 'contrast') of Hungarian pre-verbal foci follows by purely pragmatic reasoning: when one individual (or group, value, etc.) is asserted as fulfilling a particular role within a known eventuality, other hitherto contextually possible alternatives to the asserted item are implicitly excluded, by the kind of pragmatic reasoning known in the Gricean tradition as 'quantity implicature'[6].

There is therefore no reason to assume that exhaustivity as such is part of the encoded semantics of the Hungarian pre-verbal focus position. The commonly accepted analysis of this position, as put forward by the likes of Szabolcsi (1981, 1994) and É. Kiss (1998), is that it corresponds to a semantic 'exhaustivity operator'. However, the availability of an inferential pragmatic explanation of exhaustive/identificational readings suggests that this kind of detail need not be actually encoded in the grammar.

Indeed, the arguments present above, to the effect that Szabolcsi's PredOp and Focus are demonstrably the same position, provide evidence in favour of the pragmatic approach. As noted above, there is generally perceived to be a certain difference in the readings of pre-verbal

[6]The fact that the exhaustivity of pre-verbal foci may affect truth-conditions, as identified by Szabolcsi (1981), does not preclude an inferential pragmatic account of this nature. As well-founded pragmatic approaches like Relevance Theory emphasise (Sperber and Wilson 1986, Carston 2002), there is no principled reason to restrict inferential pragmatic processes to operating only over the output of truth-conditional semantics.

QNPs, compared to individual-denoting pre-verbal foci: the latter are typically associated with a strongly exhaustive cleft-like reading, while pre-verbal QNPs usually are not. This difference in interpretation appears to be one of the main motivations for Szabolcsi's distinction between PredOp and Focus—and indeed this distinction must be made, if an encoded exhaustivity operator is taken to provide the semantics of Focus. Szabolcsi (1994) argues that the correct form of any such operator must have the form in (16), to allow for appropriate entailments.

(16) $\lambda z \lambda P[z = \iota x[P(x) \,\&\, \forall y[P(y) \rightarrow y \subseteq x]]]$

As Szabolcsi (1997a, 149) notes, this definition of exhaustivity only works with set (singular or plural individual) denoting expressions. As tests like (8) show, immediately pre-verbal QNPs are not set-denoters, but part of a truly quantificational structure. It follows that if (16) is the semantic contribution made by the Focus position, such QNPs must be in a different position where they undergo a different kind of interpretation. However, this conclusion contradicts the syntactic evidence, as shown above. Encoding the semantics of exhaustivity into the Focus position therefore forces the adoption of an empirically unsustainable analysis.

In contrast, the pragmatic approach to exhaustive identificational focus predicts that narrow focus on a quantifier will tend to have a different impact to narrow focus on an individual-denoting expression. In Wedgwood (2002, 2003), I discuss at length how the nature of contextual alternatives to individual-denoters contrasts with the alternatives to asserted quantificational values (which are generally context-independent and, in the case of numerals, often open-ended) and how this tends to create different perceptions of exhaustivity. In essence, it is pragmatically predictable that the inferred exclusion of well-defined and contextually evoked alternatives will produce a stronger sense of an intentionally contrastive reading than will the exclusion of the other members of an infinite and 'ever-present' scale of values like the natural numbers[7]. Moreover, in many cases the narrowly focused item is not the whole QNP, but some sub-part of it, for reasons expounded below. In these cases, the majority of the QNP is not asserted material at all, but rather background material that is 'pied-piped' into the pre-verbal position[8]. The QNP as a whole is therefore often not expected to bear any kind of contrastive reading, under a pragmatic account of the origins of such readings.

Even besides the issue of QNPs, there are good reasons to reject the idea that Focus encodes an exhaustivity operator. First, narrow foci without markedly exhaustive readings (i.e. those naturally translated with English sentences of unmarked word order, rather than *it*-clefts) may appear in the immediately pre-verbal position—for example, the unmarked answer to a *Wh*-question like (17) appears there. Because all 'given' material is generally elided in such contexts, the answer to (17) would normally be simply *Jánost*, but native speakers confirm that the only possible full sentence answer would involve the use of the 'Focus' position, as shown (the example is taken from Horvath 2000). The idea that the Focus construction is only used in strongly exhaustive/contrastive contexts thus springs from its independently determined 'invisibility' in unmarked contexts.

(17)

Kit	*hívtak*	*meg?*	*Jánost*	*hívták*	*meg.*
who-ACC	invited-3PL	VM	János-ACC	invited-3PL	VM
'Who did they invite?'			'They invited János.'		

[7] It is of course possible for a restricted, context-specific sets of numeral values to be salient—and in this case a strong sense of exhaustivity/contrast is felt (e.g. *FIVE students [not four]*). Note that this depends only on the nature of the (psychological) context; no special grammatical encoding is required to 'add' the exhaustive reading.

[8] Despite the name, this 'pied-piping' need not entail a syntactic theory involving movement. See Kempson, Meyer-Viol and Gabbay (2001, 113) for technical ways of encapsulating pied-piping effects within Dynamic Syntax—a framework with which my analysis shares fundamental assumptions.

Furthermore, as in English, special indicators are required to convey the idea that a narrow focus is *non*-exhaustive: Horvath comments that explicit phrases such as *többek között* 'among others' are necessary to create a non-exhaustive answer to a question like (17); rising intonation also appears to be obligatory. This confirms that exhaustivity is the pragmatically unmarked reading of narrow foci, making a grammatically encoded operator superfluous.

Further evidence that the Focus position cannot encode an exhaustivity operator comes from applying a test due to Horn (1981). Horn shows that the English *it*-cleft construction cannot directly encode exhaustivity, since an exhaustive reading of the clefted constituent fails to appear in a sentence like (18-a), even though the addition of exhaustive semantics (akin to '*only* a pizza') is precisely what is required to make the meaning of the sentence coherent. As (18-b), the translation of Horn's example, shows, the same is true of the Hungarian Focus construction, demonstrating that the exhaustive meaning is not provided by the grammar and must instead be inferred from the way in which the item in Focus is asserted.

(18) a. ?? I know Mary ate a pizza but I've just discovered that it was a pizza that she ate.
b. ?? *Azt tudtam, hogy Mari megevett egy pizzát, de most vettem*
that knew.1SG that Mari VM-ate.3SG a pizza-ACC but now take
észre, hogy egy pizzát evett meg.
mind-to(VM) that a pizza-ACC ate VM

Let us summarise the argument so far. The true counterpart of Szabolcsi (1997a) successful procedural analysis of TopP and QP is not the 'counting' operation that she proposes, but rather something reminiscent of a procedural approach to 'focus frame + narrow focus' sentences. The idea that such a procedure somehow underlies the interpretation of the 'PredOp' QNPs is consistent with strong syntactic and interpretive evidence that the putative PredOp position is identical to the position known as Focus. A procedural approach to this position seems appropriate, given the existence of significant problems for the commonly-held idea that this position contributes an exhaustive focus operator. In the remainder of this paper, I present a proposal regarding the precise nature of the procedure associated with this position and show how this explains both its information-structural reading and the nature of the QNPs that can appear there.

4 The 'Focus' position as a predicative position

My proposals regarding the information-structural and quantificational significance of the position left-adjacent to the tensed verb in Hungarian rely on a radical new analysis of this position. Rather than positing a specialised Focus projection, I concentrate on the linear relationship of left-adjacency to the tensed verb. Considering the range of items that can enter into this relationship and the range of resulting interpretations, its significance is clearly more general and underspecified than any available definition of 'the semantics of focus'. I propose that the linear adjacency relationship acts as a signal to the hearer to pursue a particular interpretive procedure involving the expression to the left of the tensed verb. Depending on the nature of this expression, the procedure is predicted to trigger different inferential processes, which lead to the appropriate information-structural readings. Constraints on the distribution of QNPs also follow from the nature of this procedure.

If Focus is to be subsumed in a more general phenomenon, a new name is required for the relevant syntactic position. Furthermore, the involvement of the *tensed* verb in particular will be

shown to be crucial, so descriptions such as 'the pre-verbal position' will not suffice. Instead, I shall use the abbreviation 'PT' (for 'pre-tense') to refer to the relevant position (which continues to contrast with TopP and QP).

4.1 Pre-tense, not pre-verbal

Concentration in the literature on present and past time sentences (such as (2)–(5)), in which the main verb is inflected for tense, has led to the common perception that the position of syntactically focused expressions in Hungarian is related to the position of the main verb. Examples containing tensed auxiliary verbs and infinitival main verbs tell a different story. In these examples, the main verb is independent of the expression of tense, revealing the true nature of the PT position. Consider (19): here tense is carried by the auxiliary *fog*, which, rather like English *will*, acts in such sentences simply to convey temporal information.

(19) a. *Mari látni fogja Jánost.*
Mari see-INF will-PRES.3SG János-ACC
'Mari will see János.'
b. *Mari Jánost fogja látni.*
Mari János-ACC will-PRES.3SG see-INF
'It's János that Mari will see.'

The sentence in (19-a) has what is known as a 'neutral' reading; that is, it appears to contain no syntactically focused expression and hence is essentially read as 'topic + broad focus'. Every neutral sentence has the same basic linear structure: the main verb immediately precedes the expression of tense, whether as [verb stem + tense affix] or as infinitival verb followed by tensed auxiliary. Sentences containing auxiliaries diverge from those with tensed main verbs in clear examples of syntactic focus, like (19-b). Here the main verb appears to the right of the tensed element, effectively 'vacating' the immediately pre-tense position, which is occupied by the focused item. What these examples show is that in a neutral sentence the verb itself is in PT: the same position occupied by a focused expression when there is one. Tensed main verbs confuse the picture, inevitably appearing to the left of tense, for morphological reasons. In this position, they can be interpreted as being left-adjacent to tense, but can alternatively be viewed as *being* the tensed element themselves. In terms of semantic significance, the contribution of a main verb stem may be itself subjected to the procedure encoded by PT, or, as the tensed element, it may simply indicate that another expression is to be interpreted in terms of PT. The former situation results in neutral sentences; the latter in the identification of a syntactic focus.

The observation that PT, the position of foci, is occupied by the main verb in neutral sentences precludes any direct encoding of the semantics of focus (appropriately, given that the problems with encoded exhaustivity noted above leave us with nothing but a vague notion of 'narrow focus') and supports the idea of underspecified procedural encoding. Further evidence for this approach comes from the behaviour of verbs when there is both a tensed auxiliary and a VM. As shown in (20-a), in this case the infinitival main verb does not appear before tense even in a neutral sentence; instead, the VM does—though still postposing in the presence of a focused expression, as in (20-b).

(20) a. *Mari meg fogja hívni Jánost.*
Mari VM will-PRES.3SG call-INF János-ACC
'Mari will invite János.'

b. *Mari Jánost fogja meghívni.*
Mari János-ACC will-PRES.3SG VM-call-INF
'It's János that Mari will invite.'

The conclusion from sentences with tensed auxiliaries is that VMs, main verbs or other expressions may appear in PT, with different interpretive consequences: a neutral reading in the case of VMs and verbs and a narrow focus interpretation with other expressions. These differences follow from the ways in which each is able to fulfil the procedure that is encoded in PT[9].

4.2 PT and predication

The analysis pursued here suggests that PT encodes a fundamental semantic procedure that is highly underspecified with regard to the eventual interpretive effects it may produce. Observed interpretations arise via chains of inferential reasoning, on the basis of the kind of expression that is actually encountered in the PT position. It follows that the path from syntactic structure to observed interpretations must take account of what occurs during the processing of utterances; attempting to 'interface' a static representation of syntactic structure with semantics could at best result in a highly underspecified semantic representation. Indeed, I argue below that a crucial part of the chain of inference from PT to its eventual semantic interpretation involves the time-linear processing of utterances: the explanation of the observed information-structural readings depends on the fact that material 'to the right of' PT is processed after the PT procedure has been completed. My analysis is therefore inherently 'dynamic', in the sense of Kempson et al.'s (2001) Dynamic Syntax. This allows for forms of explanation that are not possible under more conventional approaches, with the particular advantage of allowing for a reasoned shifting of the burden of explanation from encoded semantics to inferential pragmatic processes.

The nature of the underlying interpretation of PT is suggested by the fact that it is the unmarked position of main verbs (a situation mirrored in the verb-initial focus position found in many otherwise strictly V-initial or Aux-initial languages; see Paul 2001). This indicates that the idea of predication may in some way be important in the interpretation of PT. This is consistent with the use of PT as a 'focus position'—there is a long tradition of relating background and focus to the notions of 'logical subject' and 'logical predicate', respectively (see von Heusinger 2002 for a historical overview). Note also how this connects to the basic procedures suggested in (13). The first procedure is evidently concerned with predication; if, as seems likely, the second is in some sense the inverse of the first, it too is essentially predicative.

A further indication of the underlying interpretation of PT is to be found in the following generalisation (which has been hitherto overlooked in the literature on the 'focus position'). Whatever expression appears in PT is usually the beginning of the 'new' (or 'comment') part of the utterance. This is accounted for if the PT position somehow encapsulates the idea of focus-as-logical-predicate. However, while any material following a verb or VM is typically further 'new' material, anything that follows a non-verbal expression in PT is necessarily background, leaving the expression in PT as the whole of the 'new' material by itself. To be all of the new material in the sentence is to be a narrow focus; therefore, explaining the different information-structural readings of Hungarian sentences can be reduced to explaining how different occupants of PT determine the focus/background status of *subsequent* material.

The different effects of verbal and non-verbal expressions can be accounted for if the following is assumed to be the procedure encoded in PT: the expression left-adjacent to tense contributes a

[9]For reasons of space, I do not address here why it is VMs, not verbs, that appear in PT in a neutral sentence with a tensed auxiliary; see Wedgwood (2003, Chapter 7).

predicate, the application of which must create a full, if skeletal, propositional form (apart from the temporal anchor contributed by tense), *at the point at which PT is parsed*.

The appropriate effects on subsequent material follow from this because of a key semantic difference between verbs and non-verbal expressions: the degree to which each contributes the structure of a proposition. Verbs provide rich information such as argument structure, which allows the verb alone to give the bare bones of an eventuality. In combination with tense (providing a temporal anchor point), a verb can therefore create the skeletal structure of a proposition. This is reflected in the fact that in a fully 'pro-drop' language a tensed verb alone can be a full sentence, corresponding to a full proposition. For example, the Hungarian verb *Látta* can convey the entire meaning 'S/he saw him/her'.

The fact that a verb contributes skeletal semantic structure also means that this structure can be 'filled out' by subsequent assertions, adding information without changing the propositional form that has been created. This creates the impression of a 'broad focus' reading (i.e. as part of a so-called neutral sentence). Thus, in a sentence like (19-a), the main verb in PT fulfils the procedure outlined above, a full propositional form (minus temporal anchor) being created at the appropriate point thanks to the richly structured semantics of the verb. The subsequent accusative NP *Jánost* is asserted material, elaborating on a part of the propositional form already created by the verb. The verb is therefore just the beginning of the newly asserted material in the sentence, but simultaneously also constitutes the whole of the 'logical predicate' of the sentence on its own[10].

The case of VMs is somewhat more complicated (see Wedgwood 2003, Chapter 7), but essentially similar to main verbs, in that VMs too bring abstract structure to a proposition (many VMs affect aspectual structure, for example, and in general VMs contribute to complex predicates, in ways that can be analysed as effectively 'selecting for' a main verb). Again, this structure can be 'filled out' by subsequent assertions within the same sentence, creating the effect of 'broad focus', but without changing the fundamental structure of the proposition.

A non-verbal expression, such as an argument NP, has no such internal structure. How could such an expression fulfil the proposed procedure associated with PT and create a propositional form before the rest of the utterance is parsed? On its own, it clearly cannot. All of the necessary elements of a proposition must therefore be available 'in advance', outwith the sentence itself. In practice, this means that the whole of the relevant proposition apart from the contribution of the PT expression must be 'given' in the context. This brings us back to the procedures outlined in (13): everything other than the expression in PT must be taken to be something akin to a 'complex topic', in the sense that all of this material must be treated as the logical subject over which the PT item can predicate[11]. Thus, the proposed procedure obligatorily yields a 'focus frame + narrow focus' interpretation just when the occupant of PT is non-verbal[12].

A number of other important facts about the 'focus position' are also predicted by this account of PT, without any *ad hoc* syntactic machinery or semantic operators. Notably, the apparent postposing of VMs in the presence of a focused expression is explained: if a VM intervenes between some expression and the tense-carrying element, that expression simply will not be interpreted as the proposition-creating predicate, since it will not be recognised as being in PT—and there-

[10] For a compatible view of how adjuncts relate to verbal semantics in a dynamic approach, see Marten 2002.

[11] One way to achieve this technically is to turn to neo-Davidsonian event-based semantics (Parsons 1990), within which expressions like NPs correspond to predicates over eventuality variables, giving a close parallel to the semantic contribution of verbs. An approach of this kind is taken in Wedgwood (2003), where a means of formally representing the dynamic aspects of the contribution of PT is developed.

[12] Note that, correctly, there is nothing in this analysis that prevents a verbal element from receiving a narrow focus interpretation, just in case there is a suitable 'focus frame' available in the context. The point is that this is not necessarily the reading with verbal elements—indeed, it is clearly the more marked possibility.

fore it will not be interpreted as a narrow focus. At the same time, the unmarked appearance of VMs before auxiliary verbs does not rely on any *ad hoc* operation of 'VM climbing', such as is required in many purely syntactic accounts. As shown in Wedgwood (2003, to appear), the PT analysis also explains without further the stipulation the nature of two apparently aspectual constructions that interact with focusing and, with minimal further assumptions, the positions and associated interpretations of the Hungarian negative particle.

5 PT and QNP distribution

The key to explaining the class of QNPs that appears in PT is the fact that this structural position necessarily relates to a single act of predication. In order to fulfil this function, the occupant of PT must contribute a predicate that is independent of the rest of the proposition. This must be so because the rest of the proposition is background material when the occupant of PT is a non-verbal expression, the PT predicate itself being the only asserted material in the sentence.

There is a well-known class of quantifiers within GQ theory that, in effect, contribute no predicate that is independent of the rest of the proposition in which they appear: the proportional (non-intersective) quantifiers. This is clear from basic representations of GQ semantics, viewed in terms of tripartite quantificational structure. As can be seen in (21-a), the contribution of an intersective quantifier like *four* is a predicate—it assigns to the intersection of its restrictor and nuclear scope sets the property of having the cardinality '4'. This intersection is therefore unproblematically available as a 'focus frame' for a quantifier in narrow focus. In contrast, a proportional quantifier imposes the condition that the intersection of its restrictor and nuclear scope is a certain proportion *of the restrictor*, as shown in (21-b). The contribution of *every* may be alternatively expressed as a relation between the restrictor and the nuclear scope, as in (21-c). Either way, there is no predicate over the intersection of restrictor and nuclear scope that can be identified as the property of the quantifier alone, so the quantifier cannot fulfil the predicative procedure encoded in PT.

(21) a. $|\{x : R(x)\} \cap \{y : N(y)\}| = 4$
b. $|\{x : R(x)\} \cap \{y : N(y)\}| = \frac{1}{2}|\{x : R(x)\}|$
c. $\{x : R(x)\} \subseteq \{y : N(y)\}$

Universal quantifiers and 'most' are unable to appear as the asserted item in PT (as shown in (11)), so appear to corroborate the idea that the need for an independent predicate is involved in defining the class of PT QNPs, as predicted by the analysis outlined in section 4.2. However, as noted in section 2.2, it is not the case that proportional quantifiers never appear in PT, so PT cannot be simply restricted to QNPs with intersective quantifiers. Recall that 'few (of the) N' and 'more than 50% of the N' may appear in PT, despite their proportional quantifiers (see section 2.2). Another of Szabolcsi's examples is (22).

(22) *A fiúk közül több/kevesebb, mint hat emelte fel az asztalt.*
the boys among more/fewer than six lifted up(VM) the table-ACC
'More/fewer than six among the boys lifted up the table.'

Given Szabolcsi's assumptions, whereby what appears in her PredOp position must be defined in terms of quantifier semantics, such examples mean that one must abandon the idea that the proportional/intersective distinction may be relevant to characterising this position. But given the PT analysis outlined above, these QNPs merit further analysis. Under the latter approach, the significant factor is not intersectivity as such, but a necessary consequence of intersectivity:

the ability to provide a predicate that is independent of the rest of the proposition. As outlined below, this property is in fact consistent with certain proportional quantifiers, including those listed above, though not through the semantic contribution of the quantifier as a whole. The ability to recognise and account for this depends upon a unified procedural account of PredOp and Focus.

In a syntactically complex quantifying determiner like those in (12) and (22), certain lexical sub-parts of the quantifier are potential contrastive foci. That is, one of these sub-parts may provide the predicate demanded by PT. In this case, the appearance of the whole QNP in PT represents a kind of pied-piping—something that is independently attested in Hungarian focusing (see (24) below). Furthermore, it is intuitively clear that focus on certain sub-parts of QNPs like (12) is pragmatically highly likely. The proportion '50% of N' may easily form part of the background in addressing whether more than, fewer than, or exactly this proportion of some set is involved in some eventuality. Alternatively, the value '50' may be asserted contrastively against the background assumption that, say, 'more than 30% of' some set is involved in some eventuality. The case of (22) is similar, but with more marked phrase-internal information structure. Native speaker informants report that the 'fronted' PP ('among the boys') has a 'topical feel' and requires corresponding intonation, and that contrastive focus must fall after this (on *több*/*kevesebb*, on the numeral *hat* or on the head noun). Thus, the quantifier as a whole *cannot* be taken to be the item in focus, making it unsurprising that the proportionality of the quantifier has no bearing on the syntactic distribution of the QNP.

The possibility of contrastive focus on a lexical sub-constituent explains the appearance of proportional QNPs with syntactically complex quantifiers in PT. The emerging descriptive generalisation is that *single-lexeme* proportional quantifiers cannot be focused and therefore appear to be banned from the PT position. The case of *kevés* 'few' appears to be a counter-example even to this, however, and as such might seem to be a problem for the whole PT analysis.

In fact, this apparent problem only arises through confusion over the precise application of the term 'proportional'; *kevés* does not exhibit the kind of proportionality that is relevant to PT. The meaning 'few' clearly expresses a proportion in some sense, but, unlike with 'every' or 'most', this need not be taken to be a proportion of the quantifier's restrictor set. Rather, the meaning here relates to a proportion of some contextually determined 'standard' or 'expected' amount. The number of students to fail an exam in a given year may be considered 'few' even when it is the majority of the class—for example, if most years at least three-quarters fail but this year only 60% do so. The point is still clearer with the monotone increasing counterpart of 'few', 'many' (Hungarian *sok*). Five students out of a group of 30 taken ill in a single day might be considered many, but in other contexts this could be considered a very small number. This analysis is well enshrined in semantic practice; consider the following rough semantics for *few* taken from Heim and Kratzer's (1998) textbook:

(23) $|\{x : P(x)\} \cap \{y : R(y)\}|$ **is small**

Given that *kevés* and *sok* are thus proportional to some contextual value and not to their restrictor sets as such, the intersection of the restrictor and the nuclear scope can straightforwardly act as the background against which the fully independent meaning of the quantifier is asserted as a narrow focus, as the representation in (23) implies. The generalisation therefore holds that single-lexeme quantifiers that are semantically proportional to their restrictor sets are unable to appear as the focused element in PT. This is precisely what is predicted by the analysis of section 4.2, based on PT as a special predicative position.

The hypothesis that a QNP's ability to appear in PT is determined by whether it makes a semantically independent predicate available creates another prediction that distinguishes this approach

from one based in quantifier semantics alone. If the current approach is correct, then even a QNP with the structure *minden N* 'every N' should be able to appear in PT if the head noun is taken to be contrastively focused and the rest of the QNP pied-piped, since in this case the noun itself may supply the required semantically independent predicate (presupposing a logical subject that contains the value of the quantifier and abstracts over the contribution of the noun). This prediction is fulfilled, examples like (24) being grammatical (in contrast to (11)).

(24) *Minden FIÚ ijedt meg* (*nem minden LÁNY*).
every boy feared VM not every girl
'It's every BOY that got frightened (not every GIRL).'

6 Conclusions

The denotational semantics of quantifiers helps to account for the hitherto mysterious class of quantifiers that may appear in the Hungarian 'focus position' (or Szabolcsi's PredOp) just insofar as GQ theory explains why some quantifying determiners can't contribute any predicate that makes no reference to the rest of the tripartite quantification structure. Understanding why the availability of such a predicate is crucial depends on recognising that the interpretation of QNPs in Szabolcsi's PredOp position and the apparently strictly exhaustive foci in her Focus position are manifestations of a single underlying procedure. To do so, and to identify the nature of this procedure, depends in turn on identifying what may be inferred in performance, on the basis of general pragmatic principles, and on the possibility of significant underspecification at the level of what is actually encoded in the grammar.

This analysis of Hungarian therefore carries an important lesson regarding the assumptions we bring to the analysis of linguistic data. It illustrates two major reasons why we cannot apply a strong assumption of compositionality, whereby observed semantic effects are reflected homomorphically in syntactic structure, to the study of natural languages. The first reason is that the structural details of natural languages may encode procedures rather than declarative compositional semantic material. Where this is the case, there may be apparent associations between denotational semantic generalisations and syntactic forms, but these are epiphenomenal (as in the connection between proportional quantifiers in PT). The second reason is that what is systematically encoded in the grammar of a language may be significantly underspecified. What we understand to be the semantics of a sentence is the output not only of interpreting lexico-syntactic forms but also of inferential processes, carried out in context according to general pragmatic principles (Carston 2002). For these reasons, elements of semantic representations cannot simply be attributed to those elements of linguistic structure that appear to produce them. To do so is to risk missing key generalisations, while complicating the grammar with machinery that only duplicates the work of independently necessary extra-grammatical processes.

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