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In the last decade, there has been important contributions to the discussion on Nuclear Stress (NS), both theoretical and empirical. On the theoretical side, the notion of “derivation by phase” (Chomsky 1999/2001, 2005) has provided a new way of looking at interface phenomena, in particular at the relation between syntax and phrasal stress. Furthermore, recent works have convincingly argued that “marked” prosodic patterns, based on discourse factors, should be generated by a distinct mechanism than the “unmarked” prosodic patterns (patterns that are generated by the grammar, regardless of discourse considerations). On the empirical side, the following points have been established.

First, research in prosodic phonology across different languages (e.g. Jun 2005) has recognized two typological ways of encoding the phonological notion of prominence: 1) *culminatively*, via the Nuclear Pitch Accent, which is aligned with its metrical counterpart, namely, the Nuclear Stressed (NS) syllable (e.g. English, German, Dutch, Spanish, Italian, among many others) 2) *demarcatively*, via a prosodic juncture aligned with the edge of a syntactic category (e.g. Korean, Japanese, Bengali, and many Bantu languages; see also Féry 2001 on French).

*For a more detailed version, see Zubizarreta in press, on which this appendix is based.

Throughout the text, I will refer to the original paper to which this appendix is attached as Zubizarreta and Vergnaud 2005.
Second, among the *culminative* type of language, in particular in Germanic, it has been experimentally established that there is variability in the placement of NS in focus-neutral intransitive structures, while such variability is inexistent in others (e.g. Spanish, Italian, and other Romance languages).

Third, while “marked” prosodic patterns have long been recognized to exist in Germanic (e.g. Ladd 1980, Selkirk 1984, Gussenhoven 1984, among others), recent work has shown that such patterns is also a grammatical option in certain varieties of Spanish in certain syntactic configurations (Gabriele 2010).

**The Notion of Phase.**

With the introduction of the notion of “phase” as the relevant syntactic domain for the interface components of the grammar, a new way of thinking about the interaction of syntax and phrasal stress presented itself. Chomsky op.cit. identified two syntactic categories as defining a “phase domain”: the CP and the vP, and their sister nodes, TP and VP, respectively, as the domain of spell-out and interpretation (i.e. the interface domains).1 Adger 2007 put forth the proposal in (1):

1. **The spell-out domain of a phase is the domain for phrasal stress assignment.**

In an attempt to capture the primacy of objects in transitive sentences in both head initial and head final languages, Kahnemuyipour 2004/2009 further refined that proposal as in (2):

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1 See also Legate 2003.
(2) Assign phrasal stress within *the highest constituent* within the spell-out domain.

One well-known challenge about NS placement in Germanic is its sensitivity to the
distinction between arguments and adjuncts, exemplified in (34)/(36a) and (37a) in Zubizarreta
& Vergnaud (Z&V) 2005, and repeated in (3) and (4) below. The rule in (2) accounts for the
position of NS in (3a-b) if it is assumed that the argument in these examples are in a position
higher than the verb within the spell-out domain at the point where the NS algorithm applies; this
is attributed to the fact that V-to v applies, leaving the argument as the highest constituent in the
structure. On the other hand, if the adjunct in (4) is outside the spell-out domain, it will fail to
receive the NS. Given the V-to v assumption, the spell-out domain (VP) will contain no
phonological material. It is assumed that, in such cases, the NS goes on the closest non-null
element. In (4), the closest non-null element is the verb.

(3) a. Hans hat [[ein [Buch]] gelesen].
   Hans has a book read

   b. Peter hat [[an [einem [Papier]]]gearbeitet].
   Peter has on a paper worked

(4) Peter hat [vP an einem kleinen Tisch [vP gearbeitet]].
   Peter has on a small table worked

   ‘Peter worked on a small table.’
Kratzer and Selkirk 2007 proposed a modified version of Kahnemuyipour’s phase-based account of phrasal stress assignment within the framework of prosodic phonology. According to their proposal, the domain for phrasal stress is the phonological (or major) phrase, which itself is defined as the highest phrase within the spell-out domain of a phase; see (5). It is furthermore assumed that the prosodic head of the major phrase bears phrasal stress, and the last phrasal stress is identified as the NS.

(5) The highest phrase within the spell-out domain of a phase corresponds to a prosodic major phrase in phonological representation.

The arguments in (3a-b) and the adjunct in (4) constitute a major phrase and therefore a domain for phrasal stress, and being the last p-phrase in the intonational phrase (or i-phrase), they are ultimately identified as the bearer of NS. This framework can account for the contrast between (3a-b) and (4) to the extent that the PP adjunct is assumed to be outside the prosodic VP spell-out domain of vP.2

Variability in NS placement in Germanic. Contrast with Romance.

It is by now widely acknowledged that Germanic SV intransitives exhibit variability in the location of NS (Chafe 1974, Schmerling 1976, Selkirk 1984, 1995, Sasse 1987, Zubizarreta 1998, Z&V 2005); this variability has more recently been confirmed with elicited production experiments (Nava and Zubizarreta (N&Z) 2010, Zubizarreta and Nava (Z&N) 2011, Irwin 2012). See also Truckenbrodt 2006 for another view of accounting for the argument vs. adjunct distinction.
2012). Renditions with NS on the subject and with NS on the verb are both attested with SV intransitives in wide-focus contexts. While some authors have correlated the variability with the unergative/unaccusative distinction (e.g. Zubizarreta 1998, Z&V 2005, Kahnemuyipour 2004/2009, Irwin 2012), it appears that variability in NS placement cuts across the two types of intransitives. Based on data from a Question & Answer production task with 34 native English speakers, Z&N 2011 report that while variability is systematic with unergatives (e.g. The dog is barking, The dog is barking), it is more skewed with unaccusatives. In particular, while verbs of appearance systematically elicited NS placement on the subject (e.g. the aliens arrive, the police came, a rabbit appeared), variability was found in other sub-classes of unaccusatives (the major fell, the magician disappeared). While alternating intransitives systematically elicited NS on the subject in that study (e.g. a window broke), Chafe 1974 and Sasse 1987 report variability with that verb class as well. Based on a fine-grained analysis of the context associated with variability of NS placement with intransitives, Sasse 1987 argues that the distinction is related to the thetic (eventive) vs. categorical (topic-comment) distinction. Verbs of appearance are typically associated with eventive predicates, and therefore they systematically give rise to NS on the subject.3

Kratzer and Selkirk 2007 recast the thetic vs. categorical distinction in terms of stage-level vs. individual-level predicates, and propose that while the subject of stage-level predicates occupies the Spec of T(ense) P(hrase) (a silent spatio-temporal topic is assumed to be present in such structures), the subject of individual-level predicates occupies the Spec of a higher Top(ic)  

3 For variability in Germanic “DP PP V” structures, see Féry 2011, and Zubizarreta in press for discussion.
P(phrase). The former structure gives rise to NS on the subject, while the latter gives rise to NS on the verb. See also Féry 2011 for an analysis along similar lines.

As noted in many works (e.g. Ladd 1996, Samek-Lodovici 2005, Vallduví 1995, Zubizarreta 1998, V&Z 2005, N&Z 2010, Z&N 2011), such variability in the phrasal prosody of intransitives SV structures is inexistent in Romance, where NS falls systematically on V. Based on Zubizarreta op.cit. and Z&Z op.cit., N&Z 2010 and Z&N 2011 adopt an approach to Germanic variability that is not based on syntactic ambiguity, but rather on the ambiguity of the source structure used for the computation of NS in this type of language. Under this view the locus of variation is due to the metrical status of functional categories in these two types of languages:

(6) In Germanic, functional categories may be interpreted as metrically invisible, while in Romance, functional categories are always metrically visible.

The status of metrical categories. stated in (6) above, in conjunction with a two-layered, parametrized, *Nuclear Stress Rule or NSR*, stated in (7) below, accounts not only for the noted variation in NS placement in intransitive structures in Germanic, but also for the lack there of in Romance (compare with (66) and related discussion in Z&V 2005). Note that by invoking the notion of “argument”, this rule also accounts for the argument/adjunction distinction in Germanic NS placement.

(7) Given two metrical sister nodes A and B:
(i) If $A$ is a head and $B$ is its argument, assign $S$ to $B$ ($S$-NSR). Otherwise,
(ii) assign $S$ to the right-most constituent node in the phrase ($C$-NSR).

The constituent interpreted as bearing NS is uniquely dominated by metrically $S$(trong) constituents; Liberman 1975.

To illustrate, consider the metrical structures for SV intransitives in (8). If $T$ is metrically invisible, the first part of the NSR assigns $S$ to the DP subject because it is an argument of its metrical sister $V$ (8a), which is therefore identified as the NS-bearing constituent. If $T$ is metrically visible, the first part of the NSR fails to apply because DP and $V$ are not metrical sisters; the “otherwise” part of the algorithm applies and ultimately assigns NS to the verbal constituent (8b). The former structure is used in *thetic* contexts, while the latter structure is used in *categorical* contexts.

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4 In fact, the relevant relation is not exactly between a head and its semantic argument, but between a head and its lexico-syntactic (l-s) argument (in the sense of Hale and Keyser 2002): a constituent is defined as an l-s argument of a head iff it is contained within the lexico-syntactic structure of the lexical head. This revision is important because it allows us to capture the fact that low manner adverbs, contained within the verbal projection of the head, seem to attract NS. E.g. *Hans hat ein Gedicht gut gelesen* ‘Hans has read the book well’; see Kahnemuyipour 2004:117 on similar cases in Persian.

5 Following Kayne 1994, Zubizarreta 1998 and Z&V 2005 suggested that “rightmost” is equivalent to “most deeply embedded” (as in Cinque 1993). Szendröi 2001 have argued that this cannot be the case because there are languages, such as Hungarian, where the “elsewhere” algorithm assigns NS to the left-most constituent.
In Romance, on the other hand, functional categories are consistently metrically visible; therefore only prosodic patterns with sentence final NS are generated (namely, on the V in the structures under discussion). Other grammatical means are used in such languages to encode the thetic vs. categorical distinction.

**Discourse-given information and deaccenting**

We turn next to the “marked” NS patterns in Germanic, in which discourse plays a major role in determining the location of NS. Two types of “marked” prosodic patterns have been identified; one in wide-focus contexts and another one in narrow-focus contexts. These are contexts in which the constituent that carries the unmarked NS gets deaccented by virtue of the fact that it is discourse-given (i.e. previously mentioned or inferred from the context). Because NS cannot be associated with deaccented material, it gets shifted to the left (Ladd 1980, 1996, Reinhart 2006, N&Z 2010, Z&N 2011). We refer to this phenomenon as *A(naphoric)-deaccenting & NS-Shift*.

Examples of “marked” stress pattern, where the focus is “narrow”, are given in (9) (italics mark deaccented material).
(9)  

a. Mary bought that old stamp. [Who bought that old stamp?]

b. I am drawing pictures on the cover. [What are you drawing on the cover?]

Deaccenting triggers a change in prosodic weight in the metrical structure. To illustrate, consider the metrical tree of the VP in sentence (9b). The NSR generates the metrical tree in (10a). Deaccenting of the prepositional object triggers a shift in NS. According to the NS-Shift view, the metrical tree gets relabelled as in (10b): the PP that bears the unmarked NS is relabelled $W(eak)$. Consequently, its sister node (the DO) is relabeled $S$ and is interpreted as bearing the (marked) NS. The prepositional object is therefore interpreted as rhythmically subordinate to the direct object. The same logic applies to (9a), where the deaccented VP is relabelled $W$, its sister node (the subject) is relabelled $S$ and is interpreted as bearing the primary (marked) stress, with the object as rhythmically subordinate.

(10)  

a. $\begin{array}{c}
\text{VP$_S$} \\
\text{V$_W$} \\
\text{drawing} \\
\text{N$_w$} \\
\text{pictures (on the) covers} \\
\text{N$_s$}
\end{array}$

b. $\begin{array}{c}
\text{VP$_S$} \\
\text{V$_W$} \\
\text{drawing} \\
\text{N$_s$} \\
\text{pictures (on the) covers} \\
\text{N$_w$}
\end{array}$
In the case of narrow focus, as in the examples in (9), the “marked” patterns are the only possible options, to the extent that the focused constituent must be prosodically identified as the bearer of NS; \textit{A-deaccenting & NS-Shift} must therefore apply in such cases and no variability is expected. That was indeed the case in the elicited production experiment reported by Z&N 2011.\footnote{\textbf{Footnote:} Reinhart 2006 proposes a competition between the different focus domains associated with a sentence \(S\) (the focus set) to meet prosodic interface requirements; the stress pattern obtained without NS-Shifting is preferred to the one obtained with NS-shifting.}

We turn next to “marked” prosodic patterns in “wide focus” contexts, illustrated by the examples in (11) (from Z&N 2011, modeled on Ladd’s original examples). The post-nuclear deaccented material is given in italics and the discourse context in brackets. In (11a), the NPA is on the verb and the VP is the focused constituent; in (11b), the NPA is on the DO and the entire sentence is the focused constituent.

(11) a. Because I collect \textit{stamps}. [Why are you buying that old stamp?]
    b. Because I’m drawing \textit{pictures on the covers}. [Why are these notebooks missing their covers?]

The “marked” patterns in (11) (wide-focus contexts) are different than those in (10) (narrow-focus contexts). As mentioned earlier, in cases of “marked” focus, deaccenting must apply in order for the “marked” focus constituent to be aligned with the NS, and thus be identified prosodically. On the other hand, in the case of wide-focus sentences that contain informationally given material, there is a tendency to deaccent these in Standard English. Yet, it...
is not entirely systematic: of the 35 English native speakers (ENC) tested by Z&N 2011, 75% deaccented the object in (25a) and 88% deaccented the PP in (25b). Furthermore, Ladd 1996 reports that there are dialects of English (e.g. Hawaiian) that do not deaccent given information in “wide-focus” contexts.

Under the view outlined above, the NSR is a grammatically encapsulated mechanism that determines the position of the NS in neutral contexts. Discourse factors indirectly trigger NS-Shift, which gives rise to a change in the metrical structure. But for an appealing alternative new, where the “marked” patterns are generated by directly manipulating the scaling of pitch accents, see Féry and Kügler 2008, Féry 2011.

It has often been reported that Romance languages like Spanish and Italian do not deaccent given material and that sentence-internal NS gets interpreted as emphatic in these languages; e.g. Ladd 1996, Cruttenden 1997, Zubizarreta 1998. It has been suggested that in the case of sentence-internal narrow focus, these languages use other strategies, such as word order, to align the focused constituent with NS (e.g. Zubizarreta 1998, Samek-Lodovici 2005).

More recent research suggests that sentence-internal narrow focus is not completely excluded in Spanish, and that it is in fact preferred in some cases. Gabriel 2010 reports data from Argentinian dialects, which reveal that a sentence final informationally narrow-focused subject is preferred in the case of intransitive V$\bar{S}$, as well as in the case of transitives with a cliticized object cl.V$\bar{S}$ (12a) (i.e. as an answer to “Who bought the book?”). On the other hand, in the case of an informationally narrow-focused subject in transitive structures with a lexical object, a preverbal subject SVO (26b) is preferred to the postverbal VOS order (12c) (underlines indicate the focus, perceived as most prominent, and italics indicate deaccenting). For such dialects, it is possible that A-deaccenting & NS-shift (a marked option in Spanish) is preferred to a V-XP-S
order (possibly due to “weight” considerations). Yet in other dialects, (12c) is preferred in cases of informationally narrow-focused subject, with (12b) interpreted as a case of correction or contrastive focus (Zubizarreta 1998) (as in JOHN bought the book, not PETER). The latter author suggests that accent of correction/contrast is generated by an Emphasis stress rule, which can also apply at the sub-word level (unlike the NSR or the NS-Shift rule). This rule would be comparable to Féry and Kügler op.cit.’s pitch-upstepping rule; it only serves to identify narrow contrastive focus (and corrections more generally). 7

(12) a. El libro, lo compró Juan.

The book ACC.3SG= bought Juan

‘The book, Juan bought it.”

b. Juan compró el libro.

c. Compró el libro Juan.

To summarize, while there is no dialectal variation regarding the location of the NPA in discourse neutral contexts (NPA systematically occupies the final position in the intonational domain), there are dialectal (or perhaps even idiolectal) variation with respect to the position of the NPA in the marked cases, and in some dialects this preference is dependent on the interaction with other weight-related prosodic considerations. This supports the view that “marked” patterns are obtained via some distinct mechanism than the “unmarked” patterns.

7 On the prosodic distinction between narrow-contrastive and informationally narrow (or new) focus; see also Katz and Selkirk (2011).
The research reported by N&Z 2010 and Z^N 2011 on the production of L1 Spanish/L2 English speakers point to the same conclusion. It was shown in that study that for L2 learners of English with Spanish as their L1, it was significantly easier to produce sentence-internal “marked” NS (in both narrow-focus cases like (10) and wide-focus cases like (11)) than sentence-internal “unmarked” NS (i.e. NS on the subject in eventive SV structures in wide-focus contexts, discussed in 2.1). The authors conclude that the Spanish grammar is compatible with A-deaccenting & NS-Shift and that acquiring the L2 mechanisms of A-deaccenting & NS-Shift do not require “out-competing” any algorithm of the L1 grammar; therefore, Spanish speakers can readily incorporate this mechanism into their L2 English grammar. On the other hand, native Spanish speakers have a very hard time acquiring the “unmarked” prosodic patterns with non-sentence final NS generated by the Germanic NSR. In the above-mentioned studies, few L2ers produced the Germanic stress pattern for eventive SV intransitives (and none to a native-extent). We also expect “marked” stress patterns to be more easily affected by language contact.

Additional References.


