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Table of Contents

Volume One

Introduction vii
List of Contributors xi
Table of Contents Ordered by Thematic Category xv
Transcription, Abbreviations, Bibliography xxi
List of Illustrations xxiii
Articles A–F 1

Volume Two

Transcription, Abbreviations, Bibliography vii
Articles G–O 1

Volume Three

Transcription, Abbreviations, Bibliography vii
Articles P–Z 1
Index 547

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Syntax-Phonology Interface

Most linguistic theories divide language into computational systems, such as the phonological, morphological, and syntactic (a practice that goes back at least to Morris 1938 within the linguistics literature). The syntactic component is responsible for the construction of sentences, the phonological component for how those sentences are pronounced. The syntax-phonology interface refers to the relationship between the syntactic structure of an utterance and its phonological encoding. The prosodic encoding of a sentence is modelled within the prosodic hierarchy, which includes the → utterance, → intonational phrase, → phonological phrase, → clitic group (on some accounts), and → prosodic word. The division between these two components raises a number of questions, a small sample of which I offer here: (i) How are syntactic processes affected by prosody (broadly construed to include stress, rhythm, intonational phrasing, and word length)? (ii) At what point in the syntax is prosody computed? (iii) To what extent do prosodic structures reflect morphosyntactic information? (iv) What kind of syntactic information plays a role in determining prosodic form? (v) How is morphosyntactic structure encoded?

A standard assumption of generative syntax is that syntactic operations manipulate linguistic units devoid of phonological make-up. In the course of a derivation, the syntactic component makes no reference to the sounds or prosody of a word. It is only after the morphosyntactic structure of a sentence is built that it is then handed off to the phonological component, where its phonological properties are "filled in". In short, syntax feeds phonology (and conversely, phonology just interprets syntax). While syntactic structure obviously plays a significant role in the prosodic coding of an utterance, it is worth bearing in mind that this is only one of many factors: speaker disposition (surprise, anger, irony), speech situation, and the pragmatic (or cognitive) status of constituents can all play crucial roles in how a speaker encodes an utterance prosodically. One consequence of this step-wise syntax-to-phonology derivation is the principle of phonology-free syntax (PPFS, Zwicky and Pullum 1986, 1988; Truckenbrodt 2007): syntactic computation does not access and is not subject to the phonological properties of lexical items. Intuitively this idea seems correct, as we would never expect a syntactic generalization of the sort "place words beginning with [p] in clause-initial position." In the vast majority of cases, the principle is unquestionably sound, and its proponents consider it a linguistic universal (Miller et al. 2007:67–69 and references therein). Nevertheless, significant attempts have been made to argue that the relationship between syntax and phonology is neither so neat nor unidirectional (see for instance Hetzron 1972; Inkelas and Zec 1990). Challenges to the PPFS come especially from second-position clitics, in as much as their distribution often requires reference to both syntactic and prosodic structure: see Boškovic (2001) for an overview of both the problems and the solutions that have thus far been proposed; Schütze (1994) offers detailed discussion of many of the problems involved in the distribution of second-position clitics in Bosnian/Serbian/Croatian. According to → Wackernagel's Law, for instance, second-position clausal clitics are hosted by the first phonological word within their domain, as we see for instance in the following example, where the second-position modal → particle *án* occurs after the article + noun, and not after the article itself, as one might have expected (from Hdt. 2.26.2):

(1) [*ho hḗlios*]=*án*
'the sun'-PRT.

Together the definite article *ho* and the noun *hḗlios* constitute a prosodic word, which is here signalled by square brackets. (It should be noted that other clitics in Greek, such as the discourse particle *dé* can occur between an article-noun string. Slightly more complicated is the following alternation:

(2) *ouk=àn oîd' ei dunaímēn hápanta en mnḗmēi pálin labeîn*
not-PRT I know if I could(opt.) all in mind again take
'I don't know if I could retain everything in memory again' (Pl. *Tim.* 26b4–5)

The modal particle *án* occurs second in the matrix clause (the equals sign marks the host-clitic relationship), although it is interpreted with the verb of the embedded clause *dunaímēn*. While this might at first glance remind the reader of negative-raising in English (e.g. '*I don't think he's going to be here*'), *án* would normally be found in the embedded clause where it is interpreted (e.g., Pl. *Resp*. 414c7). On the assumption that *án* selects a host at the left edge of an intonational phrase, then one wonders if in this case, there was no intonational phrase between the matrix and embedded clauses, as a result of which the only licit host was then the *ouk* of the matrix clause.

The relationship between morphosyntactic form and prosodic form is complex, and not one-to-one (cf. the remarks of Bolinger 1972). While there may be certain general correlations between syntax and prosody, such as a prototypical mapping of a root clause onto an intonational phrase, this is by no means always the case (see e.g. Devine and Stephens 1994:414–416, Selkirk 2005, Nespor and Vogel 2007). Even in a theory where prosody is not banned from syntactic derivation, it can play a role at a higher-level, for instance, between two contextually-felicitous constructions that differ rhythmically, such as:

(3) a. *the car's wheel*
b. *the wheel of the car*

As Shih et al. (to appear) argue, while prosody is not the sole factor in the choice between the two constructions, it is certainly one of them.

Investigating the syntax-prosody interface in Ancient Greek presents first and foremost methodological challenges (and indeed there is no small amount of skepticism in the literature as to whether we can really know anything: see e.g. Bornemann and Risch 1974:162). The biggest problem to contend with is how to determine prosodic structure on the basis of written corpora. In short, it has to be done indirectly. As discussed in Allen (1975) and Devine and Stephens (1994), indicators of prosodic structure include inscriptional punctuation; → movable consonants, including *-n* and *-s*; → sandhi-phenomena, including → elision; resyllabification; → accentuation; the distribution of → clitics and → particles which is the basis of the *Kolon*-model of Fränkel (1964); see also Goldstein 2010); parenthetical constructions (Fränkel 1965); → verse structure (including → caesurae and → bridges); and musical settings, above all those of the Delphic Hymns (Pöhlmann and West 2001). This list is intended as a general collection; some of these diagnostic tests can only be used to detect specific prosodic domains.

Turning to a less theory-oriented topic, a long-standing question of the philological literature is: To what extent is prosody used to mark information structure? Greek is famous for its rich particle lexicon, among which are various markers of information structure (e.g., *ge, dé, dḗ, mén, mḗn, oûn, pou, rha*, and *tar*, none of which is easily glossed). Given this rich stock, one might wonder whether Greek had less in the way of prosodic marking of information structure. We should not, however, think of lexical marking and prosodic marking as in complementary distribution. We do have some evidence for sentence-level prosody; I will name just three examples here. The first is the retraction of the accent that we find with *egṓ* 'I' and *emoí* 'me (dat)', whose accent occurs on the final syllable. In the presence of the enclitic particle *ge*, however, the accent shifts to the first syllable:

(4) a. *egṓ* → *égōge* 'I at any rate, as far as I'm concerned'
b. *emoí* → *émoige* 'to/for me at any rate'

One would normally expect the accent to simply remain acute in the presence of enclitic *ge*. What we have in the case of *égōge* and *émoige* seems to be the production of sentence stress that effectively overrode the expected word-stress pattern. On the basis of similar evidence from accentuation, we are able to determine that interrogatives in Ancient Greek could be formed with the question particle *ára* as well as the typologically-common rising intonation. We have indirect evidence for the latter feature, as rising intonation has left its mark on *wh*-words. When a word has an acute (H) accent on its final syllable and is followed by another word, the accent becomes grave (L). This process never takes place with *wh*-words, however:

(5) *tí taûta?*
'What's this?' (Eur. *Cyc*. 36)

Further evidence for the rising intonation of interrogatives comes from individual lexical items, such as *alēthḗs*. When the adjective is

used to mean 'true' the accent occurs on the final syllable; when used as a discourse-marker to mean 'really?', the accent occurs on the first syllable, i.e. *álēthes* (*LSJ* s.v. ἀληθής III.2, and Ammonius, ed. Nickau 26).

While the prosodic correlates of information structure may now by and large be beyond recovery, there are other questions of the syntax-prosody interface that can be profitably investigated. One example is that of Heavy-NP shift (Hawkins 1983), a tendency to move lengthy noun phrases to the right edge of the sentence. This would be an especially interesting investigation in Ancient Greek, where we have texts of complex rhetorical structure, at both the NP and clause levels. The relationship between syntax and phonology raises no small number of theoretical questions: for recent overviews, see Elordieta (2008), Selkirk (2011), and Truckenbrodt (2007).

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