

North East Linguistics Society

Volume 25 *Proceedings of the North East Linguistic Society 25 -- Volume One: Papers from the Main Sessions*

Article 34

1995

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Truckenbrodt, Hubert (1995) "Extrapolation from NP and Prosodic Structure," *North East Linguistics Society*. Vol. 25 , Article 34.

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Extrapolation from NP and Prosodic Structure

Hubert Truckenbrodt

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In this paper I argue that extraposition of PPs and relative clauses from NPs (henceforth *extrapolation from NP*) is subject to a prosodic restriction as formulated in (1).

- (1) Let XP be a syntactic category that is canonically mapped into the prosodic category π upon extraposition (where π is either the phonological phrase or the intonational phrase in the following). Then extraposition from NP will take XP as far as out of a prosodic constituent of the same category π .

$$(\dots XP \dots)_{\pi} \rightarrow (\dots t_i \dots)_{\pi} (XP_i)_{\pi}$$

Thus the extraposed constituent XP is assigned a certain prosodic category π upon extraposition: Phonological Word, Phonological Phrase, Intonational Phrase etc. The claim of (1) is that this prosodic category π of the extraposed element XP determines some of the properties of extraposition: On the one hand, XP has to move at least as far as out of a phonological constituent of the same category π . Thus movement as in (2)(a), will be ruled out as too short by (1). Furthermore, XP will move out of any π it is inside of, but no further than that. Thus movement as in (2)(b) will be ruled out as too long by (1).

- (2) If an extraposed XP will usually be mapped into π in the prosody, then:

(a) * $(\dots XP_i \dots \dots)_{\pi} \rightarrow (\dots t_i \dots XP_i \dots)_{\pi}$

(b) * $(\dots XP_i \dots)_{\pi} (\dots)_{\pi} \rightarrow (\dots t_i \dots)_{\pi} (\dots)_{\pi} (XP_i)_{\pi}$

I begin by showing that extraposed elements are indeed phrased separately in the phonology, as in the schema in (1). Then I will discuss movement which is too short and finally movement which is too long.

1. Extraposed elements are phrased separately in the phonology**1.1. Tohono 'O'odham**

In Tohono 'O'odham (or 'O'odham for short; the language used to be called Papago), each phonological phrase is characterized by a tonal (L)H(L) pattern. As discussed by Hale 1975, Hale, Jeanne and Platero 1977, as well as Hale and Selkirk 1987, extraposed elements are systematically phrased separately. Thus in (3)(b), the object is extraposed to a position following the verb. The tonal HL pattern on the verb followed by the H on the extraposed NP gives evidence of a phonological phrase boundary between the two.

- (3)(a) HL L HHH H L L
 (Wakial)_∅ ('o g wisilo ceposid)_∅
 cowboy AUX:IMP:3rd DET calf brand-IMP:3rd
 'The cowboy is branding the calf'
- (b) HL L H L L HLL
 (Wakial)_∅ ('o t_i ceposid)_∅ (g wisilo_i)_∅
 cowboy AUX:IMP:3rd brand-IMP:3rd DET calf

1.2. German

For the prosodic analysis of German, I rely on the following criteria¹:

- *Stress*: Nespior and Vogel 1989 argue that stress is assigned with regard to prosodic, not syntactic, constituents. On their analysis there is a one-to-one correlation between phrasal stress and phonological constituents. Adopting this analysis, we can infer from the number of phrasal stresses in a clause to the number of phonological phrases.

- A *boundary tone of ∅*: A boundary tone marks the right edge of non-final phonological phrases in the speech of many speakers². Following the notation of Hayes and Lahiri 1991, this tone will here be marked *HP*. In the example in (4), there are three instances of phrasal stress. At the right edge of the first and the second NP with phrasal stress, the boundary tone can be seen, suggesting a structure of phonological phrases as indicated.

- (4) x x x phrasal stress
 (Renate)_∅ (kann mit geschlossenen Augen)_∅ (ein Zebra malen)_∅ ∅-structure
 HP HP phrasal tones
 'Renate can with closed eyes a zebra draw'
 'Renate can draw a zebra with her eyes closed'

- A *boundary tone of I*: Some speakers distinguish different levels of tones. For these, non-final intonational phrases appear to be marked with a higher boundary tone than phonological phrases. The higher boundary tone will be marked *H^I*. An example is shown in (5).

¹The evidence from German draws on judgements and recordings from a number of German speakers. The 'O'odham examples in (10) are thanks to Albert Alvarez.

²See Bierwisch 1966 and Pheby 1980 for discussion of this; see Beckman and Pierrehumbert 1986, Hayes and Lahiri 1991, Hyman 1990 for discussion of boundary tones

- (5)
- | | | | |
|---|-------------------|-----------------|--------------------|
| x | x | x | x |
| [| x | x |]I |
| (Wenn Katharina) | (eine Fete macht) | (spielt Daniel) | (Klavier) |
| HP | HI | HP | |
| if | Katharina | a party makes | plays Daniel piano |
| ‘If Katharina throws a party, Daniel will play the piano’ | | | |

As one would expect in Nespor and Vogel’s theory of phrasal stress, the intonational phrase also corresponds to an additional amount of phrasal stress, assigned rightmost in each intonational phrase, as in (5). (6) sums up the phonological criteria that will identify prosodic structure in German in this paper.

- (6)
- | | |
|---|--|
| phonological phrase () \emptyset | intonational phrase []I |
| (x) \emptyset (x) \emptyset | [x]I [x]I |
| HP | HI |
| - phrasal stress | - additional stress (rightmost) |
| - HP at the right edge of non-final \emptyset s | - HI at the right edge of non-final Is |

Returning then to the topic of this section, extraposition from NP results in a separate \emptyset in German, as shown in (7). Here the count of phrasal stress as well as the boundary tone preceding the extraposed PP give evidence of the \emptyset -boundary to the left of the extraposed PP.

- (7)
- | | | |
|--|---------------------------------------|-------------------------------|
| x | x | x |
| (Eine Studentin) | (hat ein Buch t _i gelesen) | (von Anaïs Nin _i) |
| HP | HP | |
| a student | has a book read | by Anaïs Nin |
| ‘A student has read a book by Anaïs Nin’ | | |

2. Movement that is too short: A prosodic restriction on the landing site

Hale 1975 and Hale, Jeanne and Platero 1977 have observed a restriction on the landing site of extraposition in 'O'dham, which they argue is prosodic in nature. Haider (p.c., see also Haider 1993) has observed a curiosity about a restriction on the landing site of extraposition in German. On the present account, these restrictions both go back to the schema in (1) in the same way, representing the case of movement which is too short (see (2)(a)). The following analysis draws on the prosodic restriction by Hale et al., but differs from that analysis slightly.

2.1. Tohono 'O'dham: Ken Hale's case

Ordinarily (islands apart), elements that extrapose in 'O'dham can adjoin to any higher syntactic category. Thus, when the object of a postposition is extraposed to the right, it can adjoin either to the postpositional phrase, as in (8), or to a higher VP as in (9).

- (8)(a) (L H H H L) \emptyset (b) (L H L) \emptyset (H L) \emptyset) \emptyset
 ['am mi:sa weco]_{PP} ['am t_i weco]_{PP} [g mi:sa]_i NP P]_{PP}
 LOC table under LOC under DET table
 ‘under the table’

- (9)(a) (H)∅ (L L HH HH HL)∅
 gogs 'o [['am mi:sa weco]PP wo'o]VP
 dog AUX LOC table under lie
 'The dog is lying under the table'

- (b) (H)∅ (L L H H HL)∅ (HL)∅)∅
 gogs 'o [['am t_i weco]PP wo'o]VP [g mi:sa]i NP P]PP V]VP
 dog AUX LOC under lie DET table

However, adjunction to the PP is not possible in all cases inside a clause. Even though it is allowed when the PP is fronted, as in (10), or when the PP is itself extraposed, as in (11), it is not allowed in (12), when the PP is followed by the verb in the head-final VP of 'O'dham.

- (10)(a) (L H H H L)∅ (L H HL)∅
 ['am mi:sa weco]PP 'o g gogs wo'o
 LOC table under AUX DET dog lie

- (b) (L HL)∅ (HL)∅ (L H HL)∅)∅ (NP P]PP
 ['am t_i weco]PP [g mi:sa]i 'o g gogs wo'o
 LOC under DET table AUX DET dog lie

- (11)(a) (H)∅ (L HL)∅ (L H H H L)∅
 gogs 'o wo'o ['am mi:sa weco]PP
 dog AUX lie LOC table under

- (b) (H)∅ (L HL)∅ (L HL)∅ (HL)∅)∅
 gogs 'o wo'o ['am t_i weco]PP [g mi:sa]i NP P]PP
 dog AUX lie LOC under DET table

- (12)(a) (H)∅ (L L HH HH HL)∅ (= (9)(a))
 gogs 'o [['am mi:sa weco]PP wo'o]VP
 dog AUX LOC table under lie

- (b) ??/* gogs 'o [['am t_i weco]PP [g mi:sa]i wo'o]VP)∅
 dog AUX LOC under DET table lie NP P]PP V]VP

As shown in (8) - (12), these cases can be distinguished in the prosody: In (8) - (11), where extraposition is grammatical, the right edge of the PP coincides with a ∅-boundary. In (12), where extraposition is deviant, there is no ∅-boundary to the right of the PP before extraposition. The restriction in (1) thus rules out (12)(b) as an instance of extraposition which is too short: the extraposing element, an NP which would become a phonological phrase upon extraposition (see (8) - (11)), must move as far as out of the ∅ it originates in. In the structure with a large ∅ in (9) and (12), the NP has to move to the edge of that ∅, as in (9)(b). It cannot be extraposed within that ∅, as in (12)(b).

2.2. German: Hubert Haider's puzzle

In German, a series of head-final VPs may stack at the end of a clause, as in (13).

- (13) Daß der Peter oft [[[Rezensionen gelesen]VP haben]VP soll]VP ...
 that NOM Peter often reviews read have should
 'That Peter is supposed to have often read reviews ...'

Of these, only the outmost VP is a possible landing site for extraposition. Adjunction to the inner VPs is not possible. This is shown in (14).

- (14)(a) ??/* Daß der Peter oft [[Bücher t_i gelesen]_{VP} von Anaïs Nin_i]_{VP} haben soll, ...
 (b) * Daß der Peter oft [[Bücher t_i gelesen haben]_{VP} von Anaïs Nin_i]_{VP} soll, ...
 (c) Daß der Peter [[oft Bücher t_i gelesen haben soll]_{VP} von Anaïs Nin_i]_{VP} ...
 that NOM Peter often books read (a) have (b) should (c)
 - where (a),(b),(c) are the adjunction-sites of 'by Anaïs Nin'
 'That Peter is supposed to have often read books by Anaïs Nin ...'

As Haider (p.c. see also Haider 1993) points out, this is surprising, because when one of the inner VPs is topicalized, it may well serve as a landing site for extraposition.

- (15)(a) [[Bücher t_i gelesen]_{VP} von Anaïs Nin_i]_{VP-k} [hat_m der Peter oft t_k t_m]_{C'}
 books read by Anaïs Nin has NOM Peter often
 (b) [[Bücher t_i gelesen]_{VP} von Anaïs Nin_i]_{VP-k} [soll_m der Peter oft t_k haben t_m]_{C'}³
 books read by Anaïs Nin should NOM Peter often have
 'Peter is supposed to have often read books by Anaïs Nin'

Why, then, do the smaller VPs provide good landing sites for extraposition when they are topicalized, but not when they are in situ? The prosodic restriction in (1) provides an answer: there is no \emptyset -break after the inner VPs when they are in situ, but there is a \emptyset -break after a topicalized VP and, trivially, at the edge of the outer VP.

Note first that an unscrambled indefinite object is phrased together with the final verb in German. There is but a single phrasal stress on the VP in this case (which falls on the object, see Schmerling 1976, Selkirk 1984, Cinque 1993), suggesting a single \emptyset . Likewise, there is only one tonal contour in the VP, as indicated by the tone in (16).⁴

- (16)
- | | | | | |
|-----------------------------|-------------------------------------|-----------------|----------------|-----|
| [| x | x | x |] |
| (Daß der Peter) \emptyset | (oft Rezensionen liest) \emptyset | findet der Paul | komisch. | |
| H ^P | | H ^I | | |
| that NOM Peter | often reviews | reads | finds NOM Paul | odd |

The same evidence suggests that a series of clause-final verbs is integrated into the same \emptyset as shown in (17). This is in accord with Bierwisch's 1966 suggestions.

- (17)
- | | | | | |
|---|--|-----------------|----------------------------|-----|
| [| x | x | x |] |
| (Daß der Peter) \emptyset | (oft Rezensionen gelesen haben soll) \emptyset | findet der Paul | komisch | |
| H ^P | | H ^I | | |
| that NOM Peter | often reviews | read | have should finds NOM Paul | odd |
| 'Paul finds it odd that Peter is supposed to have often read reviews' | | | | |

³Thiersch 1985, crediting Tilman Höhle, noted that clauses of the form [_{VP} ... participle]_k [_{C'} modal ... t_k aux] (like the one in (15)(b)) are marked for some, but not other speakers. The judgements I use here are from speakers who accept this kind of topicalization.

⁴The tonal evidence here is not compelling since the boundary tone often spreads leftward to the syllable following the previous phrasal stress. It is not clear, therefore, if the actual contour is derived from L*H% or L*H%H%. The reader is referred to my forthcoming thesis for more discussion.

Thus, when a PP or relative clause adjoins to the outmost VP as in (18) or (19), it leaves the phonological phrase that it originated in, thus meeting the restriction in (1)

- (18) $\begin{array}{ccc} & x & \\ & \text{Der Peter hat (oft Bücher } t_i \text{ gelesen)}_{\emptyset} & \text{(von Anaïs Nin}_i\text{)}_{\emptyset} \\ & & \text{HP} \\ \text{NOM Peter has often books} & \text{read} & \text{by Anaïs Nin} \end{array}$

- (19) $\begin{array}{ccc} & x & \\ & \text{Daß der Peter (oft Bücher } t_i \text{ gelesen haben soll)}_{\emptyset} & \text{(von Anaïs Nin}_i\text{)}_{\emptyset} \\ & & \text{HP} \\ \text{that NOM Peter often books} & \text{read have should} & \text{by Anaïs Nin} \end{array}$

However, (1) is violated when the PP adjoins to one of the lower VPs, landing between the verbs, as in (14)(a) and (b). In that case, the PP does not move out of the \emptyset it originates in. Its move is too short. (14)(a) and (b) are thus ruled out by (1).

Why, then, is adjunction to a lower VP possible if that VP is topicalized, as in (14)? In German, fronted elements are phrased separately in the phonology as noted by Bierwisch 1966. Thus in (14), the initial VP is a phonological phrase of its own, and adjunction of the PP to VP will be in accord with (1). This is shown in (20).

- (20)(a) $\begin{array}{ccc} & x & \\ & \text{(Bücher gelesen)}_{\emptyset} & \text{(hat er oft)}_{\emptyset} \\ & & \text{HP} \\ \text{books} & \text{read} & \text{has he often} \end{array}$
- (b) $\begin{array}{ccc} & x & & x \\ & \text{(Bücher } t_i \text{ gelesen)}_{\emptyset} & \text{(von Anaïs Nin}_i\text{)}_{\emptyset} & \text{(hat er oft)}_{\emptyset} \\ & & \text{HP} & \text{HP} \\ \text{books} & \text{read} & \text{by Anaïs Nin} & \text{has he often} \end{array}$

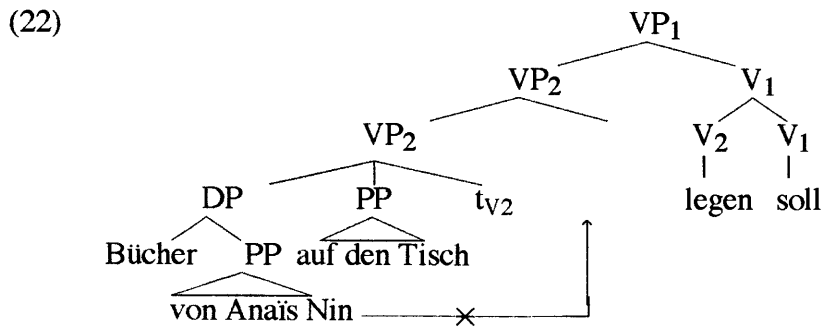
2.3. Problems with a syntactic alternative

Are there possible syntactic explanations for Haider's puzzle? Since Evers' 1975 proposal to this effect, it has been discussed whether or not the final verbs in German are incorporated into a *verb cluster*.⁵ If indeed the final verbs in (13) and (14) obligatorily form a complex head, extraposition to a position between them as in (14)(a) and (b) can be ruled out in the syntax: the structure-preserving properties of movement, preventing adjunction of an XP to a head, will not allow extraposition here: *[haben [von Anaïs Nin]_{PP} soll]_V. However, such an analysis will not solve Haider's puzzle. Consider the possibilities of extraposition in an example with a more complex VP in (21).

- (21)(a) daß der Peter [[Bücher t_i auf den Tisch [legen soll]_V]_{VP} von Anaïs Nin_i]_{VP}
 (b) * daß der Peter [Bücher t_i auf den Tisch t_k]_{VP} [[legen [von Anaïs Nin_i]_{PP} soll]_V
 (c) ??/* daß der Peter [[Bücher t_i auf den Tisch t_k]_{VP} von Anaïs Nin_i]_{VP} [legen_k soll]_V
 that NOM Peter books on the table (c) put (b) should (a)
 - where (a), (b) and (c) are the adjunction sites of 'by Anaïs Nin'
 'That Peter should put books by Anaïs Nin on the table'

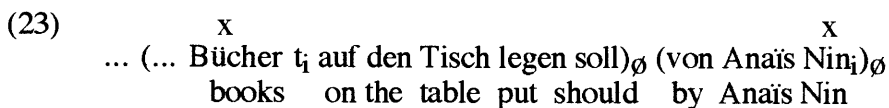
⁵Den Besten and Edmondson 1983, Haegeman and Van Riemsdijk 1986 for such incorporation analyses; see Thiersch 1985, Kroch and Santorini 1991 for analyses without incorporation and arguments against it.

(21)(a) shows the grammatical case of extraposition to the right of all the verbs. In (21)(b), extraposition has taken the PP to a position between the two final verbs. The ungrammaticality of this example would follow from the incorporation hypothesis: PP may not adjoin to V in the middle of a complex head. However, this hypothesis would lead one to expect (21)(c) to be grammatical: here the PP has adjoined to the right of the inner VP - of which the head has incorporated into the next higher verb under the incorporation-hypothesis. This is shown in (22).



Syntactically, this adjunction should be possible. On the incorporation hypothesis, the question of why one cannot adjoin to an inner VP thus pops up again in (21)(c). The incorporation account thus cannot solve Haider's puzzle.

The restriction in (1) handles these cases as follows. The last element with phrasal stress in this example is the direct object, the definite PP being destressed (see Selkirk 1995a for discussion of similar facts in English). The PP and the final verbs must therefore be part of the same phonological phrase, as shown in (23).

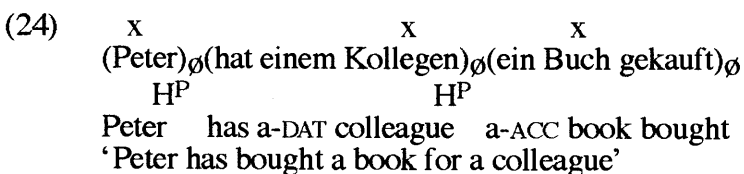


When the PP *von Anaïs Nin* extraposes, it moves out of the phonological phrase it is inside of – to the edge of the clause as in (23). By the restriction in (1), it may not move any shorter than that, landing within the \emptyset it originates in, either between the verbs as in (21)(b) or between the prepositional object and the verbs as in (21)(c). This explanation holds regardless of whether or not there is incorporation in (21)(b).

3. Movement that is too long

3.1. Extraposition on the level of the phonological phrase in German

A clause with three objects as in (24) will be divided in three phonological phrases as shown.



Extraposition is possible from the lowest object as in (25), in accord with the restriction in (1). However, extraposition cannot take a PP out of one of the higher arguments across an intervening \emptyset to the right edge of the clause as in (26). The cases in

(26) are ruled out as movement which is too long by (1) (see (2)(b)): a PP, which becomes a phonological phrase upon extraposition, may not extrapose across intervening phonological phrases.

(25)

	^x		^x		^x		^x
	(Peter) _∅	(hat einem Kollegen) _∅	(ein Buch t _i gekauft) _∅	(von Chomsky _i) _∅			
	HP	HP	HP				
	Peter	has a-DAT colleague	a book bought	by Chomsky			

(26)(a)

	^x		^x		^x		^x
*	(Peter) _∅	(hat einem Kollegen t _i) _∅	(ein Buch gekauft) _∅	(aus Italien _i) _∅			
	HP	HP	HP				
	Peter	has a-DAT colleague	a book bought	from Italy			

(b)

	^x		^x		^x		^x
*	... (daß ein Kollege t _i) _∅	(dem Peter) _∅	(ein Buch gekauft hat) _∅	(aus Italien _i) _∅			
	HP	HP	HP				
	that a-NOM colleague	DAT Peter	a book bought	has from Italy			

One might hypothesize that the direct object in these examples is *L-marked* (Chomsky 1986), whereas the indirect object and the subject are not L-marked, thus being barriers for movement. This hypothesis runs into the following problems. First, they are not islands for extraposition of relative clauses, as will be discussed below. Second, they are not even islands for PP-extraposition in a consistent way. Thus, when the intervening arguments in (26) are moved out of the way (by scrambling or topicalization) as in (27), extraposition of the PP becomes possible.

(27)(a)

	^x		^x		^x		^x
	(Der Peter) _∅	(hat die Bücher _k) _∅	(einem Kollegen t _i t _k gekauft) _∅	(aus Italien _i) _∅			
	HP	HP	HP				
	NOM Peter	has the books	a-DAT colleague	bought	from Italy		

(b)

	^x		^x		^x		^x
	(Die Bücher _k)	(hat dem Peter) _∅	(ein Kollege t _i t _k gekauft) _∅	(aus Italien _i) _∅			
	HP	HP	HP				
	The books	has DAT Peter	a-NOM colleague	bought	from Italy		

On the hypothesis about L-marking, one would expect the sentences in (27) to be as ungrammatical as the ones in (26), since indirect objects and subjects would not be L-marked due to their syntactic position. This, however, is not the case. On the other hand, the restriction in (1) correctly accounts for the difference between (26) and (27): the extraposing PP moves across intervening phonological phrases in (26), but not in (27).

Consider also (28). When an indefinite direct object is followed by a directional PP, the phonological default-structure depends on the definiteness of the prepositional object.

(28)(a) [What happened?]

	^x		^x		^x
	(Der Peter) _∅	(hat zwei Bücher) _∅	(auf einen Tisch gelegt) _∅		
	HP	HP			
	NOM Peter	has two books	on a table put		
	'Peter has put two books on a table'				

- (b) [What happened?]
 $\begin{array}{c} x \quad x \\ \text{(Der Peter)}_{\emptyset} \text{ (hat zwei Bücher auf den Tisch gelegt)}_{\emptyset} \\ \text{H}^{\text{P}} \\ \text{NOM Peter has two books on the table put} \\ \text{'Peter has put two books on the table'}$

If the prepositional object is indefinite, it will itself attract the default-stress, as in (28)(a). If it is definite, default-stress will fall on the preceding direct object as in (28)(b). (See Selkirk 1995a for discussion of similar facts in English). As predicted by (1), extraposition from the direct object is restricted in (28)(a), where it would have to cross an intervening \emptyset , but it is possible in (28)(b), where the \emptyset that contains the direct objects stretches to the edge of the clause:

- (29)(a) ?? [What happened?]
 $\begin{array}{c} x \quad x \quad x \quad x \\ \text{(Der Peter)}_{\emptyset} \text{ (hat zwei Bücher } t_i \text{)}_{\emptyset} \text{ (auf einen Tisch gelegt)}_{\emptyset} \text{ (von Chomsky}_i\text{)}_{\emptyset} \\ \text{H}^{\text{P}} \quad \text{H}^{\text{P}} \quad \text{H}^{\text{P}} \\ \text{NOM Peter has two books on a table put by Chomsky}$
- (b) [What happened?]
 $\begin{array}{c} x \quad x \quad x \\ \text{(Der Peter)}_{\emptyset} \text{ (hat zwei Bücher } t_i \text{ auf den Tisch gelegt)}_{\emptyset} \text{ (von Chomsky}_i\text{)}_{\emptyset} \\ \text{H}^{\text{P}} \quad \text{H}^{\text{P}} \\ \text{NOM Peter has two books on the table put by Chomsky}$

Furthermore, consider the stress-patterns in (30) with a topicalized object, where the phonological structure appears to vary with focus: In a neutral context, such as (30)(a), the subject and the VP each constitute separate \emptyset s. With focus on the subject, as in (30)(b), the \emptyset of the VP seems to disappear and a larger \emptyset is formed, as suggested by the reduction of stress on the VP.

- (30)(a) [Did you hear anything about the play?]
 $\begin{array}{c} x \quad x \quad x \\ \text{(Das Theaterstück)}_{\emptyset} \text{ (hat eine Journalistin)}_{\emptyset} \text{ (verrissen)}_{\emptyset} \\ \text{H}^{\text{P}} \quad \text{H}^{\text{P}} \\ \text{the play has a journalist torn-to-pieces} \\ \text{'A journalist has torn the play to pieces'}$
- (b) [Who has torn the play to pieces?]
 $\begin{array}{c} x \quad x \\ \text{(Das Theaterstück)}_{\emptyset} \text{ (hat eine Journalistin verrissen)}_{\emptyset} \\ \text{H}^{\text{P}}\end{array}$

Correspondingly, extraposition from the subject is possible in (30)(b) but not (a).

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(31)(a) ?? [Did you hear anything about the play?]

$\begin{matrix} x & & x & & x & & x \\ \text{(Das Theaterstück)}_{\emptyset} & \text{(hat eine Journalistin } t_i \text{)}_{\emptyset} & \text{(verrissen)}_{\emptyset} & \text{(vom Globe)}_{\emptyset} \\ \text{H}^P & & \text{H}^P & & \text{H}^P & & \text{H}^P \\ \text{the play} & \text{has a journalist} & \text{torn-to-pieces of-the Globe} \\ \text{'A journalist of the Globe has torn the play to pieces'}$

(b) [Who has torn the play to pieces?]

$\begin{matrix} x & & x & & x \\ \text{(Das Theaterstück)}_{\emptyset} & \text{(hat eine Journalistin } t_i \text{ verrissen)}_{\emptyset} & \text{(vom Globe)}_{\emptyset} \\ \text{H}^P & & \text{H}^P & & \text{H}^P \end{matrix}$

3.2. Extraposition on the level of the phonological phrase in English

Gueron 1980 convincingly argues that some restrictions on extraposition of PPs from NP in English are not syntactic.⁶ Thus extraposition of PPs from subjects is restricted to subjects of 'predicates of appearance'. Consider some of her examples, here annotated with structure.

- (32)(a) [A man t_i appeared] from India;
 (b) * [A man t_i died] from India; (without context)
 (c) Several visitors from foreign countries died in the terrible accident.
 [A woman t_i died] from Peru and [a man t_i died] from India.
 (33)(a) [A book t_i is making the rounds] by Chomsky;
 (b) * [A book t_i delighted Mary] by Charles;

Extraposition is possible from the subject of an appearance predicate as in (32)(a), but not in (32)(b) with the verb *died*. However, given the right context, as in (32)(c), 'appearance in the world of discourse' can be said to apply to the subject of *died*, in which case extraposition becomes possible. Likewise in (33), where a meaning of appearance can be seen in (a) but not in (b), with extraposition being possible accordingly.

Here I want to outline an analysis of these distinctions in terms of (1). The subject and the VP are normally separate phonological phrases, as in $(a \text{ man})_{\emptyset}(\text{died})_{\emptyset}$. Extraposition from the subject to the right of the clause is therefore not possible according to (1), since it would have to skip an intervening phonological phrase, as shown in (34).

(34) $\begin{matrix} x & & x \\ \text{(a man } t_i)_{\emptyset} & \text{(died)}_{\emptyset} & \text{from India;} \\ & \underbrace{\hspace{2cm}}_{\times} & \end{matrix}$

Evidence for this prosodic structure in English comes from two sources: (a) Each \emptyset is assigned one default phrasal stress in the theory of Nespor and Vogel 1989; (b) the Rhythm-Rule applies within, but not across phonological phrases (see Nespor and Vogel 1982, 1989; Hayes 1989). Hayes 1989 argues that subject and VP are separated by a \emptyset -boundary in English, since the Rhythm-Rule that shifts stress leftward on *hórizóntal* in $(\text{hórizóntal line})_{\emptyset}$ does not do so on *Mississippi* in $??(\text{Mississippi})_{\emptyset}(\text{óutlawed it})_{\emptyset}$.

What, then, of predicates of appearance? As Gueron notes herself, these have an independent prosodic property: Consider her examples in (35).

⁶See also Rochemont 1978; see Johnson 1985 for a syntactic account and Takami and Kuno 1992 for arguments against Johnson's proposal.

- (40) [What happened?]
 [x x x]_I [x]
 (Der Peter)_∅ (hat zwei Bücher t)_∅ (auf einen Tisch gelegt)_∅ (die er am Dienstag)_∅
 H^P H^P H^I H^P
 NOM Peter has two books on a table put which he on Tuesday
 x]_I
 (aus Italien mitgebracht hat)
 from Italy brought has
 'Peter has put two books that he brought from Italy on Tuesday on a table'

Here the tonal structure shows a H^I tone as opposed to a H^P tone to the left of the relative clause. This suggests that there is an intonational phrase break separating matrix and relative clause. I suggest, therefore, that relative clauses meet the restriction in (1) after all, but with the additional option of using a different level of the prosodic structure. To this effect I assume that relative clauses, unlike regular PPs, may be mapped into intonational phrases upon extraposition. The schema in (1) then allows them to move as far as out of the intonational phrase that they originate in. This will typically be an entire root clause, which will form a single intonational phrase in the default-case (see Downing 1970). The analysis that extends (1) to the level of the intonational phrase has a number of advantages over an analysis that restricts (1) to the phonological phrase and exempts relative clauses from it.

First, it correctly predicts that certain clause-internal parentheticals can block relative clause extraposition as in (41). Parentheticals will typically introduce intonational-phrase boundaries (see Downing 1970, Bing 1979, Nespor and Vogel 1986). To cross them, the moving relative clause will have to move across intervening intonational phrases. Therefore such cases can be ruled out by (1) as movement which is too long on the present proposal.⁹

- (41) ??/* [**Peter hat zwei Bücher t_i**]]_I [so sagt jedenfalls die Maria]_I
 Peter has two books so said anyway NOM Maria
 [auf einen Tisch gelegt]_I [**die er aus Italien mitgebracht hat**]_I]_I
 on a table put which he from Italy brought has

Second, a story can be told about why *long* PPs will often extrapose from NP more freely than short PPs¹⁰.

⁹But see Culicover and Rochemont 1990 for a syntactic explanation of similar effects in English, based on a suggestion about parenthetical-placement by Emonds 1976. They also present some judgements that are problematic for the present account. One of them is that the blocking-effect disappears when the parenthetical is inserted between matrix and relative clause. On a more prosodic way of looking at this, one might maintain that parenthetical-insertion follows both extraposition and the application of (1), but has as a requirement that there be an I-boundary to begin with at the point of insertion of the parenthetical. In such an analysis the clause-internal parenthetical will require a clause that is cut up into multiple Is, still ruling out (41), but the parenthetical may be inserted between matrix and relative clause, where an I-boundary is compatible with extraposition. The parenthetical will then not itself count as an I for the restriction in (1).

¹⁰This was pointed out to me by Gereon Müller; the data are not always as clear-cut as one would like, but the tendency seems to be clear.

- (42) (?) [Did you hear anything about the play?]
- $\begin{matrix} x & & x & & x \\ \text{(Das Theaterstück)}\emptyset & \text{(hat eine Journalistin t)}\emptyset & \text{(verrissen)}\emptyset & \text{(vom einer} \\ \text{the play} & \text{has a journalist} & \text{torn-to-pieces of} & \text{a} \\ & & & & \\ & x & & x \\ & \text{Zeitung)}\emptyset & \text{(aus Boston)}\emptyset & \\ & \text{newspaper from Boston} & & \\ \text{'A journalist of a newspaper from Boston has torn the play to pieces'}$

Compare (42) with (31)(a). In (42), like in (31)(a), a moving PP has skipped an intervening phonological phrase, the \emptyset of the VP. The improved status of (42) can be accounted for with reference to the intonational phrase: Longer constituents tend to form intonational phrases, even if the mechanisms of the syntax-prosody mapping proper would not assign them I-boundaries otherwise (see Nespor and Vogel 1986, Zec and Inkelas 1990, 1995). Thus an extraposed PP, if it is long enough, will at least marginally be mapped into an intonational phrase. When that happens, the distance to the trace will be measured in terms of intonational phrases, rather than phonological phrases, according to (1).

Finally, the assumption that the schema in (1) applies to relative clauses as well as to PPs allows one to make the right predictions about multiple extraposition from NP. To this effect, let us understand the schema in (1) representationally rather than derivationally, such that extraposition of more than one element on the same level is ruled out: in $(\dots t_i \dots t_j \dots)\emptyset(XP_i)\emptyset(YP_j)\emptyset$, YP is then too far away from its trace since the \emptyset of XP intervenes between the two. Multiple extraposition from NP from within the same clause is thus only possible in the structure $[\dots t_i (\dots t_j \dots)\emptyset (XP_j)\emptyset]_I [YP_i]_I$. It follows (a) that three elements cannot be extraposed at the same time - there is only room for one on the level of \emptyset and one on the level of I; (b) that the two elements extraposed from the matrix clause cannot be pronounced with equal prosodic weight; instead, the first (being a \emptyset : a PP or a relative clause) is pronounced lower and with less of a pause to its left than the second (a relative clause or, marginally, a heavy PP) which is an intonational phrase. This can be seen in the example in (43)(a) from Rochemont and Culicover 1990 (prosodic annotation my own). (c) The restrictions (a) and (b) do not apply when each of a series of relative clauses is extraposed from the immediately preceding (relative-) clause. Here the multiple extrapositions do not interfere with one another: $[\dots t_i \dots] [\dots t_j \dots]_i [\dots t_k \dots]_j [\dots]_k \dots$. It is therefore correctly predicted that in this case, unlike in the previous one, multiple extraposition can take place any number of times in a row, and that a pronunciation of equal weight of each extraposed element is allowed. This is shown in (43)(b), a variation on a famous sentence from Chomsky and Halle 1968.

- (43)(a) A man t_i came into the room t_j last night [that I had just finished painting] $_j$ # [who had blond hair] $_i$
- (b) [That is the cat t_i over there] # [that caught a rat t_j yesterday] $_i$ # [that stole some cheese t_k last week] $_j$ # [that John had brought from Switzerland] $_k$

5. Summary

I argued that extraposition from NP is subject to the prosodic restriction in (1). The following assumptions about the assignment of prosodic categories to extraposed constituents entered into the argumentation:

- (44)(a) PP → ∅
 (b) relative clause → ∅ or I
 (c) heavy element → I (optionally and somewhat marginally)

The reader is referred to my forthcoming thesis (1995) for more discussion of these assumptions, and of how (1) might be built into current models of grammar.

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