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Incongruent enjambments: the case of classical French verse*

François Dell

Romain Benini

ABSTRACT

In versified texts congruence is one facet of the concordance between the edges of metrical constituents and those of grammatical constituents. Congruence may be characterized roughly as the requirement that no element within a syntactic constituent be in a stronger metrical position than the final element in that constituent. If break strength is defined in terms applicable to any constituent structure tree, syntactic as well as metrical, incongruences are discrepancies between the relative strengths of two breaks in metrical structure and the relative strengths of their counterparts in syntactic structure. Although our primary source of data is classical French verse, the characterization of congruence we present is a rather abstract one that does not make reference to features that are specific to French poetic forms or to the grammatical structure of the French language. This should make this characterization applicable in other poetic traditions.

KEYWORDS: metrical form, enjambment, constituency matching, ease of processing, locality, sense of order.

1. Preliminaries

Our 2020 book entitled *La Concordance chez Racine* (henceforth *CCR*) presents a general account of the metrics of alexandrine couplets in Jean Racine's plays. The book's central topic is constituency matching, that is, the conditions that govern the location of metrical boundaries relative to the edges of grammatical constituents. This

article deals with those aspects of constituency matching that we call congruence. We propose a new account of congruence that is more empirically adequate and conceptually more satisfactory.

This article is organized as follows. Section 2 introduces a preliminary characterization of congruence together with examples that illustrate it. Section 3 presents a conception of congruence that is couched in phonological terms. According to this view, stronger stresses in the linguistic material must match stronger metrical positions. In section 4 we propose a unified conception of the strength of breaks in trees that represent constituent structure, metrical or syntactic, and we present an alternative view of congruence in which incongruences are discrepancies between the relative strengths of breaks in metrical structure and syntactic structure. Section 5 argues that this conception of congruence has greater empirical adequacy than the stress-based one. Section 6 reviews various outstanding issues of a general nature and section 7 concludes with the suggestion that although it builds upon the syntactic organization of the linguistic material, congruence is a constraint that is external to the language faculty.

Let us first situate our discussion of congruence in the general scheme of things. Our approach to metrics is the same as that in *CCR*. It belongs to the line of thought illustrated by Kiparsky 1977, Hayes 1989, Blumenfeld 2015.² Metered verse is a mapping between a linguistic object and a metrical pattern. The linguistic object is a text, a sequence of sentences. In the simplest case, where lines are all of the same meter, the metrical pattern is made up of repetitions of a template for the meter in question. The template for the French alexandrine is depicted in (1).

(1) ((x x x x x x)_H (x x x x x x)_H)_L

An alexandrine line is a sequence of two hemistichs and a hemistich is a sequence of six metrical positions. In the discussion below, hemistichs are the smallest metrical groupings.³ Setting aside line-final feminine schwas, which are extrametrical, the vowels of the text are matched one-to-one with the metrical positions. (2) depicts such a correspondence.⁴

(2) tes nobles jambes, sous les volants qu'elles chassent
 e ɔ ə ã ə u e ɔ ã ε ə a ə
 | | | | | | | | | | | |
 ((x x x x x x)_H (x x x x x x)_H)_L

An alexandrine is well-formed only if the right edges of its two hemistichs meet certain conditions that are dealt with in detail in *CCR*. Some of these conditions have to do with prominence (stress placement), while others pertain to constituency matching. The conditions on stress placement prohibit stress mismatches involving metrical positions which are hemistich-final; they will not be discussed here (see chapter 4 in *CCR*).

The conditions on constituency matching reflect a universal tendency for metrical structure to carve grammatical structure at its joints, as it were. The strength of metrical boundaries must match to some extent the strength of the grammatical boundaries with which they coincide. This constituency matching is a matter of degree. As noted in *CCR*, it varies across periods, genres and poets, and it was most strictly enforced in the works of 17th century authors. As the grammatical properties of a sentence are represented by two constituent structure trees, Syntactic Structure

and Prosodic Structure, there are two kinds of grammatical boundaries to consider, syntactic and prosodic. As we did in *CCR*, we assume that in French the constituents of Prosodic Structure form a hierarchy with the following categories, from the smallest to the largest: Syllable, Word, Clitic Group, Phonological Phrase, Intonational Phrase.⁵

In *CCR* we proposed to distinguish two facets of constituency matching: *cohesiveness* and *congruence*. While cohesiveness imposes a minimal strength to grammatical breaks at metrical boundaries, congruence regulates the span of grammatical constituents that straddle metrical boundaries.

Before we move on to congruence, which is the subject of this article, let us say a few words about cohesiveness. Cohesiveness avoids metrical boundaries that fall inside tightly-knit word sequences. In 17th century verse it is exceedingly rare for the end of a hemistich to fall inside a Clitic Group, as is the case in (2), in which the end of the first hemistich is straddled by the Clitic Group *sous les volants*.

According to *CCR*, all the information that is relevant for characterizing caesura cohesiveness is contained in Prosodic Structure. In Racine's tragedies, except for a few dubious cases,⁶ a Phonological Phrase is never broken up by a caesura.

An abbreviated notation for the situation in (2) is (3), where the caesura is marked by a vertical bar.

(3) Tes nobles jambes, sous | les volants qu'elles chassent,
 your noble legs under the flounces that'they drive.away
 'your noble legs under | the flounces they drive away'

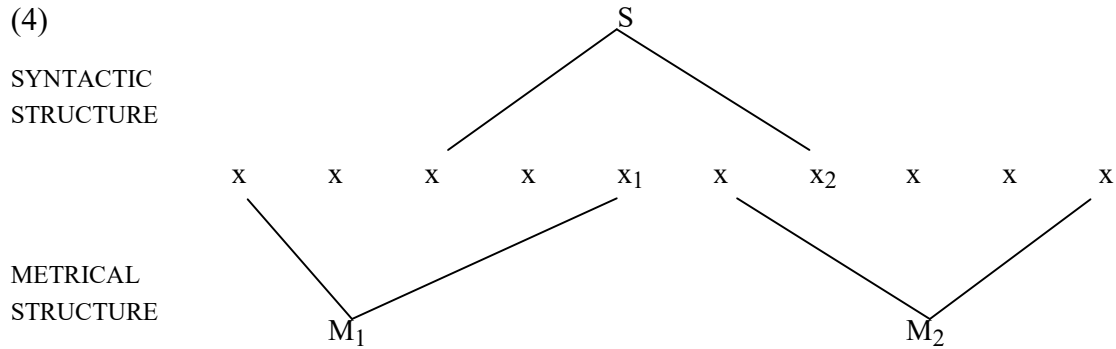
The term “caesura” traditionally designates the boundary between two hemistichs that belong to the same line of verse. In this paper it refers to the rightmost metrical position in the first hemistich. More generally, in this paper every *metrical boundary* is equated with the last metrical position of a metrical unit (hemistich, line, distich). By a line end we mean the last metrical position in a line: in the example above, the end of the line is its rightmost metrical position, that is, the position associated with the vowel /a/ in *chassent*, as shown in (2).⁷ In (3) the vertical bar after *sous* is a typographically convenient way of representing the fact that the vowel of *sous* is associated with the rightmost metrical position of the first hemistich. Once this is understood, there is no harm in saying that in (3) the word *sous* is “before” the caesura, while saying at the same time that its vowel is associated with the caesura.

2. Congruence, a First Stab

We now turn to congruence, the second term of the cohesiveness/congruence dichotomy we inaugurated in *CCR*.⁸ In discussions of cohesiveness, what is at issue is whether a grammatical constituent is allowed to span a metrical boundary. In discussions of congruence, by contrast, what is at issue is when a grammatical constituent does span a metrical boundary, how the rest of the constituent behaves with respect to other metrical boundaries. In an incongruent configuration, as schematically diagrammed in (4), a syntactic constituent *S* straddles the right edge of a metrical constituent, such that two metrical positions x_1 and x_2 occupied by vowels contained in *S* stand in opposite strength relations in metrical vs. syntactic structure: x_1 is stronger than x_2 in metrical structure but x_2 is stronger than x_1 in syntactic structure. As it is rightmost in M_1 , x_1 is metrically stronger than x_2 , which is not

rightmost in M_2 ; but x_2 is rightmost in S , which makes it syntactically stronger than x_1 .

Strength (in syntactic and in metrical constituents) will be defined below.



Consider the alexandrine in (5)-(6), whose text is a sentence in which we have boldfaced a relative clause that straddles the caesura.⁹

(5) Or celui **pour lequel** | je parle est affamé
 yet the.one for whom I speak is famished
 ‘Yet the one *for whom I am speaking* is famished’

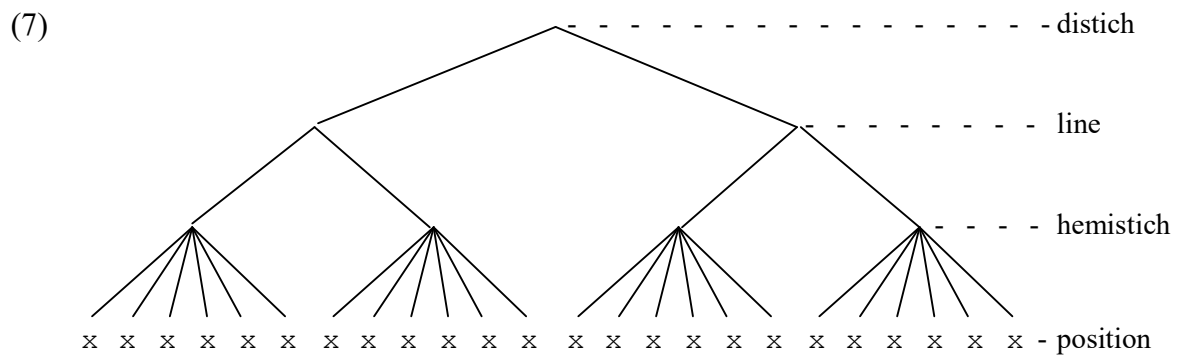
(6) or celui **pour lequel** je parle est affamé
 ɔ ə i u ə ɛ ə a ɛ a a e
 | | | | | | | | | | | |
 ((x x x x x x)_H (x x x x x)_H)_L

The metrical peak in the constituent in boldface is the rightmost position in the first hemistich (the position associated with /ɛ/ in *lequel*). On the other hand the syntactic peak in that constituent is the position associated with its rightmost vowel, which is /a/ in *parle*.¹⁰ While the relative clause is incongruent, the whole sentence is not: the

position occupied by the final vowel in *affamé* is at the same time the sentence’s syntactic peak (it is the rightmost position in the sentence) and it is the sentence’s metrical peak (it is the rightmost position in the line).

Our aim, then, is to make students of general metrics aware of the fact that one of the constraints governing classical French verse is congruence, and to present congruence in sufficiently general terms that would allow scholars to investigate its counterparts in other poetic traditions. If we use the term “enjambment” to refer to any situation in which a grammatical constituent spans a metrical boundary, our purpose is to investigate why some types of enjambment are more common than others, with reference to metrical material outside the site of enjambment itself.

Let us explain what we mean when we say that one metrical position is stronger than another. The lines of a 17th century play are grouped into distichs (rhyming pairs). The tree in (7) represents the metrical structure of a distich.

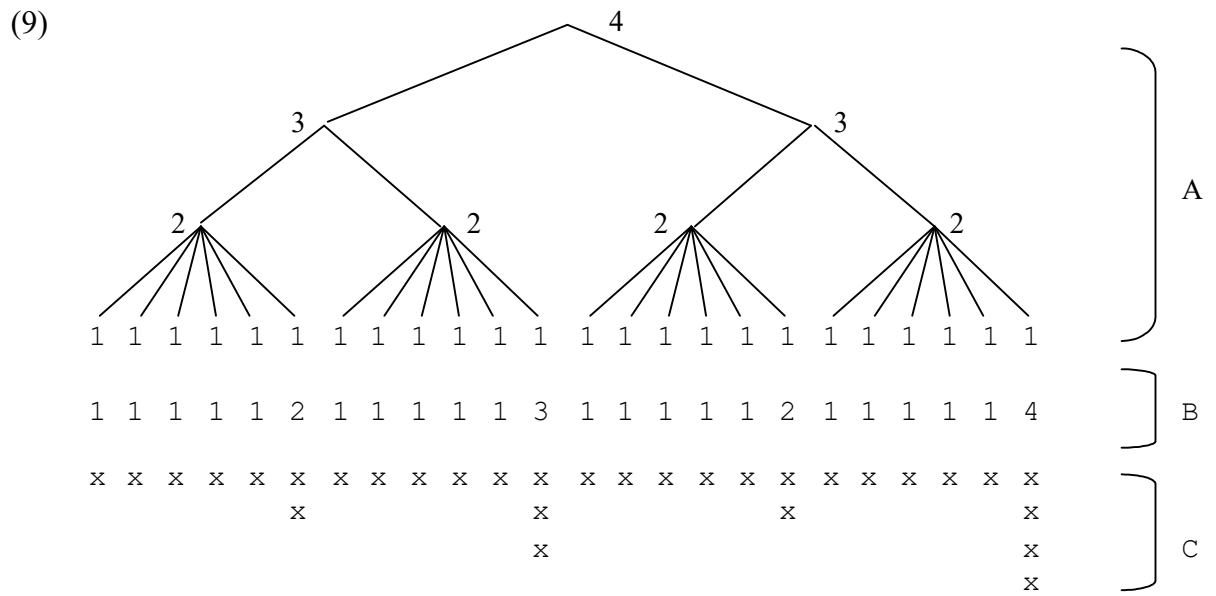


The distichs of a play are not grouped into larger metrical units. The metrical units of a play form the following hierarchy:

(8) Metrical

Position, Hemistich, Line, Distich, Poem.
 hierarchy:

Strictly speaking, a poem taken as a whole is not a metrical unit, but we need a node that will enable us to refer to it. Metrical strengths stem from the metrical hierarchy: the larger a metrical unit, the stronger its last position. Let us assign numbers to the nodes in the tree in (7), assigning 1 to the terminal nodes and adding 1 every time we move up to the next level. The result is represented in (9A). When a position is hemistich-final, we define its strength as the number assigned to the largest metrical unit in which the position is rightmost. Positions that are not hemistich-final are of strength 1. Each number in (9B) is the strength of the position lined up with it in (9A). Metrical strength can be represented by column height in a grid, as shown in (9C).¹¹



We can now examine example (5)-(6) in greater detail. The mapping between its syntactic structure and its metrical structure is depicted in (10).

in (10) constituents C and D are incongruent over the caesura, or that the caesura is incongruent in C and D. The other constituents in (10) are all congruent: none straddles a metrical position that is stronger than that associated with its rightmost vowel.

Here are other lines in which caesuras are incongruent. The syntactic constituent in boldface in each example is one in which the caesura is incongruent.

(11) Le destin charmé **suit** | **tes jupons** comme un chien¹²
 the destiny enchanted follows your petticoats like a dog
 ‘destiny enchanted **follows** | **your petticoats** like a dog’

(12) Rappelez-vous **l’objet** | **que nous vîmes**, mon âme,¹³
 recall=you the’thing that we saw my soul
 ‘remember **the thing** | **we saw**, my soul’

(13) Le vallon où je **vais** | **tous les jours** est charmant¹⁴
 the vale where I go all the days is charming
 ‘the vale where I **go** | **every day** is charming’

(14) Que vouliez-vous qu’il **fit** | **contre trois?** — Qu’il mourût,¹⁵
 what wanted=you that’he do;SBJV against three that’he die; SBJV
 ‘what did you want him **to do** | **against three** ? – He should have died’

- (15) Ce souffle **étrangement** | **parfumé**, d'où vient-il ?¹⁶
 this breeze strangely fragrant from'where come=it
 'this **strangely** | **perfumed** breeze, where does it come from?'

Congruence is the normal state of affairs in French verse. As far as we know, incongruent metrical boundaries are always a minority in a poem. Also, when a sentence is syntactically ambiguous with one structure congruent and the other not, it is as a rule the congruent structure that yields the preferred reading.¹⁷

Metrical structure can be represented as a tree, as in (9A), or as a grid derived from it, as in (9C). Congruence can be defined in terms of the grid or in terms of the tree. We dub these two views the grid theory and the tree theory. For the time being we adopt the grid theory as a convenient expository device. We will argue later that the tree theory is preferable. The following constraint will do for now:

- (16) CONG-1: If a syntactic constituent has a metrical peak, that peak must be on the constituent's last metrical position.

By the metrical peak of a constituent we mean the position whose grid column is the highest in that constituent. In (10) the vowel /ɛ/ in *lequel* is the metrical peak of the relative clause *pour lequel je parle*.¹⁸ By our definition of metrical peak, only metrical boundaries can be metrical peaks. In (10) the constituents *celui* and *je parle* don't have a metrical peak.

Congruence is a relation between a metrical boundary and a syntactic constituent, and incongruence occurs when this relation is not satisfied. When we say that a

metrical boundary is incongruent *tout court*, we mean that the boundary is the metrical peak of some syntactic constituent in which it is not the last metrical position. Consider the following lines. The caesura is congruent in the first line, incongruent in the second.

- (17) À disputer des prix | [AP [A indignes] [PP de ses mains]]¹⁹
 to dispute INDF;PL prizes unworthy of his hands
 ‘to dispute prizes | unworthy of his hands’

- (18) Derrière la [NP **muraille** | **immense**] [PP du brouillard]²⁰
 behind the wall huge of.the fog
 ‘behind the fog’s **huge** | **wall**’

In both lines the boxed sequences are NPs.²¹ These NPs are made up of a noun and an attributive adjective followed by a PP, but their constituent structures differ. In (17) the PP is a complement of the adjective, and consequently the smallest constituent that straddles the caesura is the boxed NP taken as a whole. The metrical peak of all the constituents that straddle the caesura is the position matched with *mains*. In (18), on the other hand, the PP is a complement of the noun, and we have a small NP *muraille immense* nested in a larger one. The caesura is incongruent because it is the metrical peak of *muraille immense*, but not its last metrical position.²² As is shown in online Appendix I, there is no need to check for congruence every constituent that straddles a boundary. In most cases one only needs to check the smallest one.

We have exemplified (in)congruence in the case of caesuras. Let us now exemplify it in the case of line ends. Compare the following distichs:

- (19) Pleurez l'autre, pleurez l'**irréparable affront**²³
 mourn the'other mourn the'irreparable affront
 'mourn the other one, mourn the **irreparable affront**

Que sa fuite honteuse imprime à notre front.
 that his flight shameful imprints on our brow
that his shameful flight imprints on our brow.'

- (20) La douleur est injuste, et toutes les **raisons**²⁴
 the grief is unfair and all the reasons
 'grief is unfair, and all the **reasons**

Qui ne la flattent point | aigrissent ses soupçons.
 that not it flatter not embitter its suspicions
that do not flatter it embitter its suspicions.'

In (19) the end of the first line is congruent because the only syntactic constituent that straddles it is the NP in boldface, and the end of that NP is also its metrical peak since it is that of the distich, and a distich end is metrically stronger than a line end that is not distich-final. In (20), on the other hand, the end of the first line is incongruent. It is

the metrical peak of the NP in boldface, the end of which is the caesura of the next line. Here are other distichs in which the end of the first line is incongruent.

- (21) Il m'est plus étranger, frères, que la **lumière**²⁵
 it to.me'is more alien brothers than the light
 'it is more alien to me, brothers, than the **sun's**

Du soleil à l'enfant | dans le sein de sa mère !
 of.the sun to the'baby in the womb of its mother
light is to babies in their mother's womb!'

- (22) **Pour prix d'une victoire où je perds ce que j'aime,**²⁶
 as reward of'a victory where I lose that which I'love
 'To reward a victory in which I lose that which I love,

Je lui laisse mon bien ; | qu'il me laisse à moi-même.
 I to.him leave my estate that'he to.me leave to me-self
I leave my estate to him; let him leave me to myself.'

(23) Non, je la crois, Narcisse, **ingrate, criminelle,**

no I her believe Narcisse ungrateful criminal

No, I think she is, Narcisse, **ungrateful, criminal,**

Digne de mon courroux. | Mais je sens malgré moi²⁷

deserving of my wrath but I feel despite me

Deserving my wrath. But I feel despite myself

Moving up the metrical hierarchy, here is an example in which the end of a distich is incongruent.

- (24) a. Hélas ! **Lorsque lassés de dix ans de misère,**²⁸
 alas when tired of ten years of misery
‘alas! When tired of ten years of misery,’
- b. **Les Troyens en courroux menaçaient votre mère,**
 the trojans in wrath threatened your mother
‘angry Trojans were threatening your mother’
- c. **J’ai su de mon Hector lui procurer l’appui ;**
 I’ve known of my Hector to.3SG provide the’support
‘I contrived to have my Hector support her.’
- d. Vous pouvez sur Pyrrhus ce que j’ai pu sur lui.
 you can on pyrrhus what that I’ve can on him
 ‘you have over Pyrrhus the same power I had on him.’

(24) is a sequence of two distichs. The end of line (24b) is the boundary between the two distichs. The constituent straddling it is the sentence in boldface, whose end coincides with that of line (24c). The end of line (24b), a distich end, is the sentence’s metrical peak, as it is metrically stronger than that of line (24c), which is not the end of a distich.

Congruence is a feature that is characteristic of the style of a poet, a genre or a period. The stricter congruence is, the more limited the set of texts that can be squeezed into a given metrical form. Congruence was most rigorously enforced in the

elevated poetry composed in the 17th century (tragedies, epics, odes, religious poems).

We chose to work on 17th century tragedies because we assumed that their strong congruence would increase our chances of spotting regularities that would be exceptionless or nearly so. The corpus discussed in *CCR* is the plays by Racine, eleven tragedies and one comedy totalling 18,507 alexandrines. We present the figures in table (25) to give readers a general idea of the frequency of incongruences in Racine's plays.

(25)		I	II	III
		caesura	end of a distich-initial line	end of a distich
A	metrical boundaries	18,507	9,102	9,090
	incongruent	513	221	409
B	metrical boundaries	2.7%	2.4%	4.4%

The left-to-right order of the columns in table (25) is by order of increasing metrical strength. Row A counts the occurrences of a given boundary type in the corpus. Row B counts those occurrences that are incongruent. The first column indicates that the corpus contains 18,507 caesuras (one for each alexandrine), 513 of which are incongruent, a 2.7% ratio.²⁹

Besides the frequency of incongruences, their nature is another feature that distinguishes one poetic style from another. Some types of incongruence which are rarely found in 17th century poetry became rather commonplace in the production of 19th century poets such as Hugo or Baudelaire. The incongruences in Racine's plays

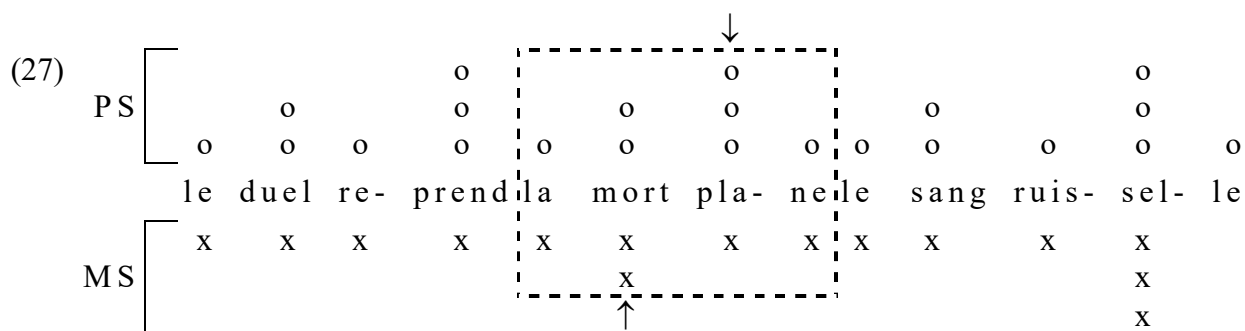
almost never violate condition CONGRAC, which will be presented in section 6.2. This suggests that such incongruences are of a rather severe kind.

3. Incongruence as a Stress Mismatch

Lewis 1982 has proposed that an incongruence is a discrepancy between metrical structure and the main stress in phrases, call this the accentual theory of congruence. French words bear final stress unless they are polysyllabic and their last vowel is schwa, in which case they are stressed on the penultimate. The bedrock of the accentual system of French is what we call the End Rule, borrowing a term from Prince (1983): the most prominent syllable in any phrase is the stressed syllable in the last word of the phrase, and prominence relations are preserved under embedding.³⁰ If accentual prominence is represented in terms of a grid, the End Rule says that in the stress grid of any phrase the highest column is that associated with the last vowel of the phrase.³¹ The resemblance between Cong-1 (16) and the End Rule is easy to see. Both rules require that the last grid column in a phrase be the highest column in that phrase. Incongruence occurs when the peak in the stress grid does not coincide with the peak in the metrical grid.

We illustrate with the line in (26), in which the caesura is incongruent. (27) shows the correspondence between the two grids, with the stress grid above the text and the metrical grid below it.

- (26) Le duel reprend. **La mort** | **plane**, le sang ruisselle.³²
 the duel resumes the death hovers the blood flows
 ‘the duel resumes. **Death** | **hovers**, blood flows.’



In the phrase in the dotted box in (27) the stress peak is on the first vowel of *plane* while the metrical peak is on the vowel of *mort*. Hayes 2009: 134 has posited for traditional Anglo-American folk songs a constraint that requires the two peaks to coincide when they are associated with syllables that belong to the same word, and in *CCR*: 89 we posited an analogous constraint to exclude stress mismatches like that in (26), where the offending peaks are associated with syllables that are string-adjacent. Under the accentual theory, congruence is nothing but a version of these constraints that is generalized to any phrase, and is violated regardless of the distance between the two peaks. The accentual theory is embodied in the following constraint:

- (28) CONG-2: If a syntactic constituent has a metrical peak M, that peak must coincide with the constituent's accentual peak A. Assign one violation for every pair (M, A) in which M and A do not coincide.

In (10) the caesura is incongruent because it is the metrical peak of the phrase *pour lequel je parle*, while the phrase's accentual peak is the position of /a/ in *parle*. In (3), on the other hand, the caesura is congruent. Its associated vowel is not an accentual peak in any constituent, and so it cannot violate the constraint.

The accentual theory is seductive because all that it seems to require is generalizing machinery that is necessary on independent grounds. The grammar of French must in any case contain a stress rule like the End Rule, and the correspondence rules for French verse must account for facts like the rarity of stress mismatches in Racine's plays.³³

We will resist accentual theory's seduction, however. In metered verse as well as in song, the rules that govern the mapping between the textual constituents and metrical/musical constituents fall into two categories, constituency matching and prominence matching. Constituency matching requires a coincidence between the edges of the two kinds of constituents. Prominence matching, in contrast, requires a coincidence between their prominence peaks.³⁴ The distinction is not easy to make in the case of French because in that language prominence peaks are located on the right edge of constituents, as implied by the End Rule. Whereas the accentual theory implies that incongruences are prominence mismatches, our contention is that they are a kind of constituency mismatch. The "stress displacements" discussed in Lewis 1982: 57-69 are not an essential feature of incongruence; they are only side-effects. We will present several arguments in favor of our position. Besides the empirical ones that stem from dubious predictions made by the accentual theory (these will be discussed later on), there is also a conceptual one: as the accentual theory crucially depends on the End Rule, which is a component of the grammar of French, under the accentual theory congruence is a matter specific to French verse. By contrast, the characterization of congruence that we will present does not make reference to features that are specific to French. This should make this characterization applicable in other poetic traditions.

Here is in our view the gist of congruence: congruence is an aspect of the need for a minimum of agreement between two trees whose terminal nodes are in a one-to-one correspondence. Incongruence is *a discrepancy between the relative strengths of two breaks in metrical structure and the relative strengths of their syntactic counterparts*. Instead of taking “strength” to be an attribute of metrical positions, we consider it a property of breaks between adjacent positions. This implies that our gaze shift away from grids, back to the trees they are derived from. It also implies a local notion of strength. The notion of metrical strength embodied in grid (9C) is not a local one, in the sense that it allows us to compare the strengths of any two metrical positions in a poem regardless of the distance between them, for example any line end is deemed metrically stronger than any caesura in the same poem no matter how many intervening lines there are between them. This nonlocality is presupposed in Cong-1 and Cong-2, the two variants of the grid theory.

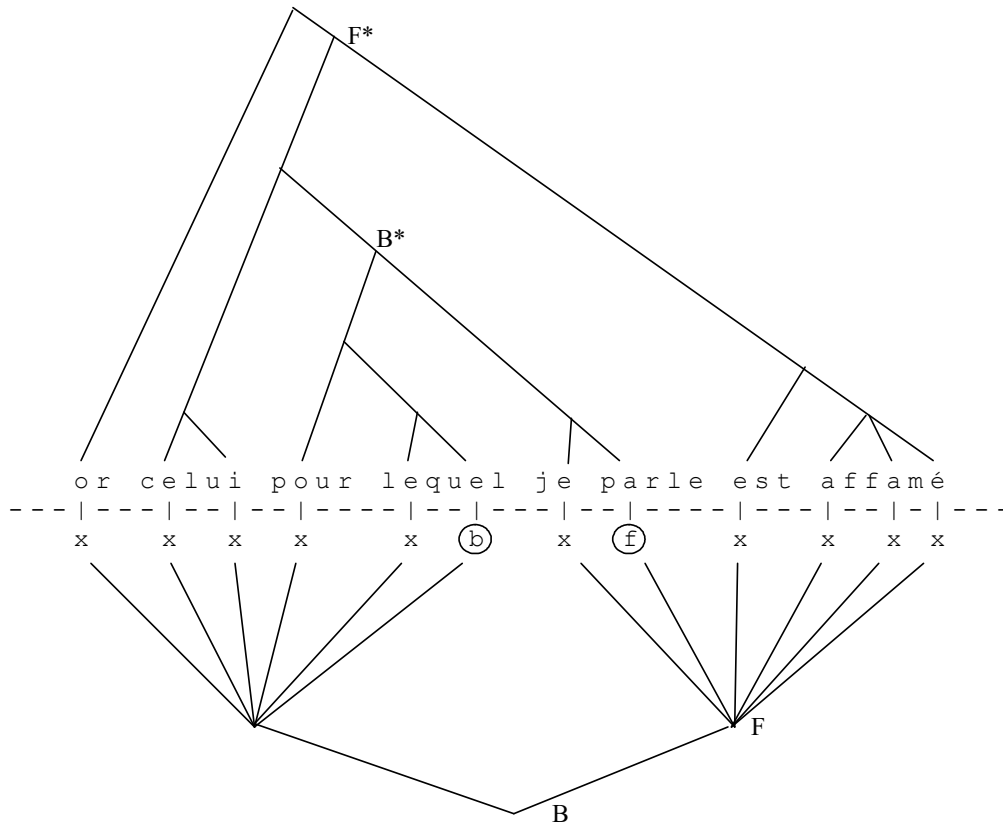
Let us first propose a characterization of congruence that is based on a local conception of metrical strength. We can then show that this conception is preferable by comparing how the nonlocal conception and the local one fare when they confront certain empirical issues.

4. A Local Notion of Strength

The notion of metrical strength we will adopt is a local one that will allow us to compare the strengths of two positions only if in metrical structure they are contained in two constituents that are in a domination relationship.

Let us return to example (5)-(6). While diagram (10) showed how its syntactic structure is mapped to a metrical grid derived from metrical structure, (29) shows how it is mapped to the metrical structure itself.

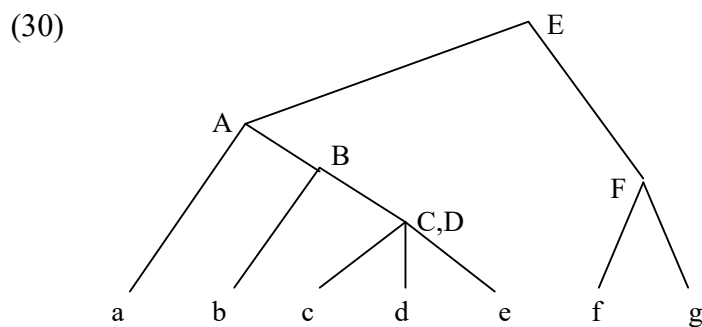
(29)



In (29) the caesura b is incongruent in the syntactic constituent B^* , whose rightmost vowel occupies position f . The diagram shows that while in metrical structure the break after b is stronger than that after f , in syntactic structure the break after b 's counterpart (the last vowel in *lequel*) is weaker than that after f 's counterpart (/a/ in *parle*). In order to make this idea more precise we must be able to characterize in a unified fashion the relative strength of breaks between syntactic constituents and the relative strength of breaks between metrical units. To do this we must give up the idea

of representing break strengths by columns in a grid, because grids do not convey constituency. Let us first introduce a definition that will allow us greater brevity.

A break in the terminal sequence of a tree can be represented as a pair of adjacent terminal nodes. Let us define the *minimal hinge* of a terminal node as the smallest constituent that contains that node and the terminal node that immediately follows it. This definition is applicable to any tree, metrical or syntactic. Every terminal node in a tree except the last has a corresponding nonterminal node that is its minimal hinge (henceforth ‘MH’), as illustrated in diagram (30).



In (30) terminal nodes are labeled with lowercase letters and their minimal hinges are labeled with corresponding capitals. Node B, for instance, exhaustively dominates the sequence *bcde*, which is the smallest constituent that contains *b* and *c*; in other words B is *b*'s MH. Node E, which is the smallest constituent that contains *e* and *f*, is *e*'s MH. The rightmost node in (30) does not have an MH because it is not followed by any terminal node. Two terminal nodes can have the same MH, as is the case for *c* and *d*, which are immediately dominated by the node labeled C,D.

A nonterminal node N in a tree is the MH of some terminal node *n*, and we take the location of N in the tree to be representative of the strength of the break between *n*

and the terminal node that immediately follows n . The higher N in the tree, the stronger the break between n and the following terminal node. We equate the strength of a break with that of the terminal node before it, which allows us to define strength relationships as follows.

(31) Stronger-than: Let y and z be terminal nodes (their left-right order is indifferent).

y is stronger than z iff y 's MH dominates z 's MH.

In diagram (30), according to the definition, the break between b and c is weaker than that between e and f because B , which is b 's MH, is dominated by E , which is e 's MH.

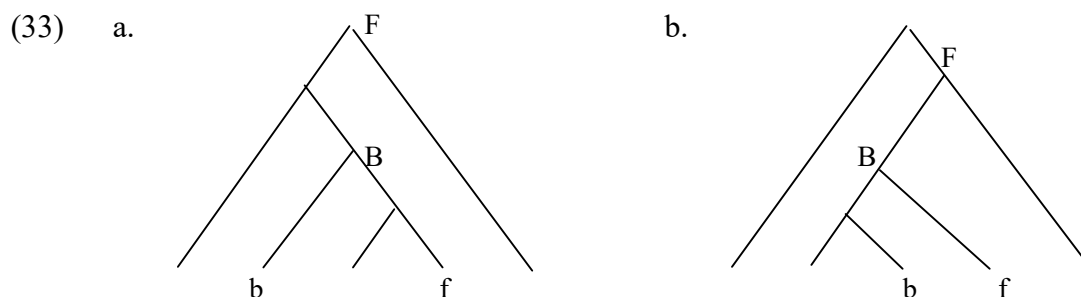
In contrast, consider the break between b and c and that between f and g , whose respective MHs are B and F . Definition (31) does not say which break is stronger, because neither MH dominates the other.

The relation "stronger-than" defined in (31) is a local one, in that it is defined only for pairs of breaks whose MHs are in a domination relationship. In contrast the relation "stronger-than" implied by a grid like (9C) is nonlocal: it is defined for any pair of positions.

We can now get to the gist of our conception of congruence. The following proposition is true of any tree:

(32) Let b and f be terminal nodes. If f is the rightmost node in a constituent that straddles b , f is stronger than b .

(32) is illustrated by particular cases represented in the diagrams in (33).



In (33) *f* is the rightmost node in a constituent that straddles *b*, B and F are the respective MHs of *b* and *f*, and F dominates B. *f* is stronger than *b* according to definition (31).

As a consequence of (32) the break at the end of a constituent is stronger than any break inside that constituent. This is true of all trees, metrical or syntactic. Consider again the break at the end of the constituent *pour lequel je parle* in the syntactic tree in (29). That break is stronger than those after the other words in the constituent. It is stronger, in particular, than that after *lequel*, the syntactic break at the caesura.

Constraint CONG-1 (16) and its accentual avatar CONG-2 (28) presuppose the non-local conception of metrical strength embodied in metrical grids. We propose instead to ground the notion of congruence on the local conception of strength defined in (31), which has to do with the geometry of the trees that represent metrical structure. Instead of defining congruence, however, we will present a definition that covers those situations in which congruence is violated. This will make the discussion easier to follow.

(34) Incongruence: Let b be a metrical boundary, B^* a syntactic constituent straddling b , and f the metrical position associated with the rightmost vowel in B^* . b is incongruent in B^* (or equivalently, B^* is incongruent over b) if b is stronger than f , that is, if b 's metrical MH dominates f 's metrical MH.³⁵ Assign one violation for every pair (b, f) which meets this condition.

To illustrate, let us apply definition (34) to diagram (29). The metrical MH of the caesura is B and the metrical MH of the end of B^* is F . B dominates F , which makes the caesura incongruent in the phrase *pour lequel je parle*.

(32) explains a feature of definition (34) that may look puzzling at first. At the end of the preceding section we stated that incongruence amounts to a discrepancy between the relative strengths of two breaks in metrical structure and the relative strengths of their syntactic counterparts. If this is indeed the case, one may wonder why (34) refers to strength relationships in metrical trees, but makes no mention of strength relationships in syntactic trees. Besides the condition “ b is stronger than f ,” should (34) not include another condition that would require that the syntactic counterpart of f be stronger than that of b ? Such a condition is superfluous, for it is met in any case: it follows from the fact that proposition (32) is necessarily true of the syntactic counterparts of nodes b and f , given how these nodes are defined in (34).

5. Comparing the Two Theories

All the examples of incongruence we've seen until now involve only one metrical boundary. We consider now cases in which a syntactic constituent that is incongruent

straddles two metrical boundaries. These will provide us a first testing ground for comparing the two conceptions of congruence. Following Halle and Keyser 1971 and Kiparsky 1977, we assume that the metrical complexity of verse increases in proportion to the number of violations. We assume furthermore that the higher the metrical complexity of a configuration, the less frequent its occurrences in a corpus. We first present cases where the two conceptions of congruence fare equally well. In (35) and (36) the syntactic constituent in boldface straddles two metrical boundaries *a* and *b* and the underlining delimits a subconstituent that only straddles boundary *b*.

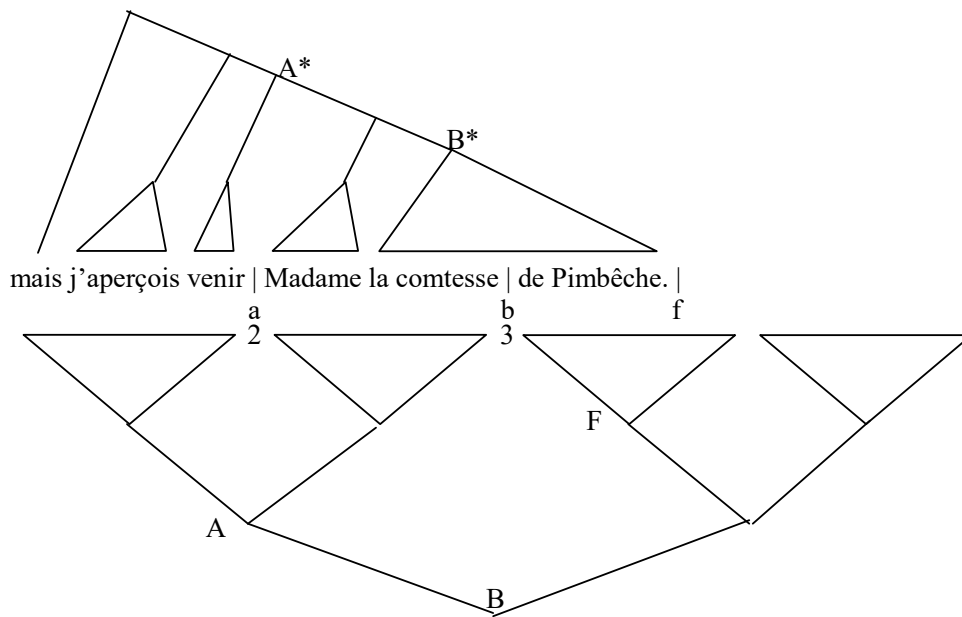
(35) a. Mais **j'aperçois venir** |_a **madame** la comtesse |_b
 but I'see come madam the countess
 'but I can see that here comes | madame la comtesse'

b. **De Pimbêche.** Elle vient | pour affaire qui presse.³⁶
 of Pimbêche she comes for matter which is.urgent
 'de Pimbêche. She comes | for an urgent matter.'

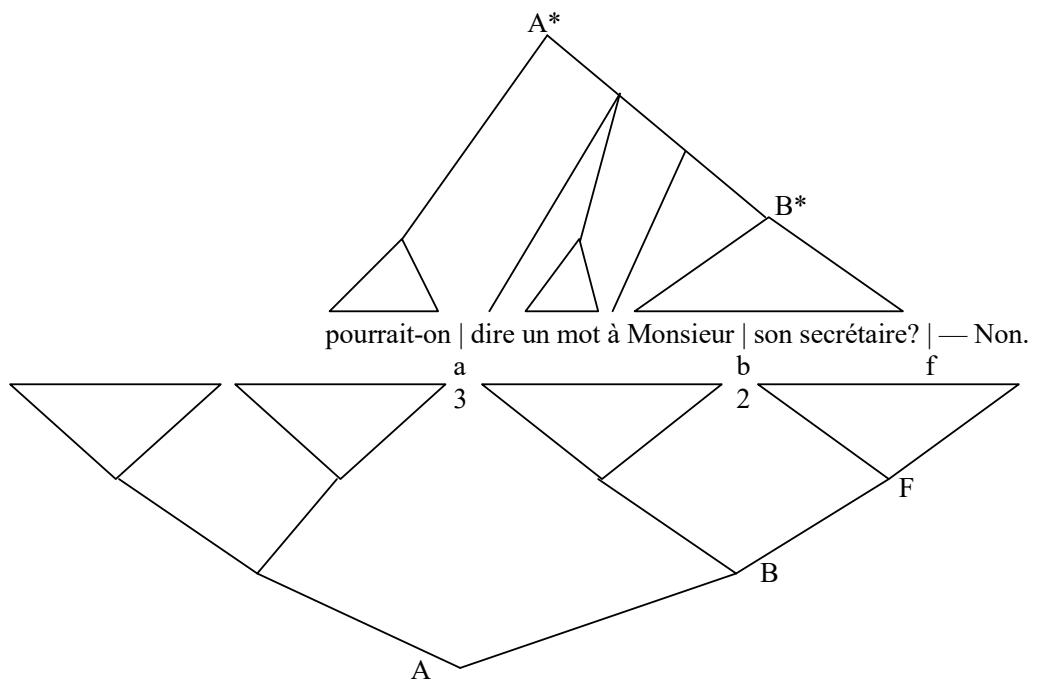
- (36) a. Qui va là? – Peut-on voir Monsieur? – Non. – **Pourrait-on** |_a
 who goes there can=one see sir no could=one
 ‘who is there? — Can one see Monsieur? — No. — **Could one**’
- b. **Dire un mot à Monsieur |_b son secrétaire?** – Non.³⁷
 say a word to mister his secretary no
 ‘**have a word with Monsieur | his secretaire?** — No.’

The scansions of (35) and (36) are represented in (37) and (38), where the numbers beneath the labels of the metrical boundaries indicate the heights of the corresponding grid columns (v. (9C)).³⁸ We examine these scansions in turn, considering each from the point of view of Cong-2 (28) (the nonlocal accentual theory), and then from that of (34) (the local theory). We will see that both theories make identical predictions: while only boundary *b* is incongruent in (37), both *a* and *b* are incongruent in (38).

(37)



(38)



Take (37) first. As the grid column associated with line end b is higher than that associated with caesura a , b is the metrical peak in any constituent that straddles it, for example in A^* and B^* . A^* and B^* are involved in the same violation of Cong-2 (28),

as they share the mismatched pair (b, f) . Caesura a , on the other hand, does not violate Cong-2 in any constituent. Looking now at (37) from the point of view of the local theory, we see that line end b meets definition (34), while caesura a does not. b is straddled by constituent B^* and f is the metrical counterpart of the last vowel in B^* . Node B , which is b 's MH, dominates F , which is f 's MH. Consider next caesura a . It is straddled by constituent A^* and f is the metrical position paired with the last vowel in A^* . But A , which is a 's MH, does not dominate F , which is f 's MH, and so a does not meet definition (34).

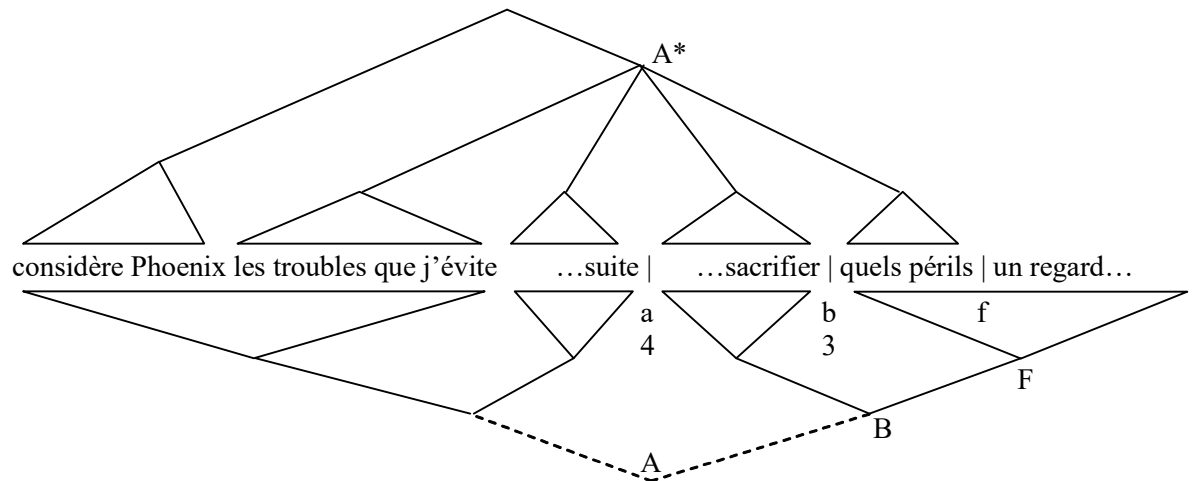
Turning now to (38), we see that line end a is the metrical peak of syntactic constituent A^* and caesura b is that of constituent B^* . Cong-2 (28) is violated by two mismatched pairs: (a, f) and (b, f) . And under the local theory, both boundaries are incongruent because they meet the conditions of (34). Node B , which is the MH of caesura b , dominates node F , which is the metrical MH of the end of B^* . Node A , which is the MH of line end a , dominates node F , which is also the metrical MH of the end of A^* , as the ends of A^* and B^* coincide.

We now turn to cases in which the two theories do not assign the same number of violations. Consider the two distichs below.

- (39) a. Considère, Phoenix, **les troubles que j'évite,**³⁹
 consider phoenix the torments that I avoid
 'consider, Phoenix, **the torments I avoid,**'
- b. **Quelle foule de maux l'amour traîne à sa suite,** |_a
 what crowd of ills the love drags in its wake
 'the numerous ills love carries in its wake,'
- c. **Que d'amis, de devoirs j'allais sacrifier,** |_b
 how many of friends of duties I would sacrifice
 'how many friends, how many duties I was to sacrifice,'
- d. **Quels périls...** Un regard m'eût fait tout oublier.
 what perils one look 1SG have; SBJV made all forget
 'what perils... One look would have made me forget it all.'

The sequence in boldface in (39) is a coordinate structure that groups 4 complements of the verb *considère*. The last complement is incomplete because the sentence is cut short.⁴⁰ The scansion of (39) is represented in (40), where lines (39b) and (39c) are represented by their last word to save space. Distichs are represented by solid lines for the sake of conspicuousness and A is the node Poem (see (8)).

(40)



Distich end *a* is incongruent under either theory. Under the nonlocal accentual theory, it is the accentual peak of constituent A^* , whose end is *f*. And considering things from the point of view of (34), A , the MH of *a*, dominates F , the MH of *f*.

(34) also assigns a violation to *b*, the end of line (39c), as B , its MH, also dominates F . The nonlocal accentual theory, by contrast, is blind to this second violation, because *b* is not the accentual peak of any constituent: the smallest syntactic constituent that straddles *b* is A^* , and the accentual peak of A^* is *a*.

In (40) two line ends (*a* and *b*) are incongruent in the same syntactic constituent (A^*). As it assigns it only one violation, the accentual theory puts this case on a par with (37). Cases in which one line end is incongruent in a coordinate structure are not uncommon in Racine's plays,⁴¹ while cases like (39), in which a coordinate structure is incongruent over two line ends are very rare,⁴² a disparity that the nonlocal accentual theory does not explain. The local theory accounts for it by assigning two violations to (39), and configurations with two violations are very rare in Racine's plays. This, then, is our first reason to prefer the local conception of strength implied by (34).

We turn next to another problematic aspect of the nonlocal accentual theory of congruence, the fact that some of its phonetic predictions are incorrect. One problem is that it predicts an overly rich number of stress levels. In a nutshell: if it is to be descriptively adequate, our notion of congruence must be sensitive to all the layers of embedding present in syntactic structure, but accentual patterns in fact do not preserve them. In the case of long sentences with many layers of embedding the End Rule predicts more degrees of prominence than are warranted by the data.

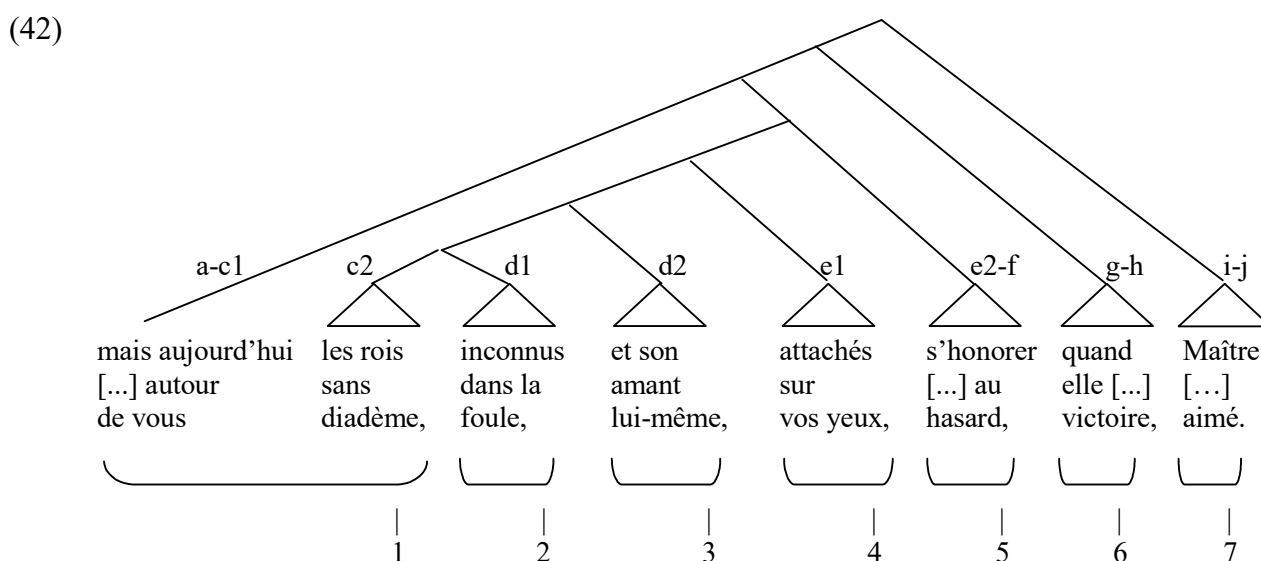
Save for the fact that the Intonational Phrase (henceforth “IP”) is the largest prosodic constituent below the sentence level, the term is used in different ways by different students of French intonation. We assume that IP is a recursive category and that IP structure above the level of minimal IPs is isomorphic with syntactic structure.⁴³ This assumption accords with the definition we proposed in *CCR*: 34. According to that definition, an IP boundary occurs at a given point of a text if and only if modern spelling conventions mandate a comma or a stronger punctuation at that point.⁴⁴ Thus defined, IP boundaries correspond to major intonational breaks. If we interpret in terms of prominence the various types of pitch excursions that have been recorded at major intonational boundaries in French, we don’t need more than two or three degrees of prominence.⁴⁵ The End Rule predicts a greater number of degrees in certain cases, as is shown by (41), which requires at the very least seven degrees of prominence above the IP level.

- (41) a. Mais aujourd'hui, Seigneur, que ses yeux dessillés⁴⁶
but today sir that her eyes unsealed
'But now, my Lord, that her unsealed eyes'
- b. Regardant de plus près l'éclat dont vous brillez,
looking from more near the'shine that you shine
'taking a closer look at the shine you shine,'
- c. Verront autour de vous les rois sans diadème,
will.see around of you the kings without crown
'will see around you crownless kings'
- d. Inconnus dans la foule, et son amant lui-même,
unknown in the crowd and her lover himself
'unnoticed amid the crowd, and her lover himself,'
- e. Attachés sur vos yeux, s'honorer d'un regard
fastened on your eyes feel.honoured by'a glance
'seeking your attention all feel honoured by a glance'
- f. Que vous aurez sur eux fait tomber au hasard ;
that you will.have on them made fall on random
'that you happened to cast upon them;'

- g. Quand elle vous verra de ce degré de gloire,
 when she you see.FUT from this degree of glory
 ‘when she sees you (come) from this pinnacle of glory’
- h. Venir en soupirant avouer sa victoire,
 come with.sighs concede her victory
 ‘disconsolately to acknowledge her victory,’
- i. Maître, n'en doutez point, d'un cœur déjà charmé
 master not'it doubt not to'a heart already captivated
 ‘Master, have no doubt, to a heart already captivated’
- j. Commandez qu'on vous aime, et vous serez aimé.
 order that'one you love and you will.be loved
 ‘order to love you, and loved you shall be.’

The sentence in (41) spans five distichs, that is, 120 metrical syllables, and its overall syntactic structure can be summarized as ((a...f)(g-h))(i-j). In this formula, (i-j) is the main clause and ((a...f)(g-h)) represents the coordination of two temporal phrases (a...f) and (g-h). The lowercase letters in the formula refer to the line labels in (41). This notation is made possible by the fact that each one of the syntactic constituents (a...f), (g-h) and (i-j) is coextensive with a sequence of adjacent lines of verse. The

tree in (42) shows only those aspects of the syntactic structure of (41) that are relevant to the operation of the End Rule above the IP level. To avoid distractions, it depicts only that part of the sentence that begins at the caesura of line (41c) and it fails to represent the four IPs that make up the main clause (i-j).



There are three layers in the diagram in (42). The top layer displays a simplified syntactic tree in which the node labels refer to the line labels in the text cited in (41). For example, the label “c2” reflects the fact that the NP *les rois sans diadème* is coextensive with the second hemistich in line *c*. The slurs indicate how the sentence is segmented into IPs. Except for the comma at the end of line (41g) the IP edges are in a one-to-one correspondence with the punctuation marks in the text. The numbers in the bottom layer depict the accentual grid that would result from applying the End Rule to all the constituents in the sentence. Each vertical bar represents the right edge of an IP and the number beneath it is the column height representing the prominence that the End Rule would assign to the rightmost syllable in that IP. The numbers only

represent the topmost layers of the accentual grid, abstracting away from all the grid layers that correspond to prominence relations inside IPs.

The different degrees of stress assigned to the final syllables of IPs c2, d1 and d2 are an example of the wrong predictions made by the End Rule when it is allowed to apply to strings that are comprised of several IPs. In a neutral pronunciation the syllables *dème*, *foule* and *même* do not bear different pitch events, nor do they require different degrees of lengthening relative to their environment.

6. Outstanding Issues

We have just given two reasons why congruence must be considered as pertaining to constituency matching rather than to prominence matching. The constituency matching view is embodied in definition (34), which implies that in the final analysis congruence is fundamentally a matter of pure geometry, or rather of pure logic: among all texts whose vowels can be paired with the terminal nodes of metrical structure, poets tend to prefer those in which syntactic breaks best match the strength of corresponding breaks at metrical boundaries.⁴⁷ We now turn to various outstanding issues of a general nature.

6.1. Congruence vs. Alignment Constraints

Moving to a metrical form with a greater depth of embedding than the distich of alexandrines, we have examined *dizains* (ten-line stanzas) rhymed *ababccdeed* in which lines are all of the same length. The metrical structure of these dizains is [([ab][ab]) ([(cc) d] [(ee) d])], that is, a quatrain followed by a sexain made up of two tercets.⁴⁸ We posit this structure on the basis of the rhyme scheme alone,

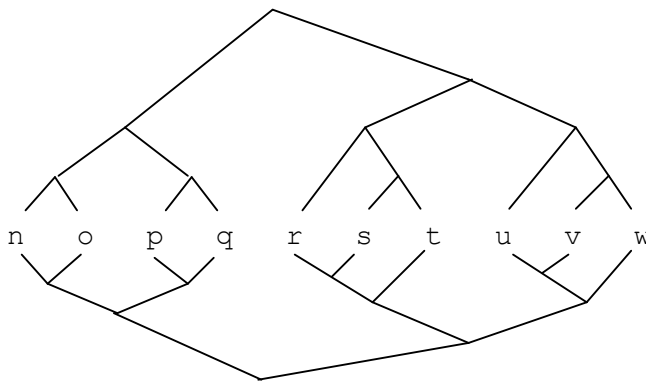
independently of the structure of the associated texts.⁴⁹ Let us give examples of stanzas with such a dizain structure. Our first example is fully congruent.

- (43) n. Ainsi quand le jeune navire⁵⁰
 thus when the young ship
 'thus when the young ship'
- o. Où s'élancent les matelots,
 where take.off the seamen
 'on which the seamen take off,'
- p. Avant d'affronter son empire,
 before to'face her dominion
 'before she faces her dominion,'
- q. Veut s'apprivoiser sur les flots,
 wants be.tamed on the waves
 'wants to be tamed on the waves,'

- r. Laissant filer son vaste câble,
letting unwind her lengthy cable
'letting her lengthy cable unwind,'
- s. Son ancre va chercher le sable
her anchor goes seek the sand
'her anchor reaches for the sand'
- t. Jusqu'au fond des vallons mouvants,
as.far.as'to.the bottom of.the vales moving.PL
'all the way down to the bottom of the moving vales,'
- u. Et sur ce fondement mobile
and on this base mobile
'and on this moving base'
- v. Il balance son mât fragile
3M.SG swings her mast frail
She swings her frail mast
- w. Et dort au vain roulis des vents!
and sleeps at.the vain roll of.the winds
'and sleeps in the vain rolling winds.'

The stanza in this example is coextensive with a single sentence. The quatrain is coextensive with a subordinate clause (*quand le jeune navire...veut s'apprivoiser...*). The sexain is coextensive with the main clause, which is a conjunction of two clauses. The first tercet is coextensive with the first clause (*laissant filer...son ancre va chercher...*) and the second is coextensive with the second clause (*il balance...et dort...*). The scansion of (43) is represented in (44).

(44)



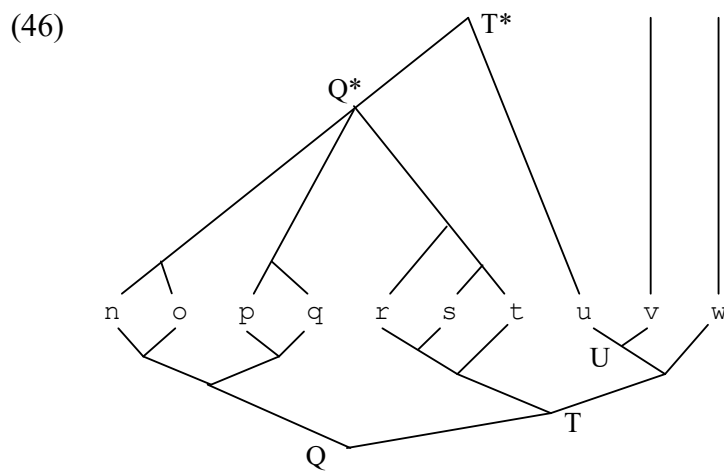
(44) follows the same convention as the earlier diagrams, with metrical structure represented in the lower half, but instead of representing a metrical position, each terminal node stands for a line taken as a whole. The internal structure of lines is irrelevant for the present purposes because the stanza has the property that any syntactic constituent in it that straddles a line end has an end that coincides with the end of another line. Consider for instance the three syntactic constituents that straddle the end of the first line of the dizain. The end of the subject NP *le jeune navire...matelots* coincides with the end of line *o*. The end of the subordinate clause *quand le jeune navire...veut s'apprivoiser sur les flots* coincides with that of line *q*. The end of the sentence taken as a whole coincides with that of the dizain.

We consider next a stanza that contains two incongruent metrical boundaries.

- (45) n. Et si mon invisible monde⁵¹
and if my invisible world
'and if my invisible world'
- o. Toujours à l'horizon me fuit,
always on the horizon me flees
'always vanishes on the horizon,'
- p. Si rien ne germe dans cette onde
if nothing not geminate in this flow
'if nothing germinates in this flow'
- q. Que je laboure jour et nuit,
that I plough day and night
'that I plough day and night,'

- r. Si mon navire de mystère
if my ship of mystery
'if my ship of mystery'
- s. Se brise à cette ingrate terre
3SG.REFL shatter at this ungrateful land
'shatters on this ungrateful land'
- t. Que cherchent mes yeux obstinés,
that seek my eyes obstinate
'that my obstinate eyes seek,'
- u. Pleure, ami, mon ombre jalouse !
mourn friend my shadow jealous
'mourn, friend, my jealous shadow!'
- v. Colomb doit plaindre La Pérouse.
Columbus must pity La Pérouse
'Columbus must pity La Pérouse.'
- w. Tous deux étaient prédestinés !
all two were predestined
'they were both predestined!'

The stanza consists of three sentences. The first sentence encompasses lines *n* to *u*, the second is coextensive with line *v*, and the third, with line *w*. In (45) as in the previous example, any syntactic constituent that straddles a line end has an end that coincides with the end of another line, and so the scansion of (45) can be represented in diagram (46), where each terminal node stands for a line taken as whole.



Two lines have incongruent ends in stanza (45), line *q* (the end of the quatrain) and line *t* (the end of the first tercet). Let us apply definition (34) to these line ends.

Consider first the end of *q*. It is straddled by *Q**, which ends in *t*, and by *T**, which ends in *u*, and *Q* dominates *T* and *U*. Then consider the end of *t*, which is straddled by *T**. *T** ends in *u* and *T* dominates *U*.

Dizains afford us the opportunity of comparing the predictive power of a congruence requirement with that of alignment constraints. Recent work on metrics has adopted violable alignment constraints as a powerful formal device for stating regularities that match metrical constituents with grammatical constituents.⁵²

Alignment constraints are of the form AL(*Y*, *Z*, Edge), where “Edge” stands for Left

or Right, and where one member of the pair (Y, Z) is a category of metrical structure (M), and the other member, a grammatical category (G). There are two kinds of alignment constraints depending on how M and G are mapped to the pair (Y, Z). We give an example of each kind in [47], limiting ourselves to right-alignment:

(47) a. AL (M, G),

e.g. AL (Distich, Sentence): The right edge of every distich coincides

with that of a sentence.

b. AL (G, M),

e.g. AL (IP, Line): The right edge of every IP coincides with that of a Line.

Congruence is at first blush like an alignment constraint of type (47b), as it requires the end of every syntactic constituent that has property P to coincide with the end of a metrical unit that has property Q. Focusing on congruence violations at the end of the quatrain and at that of the first tercet, we have examined their frequency in 233 *ababccdeed* dizains composed in the 19th century, almost all of them in octosyllabic lines. Our results are displayed in table (48), which also takes into account whether quatrain and first-tercet ends coincide with sentence ends.⁵³

(48)

		A	B	
		end of quatrain	end of first tercet	
a	congruent	198	139	sentence-final
b		26	69	
c	incongruent	9	25	sentence-internal
d	total	233	233	

Table (48) indicates that 224 out of 233 quatrain ends are congruent ($224 = 198 + 26$), and 208 out of 233 first-tercet ends are congruent ($208 = 139 + 69$). These figures illustrate the fact that congruence is not a property specific to sequences of distichs. The table presents another salient fact, which is the tendency of quatrain ends and first-tercet ends to coincide with sentence ends. To account for this tendency one could posit violable constraints such as the following:

(49) AL(Quatrain, Sentence): The end of every quatrain coincides with a sentence
boundary.

However, positing (49) would not dispense us from invoking congruence, because (49) has nothing to say about the difference between the quatrain ends in (48b) and those in (48c), which both violate (49). There are 35 ($26+9$) quatrain ends that fall inside a sentence, and they are congruent in 74% of the cases ($26/35$). The same holds for

first-tercet ends: there are 94 of them (69+25) that are sentence-internal and 73% of them are congruent (69/94).

One may wonder whether the effects of congruence could be parcelled out and attributed to several alignment constraints. The prospects in this direction are rather dim. While alignment constraints are only concerned with edges, congruence is also concerned with containment relationships, as implied by definition (34). Furthermore, alignment constraints refer to specific constituents, for example (49) refers to Quatrain and Sentence. Definition (34), by contrast, is applicable to any constituent.

If congruence cannot be considered a special case of alignment, could it be the other way around, alignment being just an extreme case of congruence? Note that a radical means of shielding a metrical boundary from incongruence is to align it with the end of a sentence.

6.2. *Congruence and the Hypothesis of Phonological Metrics*

A remarkable property of congruence is the fact that the grammatical information it depends on is that contained in syntactic structure. This poses a serious challenge to the Hypothesis of Phonological Metrics proposed by Hayes 1989: 224. According to that hypothesis “metrical rules NEVER [*sic*] refer to syntactic bracketing, only to prosodic bracketing. In other words, syntax has effects in metrics only insofar as it determines the phrasing of the Prosodic Hierarchy.” Here is why we hold that congruence must refer to syntactic structure. First, there is the fact that Racine’s plays contain only a few incongruences that are exceptions to the generalization below, which refers to syntactic categories.

- (50) CONGRAC: If an incongruent metrical boundary does not coincide with an IP edge, the smallest syntactic constituent that straddles it is not an NP, an AP, a PP, or an AdvP.

This generalization is discussed in *CCR*: 35-36, 139-144. The violations of CONGRAC in Racine's plays fall into two classes. There are on the one hand, those in which an incongruent metrical boundary is straddled by a coordinate structure, as in the following examples:

- (51) Et ce sont **ces plaisirs** | **et ces pleurs** que j'envie.⁵⁴
 and it are those pleasures and those tears that I'envy
 'and it is **those pleasures** | **and those tears** that I envy.'

- (52) Pensez-vous être **saint** | **et juste** impunément ?⁵⁵
 think=you be saint and just with.impunity
 'do you think you can be **saint** | **and just** with impunity?'

- (53) Tout mon sang **de colère** | **et de honte** s'enflamme.⁵⁶
 all my blood with anger and with shame is.ablaze
 'my blood **with anger** | **and shame** is all ablaze.'

These cases are common enough.⁵⁷ They may be due to properties of coordinate structures that elude us.⁵⁸ We have to leave them unaccounted for. Apart from these, Racine's plays contain only 15 exceptions to (50), and two-thirds of them are found in

Les Plaideurs, the only comedy, whose 884 lines only amount to 5% of the total number of alexandrines in the corpus.⁵⁹

The hybrid nature of CONGRAC, which refers at the same time to Syntactic Structure and to Prosodic Structure, is puzzling. As the local theory embodied in (34) implies that congruence has to do fundamentally with syntax, one may wonder whether the IP edges referred to in (50) are not in fact a proxy for a class of loose syntactic breaks the membership of which awaits investigation. Alternatively, we can take CONGRAC at face value and consider it as data pointing to the interplay between syntax and phonology in the matching of texts with metrical structure. Of the three metrical boundaries in Racine's plays, the caesura is the only one whose cohesiveness can be characterized by conditions that refer solely to Prosodic Structure. Syntactic and semantic properties are relevant for characterizing cohesiveness at the end of lines, as shown in *CCR*: 66-77, 84.

The research that led Hayes to formulate his Hypothesis of Phonological Metrics mainly dealt with the distribution of word stresses in small-scale metrical units up to the line level. The effects of congruence, however, are not confined to linguistic strings that fit in a line. The largest constituent in Prosodic Structure is the IP. There are numerous cases of concordance between metrical structure and grammatical structure that involve grammatical constituents larger than the IP. Representations in which the linguistic material is divided into segments no larger than IPs would miss the information relevant in such cases. To get an idea of what is at stake, let us compare the following dizain with that in (43).

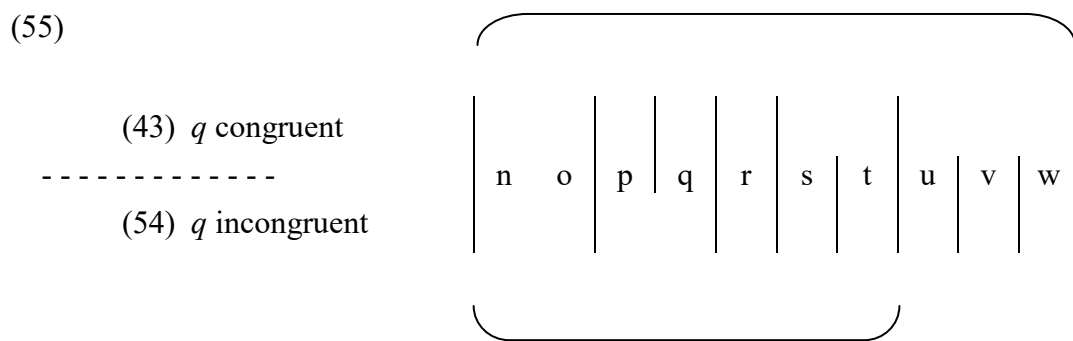
- (54) n. L'enfant dont la mort cruelle⁶⁰
the'child whose the death cruel
'the child whose cruel death'
- o. Vient de vider le berceau,
has.just to empty the crib
'just emptied the crib,'
- p. Qui tomba de la mamelle
who fell from the breast
'who fell from the breast'
- q. Au lit glacé du tombeau ;
to.the bed icy of.the tomb
'to the icy bed of the tomb;'

- r. Tous ceux enfin dont la vie,
all those to.sum.up whose the life
'all those, to sum up, whose life,'
- s. Un jour ou l'autre ravie,
one day or the'other stolen
'one day or another stolen,'
- t. Emporte une part de nous,
takes a part of us
'takes with them a part of ourselves,'
- u. Murmurent sous la poussière :
whisper under the dust
'whisper under the dust:'
- v. Vous qui voyez la lumière,
you who see the light
'you who see the light,'
- w. Vous souvenez-vous de nous ?
you remember of us
'do you remember us?'

While the end of the quatrain is congruent in (43), it is not in (54), and yet the differences between the prosodic phrasings of the two dizains do not seem to bear any relationship with this fact, as we shall now see.

As explained earlier, the end of the quatrain in (43) coincides with the limit between a subordinate clause and a following main clause, and the only syntactic constituent that straddles the quatrain end is the sentence. In (54), on the other hand, the quatrain is coextensive with the NP *l'enfant...tombeau*. This NP is conjoined with another, *tous ceux...une part de nous*, and the two NPs form a constituent whose end coincides with that of the first tercet. Consequently the end of the quatrain is incongruent.

The two dizains are lined up in (55) so as to make it easy to compare their division into successive IPs. Each letter in the medial sequence stands for the end of a line. A bar after a letter indicates that the end of the line coincides with an IP edge. A bar jutting upwards indicates an IP edge in (43) and one jutting downwards indicates an IP edge in (54). The span of the syntactic MH of the quatrain end in either stanza is represented by a slur.



The dizains in (43) and (54) share IP boundaries at the end of lines *o*, *q*, *r*, *t* and *w*, but there is no apparent relation between their decomposition into IPs and the fact that the end of the quatrain is congruent in (43) but not in (54).

The largest syntactic domain is the sentence, but we presented in *CCR*: 127-131 several examples which suggest that congruence may still be relevant above the sentence level if constituent structure trees are formal devices suitable for representing the way sentences group themselves into higher-order units to form a coherent discourse. If this is the case, it is semantic representations that we should expect congruence to make reference to.⁶¹

6.3. *Congruence Is Gradient*

Congruence is a matter of degree. French readers find some incongruences more noticeable than others. They find the incongruence in (11b) more noticeable than that in (11c), and that in (21) more noticeable than that in (20). There is evidence that the severity of incongruences depends on syntactic structure as well as on metrical structure. The evidence on the syntactic side is generalization CONGRAC (50). As noted in section 6.2, Racine avoids incongruences that violate CONGRAC, while such incongruences are not as rare in poems composed by 16th or 19th century poets. Furthermore, as also noted in section 6.2, most of the exceptions to CongRac in Racine's plays are found in the comedy *Les Plaideurs*, and comedies are generally more permissive.

On the metrical side, one aspect of Racine's plays that might be taken to reflect the gradient nature of congruence is the frequency distribution of those incongruent syntactic constituents whose end falls inside a hemistich. Here is an example.

(56) L'aimable Bérénice **entendrait de ma bouche**⁶²

the'charming Bérénice would.hear from my mouth

'the charming Bérénice **would hear me say**'

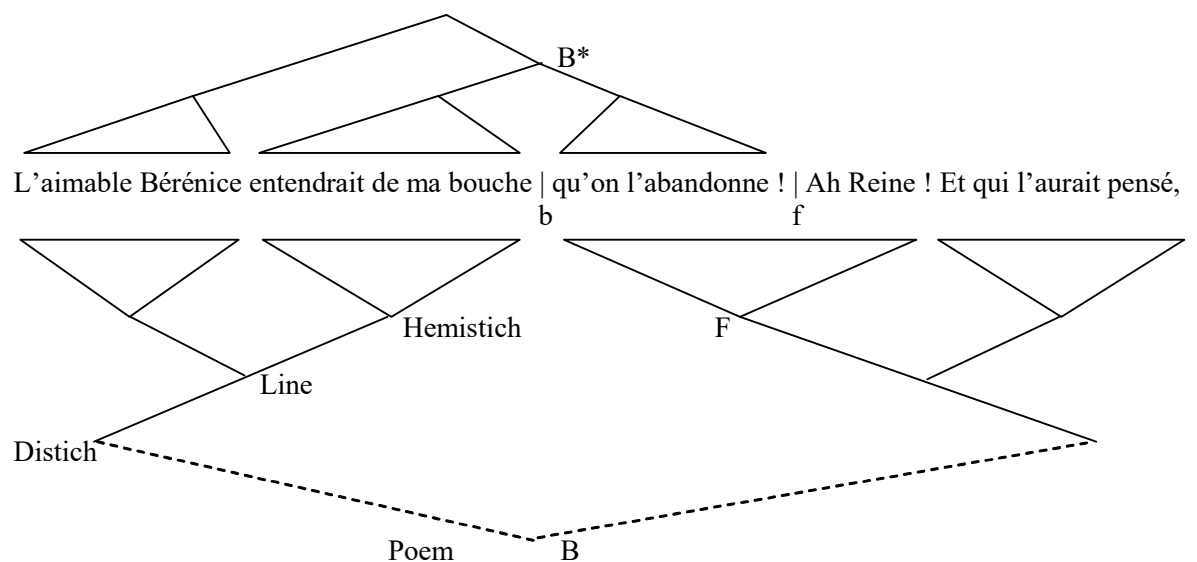
Qu'on l'abandonne ! Ah Reine ! | Et qui l'aurait pensé,

that'one her'abandon ah queen and who it'would.have thought

'that I abandon her! Ah Queen! | Who would have thought,'

In this example the incongruent boundary is a distich end and it does not coincide with the edge of an IP. Instances like (56) are very rare in Racine's plays. There are only three of them.⁶³ We conjecture that this rarity is due to the distance between two nodes of metrical structure, the MH of the boundary and the MH of the end of the straddling constituent. This distance is maximal, as can be seen in (57), which represents the scansion of (56).

(57)



As the boundary under consideration is a distich edge, the solid lines in the lower half of diagram (57) represent portions of two abutting distichs, after the fashion of diagram (40). Node B, the MH of the incongruent distich boundary, is Poem, while F, *f*'s metrical MH, is a Hemistich node.⁶⁴ The distance between B and F is maximal: in a poem in which the largest metrical unit is the distich, if one node dominates another in metrical structure, the distance between them cannot be greater than 4, which is the number of grouping levels in the metrical hierarchy: Hemistich, Line, Distich, Poem. Given the extreme rarity of cases like (56) in Racine's plays, we venture the following conjecture:

(58) Let *b* be a boundary which is incongruent in a syntactic constituent whose end does not coincide with a metrical boundary. The higher *b* is in the metrical hierarchy, the higher the degree of incongruence.

This conjecture is borne out by the frequencies in Racine's plays of incongruent metrical boundaries with syntactic MHs whose ends do not coincide with metrical boundaries. The higher the boundaries are in the metrical hierarchy, the fewer their occurrences, as can be seen in table (59).

(59)	caesura	end of a distich-initial line	end of a distich
	513	153	73 ⁶⁵

Conjecture (58) is corroborated by the distribution of incongruences in our corpus of dizains. An instance of an incongruence meeting the conditions of (58) is that at the end of the second line in the following quatrain, which begins a dizain by Hugo:

(60) n. Comment naît un peuple ? Mystère !⁶⁶

how is.born a people mystery

‘how is a people born? Mystery!’

o. À de certains moments, **tout bruit**

at some certain moments all noise

‘there are times when **all noise**’

p. **A disparu ;** toute la terre

has disappeared all the earth

Has died out; the whole earth

q. Semble une plaine de la nuit ;

seems a plain of the night

‘seems like a plain of the night;’

The end of a quatrain or a tercet is not involved in any one of the incongruences meeting the conditions of (58) that occur in the 233 dizains we have examined.⁶⁷ This fact is in accord with conjecture (58), as quatrains and tercets are the highest metrical units in a dizain.

6.4. *Congruence and Ease of Processing*

Contrary to what the layout of our diagrams might suggest, the relation between linguistic structure and metrical structure is not a symmetrical one. While the grammatical structure of a poem can be described independently of its metrical structure, the description of its metrical structure necessarily makes reference to grammatical structure, as it cannot avoid referring to grammatical entities like syllables or sentences. When we read a poem we take linguistic structure as a given. It is the raw material through which the regularities that give rise to metrical structure are woven. Readers of poetry retrieve metrical structure from linguistic structure, not the other way around.

Congruence is a rightward-oriented property. Definition (34) implies that the left edges of constituents are not relevant to congruence; only their right edges matter. Why is it so? We suggest that there is a functional explanation to this inherent directionality. Online processing of metered verse requires listeners/readers to do two things in parallel: they must parse the syntactic structure of the text so as to compute its meaning, and in addition they must apprehend its metrical structure. Listeners/readers must wait till the end of a syntactic constituent before they have all the information needed to compute its meaning, and they must wait till the end of a metrical constituent before they can assess the well-formedness of its correspondence with the portion of text that instantiates it. In accord with the suggestions in Obermeier et al. 2013 and in Fabb 2015: 188-191, we like to think that the burden that this two-fold task imposes on memory is alleviated if the coincidence between the ends of metrical units and those of syntactic constituents is made predictable to a certain extent.

Besides its orientation rightward, another property of congruence that may facilitate processing is its locality. This locality has two aspects, call them metrical locality and syntactic locality. Metrical locality: congruence can be violated in a constituent only if the boundary's metrical MH and the metrical MH of the constituent's end are in a domination relationship to one another. Syntactic locality: in order to check a metrical boundary for congruence, it is in most cases sufficient to check a very limited portion of its syntactic environment, namely the smallest syntactic constituent which straddles the boundary. This follows from two generalizations that are discussed in Appendix I.

Tying congruence to ease of processing would explain why readers find it difficult to keep track of metrical structure in French verse that contains frequent incongruences. It would also explain why all metered verse composed in French is congruent to some degree.

Given that our characterization of congruence does not make reference to any features that are specific to French poetic forms or to the structure of the French language, it would be surprising if congruence did not manifest itself in many poetic traditions.

7. Conclusion

We have argued that incongruences are not stress mismatches, nor are they violations of an alignment constraint of the kind posited by other students of metrics. Is congruence, then, a novel theoretical construct that must be incorporated into linguistic theory? There are forces guiding the form of verbal artefacts that run deeper than those that govern language. We believe one should look beyond the confines of the language faculty and see congruence as an aspect of that general property of mind

that Gombrich 1979 calls the sense of order: “What I have called the ‘sense of order’ underlies all human creations and many activities lower down the evolutionary scale as well. [...] In adorning the body an order is superimposed on an existing order, respecting or sometimes contradicting the symmetries of the organic form. The same applies to the decoration of technical products. Whether he decorates a canoe or a house, a weapon or a pot, the craftsman is confronted with a given shape he must ‘adorn’.” (pp. 64-65). In the analogy that we suggest between the text-meter correspondence and decorative art, the text is like an Ancient Greek vase and metrical structure is like the scenes and patterns painted on it. The main articulations of the vase (mouth, handles, neck, etc.) are like linguistic constituents such as phrases and clauses, and they serve as a frame for the arrangement of the motifs and figures on its surface. Another manifestation of the sense of order in verse is the grouping of lines into rhyming couplets, and more generally, the patterning of rhymes or metres above the couplet level. Some aspects of the arrangement of words in verse are regulated by constraints whose purview extends beyond the realm of verbal artistry.

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² For the study of French verse we owe a special debt to Cornulier 1982, 1995, 2000 and Verluyten 1981, 1982, 1989.

³ There is no generally accepted analysis of hemistichs into feet. For proposals about foot structure in alexandrine verse, see for instance Porohovshikov 1932, Dinu 1993, Fabb and Halle 2008: 133 sqq.

⁴ Baudelaire, *Les Fleurs du Mal*, “Le beau navire”. This example is translated in (3).

⁵ On Prosodic Structure, see for instance Selkirk 1984, Hayes 1989. For French, we follow the definitions of Clitic Group, Phonological Phrase, and Intonational Phrase, presented in *CCR* on pages 56, 77, and 34.

⁶ See *CCR* 83.

⁷ In (2) the schwa of *chassent* is not associated with a metrical position because in classical French verse a schwa is extrametrical if it is the rightmost vowel in a line-final polysyllabic word.

⁸ The notion of congruence harks back to rules laid down by 17th century theorists, see *CCR*: 21.

⁹ Molière. *Les Plaideurs*, III, 3.

¹⁰ The *e* in *parle* is elided before the following vowel.

¹¹ On metrical grids, see Liberman and Prince 1977.

¹² Baudelaire, *Les Fleurs du mal*, “Hymne à la beauté”.

¹³ Baudelaire, *Les Fleurs du mal*, “Une charogne”.

¹⁴ Hugo, *Contemplations*, “Pasteurs et troupeaux”.

¹⁵ Corneille, *Horace*, III, 6.

¹⁶ Heredia, *Les Trophées*, “Brise marine”

¹⁷ See *CCR*: 176-177 for examples.

¹⁸ “Vowel Z is the metrical peak” is shorthand for “the position associated with vowel Z is the metrical peak”. We will often allow ourselves such abbreviations.

¹⁹ Racine, *Britannicus*, IV, 4.

²⁰ Baudelaire, *Les Fleurs du Mal*, “Le cygne”.

²¹ We use the following abbreviations: A = Adjective, Adv = Adverb, N = Noun, P = Preposition. XP is a phrase the head of which is of category X.

²² While lines like (18) are rather commonplace in 19th century verse, not a single instance is to be found in Racine’s plays. Such lines are prohibited by CONGRAC, on which see below.

²³ Corneille, *Horace*, III, 6.

²⁴ Racine, *Britannicus*, I, 2.

²⁵ Hugo, *Cromwell*, V, 12.

²⁶ Corneille, *Le Cid*, V, 6. Dashes indicate turn taking in a dialogue. Classical French versification is blind to speaker changes.

²⁷ Racine, *Britannicus*, III, 6.

²⁸ Racine, *Andromaque*, III, 4.

²⁹ The incongruences counted in the table are listed in *CCR*: 181-193. Certain plays contain passages that are not sequences of alexandrines. This is the reason why the number in cell A-I is not an even number. Lines not contained in a pair of rhyming alexandrines are not counted in columns II and III, which explains why A-I is larger than the sum of A-II and A-III. Furthermore, as the end of the last distich in a play is necessarily congruent, the final distichs of the twelve plays in the corpus were not counted in column III, which explains why the difference between the figures in cells A-II and A-III is 12.

³⁰ An early formulation of the End Rule for French is found in Kellenberger 1932: 29.

³¹ ...or the penultimate if the phrase ends in a polysyllable whose last vowel is schwa. For the sake of brevity we ignore from now on the distinction between oxytones and paroxytones, as it is a detail of no consequence in the context of the present discussion.

³² Hugo, *La Légende des siècles*, “Le mariage de Roland”.

³³ Chapter 4 in *CCR* is devoted to stress mismatches in Racine’s plays.

³⁴ See Dell and Halle 2009. The distinction between constituency mismatches and prominence mismatches is the same as that between bracketing and labeling mismatches in Kiparsky 1977.

³⁵ As *b* and *f* both belong to metrical structure, their minimal hinges also belong to metrical structure, given our definition of minimal hinges. In the final clause of (34) the redundant occurrences of *metrical* were added as aids to the readers.

³⁶ Racine, *Les Plaideurs*, I, 6.

³⁷ Racine, *Les Plaideurs*, I, 7.

³⁸ As explained in the paragraph beneath (3), a vertical bar stands for the rightmost metrical position to its left. In (37) and the diagrams below, the vertical bars are positioned inside the text, while in fact they represent features of metrical structure. In (37) the bar labeled *b* stands for the last metrical position in line A, a position mapped to the penultimate vowel of *comtesse*. It is for the sake of conspicuousness that the bar and its label stand above the space between the two inverted triangles that represent hemistichs. Strictly speaking they should stand above the right vertex of the triangle on the left.

³⁹ Racine, *Andromaque*, II, 5.

⁴⁰ It is commonplace for the last metrical boundary spanned by a cut short sentence to be incongruent, see *CCR*: 33.

⁴¹ We have found 84 instances of such a configuration. The line end is a distich end in 68 of them.

⁴² Besides (39) we know of only 4 instances in which two metrical boundaries are incongruent in the same constituent: *La Thébàide*, vv. 1414-1416, *Mithridate*, vv. 308-310, *Les Plaideurs*, vv. 148-150 and 732-733.

⁴³ Hayes 1995: 369 is noncommittal as to whether in English the End Rule applies to morphosyntactic structure or to Prosodic Structure.

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- ⁴⁴ The notion harks back to the *tronçon* defined in Dell 1984: 68.
- ⁴⁵ See for example Mertens 2008, Delais-Roussarie et al. 2015, Martin 2018.
- ⁴⁶ Racine, *Britannicus* II, 2.
- ⁴⁷ Definition (34) renders pointless the difference between two kinds of incongruence that is discussed in *CCR*: 124-126.
- ⁴⁸ Martinon 1912: 367ff., Cornulier 1993: 28-29. The two kinds of brackets are for the sake of conspicuousness.
- ⁴⁹ On the general principles involved, see Dell 2003.
- ⁵⁰ Lamartine, *Harmonies poétiques et religieuses*, “Le chêne”.
- ⁵¹ Hugo, *Les Feuilles d’automne*, “À M. de Lamartine”.
- ⁵² See for example Hanson 2009, Hayes, Wilson and Shisko 2012, Blumenfeld 2015.
- ⁵³ See Appendix II for details.
- ⁵⁴ Racine, *Britannicus*, II, 3.
- ⁵⁵ Racine, *Esther*, I, 1.
- ⁵⁶ Racine, *Esther*, III, 4.
- ⁵⁷ See *CCR*: 197-199.
- ⁵⁸ The assumptions undergirding our syntactic analyses are described in *CCR*: 31-33, 155-177.
- ⁵⁹ On the greater permissiveness of enjambment in comedies and fables, see Quicherat 1850: 18, 70.
- ⁶⁰ Lamartine, *Harmonies poétiques et religieuses*, “Pensée des morts”.
- ⁶¹ Scherr 2006 presents generalizations on the grouping of lines in Pushkin’s *Eugen Onegin*. Some of these generalizations refer to boundaries that are syntactic *or semantic*.
- ⁶² Racine, *Bérénice*, III, 3.
- ⁶³ The other two instances occur in the comedy *Les Plaideurs*. These can be found in *CCR*: 210.
- ⁶⁴ On the left-hand side of (57) the node labels on metrical structure are reminders for the readers’ convenience.
- ⁶⁵ 73 instead of 85, the figure in Table [1] in *CCR*: 195. A review of all the cases listed in *CCR*: 183-193 shows that this figure is erroneous. In 70 out of these 73 instances the incongruent boundary

coincides with an IP edge. As with CONGRAC (50), not coinciding with an IP edge drastically reduces the number of incongruent boundaries.

⁶⁶ Hugo, *Les Contemplations*, “Les mages”.

⁶⁷ See Table (2) in Appendix II.

Appendix I. Two generalizations

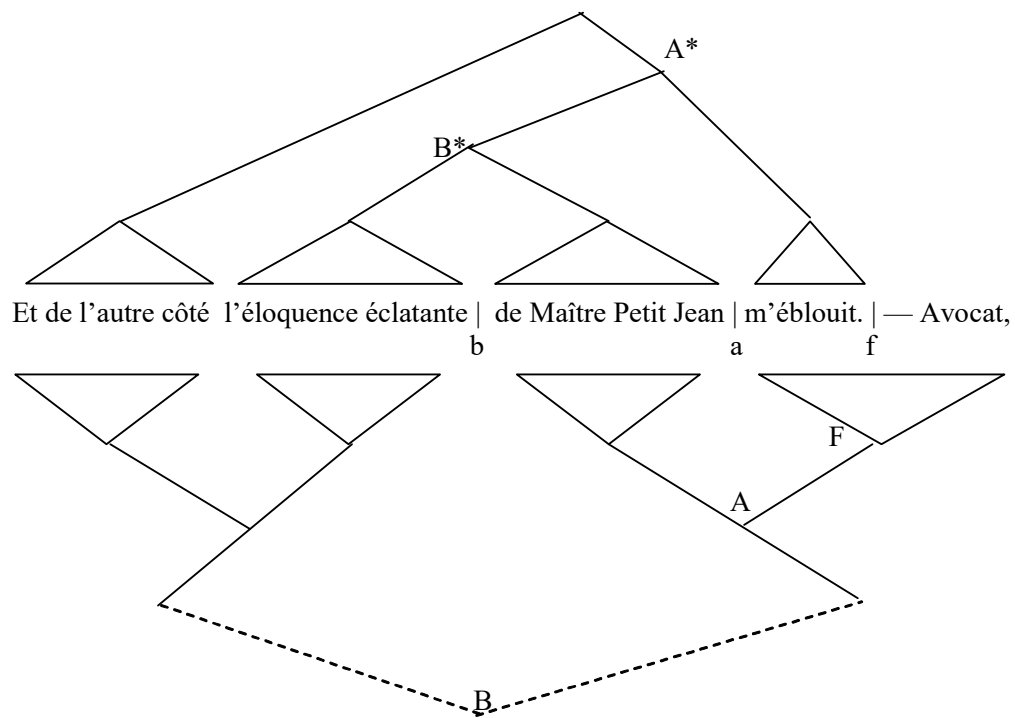
The upshot of this appendix is that although a metrical boundary may be spanned by many syntactic constituents, in most cases it is only necessary to check the smallest one for congruence. As a background to the discussion, it is necessary to point out the existence of a kind of configuration that lack of space prevented us from discussing in the main body of the article: a given metrical boundary may be incongruent in two different syntactic constituents. Here is an example.

- (1) a. Et de l'autre côté l'éloquence éclatante¹
 and on the'other side the'eloquence sparkling
 'on the other hand the sparkling eloquence
- b. **De Maître Petit Jean** | **m'éblouit.** — Avocat,
 of Master Petit Jean me'dazzles attorney
of Master Petit Jean | **dazzles me.** — Attorney,'

The end of line (1a) is incongruent in two constituents, the underlined NP and the clause in boldface. The scansion of (1) is represented in (2).

¹ Racine, *Les Plaideurs* III, 3.

(2)



In (2), line end *b*, which is incongruent in constituent B^* , is also incongruent in constituent A^* . The solid lines in the lower half of the diagram represent portions of two abutting distichs. As *b*, the end of the first line, is a distich boundary, B , its metrical MH, is the node Poem. *b* is incongruent in B^* , the end of which coincides with caesura *a*, as B dominates A , which is *a*'s metrical MH. *b* is also incongruent in A^* , as B dominates F , which is the MH of *f*, the metrical counterpart of the end of A^* .

Our goal is to compare the frequency of various kinds of incongruences across periods, poetic genres, etc. Cases like (2), in which the same boundary is incongruent with respect to different syntactic constituents, show that in a tally of incongruences it is not enough to count those boundaries that are incongruent; one must also take into account the syntactic constituents involved. A poem contains as many instances of incongruence as there are pairs (*b*, B^*) that meet definition (34). As any syntactic

constituent that straddles a metrical boundary can be a source of incongruence, it would seem that in order to identify all the incongruences in a poem, one would have to check for congruence in the poem every syntactic constituent that straddles a metrical boundary. Fortunately, in most cases the constituents that it is sufficient to check for congruence are those that are a metrical boundary's *syntactic* minimal hinge. This follows from two generalizations. The first generalization concerns syntactic constituents whose ends coincide.

- (3) Generalization 1 (redundancy): Let b be a metrical boundary and B^* a syntactic constituent whose rightmost vowel is v . If b is incongruent in B^* , it is also incongruent in any syntactic constituent K such that K contains B^* and v is the rightmost vowel in K .

The validity of this generalization is easy to see. Let us illustrate with line end b and constituents A^* and B^* in (31). According to definition (34), the congruence of a boundary b in a constituent B^* depends on the pair (B, F) , where B is b 's metrical MH and F is the metrical MH of the last vowel in B^* . Both constituents end with the same vowel, B^* is the smallest constituent that straddles b , and A^* contains B^* . The pairs (b, B^*) and (b, A^*) both meet definition (34), but as they share the pair (B, F) in metrical structure, they belong to one and the same instance of incongruence.

(Remember that in (37) the pair (a, A^*) does not meet the conditions of definition (34).)

The second generalization concerns metrical boundaries that are congruent in the smallest syntactic constituent that straddles them.

- (4) Generalization 2 (nested congruences): Let b be a metrical boundary and B^* a syntactic constituent straddling b . If b is congruent in B^* it is also congruent in any constituent that contains B^* .

Before we justify this proposition, let us illustrate its consequences. Suppose that we want to determine whether the caesura is congruent in the third line of the following example, in which a single sentence is coextensive with a sequence of four distichs.

- (5) a. [₆ Pour toute ambition, pour vertu singulière,²
 for all ambition for virtue distinctive
 ‘as his only ambition, as his distinctive virtue’
- b. [₅ Il [₄ excelle [₃ [₂ à conduire un char dans la carrière,
 he excels at drive a charriot in the racetrack
 he excels at driving a charriot in the racetrack
- c. [₁ À disputer des **prix | indignes de ses mains**,₁]
 at dispute INDF;PL prizes unworthy of his hands
 at disputing prizes unworthy of his hands
- d. À se donner lui-même en spectacle aux Romains,
 to self give himself as spectacle to.the Romans
 at making a spectacle of himself in front of the Romans

² Racine, *Britannicus*, IV, 4.

- e. À venir prodiguer sa voix sur un théâtre,
to come display his voice on a theater
at displaying his voice on a theater
- f. À réciter des chants qu'il veut qu'on idolâtre, _{2]}
to recite INDF;PL cantos that'he wants that'one rave.about
at reciting cantos that he wants people to rave about
- g. Tandis que des soldats de moments en moments
while that INDF;PL soldiers from moment to moment
while from time to time soldiers
- h.. Vont arracher pour lui les applaudissements. _{3]} _{4]} _{5]} _{6]}
go wrest for him the applause
force the audience to applaud him.'

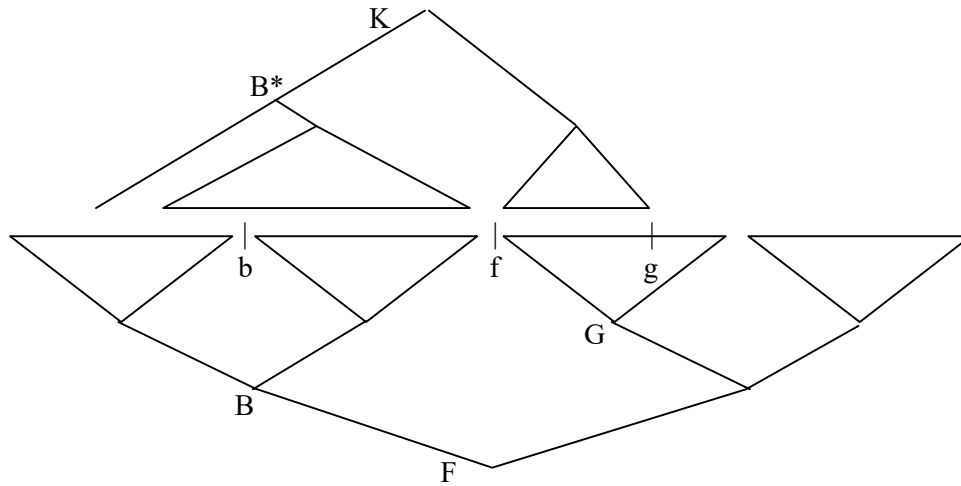
We first consider the boldfaced phrase in line (5c), which is the smallest syntactic constituent that straddles the caesura in question. The caesura is congruent in that phrase, as explained earlier in our discussion of (17). There are six syntactic constituents that straddle the caesura of line (5c) besides the phrase in boldface. We have enclosed them between brackets in (5). The need to check those constituents one by one for congruence would greatly detract from the locality that we consider a desirable property of congruence. But there is no need for such checks, as proposition (4) ensures that the caesura is congruent in every one of the six constituents.

We now explain here why proposition (4) is true. Let b be a metrical boundary that is congruent in B^* and let f be the metrical position associated with the rightmost

vowel in B^* . Let K be a constituent that contains B^* and let g be the position associated with the rightmost vowel in K . Here is why b is congruent in K , i.e. why B , the MH of b , does not dominate G , the MH of g .

Suppose b were discongruent in K . B would then dominate G . But as can be seen in diagram (6), B could dominate G only if g were located to the left of f . And if g were located to the left of f , this would contradict our premise that K contains B^* .

(6)



Appendix II

We give here details on the dizains discussed in Section 6.1. These dizains are all those contained in the poems listed in the table below. The poems are all by Victor Hugo except for those in the first three rows. Columns A and B correspond to their counterparts in table (48), with figures b/c corresponding to those in rows b and c in table (48). Column C indicates the number of boundaries which are incongruent in a syntactic constituent whose end does not coincide with a metrical boundary (see conjecture (58)).

(1)	title of poem	A	B	C	
		number	end of		
		of dizains	quatrain	end of	
			b/c	first tercet	
			b/c		
a.	Pensée des morts (Lamartine)	19	0/2	6/0	0
b.	Le malheur (Vigny)	8	1/0	2/1	2
c.	Hélène (Vigny)	4	0/0	0/0	1
d.	Le chant du tournoi	9	1/0	4/0	0
e.	À M. de Lamartine	26	3/2	10/2	1
f.	Les mages	71	8/5	14/19	9
g.	La fonction du poète	25	6/0	12/1	0
h.	Dicté après juillet 1830	13	1/0	5/1	1
i.	Le génie	13	1/0	3/0	1
j.	La bande noire	11	5/0	7/0	0
k.	Le poète dans les révolutions	10	0/0	0/0	0
l.	Pluie d'été	7	0/0	5/0	0
m.	Naissance du duc de Bordeaux	8	0/0	1/1	0
n.	Baptême du duc de Bordeaux	9	0/0	0/0	0
		233	26/9	69/25	15

References to the poems in Table (1)

a, *Odes* IV-12; b, *Poèmes antiques et modernes*, “Livres moderne”, II; c, *Hélène*, “Chant troisième. L’urne” ; d, *Odes et ballades*; e, *Feuilles d’automne* 9; f, *Contemplations* 23; g, *Rayons et ombres* 1; h, *Chants du crépuscule* 1; i, *Odes* IV-6; j, *Odes* II-3; k, *Odes* I-1; l, *Odes* V-24; m, *Odes* I-8; n, *Odes* I-9.

The incongruences that meet the conditions of (58) in dizains are tallied in table (2).

The letters in the top row are the labels for the ten lines in a dizain, q for the end of the quatrain, t for the end of the first tercet, and w for that of the dizain. The numbers in the bottom row are the line-by-line tallies.

(2)	n	o	p	q	r	s	t	u	v	w	total
	2	3	0	0	2	2	0	5	1	0	15