



BRILL

A Linguistic Analysis of the Modern Greek *Dekapentasyllavo* Meter

*Nina Topintzi**

Aristotle University of Thessaloniki

topintzi@enl.auth.gr

Stefano Versace

Goethe Universität Frankfurt am Main

versastef@gmail.com

Abstract

Dekapentasyllavo (DPS), the dominant poetic meter in the Modern Greek poetic tradition since several centuries, has barely received any attention by modern linguistic theories. Basing our discussion on the analysis of several *dimotiká tragóúdia* (folk songs), we seek to understand the structure underlying the meter. Our investigation reveals which patterns are frequently attested, which are less frequent and those which are (virtually) inexistent. DPS verifies the oft-cited L-R asymmetry in verselines (cf. Ryan 2013), which renders L-edges looser than the stricter R-edges. It also tolerates stress lapses much more than stress clashes. Our ensuing account captures this distribution by referring to, primarily, the relation of phonological phrasing to counting of metrical positions and, secondarily, to rhythm. These components are then integrated within a formal analysis along the lines of the Bracketed Grid Theory (Fabb & Halle 2008). We conclude by outlining how DPS poses a challenge for theories of poetic meter and by contemplating its contribution to the field.

Keywords

dekapentasyllavo – poetic meter – phonological phrasing – iambic rhythm – asymmetries – Bracketed Grid Theory

* Both authors have contributed equally to the paper and authors' names are listed in alphabetical order. We are also grateful to two JGL anonymous reviewers, as well as to François

1 Introduction

Dekapentesyllavo (DPS), literally meaning “15 syllables”, is the most important indigenous meter of the Modern Greek (MG) poetic tradition spanning several centuries and poetic genres, including folk songs, medieval and early modern vernacular poetry, as well as much learned Byzantine writing in the ceremonial and exegetical traditions (Hörandner 1974). We explore it here in the context of the folk songs, the so-called *dimotiká tragoudia*, where the metrical form flourished. As Horrocks (2010: 407) seems to imply, there is no absolute consensus regarding the beginnings of *dimotiká tragoudia*, but it is undeniable that they share elements that date back to the Byzantine era and present affinities with the ‘akritic circle’. The verse-type itself, however, that is predominant in the songs actually predates them. Horrocks (2010: 328) citing Jeffreys (1974) suggests that its origins “go back to the acclamations employed to greet triumphant generals in Republican Rome”, allowing it to orally evolve in its full form over the course of the following millennium.

With the exception of Nespór (1999) who only briefly examines Greek folk songs, there is, to our knowledge, no linguistic analysis that has focused on the structural properties of this metrical form. We aim to start filling up this gap by examining a substantial number of lines as collected in the Politis (2009) corpus of Greek folk songs. It is worth clarifying that most of the songs in our corpus do not consistently display division into strophes, nor rhyme schemes. We by no means exclude the possibility that other sections may display such forms. However, for the purposes of the present paper, we only focus on the linguistic structure of the DPS line.

After a presentation of the data under discussion (§ 2), we proceed with a detailed exposition of the patterns found in the first and second half-lines (§ 3.1–3.2) and demonstrate the lack of co-occurrence restrictions between the patterns of the two half-lines (§ 3.3). Section 3.4. summarizes the main patterns found. In section 3, we briefly discuss the evidence for the caesura (§ 4.1), then highlight the role of phonological phrasing (§ 4.2) and how it is integrated into the analysis of the defining features of DPS (§ 4.3). In particular, we claim that the structure of DPS predominantly relies on phonological phrasing as well as the counting of metrical positions; (iambic) rhythm is also important, but as a subsidiary component. Other traits of the meter such as the preference for lapses over clashes and asymmetries between the left and the right edges of (half)lines are also addressed. Section 5 seeks to offer a formal account of DPS

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along the lines of Fabb & Halle (2008). Finally, Section 6 accentuates how the study of DPS poses challenges for theories of poetic meter. A few concluding remarks are also offered.

2 Data Overview

For the present research, we have examined 1228 lines from the landmark collection of Greek folk songs, *Εκλογαί από τα τραγούδια του ελληνικού λαού* ['Selections from the songs of the Greek people'], compiled by Nikolaos Politis (1852–1921) in 1914. Many editions have followed since then. Our corpus follows the 2009 edition, but we have occasionally consulted the versions of 1925 and 2001 (for lines missing, possible typos, etc). Although highly esteemed, it should be noted that the collection is claimed by e.g. Beaton (1986) to be hypercorrected, sometimes regularized.

Our paper includes scansions of 4 sections in the Politis (2009) corpus. Following his numbering, these are: (i) *Istorika Tragoudia* 'historical songs' (songs 1–19), (ii) *Kleftika Tragoudia* 'songs of the partisans' (songs 20–68), (iii) *Nanarismata* 'lullabies' (songs 148–154) and (iv) *Moirologia* 'mournings' (songs 173–204). Occasionally in these sections, a few songs structured in verse-patterns different from DPS, e.g. 8σ or 12σ, were identified. We refer in particular to songs 10B, 17, 18B, 22, 34, 40, 44, 61A, 151. Obviously, these were excluded from our survey. Our corpus of 1228 lines thus contains: 18 *Istorika* = 298 lines, 44 *Kleftika* = 652 lines, 5 *Nanarismata* = 61 lines and 34 *Moirologia* = 217 lines.

Before proceeding, some terminological clarification is in order; it is well-known that the term 'metrical' is used in the literature to refer both to patterns arising in poetry, as well as in language generally, thus one language may possess a poetic meter that is for example iambic, while the language's meter is in general trochaic. To avoid confusion, we reserve the terms metrical for poetic purposes and phonological or grammatical for the general language. We also use the term 'lexical' to refer to the linguistic prominences/stresses that in the case of Greek are basically lexically assigned (e.g. Revithiadou 1999) and which of course play a significant role in the design of poetic meter.¹ Example-lines follow an (x.y) schema, where x = song number, y = line number; for the notation of metrical positions, we use the system PZ, with P standing for 'position' and Z indicating the number of the metrical position in the line from 1–15, thus P8 = position 8. We often use the slash '/' to indicate halfline boundaries. The

¹ In our scansion we counted the lexical stresses of: (a) all fully-lexical words even if monosyllabic, e.g. γής 'earth', (b) functional words with two or more syllables, e.g. από 'from', όπου 'where' etc.

lines quoted are accompanied by their IPA transcription and translation in the Appendix.

The prototypical DPS-pattern contains two asymmetric halflines/hemistichs, the first of which contains 8 metrical positions and the second 7. Typically, even-numbered positions tend to receive stress creating an iambic alternation with seven strong metrical positions, i.e. 2-4-6-8/10-12-14, as in (1).

- (1) a. βαρεί δεξιά, βαρεί ζερβιά, βαρεί μπροστά και πίσω (56.16)
 2 4 6 8 10 12 14

In practice however and in the overwhelming majority of cases, only a subset of these strong metrical positions is actually present. For instance, in (2a) all 15 metrical positions are laid out for convenience, but the ones actually bearing phonological stress are just 2-6/10-14 in boldface. In (2b) the strong positions in the meter are instead 2-8/12-14.

- (2) a. Το Σούλι κι αν προσκύνησε, κι αν τούρκεψε νη Κιάφα (8.8)
 1 2 3 4 5 **6** 7 8 9 **10** 11 12 13 **14** 15
- b. Ταηδόνια της Ανατολής και τα πουλιά της Δύσης (1.1)
 1 2 3 4 5 6 7 **8** 9 10 11 12 13 **14** 15

Other recurrent features of DPS, some of which are (near-)universal include the (almost) absolute lack of stress on P7, the compulsory presence of stress on P14, the optionality of stress on either P6 or P8 in the first halfline and the obligatory presence of a word-boundary at P8. Much less robustly, we also find stress clashes and lapses, typically arising through trochaic inversions, whereby (certain) odd-numbered positions are metrically strong.

For instance, in (3a) P1 and P5 constitute odd positions filled by lexically stressed syllables, in violation of the assumed iambic template. P5 is followed by another strong position, P6, thus creating a stress clash. This clash is *optionally* resolved by some speakers by means of a stress shift from P5 to P4 [N.B.: the de-stressed position is underlined and the position where stress shifts is capitalized], thus bypassing the clash problem altogether, while simultaneously ensuring a more normalized scansion.² Even with such shift though, a lapse between P1 and—now—P4 emerges, a pattern sometimes found in DPS, as discussed in more detail in § 3.1 and § 4.3.

2 A reviewer correctly points out that for *κυρά* a lexicalized variant *κύρα* already exists that would facilitate the stress shift even more.

Interestingly, the comparable clash in (3b) between P₂ and P₃ does not receive equal resolution. One can imagine that this is because doing so leads to a sequence 1–3 in strong positions, a situation far from the desirable alternating iambic pattern. The rightward shift P₃⇒P₄ on the other hand in (4a) derives exactly such a welcome result and is admitted. (4b) communicates the same point for the 2nd halfline too.

- (3) *Leftward shift*
- a. Σώπασε ΚΥρά Δέσποινα (2.17) *allowed*
 1 4⇐5 6
- b. *ΚΑλά τρώμε και πίνουμε (29.7) *avoided*
 1⇐2 3 6
- (4) *Rightward shift*
- a. καλά τρώμε και πίνουμε (29.7) *allowed*
 2 3⇒4 6
- b. χωρίς ύπινο στο μάτι (66.B7) *allowed*
 10 11⇒12 14

Put differently, the re-adjustments above, albeit by no means obligatory, are regulated by a preference for iambic rhythm, thus shifts from odd-numbered to even-numbered positions do occur, at least in performance, but not vice versa.³ Nonetheless, the fact that violations of iambicity are commonly left untreated is an indication that rhythm, while an important component of DPS, is not the most fundamental one, as argued in detail in the coming sections.

In what follows, we endeavor to identify the bare bones of DPS, that is, its intrinsic linguistic properties. To that end, we propose (i) an analysis of the actual phonological stress patterns found in DPS and (ii) a generalization that

3 The rhythmic preference may also explain why some speakers—such as the first author, a native speaker of the language, and several other speakers informally tested through questionnaires—are very likely to introduce additional stresses (in even-numbered positions) that are missing lexically, but are presumably provided during performance, so as to achieve a completely rhythmic line with alternating stresses throughout, as in (1). To visualise what this means, it largely amounts to producing e.g. (2a) as shown here, but with extra stresses on P₄, 8 and 12. Although this may indeed reflect the underlying metrical schema of DPS, we cannot outright exclude the possibility that the effect is at least partly due to schooling, since DPS is taught in schools and is always presented as a very regular meter of alternating iambs that students are encouraged to recite accordingly. We leave this issue open for future investigation.

associates them to the domains of the line and the halfline. In our view, the meter's intrinsic linguistic properties need to be instantiated by each legitimate DPS line, before other factors (stress shifts/additions, music, dance) enter the equation and give as an output a much more consistently rhythmical form. Consequently, we offer a performance-free-account. That is not to say however that we are oblivious to performance factors; on the contrary, we acknowledge those when appropriate, but suggest that performance appears to be superimposed and, as such, not central to the core of DPS.⁴

3 Patterns in Detail

This section presents a thorough discussion of the various patterns found in our corpus. § 3.1. and § 3.2 deal with the first and second halflines, respectively. § 3.3. discusses the possibility that the structure of the first halfline determines that of the second halfline. § 3.4. summarizes the main findings that our account (§ 4) and formal analysis (§ 5) seek to capture. § 3.1–3.2. are fundamental in justifying why we choose certain patterns as the core ones. However, the reader who wishes to be informed on the main patterns without the relevant argumentation, may skip over to § 3.4 directly, before moving on to the analysis.

3.1 *First Halfline*

Figure 1 below contains all the phonological patterns found in our corpus. A total of 42 patterns have been identified, the majority of which however appear extremely infrequently (shown here in solid gray). The 7 most frequent patterns (in boxes with diagonal lines) account for 81,27 % of the data, i.e. 998 instances of the total 1228 lines. The next 3 low-frequency patterns (in dotted boxes) amount to 113 lines, that is, 9,20 % of the total. The remaining 32 rare patterns correspond to 117 lines, i.e. 9,53 %.

The next figure focuses on the 10 most common patterns that add up to 90 % of the lines examined. Of these patterns, 7 involve the canonical iambic schema (836 lines = 68 %), whereas 3 present a metrical inversion on the first foot (275 lines = 22 %), thus displaying an initial sequence of Stressed-Unstressed syllables.

4 Future work on DPS will also have to look into the phonetic realization of DPS lines in existing recordings, and to the relation between prosody and the properties highlighted in the present research. For a similar perspective on languages other than Greek, namely Finnish, Estonian, Swedish and Lithuanian, the reader may consult Lehiste (1992).

HemA: Phonological Stress Patterns

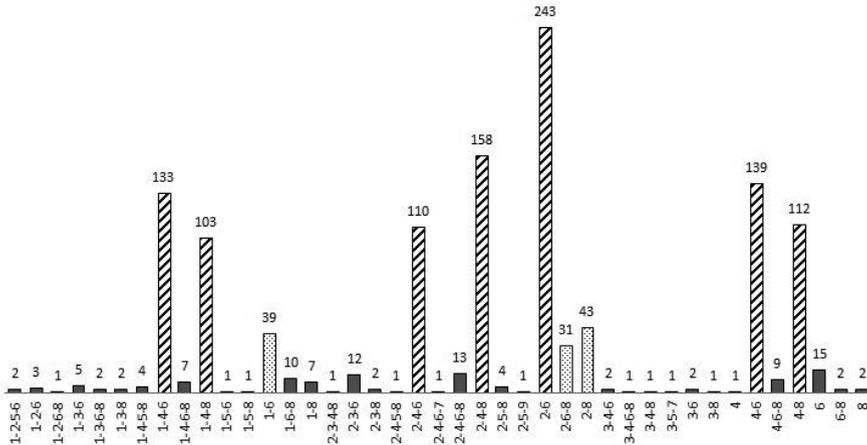


FIGURE 1 *Collection of all attested lexical stress patterns in the 1st hemistich, accompanied by the number of lines illustrating each pattern*

HemA: Most common patterns

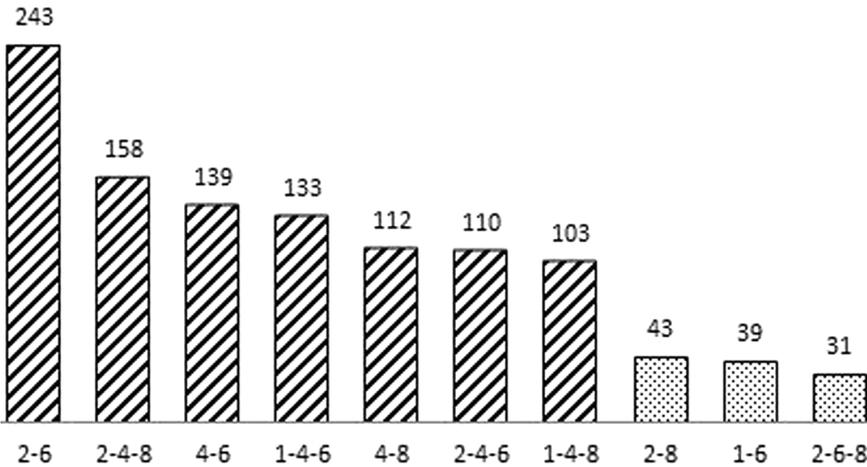


FIGURE 2 *Most-commonly attested patterns in the 1st hemistich*

Let us first draw some observations focusing on the patterns that are consistently iambic. Overall, one can observe that what we dub *dyads*, i.e. halflines with 2 lexical stresses, are preferred over *triads*, i.e. halflines with 3 stresses. There are 6 possible types of *dyads*, as listed in (5).

- (5) {2-4} {2-6} {2-8} {4-6} {4-8} {6-8}

Of those, three are common, i.e. {2-6}, {4-6}, {4-8}; in fact, the first is the predominant pattern throughout. {2-8} is also possible, although rather infrequent. Interestingly, the two remaining patterns are either vanishingly rare, cf. {6-8}, or nonexistent, cf. {2-4}. Both share the presence of consecutive lexical stresses at the halfline edges.

In the case of *triads*, four schemata are possible: {2-4-6}, {2-4-8}, {2-6-8} and {4-6-8}. While all are attested, the former two appear with much higher frequency than the other two. In fact, {4-6-8} is quite marginal. Evidently, it is very much preferred that a lexical stress appear early on in the halfline (P2). As for *tetrads*, the only logical possibility {2-4-6-8} does occur, although not as often, as one would expect given the traditional descriptions alluding to the highly rhythmic character of the meter.

While inversions are admitted in the meter, they are for the most part restricted to the beginning of the line, where P1 rather than P2 gets stress. In patterns with inversions, the situation is reverse compared to the absolute iambic ones; here *triads* are favored over *dyads*, hence {1-4-6}, {1-4-8} > {1-6}. Inversions later in the halfline are not completely unheard of (see Fig. 1), e.g. for all of {2-3-6}, {2-3-8}, {2-4-5-8} or {2-5-8} among others, a few occurrences are observed. However, it seems that P3 constitutes a slightly better inversion than P5, e.g. compare the 12 instances of {2-3-6} vs. the 4 of {2-5-8}. A similar trend arises in the examination of double inversions; there are a few more instances of patterns {1-3-6}, {1-3-6-8} and {1-3-8} as opposed to {1-4-5-8}, {1-5-6}, {1-5-8}. Of course, the occurrences are at any rate so few, that the effect may actually be random. What is evident though is the primacy of the P1 inversion over the others, hence $P1_{inv.} > P3_{inv.}, P5_{inv.}$.

A few more facts are noteworthy; first, we identified a limited number of single-stressed halflines. In particular, we found 15 examples with P6 stressed, 2 with P8, and 1 example with P4. No instance of P2-only was found, which of course makes sense given the halfline length. Second, first halflines are virtually always 8 metrical positions long, with a couple of exceptions, both of which prove less convincing at closer scrutiny. One is found in 42.10. In Politis (2009), the line appears as “μον πήτε την πλάκα πεθερά, τη μαύρη γης γυναίκα”, that is, 16σ- rather than 15σ-long and exhibits the {2-5-9} pattern above. However, in

other editions of the collection, e.g. Politis (1925, 2001), the line is a 15σ ordinary one “μον πήτε πως παντρεύτηκα νεδῶ σ’αυτά τα μέρη”, which we take to be the correct one. The second counter-example also seemingly exhibits stress on P7, which is otherwise virtually unattested.

- (6) δε μπορώ ’α σύρω τάρματα, τα γέρημα τσαπράζια (38.2)
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

In the scansion above, 16 positions are present and the stressed patterns {3-5-7} and {11-15} emerge. The problem here seems to originate in position 4. To resolve the problem, one could imagine a synaloepha occurring between P3-4, which would turn the line into a 15σ-long one with presumably the patterns {3-4-6} and {10-14}. While this is reasonable, we note that the suggested rendition seems very difficult to perform, as it would necessarily create a potential clash between two primary stresses, those on *μπορώ* and *σύρω*. There is one more line with stress on P7. The symbol \wedge indicates here the assumed synaloepha.

- (7) κῖαν πέση \wedge αιτός και πάρη \wedge ένα, ἐν ἀπό τα πουλιά της (182.4)
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Although lexical stresses are positioned as indicated in the scansion, we feel that the line reads oddly; we actually prefer a rendition whereby 3 of the stresses in the line move one position to the right, i.e. 7-9-11 → 8-10-12 producing the following line with rhythmic alternation: “can pési ajtós ce pári ená, enápo tá pu $\acute{\alpha}$ tis”. Since this is however a matter of performance, we presently merely acknowledge the point, but still count 182.4 as a possible, though unique exception to the generalization that P7 never receives stress.

3.2 Second Halfline

The situation in the second halfline presents both similarities as well as differences with that of the first hemistich. Figure 3 illustrates all the patterns found in that halfline. Compared to the 42 patterns of Fig. 1, here we only get 12.⁵

A difference that easily stands out is that P14 always receives stress and hence is included in all patterns. In the first halfline, there is no one single syllable that always receives stress, although either P6 or P8 must. This issue is taken on in

5 Note that the pattern {11-15} is the one found in the two exceptional, and most likely wrongly reported, lines of a 16σ-length. See the previous section for discussion.

HemB: Phonological Stress Patterns

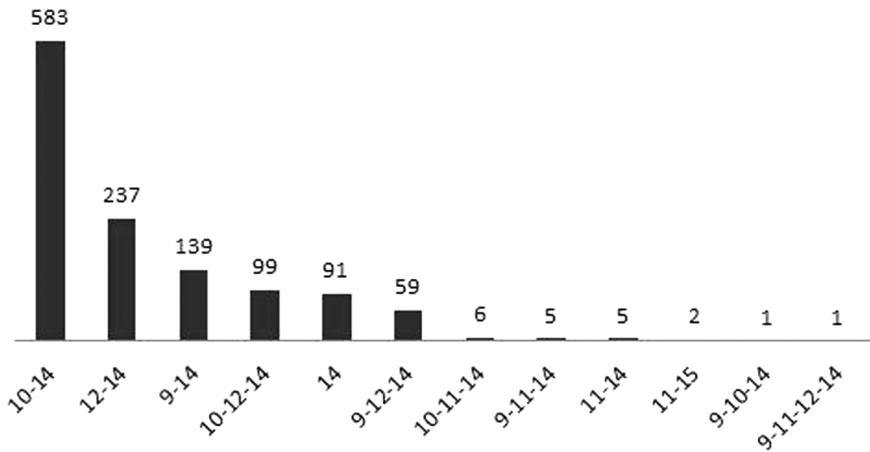


FIGURE 3 Collection of all attested lexical stress patterns in the 2nd hemistich, accompanied by the number of lines illustrating each pattern

§ 4.2. It suffices to mention at this point that it is natural then to have a smaller domain of possibilities to play with in the second halfline, while at the same time avoiding stress clashes to the extent possible. As a result, fewer patterns can actually be generated.

What is more, the 6 commonest patterns account for the 98,37% of all the patterns (1208 lines), rendering the exceptional patterns true outliers, which are consequently not taken into consideration in the numbers below. In fact, the two most common dyads {10-14} and {12-14} alone amount to 820 lines, a number that already constitutes the majority of examples (66,78%). As in the case of the first hemistich, the iambic patterns, that is {10-14, 12-14, 10-12-14, 14}, add up to 1010 lines, i.e. 82,25% of all the patterns. The 198 instances of patterns with trochaic inversions initially, i.e. {9-14} and {9-12-14}, correspond to 16,12%. Common to both hemistichs is the presence of a sizeable number of trochaic inversions at the beginning of the halfline.

Bearing in mind that marginal patterns are commoner in the first halfline (roughly 10% in HemA vs. 1,63% in HemB), it is worth noting that the tendency for iambs is quite stronger in the second hemistich (HemB: 82,25% vs. HemA: 68%), whereas the presence of trochees in both halflines is more comparable (HemB: 16,12% vs. HemA: 22%), although still more inversions are admitted in the 1st halfline. Overall then, the 2nd halfline presents a stricter iambic rhythm compared to that of the 1st halfline.

Another similarity between the two halflines is that the commonest pattern in either case is a dyad where the first stress appears on the first even syllable at the beginning of the halfline and the next one 4 positions later, i.e. {2–6} and {10–14}. Apparently, there is a preference to keep the two stresses at some distance, without having them too close, as in {2–4} or {4–6}, but also not too far from each other, as in {2–8}. In some abstract sense and in a way that would be compatible with the preferred regularized performance, the line is then ideally composed of 7 iambic feet, as shown in (8), 4 of which receive actual prominence (stressed syllable in bold) in an alternating way starting from the first foot; the remaining three ‘silent’ feet act as a buffer zone in between, but their even syllables (underlined) can be stressed in performance.

- (8) *Schematic Representation of the ‘Ideal’ {2–6 / 10–14} line*
 (1 2)(3 4)(5 **6**)(7 8) / (9 **10**)(11 12)(13 **14**)15

Of course, while this is the commonest pattern (especially in the second halfline), it is by no means the only one. Others also emerge; we show that the variation arising—perhaps driven by aesthetic purposes, so as to keep the audience interested—is governed by particular principles to be discussed in Section 4.

3.3 *The Lack of Co-occurrence Restrictions*

Our presentation of the data so far has largely treated the two halflines as individual entities and has examined the patterns arising independently. It is of course possible however that there is some correlation between the two hemistichs so that if one pattern is chosen in HemA, say {4–8}, then a specific pattern is (more likely) chosen in HemB. Fig. 4 below indicates that no such correlation seems to emerge.

Had there been some correlation between types of patterns between the two hemistichs, we would have found evidence for certain patterns to be more likely associated with one another, but instead what we see is a fairly equal distribution for all.

Nonetheless, at least superficially a few more observations can be made if we focus on Fig. 5, which is a reproduction of Fig. 4 only this time displaying the information relevant to the 10 most common patterns found in HemA (cf. Fig. 2). Given that the current paper is more interested in the inherent structure of DPS, rather than the specific statistics pertaining to the corpus used (for an approach along these lines, see e.g. Hayes, Wilson & Shisko (2012)), the following should be treated with some reservation, since no further tests, e.g. for statistical significance have been conducted.

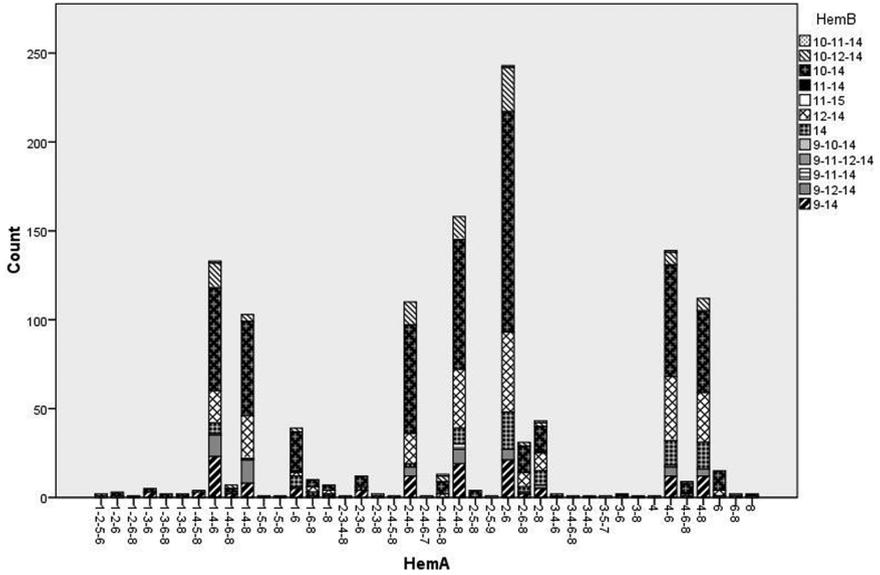


FIGURE 4 *Distribution of patterns across the whole DPS line by matching the pattern of HemaA with the corresponding in HemaB*

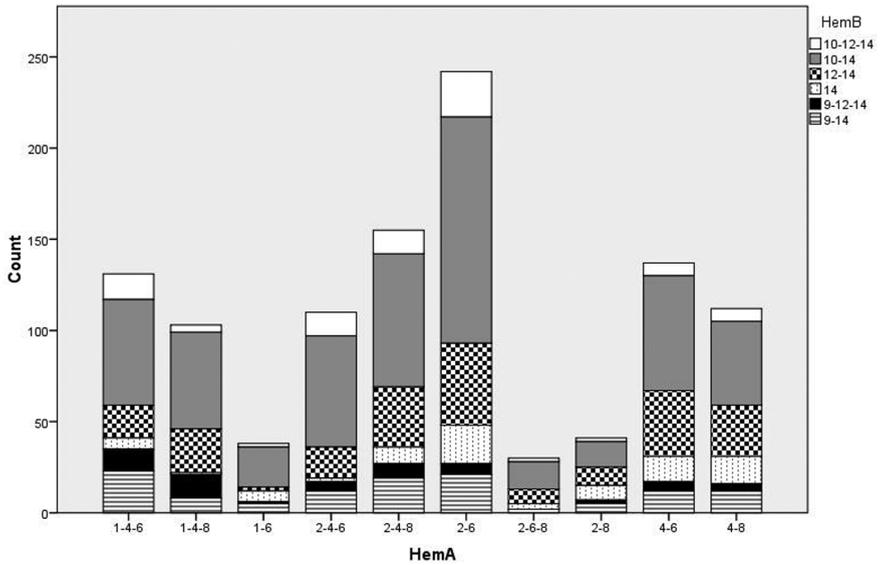


FIGURE 5 *The 10 most common patterns of HemaA matched against the patterns in HemaB*

While the rather scattered distribution of patterns is confirmed when looking up-close, it seems that the combined pattern of a triad with inversion in the first hemistich, i.e. {1-4-6} and {1-4-8} is possibly more commonly associated with inversion in the second halfline too, especially the one of the {9-12-14} type. The latter pattern is otherwise fairly infrequent. Interestingly, creation of a clash at the halfline boundaries, i.e. between P8 and P9, is not actively avoided. One could perhaps have expected that patterns with stress on P9 would correlate better with patterns that do not end in a stressed syllable in P8, but this is not the case. A nice indication of that is the comparison between {4-6} and patterns beginning with {9 ...} in the second halfline, vs. {4-8} and the same patterns in the second halfline. The frequency looks identical, but, given the smaller number of {4-8} instances on the whole, clash turns out to be somewhat more frequent in that combination, i.e. {4-8-9 ...}.

Pattern {10-14} in the second hemistich seems to be the most stable of all the *normal* patterns, i.e. those lacking inversion, in the sense that its distribution is roughly the same, in fact predominant, no matter what the pattern in the first hemistich is. This is not the case for instance for {10-12-14} whose frequency fluctuates. It is not uncommon when combined with {2-6} or {1-4-6}, but it is vanishingly rare when combined with {1-6} or {2-8}. Further statistical investigation of the data in the future might be able to establish the statistical significance or randomness of the observations above.

3.4 Summary

The preceding exploration has identified several facts about DPS that emerge systematically or frequently. For convenience, these are summarized below. Section 4 attempts to relate most of these features with more fundamental properties that, we claim, regulate DPS at its core. § 4.3 in particular revises and restates these traits in terms of asymmetries.

(9) *Recurring facts about DPS*

- Lines consist of 15 positions
- There are two halflines: the 1st is 8Ps long, the 2nd 7Ps long, always in that order
- Even-numbered strong positions are preferred (tendency for iambic rhythm)
- P14 is obligatorily strong
- Either P6 or P8 is strong (but not both typically)
 - o A consequence of the latter two: most lines exhibit either {6-14} or {8-14}
- P8 always coincides with the end of a word (caesura)

- P7 and P13 are never stressed
- Inversions in the beginning of the half-lines are relatively common, primarily producing {1-4-6}, {1-4-8} or {9-12-14}

4 Observations and Analysis

The present section provides an analysis of the main DPS features introduced above. After some discussion on the caesura as a relevant constituent that DPS makes reference to (§ 4.1), we point to a systematic asymmetry between P6&P8 versus P14 at the right edges of the half-lines and suggest that the alignment of phrases at that edge is instrumental towards the understanding of DPS (§ 4.2). We then claim that the form of DPS relies on three factors: (i) the said alignment, (ii) the number of positions within the half-line and (iii) iambic rhythm. While we argue that all are significant, we suggest a preponderance of the first two and the complementary character of (iii).

4.1 *In Favor of the caesura*

In this section we argue in favor of the existence of the caesura in DPS, which consequently renders it a compound meter. While a re-analysis of DPS as a couplet of alternating lines of $8+7\sigma$ cannot be outright dismissed, we suggest that the traditional view of DPS as 15 σ -long with a caesura after P8 allows us further insights and supports a deeper understanding of other features of the meter, in particular those discussed in the following sections.

First, consider the fact that the 8th position is always followed by a word-boundary. In other words, P8 is always either the stressed syllable in a stress-final word, or the last syllable of an antepultimately-stressed word. We found no lines that contest either of these configurations and no word that stretches across P8 and P9, or beyond. In our corpus, P8 is also always followed by a φ -break (phonological-phrase break), while the syntactic and prosodic structures of the two assumed half-lines are comparable/parallel to one another. In order for a line to be a legitimate instance of DPS, the counting of syllables must be paired with the placement of the caesura, and the distribution of the lexical and phonological material within the half-lines must be strictly tied to the counting and the caesura. In turn, this also justifies the existence of two separate half-lines which are both crucial for the verse design.

Furthermore, a trochaic inversion may often occur on P9–10. This is indirect evidence for the caesura itself, but also an indication that P9 and P10 are equally variable with respect to their being strong or weak. The behavior of P9–10 mirrors that of P1–2, whereby the likelihood for metrical inversions is high;

apparently, inversions target the L-edges of the metrical structures, which, in the case of DPS, are thus straightforwardly analyzable as two separate halfines. We also notice that performance, although explicitly not taken into consideration for the reasons provided above, usually marks the assumed caesura with a pause after P8. This is predictable on the grounds of how the prosodic material is distributed within the line.

While we subscribe to the idea that DPS lines indeed contain 15 syllables each, composed of two asymmetric (in length) halfines of 8+7 syllables (10), this is not the only possibility. It is conceivable that one could only allow for lines instead (i.e. no halfines), whose length would alternate between 8 and 7 syllables. DPS would thus be re-interpreted as a couplet (11) and the observations above could be re-interpreted as referring to edges of lines, rather than halfines.

(10) [[1 2 3 4 5 6 7 8]_{HL}[9 10 11 12 13 14 15]_{HL}]_L

(11) [1 2 3 4 5 6 7 8]_L
 [9 10 11 12 13 14 15]_L

While it is true that we have not traced so far a phenomenon that unambiguously requires reference to the 15 σ -line in order to definitely eliminate the couplet option,⁶ there are some points that render the understanding of DPS under (10) preferable; first, DPS always involves a sequence of two strings, i.e. 8 σ +7 σ , always in that order and never the other way round (7+8), as one could potentially imagine, had the two strings been more independent from one another by each forming a line. Second, the conditions on the location of stresses at the left and right edges of the strings in question can be better understood under the first structure.

The reasoning goes as follows. It is widely observed in meter and music that more flexibility is found at the beginnings of constituents rather than at

6 An anonymous reviewer suggests that what constitutes a line, a halfline or a couplet is not universally defined and as such the discussion here really has to do more with terminology than essence. We disagree however for two reasons; first, the argument on the lack of universal definition is weak. Terms such as 'rhotic consonants' and concepts like 'sonority' presumably receive no satisfactory—at least phonological—universal definition and yet are important in phonology. Conversely, extrasyllabic and extraprosodic consonants may be clearly structurally distinguished, but often end up being representational variants. Second, we contend that the justification presented here indeed suggests that reference to the halfline offers more accurate insights empirically for the DPS facts, when compared to the couplet.

their ends. This is the so-called *increasing/final strictness* effect (Ryan 2013). Assuming that the $8/7\sigma$ -strings establish constituents, then it falls out that inversions are allowed at the left edge of the constituent, but not at the right. In addition, Fig. 1 has shown that either P6 or P8 must necessarily receive stress, accounting also for the fact that we never get dyads of the type $\{2-4\}$. Similarly P14 also receives stress. While these results are compatible with viewing the $8/7\sigma$ -strings either as halflines or as independent lines, there is an additional fact that is captured much more neatly under (10). Although stress in all three positions (6, 8, 14) is strictly regulated, stress on P6 and P8 is somewhat looser, as either position may bear it, whereas P14 is stressed without exception. This relative vs. absolute strictness can be seen as a result of the fact that P14 is not only at the R-edge of a halfline, but in fact at the R-edge of the rightmost halfline in the line, thus subject to overall stricter conditions compared to the right edge of the first halfline. Under (11) though, this asymmetry is unexpected, since both strings are independent lines, thus they should exhibit comparable behaviour towards one another.⁷

4.2 *The Importance of Phonological Phrasing and the R-edge*

In the light of the preceding discussion, a structural fact about DPS becomes evident. The R-edges of the two halflines behave in a systematically different fashion in that they build a consistently asymmetric structure. To unfold this generalization, consider some of our findings so far; a DPS line displays 15 metrical positions and exhibits a very strong tendency for stresses to fall on even positions, though it is not the case that all even positions must match with phonological stresses. A longer 1st halfline (with 8 syllables) must always be paired with a shorter 2nd one (7 syllables); while the former may have its last stress on either P6 or 8, the latter has only one fixed option, i.e. P14. Interestingly, phonological stress typically fails to occupy both P6 and P8 in the same line; while a number of counterexamples emerge in the corpus and representative examples are shown in (12), we argue that these are merely apparent.

7 In favor of (11) one could still entertain the idea that the absolute strictness in P14 is actually the result of the fewer positions present in that line, thus rendering the right-edge-domain of the line smaller than the one available when the positions are 8. For this to work, one must also assume that P12 can never be rendered part of the R-edge of the line (an assumption not shared with the alternative account endorsed here). By the same token though, one would then expect that in the 8σ -string, stress should too systematically appear at the R-edge of the line, namely on P8, against facts.

- (12) a. Μουχτάρ Πασάς (5.13)
 5 6 7 8
 b. ταλαφρά σπαθιά (11.14)
 4 5 6 7 8
 c. εφτά μερών ζωή (11.35)
 3 4 5 6 7 8

In fact, it turns out that either P6 or P8 is matched with the Designated Terminal Element (DTE) of φ ,⁸ and that no φ -breaks can ever occur between P6–8. By being part of formulaic expressions, involving two-part names, as in (12a), and adjective-noun couples, as in (12b), the potential counterexamples are no longer real exceptions to the generalization. (12c) is the one of the two examples found in the corpus with a more complex configuration, displaying PP and Noun, but this too can be thought of instead as a single restructured φ , thus making the stressed syllable in ζώή the last DTE of the phrase. We argue then that DPS lines conform to the principle in (13) that regulates the alignment of phonological phrases with the right edges of the halfines.

(13) *Principle of φ -alignment with R-edge in DPS*

1st halfline

- i) P6–8 must belong to the same φ , either position hosting its DTE
- ii) a φ -break must follow P8

2nd halfline

- i) P14 must correspond to a DTE of φ
- ii) P15 must be unstressed and the last of the line

While reference to higher level prosodic constituents, such as the φ -phrase, is made in several other metrical traditions (e.g. in Italian, cf. Nespor & Vogel 1986/2007),⁹ what seems to be particularly interesting and possibly unique in DPS is how strictly regulated such reference is, as outlined above.

8 We refer to DTE as the most prominent syllable within the φ -domain, as defined in Nespor & Vogel (1986/2007).

9 For completeness, we note that in her discussion of DPS, Nespor (1999: 271) mentions that in the unmarked situation, a DPS line contains two intonational phrases (IPs) that correspond to the two halfines; each IP further consists of two phonological phrases. Beyond that, there is not much discussion on phrasing and in particular its prominent role in DPS.

The abstract examples in (14) and (15) help in visualizing the metrical and (some of the) unmetrical configurations respectively, that result from (13). The structures in (14) are exactly those emerging in DPS. The first halfline ends in a single φ that contains the string P6–8 with phonological stress appearing either on P6 or P8, but not on both, since that would immediately signal the presence of one more separate φ , where P6 belongs to. The situation in the 2nd halfline is stricter, since only one position, i.e. P14, can bear the stress and must be followed by an obligatorily unstressed position that also constitutes the end of the line.

(14) *DPS: Metrical Configurations*

- a. $\acute{\sigma} \sigma \sigma]_{\varphi}$ / (1st halfline)
6 7 8
- b. $\sigma \sigma \acute{\sigma}]_{\varphi}$ / (1st halfline)
6 7 8
- c. $\sigma \acute{\sigma} \sigma]_{\varphi}$ (2nd halfline)
13 14 15

The unattested examples in (15) focus either on phrasing and the determination of the DTE (a, b) or on the role of counting (c, d). Although in both (15a, b), the number of positions in the halfline is correct, the placement of the DTE is not (a) or more φ s than permitted are generated (b). On the contrary, in the remaining examples, the phrasing and the position of the DTE is correct, but the counting is not, thus (c) fails as it contains one more position, whereas (d) is one position short.

(15) *DPS: A selection of unmetrical configurations*

- a. $^* \sigma \acute{\sigma} \sigma]_{\varphi}$ / (1st halfline)
6 7 8
- b. $^* \sigma]_{\varphi} [\sigma \acute{\sigma}]_{\varphi}$ / (1st halfline)
6 7 8
- c. $^* \sigma \acute{\sigma} \sigma \sigma]_{\varphi}$ (2nd halfline)
13 14 15 16
- d. $^* \sigma \acute{\sigma}]_{\varphi}$ (2nd halfline)
13 14

Note that the principle in (13) is also telling about the role of performance, as foreshadowed in §2. If the principles underlying DPS are simply to be found in performance, then we have no principled explanation as to why P6 and P8 cannot simultaneously carry phonological stress. It would then be a pure coin-

cidence that in the overwhelming majority of lines (save those mentioned in relation to (12)), it is only one of the two positions that receives real lexical stress and the other one—to the extent it does—receives it for rhythmic purposes.

4.3 *The Defining Components of DPS*

We now have all the components in place that shape the structure of DPS. These are summarised below.

(16) *Components of the DPS Form*

- (i) φ -alignment with R-edge (cf. (13))
- (ii) number of positions within the (half)line (also alluded to in (13))
- (iii) iambic rhythm (cf. § 2)

Given the frequent inversions attested in DPS, one could argue that iambic rhythm is parasitic to (16i-ii), that is, these two components basically regulate the DPS structure. What looks like iambic rhythm particularly in performance is then a side-effect of that, under the assumption that systematically alternating metrical stresses are preferred during performance and thus iambic, rather than trochaic, rhythm is more compatible with stress on P6 or P8. This conclusion is not accurate either.

Had it been the situation that iambic rhythm is an emergent property during performance, then we would expect the patterns of lexical stress in Figures 1&3 to be much more scattered, even random, provided the conditions in (16i-ii) are observed. Rather than presenting the picture in Fig. 2 which highlights a clear preference for stress on even positions (iamb), as well as the occasional trochaic inversion at the beginning of the line, we would anticipate a host of other patterns to emerge with much greater frequency, instead of being vanishingly rare or even unattested, as is the present situation. These would include, among others, patterns like: {3-5-8}, {1-3-6}, {1-3-8}, {3-6}, {2-5-8} or {5-8}, all of which oblige to (16i-ii) otherwise. A possible objection could be that such patterns are in fact avoided not due to their rhythmic properties, but because they would not really adhere to the alternating rhythm leading up to stressing P6 or P8 in performance. But this argument fizzles, since it has been assumed that performance itself can function separately and necessitate its own requirements, such as the preference for iambic rhythm, as we have seen already through the regularizations in (3) and (4). If performance tends to drive stress shifts towards iambic rhythm, then why don't we find many more instances of the aforementioned rare patterns that could simply turn into iambs during performance?

Our answer to that is that iambic rhythm is in fact an inherent—rather than derived in performance—property of DPS, and certainly one that has a rather tight relationship to its linguistic structure. In that sense, then, φ -alignment and counting are predominant in DPS, with rhythm being subsidiary, given that departures from it are admitted. It is still a significant component of the meter though. Because of the above, we consider the meter being fundamentally characterized by two core patterns, namely, {6–14} and {8–14}.

Taken together, the components in (16) produce a series of asymmetries between the L and R edges of the DPS line and its halfines. As pointed out earlier, L/R asymmetries are attested in many metrical traditions (cf. Golston 1998, Fabb 2009, Hayes, Wilson & Shisko 2012, Ryan 2013, among many others) and DPS offers further empirical corroboration to this claim. The main DPS asymmetries are listed in (17). Property (i) is self-explanatory, whereas (iii) has been discussed at some length in § 3.2. The remaining points have been alluded to already, but merit some further discussion.

(17) *Cluster of Asymmetries in DPS*

- (i) halfline length (8 and 7 syllables)
- (ii) stress pattern variability (less variable the closest to the R-halfline edge)
- (iii) location of phonological peak (P6 or P8 for 1st halfline / P14 for 2nd halfline)
- (iv) occurrence of stress clashes (rare overall / frequent across halfines)
- (v) lapses over clashes (lapses are better tolerated than clashes)

Concomitant with stress variability (ii) are stress inversions. As noted before, while these are allowed in either halfline, they typically occur on the first foot, rather than further away. A consequence of that is the emergence of lapses, which is also more likely at the left edge; through stress inversion we commonly get a stress lapse between P1–4, but much less frequently later in the line, e.g. P3–6.

A quick look through Fig. 1 and Fig. 3 makes it clear that stress clashes (iv) are rather rare within the hemistich, but fairly frequent across hemistichs. This can be taken as additional evidence in favor of the existence of halfines in the sense that the caesura sets a boundary that tolerates the presence of stresses on either of its sides. A consequence of (ii) and (iv) is the property in (v) indicating an asymmetry between lapses and clashes. While the former—either as a result of inversions, e.g. P1–4, or due to the distance between lexical stresses, e.g. P2–6—are commonly admitted, clashes are overall dispreferred.

5 A Formal Account

Having established the core properties and asymmetries of DPS (cf. (9), (17)), we sketch a formal analysis of the meter following the model of Bracketed Grid Theory (BGT) put forth by Fabb & Halle (2008; henceforth F&H), a brief introduction of which appears in § 5.1. We suggest that BGT can provide a unitary formal account of the properties highlighted in (16), and we therefore develop such an account in § 5.2.

5.1 *Fabb & Halle (2008): The Basics*

In general terms, BGT formally accounts for the relationship of the constitutive elements of a verseline to the line itself as a whole unit. To do so, BGT develops meter-specific algorithms to account for metrical patterns in verse. These algorithms are implemented as a set of *rules* and *conditions*: the rules take as input phonological units that are designated by each specific poetic tradition, and produce as an output a Bracketed Grid; the well-formedness of the grid is then checked against the specific conditions that may be imposed by a given meter. The grid is generated from each verse-line, rather than imposed onto them.

More specifically, the rules count over an underspecified representation of the phonology of the line. The rules operate on the building blocks of each meter, namely syllables in the case of a syllable-counting or stress-counting meter; these blocks are instantiated as asterisks projected on Gridline 0 (GL0). Through the insertion of brackets iteratively in the fashion of Idsardi (1992), the asterisks are grouped until the input (that is, the line) is over. What creates the further levels of the grid-structure is the combination of the counting rules with a general rule that promotes each head of the constructed groups onto a further level of the grid. All rules apply automatically and stop only when the input is over. In other words, when the rules have grouped the asterisks and projected them onto the upper GLs, there will be a point whereby only a single asterisk is left in the succession of GLs: there are then no more asterisks to group and the iteration ends.

The grouping occurs after the setting of the five parameters listed in (18). Note that parameter setting is defined at each GL, thus it is possible that, for example, GL0 and GL1 present different settings for one or more parameter.

- (18) i) where the bracketing starts (just at L/R line edge, or 1 asterisk in, or 2 asterisks in)
 ii) the kind of brackets inserted (L/R)
 iii) the direction of brackets insertion (L→R or R→L)

- iv) the interval between brackets insertion, that is, the kind of groups constructed (binary or ternary)
- v) the location of heads within the groups (L/R)

By means of illustration, here is F&H's: 6 representation of a line in Keats' *Fancy*.

(19) Pleasure never is at home GL
 (* * (* * (* → 0
 (* * (* * * (→ 1
 (* * * (→ 2
 * 3

At GL0, starting just at the L edge, L brackets are inserted from L to R, building L-headed binary groups.¹⁰ While the final asterisk here is grouped by the computation, this does not necessarily have to be the case. When an asterisk is left ungrouped, then further steps of grid construction will simply disregard it. We will see an instance of this sort in our analysis of DPS below (cf. (21)). Coming back to the case at hand, the algorithm gets to be repeated at GL1 and GL2 with the same setting of parameters, at which point a single asterisk is projected on GL3, thus the computation ends. This final asterisk is named Head of the Verse (HoV). It is worth noticing that this designation is simply the by-product of the computation, and has in itself no association with any particular phonological status of the syllable (*plea-* in the example above) the asterisk projects from. Also, example (19) does not exploit different settings for the parameters, but the latter is in fact what typically occurs and what our DPS analysis below also illustrates.

Another crucial tenet of BGT maintains that the iterative rules are strictly ordered; they apply onto each successive GL and no look-ahead is allowed. Also, the rules are sensitive only to designated aspects of phonological structure. For each poetic tradition (or meter, or author if necessary), BGT defines the relevant phonological property the grid is sensitive to. These properties may correspond to phonological peaks, and they are named 'stress maxima'. Stress maxima influence the computation in that they may be taken into account when explicitly required by the grid-constraining conditions.

We suggest next that BGT provides a unitary formal account for the core properties of DPS as outlined in the previous sections. In particular, we will

¹⁰ These groups basically amount to feet (F&H: 5), but F&H prefer the former term. We use both.

show how defining stress maxima in DPS as DTE of phonological phrases (cf. (28)) and how BGT formally captures the asymmetric relation the meter establishes between the R-edge of both halflines, and the whole line (cf. § 4.2). We now proceed to the formulation of the rules that apply to generate each DPS line, their concrete exemplification, and discussion.

5.2 *A Bracketed Grid Account of DPS*

We propose that a BGT account of DPS should primarily focus on the following characteristics of the meter:

- (20) i) The R-edge of HemA always falls after P8, but the last stressed element in that halfline is either P6 or P8
- ii) The R-edge of HemB always falls one syllable after P14, which in turn is always the last stress-bearing position within the halfline
- iii) P6 and P8 cannot be associated with the same degree of stress
- iv) There is a tendency for all even Ps in the line to be stressed; only P6/8 and P14, however, are always stressed

Plainly put, the analysis put forward to account for the facts in (20) is designed in such a way to address the issue of line length, as well as the fundamental for DPS patterns related to P6, P8, and P14. For this reason, we focus on what we deemed to be the core patterns {8–14} and {6–14}. Our algorithm accounts for the (semi-absolute) lack of stress on P5 and P7 (and similarly for P13, P15), while it indirectly derives the preference for iambic rhythm. We also provide some ideas that may explain the trochaic inversions too, i.e. more likely inversions on P1 and/or P9 versus P3 or P11.

With these clarifications in mind, we propose a single set of rules and conditions to generate the structure shared by each DPS line. The algorithm follows in (21). The grid derived by this algorithm without any further considerations appears in (22).

(21) *Rules for DPS*

- GL0: starting just at the R edge, insert L parentheses, building left-headed binary groups from R to L; incomplete groups are not admitted
- GL1: starting just at the L edge, insert R parentheses, building left-headed binary groups from L to R; incomplete groups are admitted
- GL2: starting just at the L edge, insert R parentheses, building right-headed binary groups from L to R
- GL3: starting just at the L edge, insert R parentheses, building left-headed binary groups from L to R

(22) *Pattern 6–14*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	GL	
*	(	*	*	*	*	*	*	*	*	*	*	*	*	*	*	←0
	)	*	*	)	*	*	)	*	*	)	*	*	)	*	)	→1
	)	*		*		)		*		*		)	*	)	)	→2
				)	*								)	*	)	→3
				*												4

(22) exemplifies any DPS line that has a DTE corresponding to P6 (as well as to P14)—thus making these positions stress maxima. It is the application of the rules in (21) that renders P6 the HoV. Notice that the algorithm, as it stands, does not generate the other core pattern of DPS, namely {8–14}. With the amendments below this can be achieved too. In particular, we suggest introduction of two additional rules.

(23) *DPS filter rule*: No deletion rule may apply on the projection of a stress maximum¹¹

(24) *DPS deletion rule*: Delete the GL0 and GL1 asterisks projecting to the HoV

The filter rule identifies the stress maxima present in the structure and ensures that no deletion rule may affect them. The second rule requires deletion of certain asterisks. The filter in (23) effectively protects the output of the algorithm in (22) from undergoing deletion; having identified P6 as a stress maximum, (24) is blocked from applying. But when P6 is not a stress maximum, the filter is inapplicable, allowing (24) to freely apply.

For clarity, we illustrate the procedure stepwise. Deletion (indicated through Δ) at GL0 of the P6, the HoV, shifts the projection of any further asterisk promoted from the deleted item on to the next available asterisk within the same group as shown through underlining in (25a). The new head of the group—which would by the rules project to HoV—is then the asterisk corresponding to P7; deletion at GL1, then, further shifts the projection onto P8, which now gets projected up to GL4 and thus is designated the HoV. The applicable changes are again underlined (25b). (26) presents the resulting grid for pattern {8–14}.

11 We are thankful to Nigel Fabb for discussion on the rule in (23).

(25) *Towards pattern 8-14*

a. Deletion at GLO

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	GL	
*	*	*	*	*	$\underline{\Delta}$	*	*	*	*	*	*	*	*	*	(	←0
)	*	*	)		$\underline{\quad}$	*	*	)	*		*	)	*			→1
)	*				$\underline{\quad}$	*			*				*			→2
					)	*							*			→3
					$\underline{\quad}$	*										4
					$\underline{\quad}$											

b. Deletion at GLI

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	GL	
*	*	*	*	*	Δ	*	*	*	*	*	*	*	*	*	(	←0
)	*	*	)		$\underline{\quad}$	*	*	)	*		*	)	*			→1
)	*				$\underline{\quad}$	*			*				*			→2
					)	*							*			→3
					$\underline{\quad}$	*										4
					$\underline{\quad}$											

(26) *Pattern 8-14*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	GL	
*	*	*	*	*	Δ	*	*	*	*	*	*	*	*	*	(	←0
)	*	*	)		$\underline{\quad}$	*	*	)	*		*	)	*			→1
)	*				$\underline{\quad}$	*			*				*			→2
					)	*							*			→3
					$\underline{\quad}$	*										4
					$\underline{\quad}$											

An obvious advantage of our account is that it manages to derive both core patterns, i.e. {6-14} (22) and {8-14} (26), through a single set of rules. A few additional remarks are in order. First, notice that application of the filter rule must precede the Δ -rule; the reverse ordering would predict a single core pattern, namely {8-14}. Had deletion applied first, then the structure in (26) would be generated no matter what; the filter rule that would identify that p6 is normally HoV would be unable to block deletion, since the latter would have applied too late. Furthermore, observe that we have assumed that deletion of an asterisk at one level causes shift of the asterisks within the same group. This idea originates in Carlos Piera’s chapter on Southern Romance in Fabb & Halle’s (2008) book.

Finally, to complete the algorithm, two conditions need to be specified for DPS. The first one accounts of the phenomenon characterized as a caesura in §4.1., and another one motivates the set of rules proposed above by specifying the interaction with the stress. The conditions must be formulated as follows:

(27) *Conditions on DPS*

- i. a word boundary must follow the GL1 group that contains the asterisk projecting to HoV
- ii. the asterisks projecting to GL3 must correspond to stress maxima

(27i) states the necessary condition that a caesura must be placed after P8, and defines it as immediately following a GL1 group, which is designated by the grid internal structure. Condition (27ii) states instead that the head of the verse must be a stress maximum. For DPS, we propose stress maxima to be defined as follows.

(28) *Stress maximum definition*

A syllable is a stress maximum if it corresponds to a DTE of φ

Let us now consider two important effects of definition (28) when applied in combination with the rules detailed above. First of all, the definition of stress maximum as DTE entails that it is the most prominent syllable in its φ -domain, i.e. P6 or P8, as discussed throughout the paper. This in turn entails that the syllables associated with P5 and P7 must necessarily carry lesser stress, which explains why these positions virtually always appear stressless in our corpus. On the other hand, (28) allows for the possibility that P9 is the head of a φ , a recurring situation in our corpus. Second, we notice that P8 does not need to be a maximum for the grid to be well-formed, because the interaction of filter, deletion and counting rules would only have the effect to inspect the grid once as to whether P6 occupies a maximum. If this is not the case, the same set of rules and conditions would automatically proceed with the following ordered steps: i) deletion of one asterisk at GL0; ii) deletion of one asterisk at GL1; iii) projection of the other asterisk available, that is, the one corresponding to P8. In turn, P9 could in principle be a DTE of φ . However, it will always follow a major break, when not an actual pause in performance; and it will necessarily be a weaker DTE than the one on 8 given the latter being also the head of an IP. This consequently explains clashes between P8–9 may be frequently admitted. We also notice that the counting rules leave P1 ungrouped: this implies that it is not controlled by the meter with regard to any of its phonological characteristics. Formally this corresponds to the fact that P1 is freer to receive a stress, than for example, P3, P9 or P11. These are the three other positions that can host an inversion, which the proposed algorithm explicitly ignores. For the reader's convenience, we represent below an actual line with such inversions on P3 and P9.

(29) *Inversions on P3 and P9*

Πέντε Τούρκοι την κυνηγούν, πέντε τζοχανταραίοι	(7.8)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	GL
* (* * (* * (Δ * (* * (* * (* * (*	←0
) * (* * Δ * * * * *	→1
) * * * * *	→2
) * * *	→3
* *	4

The reader will have observed that the algorithm scans through the line constructing for the most part left-headed binary groups. What can in effect be seen as a trochaic alternation, however, does not correspond to any claim regarding the phonology or the phonetics of the line. On the contrary, the computation simply expresses the formal relationship between the elements constituting the phonological input of the meter (i.e. simple syllables on the one hand, and stress maxima, on the other). It is in this sense that BGT thus assumes the meter to be a system operating on a simplified, binary representation, parasitic upon the phonology of a language. In more general terms, the algorithm proposed above separates performance off the metrical structure by suggesting that the computation groups syllables disregarding the iambic pattern arising in performance and evidenced by our analysis of DPS' phonological structure. This is ultimately motivated by the grid construction, but it also conforms to the no-performance approach adopted in § 2. As detailed in § 4.3, DPS' specific signature consists of a stress alternation on either P6 or P8, the latter of which must obligatorily be followed by a word boundary. The grid accounts for these two facts by imposing two conditions constraining the algorithm. This generates the peculiar alternation of stresses on P6 or P8 in combination with a given line length, and with an obligatory stress on P14. The relationship of the grid to the phonology, however, could in principle be made tighter, by adding for example a condition on the projection of all stress maxima onto GL. At present we do not commit ourselves to that endeavor; future investigation of the patterns of phrasal stress in DPS is likely to shed more light on the constraints relevant to this meter.

To summarize our BGT analysis, we have argued that a single combination of rules, as laid out in (21), (23) and (24), is able to capture the core DPS patterns, as well as the fact observed in the data that either P6 or P8 must coincide with a DTE of φ-phrase, and that this must be the last in the halfline. The Δ-rule we have postulated applies generally and generates the {8–14} pattern, unless hindered by a filter rule which blocks the deletion of the GL0 asterisk if this is the projection of a stress maximum, i.e. when P6 is stressed and the head of φ. In that case, pattern {6–14} emerges.

We conclude this section by proposing a way to understand the relation of the BGT account to the phonology of the line. In general, BGT—and so its application to DPS proposed above—ignores any variation in the stress pattern, as well as the much higher likelihood for all the stresses within the line to be matched onto even positions. The only relationship between the grid and the phonology, beside the fact that the counting rules operate over a representation of syllables, is the interaction regulated through the stress maxima definition. However, if we take the BGT account to its extreme, nothing prevents in principle to see a strong link between the strictly iambic performance of this meter, and the output of the algorithm proposed. As it can be seen, for example in (29) above, the grid promotes up to GL1 all the asterisks corresponding to the even positions in the line, exactly the ones speakers tend to reproduce (at least metrically) stressed in the characteristic performance of DPS. At a slightly deeper level, the structure generated by the algorithm, while still not encoding the complete range of variation attested in the patterns, can then be seen as instantiating the score that must then be followed while making decisions on (i) how to set text onto the remaining positions in the line, and (ii) how to perform the meter. (i) is partly supported by the statistical distribution of the phonological stresses (as observed in Fig. 5) within the line. The most common pattern of all is 2-6-10-14, and this is encoded in our BGT account: these positions correspond to the GL2 heads in the grid constructed in (22) above. That is, determining one of the two core patterns in DPS automatically implies enhancing the likelihood of patterning for the other stresses within the line. (ii) could instead be seen as the most straightforward option available to the performer, whose knowledge would prescribe that the meter has to end the 1st halfline by performing a sequence w-s-w-s, and the 2nd halfline w-s-w.

6 Discussion and Conclusion

In this paper, we have attempted to approach the poetic meter of dekapentasyllavo (DPS) from a formal point of view as it emerges in the Greek *dimotiká tragóúdia*. To our knowledge, this is the first endeavor of its kind and brings to light numerous facts concerning DPS that were previously either unknown or unaccounted for; moreover, we contend that the data we have analyzed constitute a challenge to poetic metrical theory in several regards.

We have argued that, in its core, DPS consists of three components: (i) φ -alignment, (ii) counting of metrical positions, and (iii) (iambic) rhythm. We have also claimed that (i) and (ii) are predominant in DPS, with rhythm being subsidiary, albeit still a significant component of the meter. Preliminary statis-

tics has shown that in the lines examined, 90% employs one of 10 patterns in the first halfline (out of the possible 42) with 7 of those involving the canonical iambic schema and the remaining 3 presenting an inversion of the first foot to a trochee. In the second halfline, things are even stricter; 98,37% of all the (second half-)lines can be understood by means of just 6 patterns. As before, inversion of the first iamb to a trochee is sometimes observed too. In addition, no correlation was found between the patterns appearing in the first halfline with those of the second.

Both these traits (inversions, number of patterns) illustrate a recurrent phenomenon in various poetic traditions, which DPS now further corroborates, namely the L-R asymmetry in the verselines, which renders L-edges looser than the stricter R-edges (see Golston 1998, Fabb 2009, Hayes, Wilson & Shisko 2012, Ryan 2013). More concretely, DPS admits inversions at the beginnings of halflines, but tends to avoid them the closer they are to the R-edge. Similarly and on a more global level, the patterns in the first hemistich are somewhat looser than those in the second. Within this reasoning we can also incorporate our finding that the rules of phonological phrasing are very tightly regulated at the R-edge of the (half)line. But the specific kind of asymmetry we found in DPS seems to go beyond this, in that it is highly regulated: we have never found a line in which both P6 and 8 are both DTEs of φ (except for the cases in (12) which receive a principled explanation though). But what could this kind of regulated asymmetry be ascribed to?

The simplest explanation is that due to the language's trisyllabic-stress-window—referring to the fact that Greek primary stress may appear on any of the final three syllables but not further to the left—the combination of iambic rhythm and textsetting does not allow many options to start with. For example, the lack of stress on both P7 and P8, while formally captured in our system, is one that could also be excluded—or at least be rendered extremely infrequent—on the grounds of a highly unlikely combination of words. In particular, this example would require that P7 constitutes a stressed syllable in word-final position followed by a stressed monosyllabic lexical word, e.g. *λαμπρό φώς* [labró fós] 'shining light'; extending somewhat this idea, our data may present some evidence in support of the parametric theory of poetic meter developed in Hanson & Kiparsky (1996), whose key idea can be summarised as: "meter is language imitating itself" (Hanson & Kiparsky 1996: 325).

Consider for a moment the observation in (17v) that DPS prefers lapses over clashes. In Nespor & Vogel (1989), it is claimed that MG prefers to resolve lapses (also see Malikouti-Drachman & Drachman 1981), especially at the R of a phonological stress. They call this phenomenon a R-preference rule; this transforms, e.g. a sequence [σ σ σ] into [σ σ σ́] by the addition of a rhythmic

secondary stress. In our case, that would straightforwardly explain the addition of such stress on P8, when P6 has phonological stress. This, in turn, would support the idea that the rhythmical performance of DPS (that is, one that realizes 7 strong metrical positions in the whole line) is not necessarily a non-linguistic fact, but the development of a possibility made available by the language. The main idea would then be that while lapse resolution through the addition of another stress is at best marginal in the language generally, in its meter, it is rendered ubiquitous. However, Arvaniti (2007, esp. § 4.3 and references therein) challenges the existence of rhythmic stress in the first place, thus calling into question such a R-preference rule. Besides, such rule fails to capture the opposite pattern, which is equally acceptable in the DPS system, whereby a metrical stress on P6 is added when P8 corresponds to a phonological stress.

A less debatable observation, and one more straightforwardly compatible with the reasoning of Hanson & Kiparsky (1996), would concern the match of a phonological stress on either P6 or P8 in the first halfline, and on P14 in the second. This could be treated as an optimization strategy of the possibilities available in the lexicon of MG. This meter would then be a “grammar game”, i.e. a way to systematically play with the possible patterns of phonological stress in order to optimize the lexicon.

Another possibility—especially with regard to the regulated asymmetry mentioned above—that does not in principle exclude the idea of optimization, is that such asymmetry is driven by some aesthetic principle, whose purpose is to fulfill a need for variety coupled with constraints, but is at the same time independent from linguistic rules. An attempt to characterize such principle is well beyond the scope of the current paper, but, once achieved, it should be able to shed light on why, when we deploy language for aesthetic purposes, we tend to do that in highly constrained ways, as well as to contribute to our understanding of the variety of poetic forms in the languages of the world. Looking into the comparison between MG and Italian, for instance, might allow us to explain why two typologically similar languages develop poetic metrical traditions that differ significantly from one another in some respects but are similar in others. For example, the fact that in both traditions crucial reference to the φ -phrase is made is not surprising, being this attested in several other metrical traditions. However, somewhat differently from the evidence provided by Nespov & Vogel (1986/2007) for the Italian meter *endecasillabo*, where the location of φ s is not constrained within nor across lines,¹² in DPS we found a

¹² See also Versace (2014) for discussion.

much tighter match between positions in the meter and prosodic constituents in the phonology.

We should, however, note that the same comparison is also puzzling for the theory of Hanson & Kiparsky (1996). While MG seems to resolve lapses to some extent, it is unclear why it utilizes such highly rhythmical kind of verse, when the language itself is less rhythmical (cf. general avoidance of secondary stress, tolerance of clashes etc.) whereas the opposite is true for Italian. What is even more spectacular is how English, a language so rhythmically different from Greek (Arvaniti 1992: 398), could have developed a poetic meter similar to DPS, namely the *fourteener*,¹³ a meter found in some English poetry of the 16th and 17th centuries that consists of a line with 14 positions which present iambic alternation. Although it does not fall within the scope of the present paper, the similarity (as well as potential actual contacts) between the two meters may indeed prove an excellent testing ground for the premises of Hanson and Kiparsky's theory. The specific mechanism by which then each tradition selects one kind of meter over another yet remains to be clarified.

The questions that the MG poetic tradition of DPS poses to poetic metrical theory thus go well beyond the characterization of one single metrical tradition. Future work should consequently also aim to develop a methodology that will allow us to satisfactorily comprehend the nature of the relationship between verbal art and the respective source languages.

While we hope to have provided initial ideas, observations and a proposal for a formal analysis of DPS, we are well aware that we have merely touched upon the topic. Much more research needs to be performed to gain a good understanding of the DPS meter and its particulars. Further work will definitely profit from inter-disciplinary collaboration with other specialists, especially psycholinguists and musicologists. It may prove telling to conduct experimentation on native speakers' intuitions, although the challenge to minimise the possible effect of normalization through schooling and orthography is one that cannot be underestimated. A larger database of scanned lines should also allow us to conduct various statistical tests and thus enable us to fine-tune our formal account further. Moreover, the investigation of how *dimotiká tragoúdia* are set into music and dancing could shed light onto the debate regarding performance vs. inherent structure of meter, a highly contentious issue in the literature. In fact, some recent studies, e.g. Dell (to appear: 1) take this idea a step further by incorporating performance—through text-to-tune alignment—within inherent structure by suggesting that “the lyrics of a song do not have a metrical structure that can be described independently of the tune”.

13 We thank Bruce Hayes and Kristin Hanson for bringing this meter to our attention.

All in all, the investigation of metrics both in an interdisciplinary, as well as in a purely linguistic, context poses numerous challenges and unresolved puzzles, and as such offers ample ground for fruitful research into language and cognition generally through music, dancing and textsetting.

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Appendix

List of lines included in the text following the format: (i) line in Greek, (ii) line in IPA, (iii) line translation. The numbering of the line (if applicable) in the text appears on the left and in the Politis collection on the right (2009).

- (1) βαρεί δεξιά, βαρεί ζερβιά, βαρεί μπροστά και πίσω (56.16)
 [varí ðekszá, varí zervjá, varí brostá ce píso]
 '(Xronis) hits to the right, hits to the left, hits in front
 and behind (him)'
- (2a) Το Σούλι κι αν προσκύνησε, κι αν τούρκεψε νη Κιάφα (8.8)
 [to Súli ki an proscínise, ki an túrkeψε ni Cáfa]
 'even if Souli bowed, even if Ciafa became turkish'
- (2b) Ταηδόνια της Ανατολής και τα πουλιά της Δύσης (1.1)
 [tajðónia tis anatólis ce ta puλιά tiz ðísis]
 'the nightingales of east and the birds of the west'
- (3a) Σώπασε κυρά Δέσποινα, και μη πολυδακρύζης (2.17)
 [sópase cirá ðéspina ce mi poliðakrízis]
 'hush lady Despoina and don't cry so much'
- (3b)/(4a) καλά τρώμε και πίνουμε και λιανοτραγουδάμε (29.7)
 [kalá tróme ce pínume ce líanotraguðáme]
 'we eat and drink well and we sing little songs/couplets'
- (4b) χωρίς ψωμί, χωρίς νερό, χωρίς ύπνο στο μάτι (66.B7)
 [xorís psomí, xorís neró, xorís ípno sto máti]
 'without bread, without water, without sleep'
- § 2.1 μον πήτε την πλάκα πεθερά, τη μαύρη γης γυναίκα (42.10) [Politis
 [mon píte tin pláka peθερά, ti mávri jis jinéka] 2009]
 'just call the gravestone mother-in-law, the black earth
 wife'
- § 2.1 μον πήτε πως παντρεύτηκα νεδώ σ'αυτά τα μέρη (42.10) [Politis
 [mon píte pos padréftika nedó s'aftá ta méri] 1925/2001]
 'just say I got married here in this land'
- (6) δε μπορώ 'α σίρω τάρματα, τα γέριμα τσαπράζια (38.2)
 [ðe boró a síro tármata, ta jérima tsaprázja]
 'I can't drag the weapons, the forlorn tsaprazia'¹⁴

14 'Tsaprazia' were chain ornaments, usually made of silver that would form an x across the chest. They were especially worn by warriors during the Turkish occupancy.

- (7) κίαν πέσηαιτός και πάρηΈνα, έν' από τα πουλιά της (182.4)
 [can pési ajtós ce pári éna, én' apó ta puλά tis]
 accurate positions for lexical stress
 [can pési ajtós ce pári ená, enápo tá puλά tis]
 suggested performance
 'and if an eagle falls and takes one, one of her birds'
- (12a) Μουχτάρ Πασάς (5.13)
 [Muxtár Pasás]
 'Muhtar Pasha'
- (12b) ταλαφρά σπαθιά (11.14)
 [talafrá spaθιά]
 'the light swords'
- (12c) εφτά μερών ζωή (11.35)
 [eftá merón zoí]
 'life of seven days'
- (29) Πέντε Τούρκοι την κυνηγούν, πέντε τζοχανταραίοι (7.8)
 [pénde túrci tin ciniyún, pénde dzoxadaréi]
 'five Turks are chasing her, five dzohadaraioi'¹⁵

15 'Dzohadaraioi', a Turkish word, refers to the followers of a tycoon.