

Text-to-tune alignment and lineation in traditional French songs

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1. Introduction

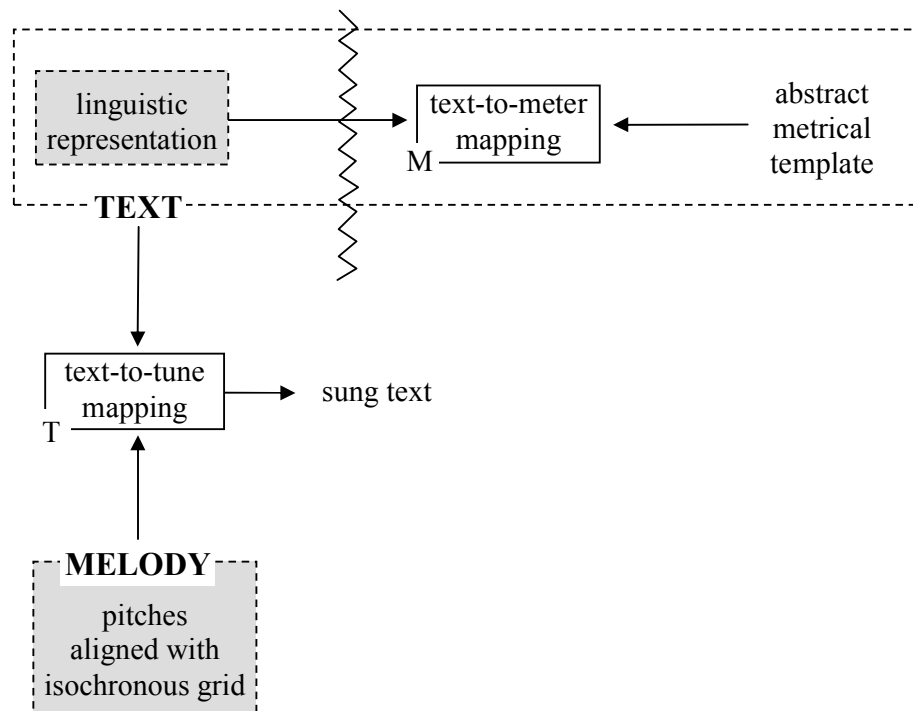
This article describes some of the basic formal features of traditional French songs. Studies of the formal features of songs usually focus on one particular aspect of the tunes or the lyrics, e.g., the patterning of rhymes. In contrast, I intend to provide an overall view, with special attention paid to the way texts mesh with melodies. The guiding idea is that the lyrics of a song do not have a metrical structure that can be described independently of the tune; the regularities that are found in song texts are to

¹ This paper has gone through three different versions written between 2004 and 2012. I am grateful to the following people, who commented on one or another of these versions: Jean-Louis Aroui, Romain Benini, Ioana Chitoran, Giulia D'Andrea, Varun deCastro-Arazola, Nigel Fabb, John Halle, Bruce Hayes, David Hill, Jonah Katz, Marc Plénat, Teresa Proto, Tomas Riad, Russell Schuh and Lisa Selkirk. Their responses and reflections led to many important improvements — though I did not always follow their advice, or followed it in a way that they might find perverse. All remaining flaws are my responsibility.

a large extent mere reflections of the structure of the associated tunes. My general outlook is that of generative metrics.²

An issue that will take center stage is that of the formal similarities and differences between the texts of songs and literary verse. (By “literary verse”, I mean verse that is transmitted in written form and was not composed in order to be sung.) The similarities between song lyrics and literary verse are obvious. Researchers usually assume, explicitly or not, that song lyrics have an inherent metrical structure that is analogous to that of literary verse. This is what one may call the traditional stance on the structure of song lyrics. This is for instance the position taken by Kiparsky 2006. Kiparsky’s position is represented in (1).

² See, e.g., Hayes 1988, Hanson and Kiparsky 1996, Fabb and Halle 2008.



(1) THE TRADITIONAL VIEW (AS IMPLEMENTED IN KIPARSKY 2006)

In (1), the text is a metrical text. It owes its metrical nature to the fact that the linguistic representation can be mapped in an appropriate fashion to an abstract metrical template. The solid box labeled M represents the constraints that govern this mapping. The metrical text is mapped to the tune by another set of constraints that govern textsetting. These are represented by the solid box labeled T.

The view depicted in (1) is a particular version of the traditional view. An alternative to the traditional view is that song lyrics do not have an inherent metrical structure and that the tunes of songs do the same work as is done by metrical

templates in literary verse.³ One example of this alternative approach is Hayes 2009a. In (1), if one deletes everything to the right of the wavy line, the resulting diagram is a picture of Hayes's position: in his view, the representation of the lyrics of a song is no different from that of a passage of prose. Feet, lines and stanzas are units that belong to the organization of the tune.

My own views are akin to Hayes's, but I cannot follow him in the particulars of his analysis. Above all, I am keen to stress the kinship of meters and melodies. In French songs, I hold that there is no need for separate metrical templates like those used to describe literary verse; such metrical templates would to a large extent duplicate the information that is already present in the representations of melodies. I propose instead that the linguistic material is mapped to a MELIC TEMPLATE. A melic template is a hybrid object formed by incorporating information about line ends and melismas into the representation of the melody.

This essay deals with a particular singing idiom, that of traditional French songs (I use "traditional" for lack of a better term). Like most French-speaking people of his generation, the author (born in 1943) is a fluent participant in that singing tradition, an "experienced listener" in the sense of Ler Dahl and Jackendoff 1983. The songs in the traditional French singing idiom ("TF" from now on) are of two kinds, folk songs and commercial songs. The main mode of transmission of folk songs (nursery rhymes, bawdy songs, drinking songs, campfire songs, etc.) is through word of mouth. People

³ Hayes and Kaun 1996, Hayes and MacEachern 1996, 1998, Hayes 2009a,b, Dell and Halle 2009.

Cornulier, as well, takes a position on the metrical structure of songs that is a variant of the alternative approach; see, e.g., Cornulier 1989, 2010. What sets Cornulier's approach apart is that he does not view literary meters as abstract templates.

are exposed to commercial songs, on the other hand, through recordings by professional artists. Commercial songs draw on a wide variety of musical styles, especially dance tunes, and their lyrics often show a strong influence from literary verse, but they follow the same basic principles of text-to-tune alignment as folk songs. TF was predominant in commercial songs up to the early 1960s, when French imitations of rock and roll and the like became popular. Nothing will be said of songs in these new singing idioms.⁴ The appendix to Dell 1989 gives a small sample of well-known folk songs and commercial songs that belong to TF.

The remainder of this article is organized as follows. Section 2 presents the basic features of stanzas in French literary verse, section 3 introduces melic templates and shows how they account for the basic features of stanzas in TF songs, section 4 reviews important differences between songs and literary verse, section 5 deals with the status of lines in songs, section 6 with the structure of stanzas above the line level, and section 7 concludes with the general suggestion that the meters of literary poetry are impoverished melic templates.

2. Metrical templates for stanzas in French literary verse

Rather than introducing melic templates directly, let us first consider the abstract metrical templates used to describe French literary verse and how they regulate stanza form. This will give us a convenient starting point for our discussion of melic templates. From now on, I use the expression “(French) literary verse” to refer to

⁴ I also exclude from TF, at least provisionally, pre-Sixties commercial songs with syncopated tunes of the kind found in jazz. In these songs prominence matching at line ends does not conform to ENDPROMIN (30). The relevant regularities have yet to be worked out.

“classical” French poetry, i.e. poetry written between the second half of the 16th century and the last third of the 19th, from Ronsard to Verlaine, roughly.⁵ The list in (2) gives the most important generalizations about literary poems that have a strophic form.

- (2) All stanzas in a poem have the same
- (a) number of lines,
 - (b) rhyme pattern,
 - (c) line-length pattern.

To illustrate these generalizations, here are two stanzas from Musset’s *Ballade à la lune*.⁶

(3)	(i)	(ii)		
	T’aimera le <u>pilote</u> ,	Et la fillette <u>preste</u>	6	a
	Dans son grand <u>bâtiment</u> ,	Qui passe le <u>buisson</u> ,	6	b
	Qui <u>flotte</u>	Pied <u>leste</u> ,	2	a
	Sous le clair <u>firmament</u> .	En chantant sa <u>chanson</u> .	6	b

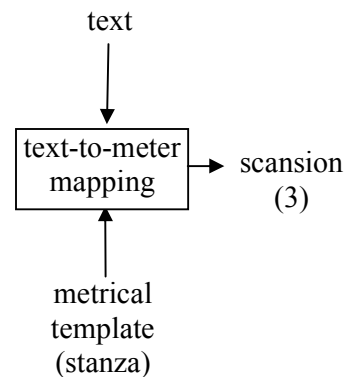
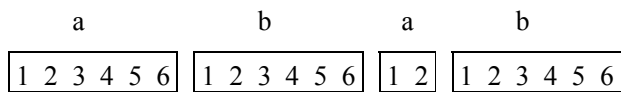
⁵ On French literary verse, see Cornulier 1982, 1995. For a systematic exposition of the basic facts, see Gouvard 1999. Aroui 2000 is an attempt at characterizing the prototypical stanza in literary poetry. For a recent discussion along generative lines, see Fabb and Halle 2008: 133-152.

⁶ Berthier, ed., 1976: 73-74. (i) The pilot will love you, / In his big ship, / Who floats / Under the clear sky. (ii) And so will the nimble girl / Who passes by the bush, / Swift-footed, / Singing her song.

The two columns to the right of (3) note features of lines that figure in (2), namely line length and rhyme. Here and throughout, an underscore indicates the rightmost stressed syllable in the line, a feature that will become relevant later. Like all the stanzas in the poem, the stanzas cited in (3) consist of 4 lines (2a), they have the rhyme pattern *abab* (2b), and line lengths pattern in the same way (2c): in every stanza of Musset’s poem the third line has 2 metrical syllables and the other lines have 6 metrical syllables (on metrical syllables in literary verse, see below).

The display in (4) should give an idea of what a formal account of French literary verse would be like.

*T’aimera le pilote, dans son grand bâtiment, qui flotte sous
le clair firmament. Et la fillette preste, qui passe le
buisson, pied leste, etc.*



(4) TEXT-TO-METER MAPPING (LITERARY VERSE)

In (4) the box labeled “text-to-meter mapping” represents a procedure that scans a text to determine whether it conforms to a certain template. This procedure has two inputs, a text and a metrical template. Instances of both inputs are displayed on the left-hand side of (4).

By a TEXT I mean any sequence of linguistic expressions. The running text in the upper half of (4) stands for the material in the stanzas by Musset in (3), when this material is viewed purely as a linguistic object. Although it is in standard spelling, this running text is meant to stand for the kind of formal structures that linguists use to represent the syntactic and phonological features of utterances.

In a strophic poem all stanzas have the same shape because they all conform to an abstract metrical template that specifies the three parameters in (2). The template at the bottom of (4) specifies the stanza form for Musset's poem. This stanza template is made up of 4 successive line templates, which are represented by boxes. Each line template is labeled with a lowercase letter that indicates how the line fits into the rhyme pattern of the stanza. Line templates are made up of metrical positions, which are represented by digits.

Text-to-meter alignment scans the text to see if it can be divided in a well-formed manner into parts that can each be matched to the line templates in the stanza template. If the text can be mapped to the template in an appropriate fashion, the text is deemed metrical, and the procedure outputs a SCANSION, which is a mapping between the text and the template. The layout of (3) follows generally accepted typographical conventions whose function is to make manifest certain aspects of text-to-meter alignment.

How are portions of text mapped to lines in the template at the bottom of (4)? Setting extrametrical syllables aside,⁷ there is a one-to-one correspondence between

⁷ In a French expression — a word or a phrase — stress falls either on the last syllable or on the penultimate. Line-final syllables that are unstressed are extrametrical, i.e. an unstressed syllable may not match the last position in a line template.

syllables and metrical positions. This is illustrated in (5a), which displays the scansion of the first line of (3-i). Rows (5b-d) show attempts to map invented texts to the same line template.⁸ Like (5a), the string in (5b) counts as a 6-syllable line of verse, but not those in (5c,d), which are both one syllable short.

(5)	LINE TEMPLATE :	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr></table>	1	2	3	4	5	6
1	2	3	4	5	6			
a	t'aimera le <u>pilote</u>	t'ai- me- ra le pi- <u>lo-</u> te						
b	t'aimera le <u>marin</u>	t'ai- me- ra le ma- <u>rin</u>						
*c	t'aimera l' <u>actrice</u>	t'ai- me ra l'ac- <u>tri-</u> ce						
*d	t'aimera l' <u>enfant</u>	t'ai- me ra l'en- <u>fant</u>						

The display in (6) shows one aspect of the result of mapping the text in the upper half of (4) to the template in the lower half of (4). The mapping yields a scansion in which the text is divided into successive chunks that each correspond to a line in (3).

(6)	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>t'aimera le pilote</td><td>dans son grand bâtiment</td><td>qui flotte</td><td>sous le clair firmament</td></tr></table>	t'aimera le pilote	dans son grand bâtiment	qui flotte	sous le clair firmament
t'aimera le pilote	dans son grand bâtiment	qui flotte	sous le clair firmament		
	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>et la fillette preste</td><td>qui passe le buisson</td><td>pied leste</td></tr></table> etc.	et la fillette preste	qui passe le buisson	pied leste	
et la fillette preste	qui passe le buisson	pied leste			

A general requirement on metrical verse, which is not limited to strophic poems, is that the LINEATION of the text, i.e. its partition into lines, must be congruent to a

⁸ (b) The sailor will love you; (c) the actress will love you; (d) the child will love you.

certain extent with its grammatical structure. More specifically, it must be congruent with that aspect of grammatical structure that is called Prosodic Structure (henceforth P-structure).⁹ Congruence between lineation and P-structure is a gradient property. Rather than use a precise measure of the degree of congruence between the lineation of a text and its P-structure,¹⁰ I will use (7) below, which is a condition that must be met for a minimal degree of congruence to obtain.

(7) LINE/CLG: The last syllable of a line is the last syllable of a Clitic Group. (To partition a text into Clitic Groups, insert a boundary after every word that is a content word.¹¹)

The formulation in (7) is a crude approximation that will suffice for the purposes of this paper. The result of dividing the text of stanza (3-i) into successive Clitic Groups is displayed in (8), where the end of each Clitic Group is marked by a bracket. It is easy to see that every line in (3) satisfies LINE/CLG.

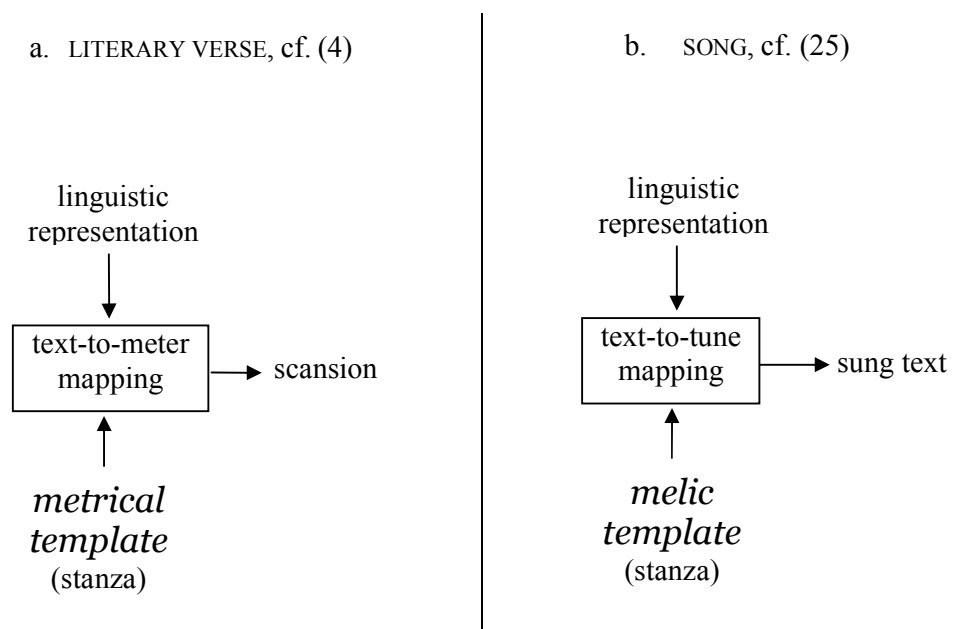
⁹ On P-structure, see, e.g., Hayes 1989.

¹⁰ Hayes, Wilson and Shisko (2012) have recently proposed such a measure. Their paper has come to my attention too late.

¹¹ I am assuming that postclitics join with their hosts to form a single word.

(8) T'aimera] le pilote] dans son grand] bâtiment] qui flotte] sous le clair]
firmament]

I am now ready to argue that, with certain information added to them, song tunes can be used to do the same kind of work as stanza templates in literary verse. The analogy I am proposing between literary verse and strophic songs is diagrammed in (9). Diagram (9a) reproduces what we have seen instantiated in (4) for the poem by Musset. Diagram (9b) differs from (9a) only on one point: the metrical template is replaced by a melic template.



(9) THE ANALOGY BETWEEN METRICAL TEMPLATES AND MELIC TEMPLATES

3. Melic templates

3.1. Matching syllables with notes

Let us begin with basic assumptions about the structure of melodies and about text-to-tune alignment.¹² The display in (10) is a representation of the first line of the song *L'alouette est sur la branche*.¹³ The melody is notated using the standard musical notation. The syllables of the text *l'alouett' est sur la branche* ('the lark is on the bough') are matched with the notes of the melody and the resulting object is what I will call a COMPOSITE.

(10)

L'a- lou- ett' est sur la bran- — che

The diagram in (11) is a different representation of the same composite. This is the form of representation we will use from now on. The melody is represented in the boxed part of the diagram. A MELODY is a sequence of notes, where each note is

¹² On text-to-tune alignment, see, e.g., Chen 1983, Halle and Lerdahl 1993, Hayes and Kaun 1996, Halle 2003, Hayes 2009a,b and Schuh 2011.

¹³ Berthier 1979: 25.

positions in the grid. I will talk loosely about syllables being associated with notes, but what the association lines in (11) are meant to represent is coincidence in time between the beginnings of syllable nuclei (i.e. vowels) and the attacks of notes.

(12) SYLLABLE/NOTE: Every syllable must be associated with a note.

Note that (12) does not require that every note be associated with a syllable. If a note does not have an associated syllable, the note is realized on the same syllable as the preceding note. This is what happens in (11), where *branche* is pronounced /bʁɑ̃fə/ with the vowel [ɑ̃] sung to two notes G and F[#] in succession. In (11), the time interval between positions 0 and 2 is occupied by the sequence [ɑ̃f], i.e. position 0 coincides with the beginning of [ɑ̃], which is the nucleus of the syllable /bʁɑ̃/, and position 2 coincides with the beginning of [ə], which is the nucleus of the syllable /fə/. Abstracting away from the duration of [f], the note G takes up one half of the duration of the vowel [ɑ̃] and the following F[#] takes up the remaining half. This way of representing melismas is justified in Dell 2011.

Lerdahl and Jackendoff have argued that in addition to a metrical grid, a melody has a hierarchical organization which they call “GROUPING STRUCTURE.” Grouping Structure has formal properties reminiscent of constituent structure in syntax, notably recursion. It corresponds to the intuitions listeners have, when listening to a melody, that some sequences of notes cohere, and that some sequences of sequences also cohere. The diagram in (13) is a more complete representation of the structure of the

generalizations about songs would be impossible to formulate, or could only be formulated with great loss of generality.¹⁶

Take for instance the song *Ah! vous dirai-je, maman*,¹⁷ which is sung to a tune whose score is given in (14) along with the lyrics of the first stanza.¹⁸ (The notes in the score are numbered for ease of reference.) Since the song has four stanzas, the melody of the song taken as a whole is a concatenation of four repetitions of that tune.

¹⁶ One might think that the habit of dividing up song lyrics into lines is an artifact of the use of writing, rather than reflecting anything about the organisation of songs. The songs of some nonliterate cultures show that this cannot be true in general. The songs of the Tashlhiyt Berber are a case in point. The quantitative meters on which the songs are based cannot be made sense of by the analyst without recourse to the notion “line of verse”. Particularly compelling evidence is provided by intraword enjambments, in which a word straddles a line boundary (see Dell and Elmedlaoui 2008: 107-150), and by songs in which musical grouping and lineation are systematically out of phase with each other (pp. 209-222). The latter phenomenon also rules out a different possible suggestion, namely to equate lineation in songs with their Grouping Structure.

¹⁷ Berthier 1975: 17.

¹⁸ This tune is the same as that of the English nursery rhyme *Twinkle twinkle little star*.

(14)

1 2 3 4 5 6 7 8 9

Ah vous di-rai-je ma-man ce qui

10 11 12 13 14 15 16 17 18

cau- se mon tour-ment de- puis que j'ai

19 20 21 22 23 24 25 26 27 28

vu Sil-van-dre me re- gar- der d'un air

29 30 31 32 33 34 35 36 37

ten-dre mon coeur dit à chaqu' ins- tant

38 39 40 41 42 43 44

peut- on vi- vre sans a- mant

The text of two stanzas is given below, with the layout used in song books.¹⁹

¹⁹ (i) Ah, will I tell you, Mom, / What is tormenting me? / Since I saw Silvandre / Give me tender looks, / My heart constantly says: / "Can one live without a lover?" (ii) I blushed and unfortunately / A sigh betrayed my heart. / The cruel one adroitly / Took advantage of my weakness. / Alas, Mom, one false step / Made me fall into his arms.

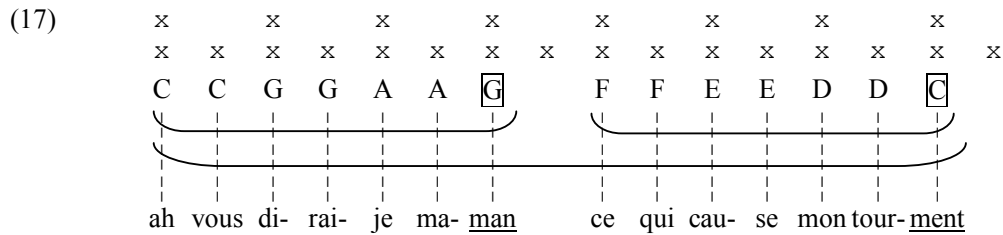
(15)	(i)	(ii)
a	Ah! vous dirai-je, <u>maman</u> ,	Je rougis et par <u>malheur</u>
b	Ce qui cause mon <u>tourment</u> ?	Un soupir trahit mon <u>coeur</u> .
c	Depuis que j'ai vu <u>Silvandre</u>	Le cruel, avec <u>adresse</u> ,
d	Me regarder d'un air <u>tendre</u> ,	Profita de ma <u>faiblesse</u> .
e	Mon coeur dit à chaque <u>instant</u> :	Hélas! maman, un faux <u>pas</u>
f	“Peut-on vivre sans <u>amant</u> ?”	Me fit tomber dans ses <u>bras</u> .

Consider the first stanza. Its text is a sequence of three sentences:

- (16) Ah! vous dirai-je, maman, ce qui cause mon tourment? Depuis que j'ai vu
 Silvandre me regarder d'un air tendre, mon coeur dit à tout moment: “Peut-on
 vivre sans amant?”

The display in (15-i) conveys more than (16). It conveys the fact that when the linguistic material in (16) is sung to the tune in (14), French speakers perceive it divided up into six chunks. A further fact, not encoded in the layout, is that these chunks form three rhyming pairs with the pattern *aabbcc*. (The other stanzas follow the same pattern.)

The first couplet of (15-i) is represented in (17); as in (13), the tie symbols represent Grouping Structure. (In (17) and in the following diagrams, the pitches associated with line-final syllables are boxed. Disregard this for the time being; it will become relevant later on.)



In this essay, I use the term “line” ambiguously to designate portions of melody or portions of text. In (17), for instance, the text is divided into two segments, *ah! vous dirai-je, maman* and *ce qui cause mon tourment*, and there is no harm in using the same term “line” to refer to CCGGAAG and FFEEDDC, the corresponding segments in the melody. We could distinguish between musical lines and textual lines. We would say that in (17), CCGGAAG is a musical line, while *ah! vous dirai-je, maman* is a textual line. I think that this burdensome terminology is unnecessary.

Like lineation in literary verse, lineation in songs is in general congruent with P-structure. LINE/CLG (7) is satisfied everywhere in (14), for instance: the line-final syllables (those associated with a note whose number is boxed) all occur at the end of a Clitic Group.

If the text of a song is a bare linguistic representation and it does not have an associated metrical template like that of literary verse, where does the lineation of songs come from? It may seem at first that lineation is a mere reflection of the structure of the melody: in (17) the melody is formed of two musical groups, CCGGAAG and FFEEDDC, and these correspond precisely to the linguistic chunks *ah! vous dirai-je, maman* and *ce qui cause mon tourment*. As we shall now see, however, lineation is not uniquely determined by Grouping Structure; it is merely congruent with it.

In most songs every line boundary coincides with a musical group boundary, but there are also songs in which a stretch of several short lines is coextensive with a single minimal musical group. By a minimal group, I mean one that cannot be broken down into smaller groups. The song *La Marguerite* by Georges Brassens is a case in point.²⁰ Stanzas consist of sextets in which the rhyme pattern is *aabccb* and the pattern of line lengths 4-4-3-4-4-3. The first two sextets are given in (18):²¹

(18)	(i)	(ii)		
A	La <u>peti</u> te	Trois <u>péta</u> les	4	a
	marguer <u>i</u> te	de scand <u>a</u> le	4	a
	est tomb <u>é</u> ,	sur l' <u>aut</u> el,	3	b
B	singul <u>i</u> ère,	indiscr <u>è</u> te	4	c
	du bré <u>v</u> iaire	pâquer <u>e</u> tte,	4	c
	de l' <u>abb</u> é.	d'où vient- <u>ell</u> '?	3	b

The score of the first sextet is displayed in (19) and its metrical grid is represented in (20). As the melody is composed of two halves whose rhythmical structures are identical, at this point it is sufficient to represent only the first half of the grid (tercet A). The grid for tercet B will be given later; see (53).

²⁰ Brassens 1973: 225, 241.

²¹ (i) The little / daisy / fell, / odd, / from the abbot's / breviary. (ii) Three scandalous / petals / on the altar, / indiscreet / daisy, / where does it come from?

(19)

A

1 2 3 4 5 6 7 8 9 10 11

la pe- ti- te mar- gue- ri- te est tom- bé'

B

sin- gu- liè- re du bré- viai- re de l'ab- bé

(20) 1 2 3 4 5 6 7 8 9 10 11

x x x x x x x x x x x x x x x

x x x x x x x x x x x x x x x

D D B^b, D F F D B^b C A, B^b

[la pe- ti- te] [mar- gue- ri- te] [est tom- bé']

In (20) lineation is indicated by brackets on the text tier. Like the numbers in the top row, these brackets are only visual aids; they do not form part of the representation. The melody of this tercet consists of two musical groups, as indicated by the tie symbols in (20), and these groups cannot be broken down into smaller groups. A remarkable feature of the song *La Marguerite* is that most lines do not end on group-final notes. In (20) only the last line of the tercet has a final syllable that is linked to a note that is final in a musical group; the other two lines do not have their ends aligned with the ends of musical groups.

Configurations like (20) present a serious challenge to a theory that would dispense with the notion “line” and posit a direct correspondence between P-structure and Grouping Structure, because such a theory would not have anything to say about the fact that in every stanza, positions 4 and 8 in (20) are occupied by final syllables of feminine words. In terms of the framework proposed here, the fact that these syllables are word-final is a consequence of Line/CLG (7); on their gender, see section 3.4.

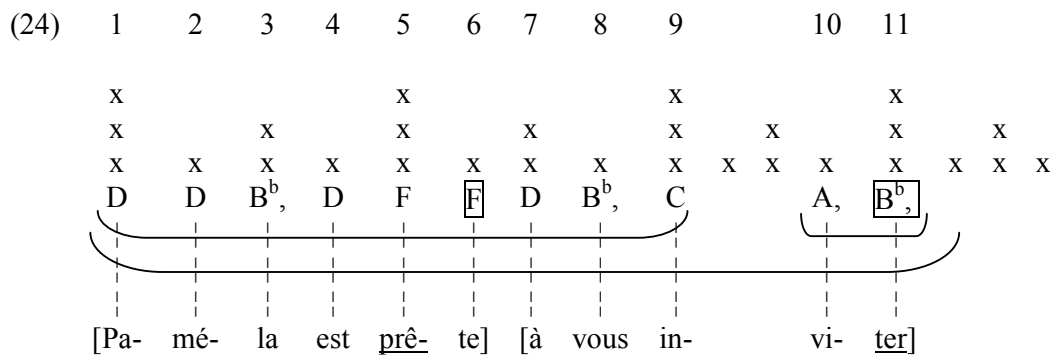
The permissibility of configurations like (20) must be taken into account in devising an adequate characterization of congruence between lineation and Grouping Structure. Like congruence between lineation and P-structure, this is a gradient property. For congruence to be satisfied minimally, the following condition must be met:

(21) LINE/MGROUP: If a line contains a note that is group-final, the last note of that line is group-final.

Or equivalently: if the last note of a line is not the last note of a musical group, then the line must be entirely contained within a minimal musical group; only lines whose final note is group-final may straddle a grouping boundary. Configurations that (21) allows or prohibits are displayed in (22), where capital letters stand for arbitrary notes. The tie symbols above the notes indicate how they form minimal musical groups, and the brackets beneath them represent lineation. (22a) and (22b) satisfy the condition, but (22c) violates it: line L_1 contains note Q, which is group-final, but its last note R is not the last in a musical group.

those in (18), French speakers perceive it as the quatrain in (23). The first half of this composite is depicted in (24).²³

(23)	Paméla est <u>pr</u> ête	6	a
	à vous <u>inv</u> iter,	5	b
	mais avant la <u>f</u> ête	6	a
	il faudra l' <u>a</u> ider.	5	b



We have just seen that the information contained in the melody of a song is not sufficient to allow us to predict how the song can be broken down into successive lines. Consequently the template that specifies stanza form cannot consist of the melody alone; it must also contain information about the location of line ends. How is this information to be represented?

²³ Note that LINE/MGROUP (21) is satisfied in (24), as it is in (20).

Let us return to the two diagrams in (9) and make a comparison. The metrical templates for literary verse in (9a) impose certain *periodicities* on texts in strophic poems. Take for instance the template in (4). In conjunction with LINE/CLG (7), this template implies that for a text to be a well-formed poem with stanzas like those of Musset's poem in (3), it must be possible to divide it into successive sections each made up of exactly 20 metrical syllables, with syllables 6, 12, 14 and 20 the rightmost in a Clitic Group. Periodicities like these constrain texts, but they do not regulate their manner of delivery when these texts are rendered orally.

By contrast, the melic templates in (9b) impose periodicities on the audible realization of texts. Some of these periodicities can be characterized in purely musical terms. For instance, the melody of the song *Ah! vous dirai-je, maman* is a succession of repetitions of the 44-note melody whose score was given in (14). Other periodicities concern the relationship between the text and the melody: in order to conform to LINE/CLG, the syllables associated with notes 7, 14, 22, 30, 37 and 44 must be rightmost in a Clitic Group, as is exemplified in (14) for the song's first 44-note cycle.²⁴

A melic template must contain a complete representation of the melody with whatever additional information is necessary to ensure an adequate text–melody mapping. Specifically, I propose that on the pitch tier of the melody, certain notes

²⁴ Other lineations are compatible with the melody of *Ah! vous dirai-je, maman*, i.e., other periodicities could obtain in the text/melody mapping. For instance, instead of a 7-7 couplet, the syllables associated with the first 14 notes in a 44-note cycle could form a 4-3-4-3 quatrain. French speakers can perceive the following sequence of given names as an *abab* quatrain when it is sung to the notes in (17):

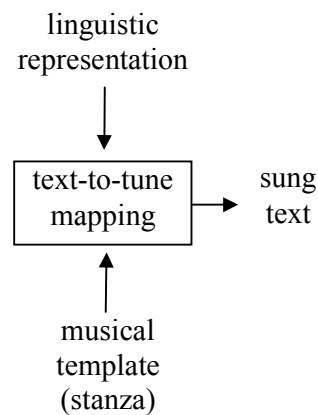
Caroline, Madelon, Jacqueline et Lison.

bear a special mark indicating that they must be last in their line. Let us use boxes to do this, as already in (17), (20) and (24). The objects associated with the texts in these composites are not bare musical objects — melodies; rather, they are melic templates. The texts in (20) and (24) are mapped to different templates. Although these templates share the same melody, they specify different lineations: in (20) it is notes 4, 8 and 11 that are marked as line-final, while in (24) it is notes 6 and 11.

Let us return to the parallel between literary scansions and textsettings in strophic songs. In the same way as (4) is an exemplification of (9a), the diagram in (25), which is based on (17), is an exemplification of (9b).

*Ah! vous dirai-je, maman, ce qui cause mon
tourment? Depuis que j'ai vu Silvanre, etc.*

x x x x x x x x
x x x x x x x x x x x x x x x
C C G G A A G F F E E D D C



(25) TEXT-TO-TUNE MAPPING (TRADITIONAL FRENCH SONGS)

The diagram in (25) depicts text-to-tune alignment in the beginning of the song *Ah! vous dirai-je, maman*. The running text in the upper left stands for the linguistic representations of the sentences in (16). The other input to the mapping is the melic template, which is the melody of the song with certain notes marked as line-final. The

structure of the melody includes not only its metrical grid, but also its Grouping Structure, which has been omitted from (25) to avoid clutter. From now on, ties representing Grouping Structure will be omitted from melic templates when they are not directly relevant to the discussion.

It may seem counter-intuitive to view the segmentation of a song into successive lines as imposed from outside the linguistic material. This matter will be taken up at the end of section 3, when we have an overall view of the general scheme that I am proposing.

A typical traditional song is a succession of stanzas all of the same form, i.e. with the same melody and with the linguistic material patterned in the same manner. I am proposing that melic templates like those in (17), (20) and (24) are adequate means of specifying stanza form. Positing such templates excludes the possibility of songs in which the successive stanzas have the same melody but different lineations. Imagine for instance a song to the tune of *La Marguerite*, in which the first stanza begins with a tercet like (20), and the second stanza begins with a couplet like (24). These two composites have the same melody, but they follow different melic templates, and consequently they could not coexist within the same song, for two stanzas with identical melodies must conform to the same melic template.

In addition to the location of line boundaries, melic templates must be able to specify rhyme patterns. This can be done by labeling notes that are marked as line-final with lowercase letters that indicate how lines fit into rhyme patterns. (26) is a more complete representation of the template in (20), including its rhyme pattern.

(26)	1	2	3	4	5	6	7	8	9		10	11
	x				x				x			x
	x		x		x		x		x	x		x
	x	x	x	x	x	x	x	x	x	x	x	x
	D	D	B ^b ,	D	F	F	D	B^b,	C		A,	B^b,
				a				a				b

Unlike congruence with Grouping Structure and with P-structure, and unlike the satisfaction of ENDPROMIN (see (30) below), rhyming is not an obligatory feature of lineation in TF songs. While commercial songs are as a rule fully rhymed, folk songs with only partial rhyming or with no rhyming at all are commonplace; see (33) and (43) below. Rhyming enhances the salience of line ends and it is necessary in situations where other cues to lineation are rather weak. This happens in particular when some line ends do not coincide with ends of musical groups, as is the case in (20) and (24).

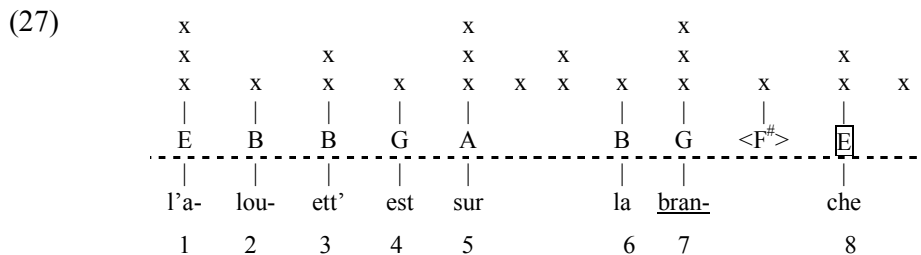
3.3. Melismas and syllable count

Positing melic templates like (26) enables us to account for two properties that TF songs share with literary verse: lineation is uniform across stanzas (see (2a)), and so is the patterning of rhymes (see (2b)). We have yet to see how melic templates can account for a third shared property, the fact that syllable count patterns in a uniform way across stanzas (see (2c)): in TF, when two stanzas have the same melody, if the

n th line in a stanza has p syllables, the n th line in all the other stanzas also has p syllables. Let us call this “length responion.”

When the correspondence between notes and syllables is one-to-one, it is easy to see that the successive notes of the tune act, as it were, as counters for the syllables in the text, and patterns involving syllable count can be considered mere by-products of text-to-tune alignment. The melic template depicted in (17), for instance, requires that every stanza in the song *Ah! vous dirai-je, maman* begin with two lines with seven notes each, and since note-syllable correspondence is one-to-one in this song, it follows that every stanza begins with two seven-syllable lines.

But what about lines with melismas, which contain more notes than syllables? Consider again (11), the first line of the song *L'alouette est sur la branche*, in which the first syllable of *branche* is stretched over the notes G and F[#]. I propose that notes like F[#] in (11) bear a special mark that indicates that they may not have an associated syllable. Let us mark such VACANT notes with angled brackets. In (27), a more worked-out version of (11), the part of the diagram above the dashed line is the melic template.



The template in (27) is comprised of nine notes, but it has room for only eight syllables. Since this is the template for the first line of every stanza in the song, every stanza begins with an eight-syllable line. Marking certain notes of melic templates as vacant allows us to view the uniform patterning of syllable count across stanzas as an epiphenomenon: rather than being due to the text having a metrical structure that is independent of the melody, as is commonly assumed (see (1)), length respension is a mere side-effect of text-to-tune alignment.

The marking of specific notes as vacant has another desirable consequence. It accounts for the fact that violations of melismatic respension are very rare in TF. By “melismatic respension” I mean the occurrence of a melisma in the same place in the same line across stanzas. Given the vacant note F[#] in (27), a melisma is expected on the penultimate syllable in the first line of every stanza, and this is indeed the case, as shown in (28), which gives the initial lines of the first four stanzas of the song.²⁵ (The topmost row represents the pitch tier of the melody.)

(28)		E	B	B	G	A	B	G	F [#]	E
a	<i>l'alouett' est sur la branche</i>	l'a-	lou-	ett'	est	sur	la	<u>bran-</u>	—	che
b	<i>mettez vos bras en liance</i>	met-	tez	vos	bras	en	li-	<u>an-</u>	—	ce
c	<i>faites-nous trois pas de danse</i>	fai-	tes-	nous	trois	pas	de	<u>dan-</u>	—	se
d	<i>faites-nous trois révérences</i>	fai-	tes-	nous	trois	ré-	vé-	<u>ren-</u>	—	ces

SYLLABLE/NOTE (12) must be modified to ensure a one-to-one correspondence between syllables and nonvacant notes. Here is its new formulation:

²⁵ (b) Link arms with one another; (c) make three dance steps for us; (d) make three curtseys for us.

(29) SYLLABLE/NOTE:

- a. Every syllable must be associated with a note.
- b. Every note must be associated with a syllable, unless the note is marked as vacant.
- c. Notes marked as vacant must be left unassociated.

As indicated in the text immediately above (12), what it means for a syllable and a note to be associated is that the beginning of the syllable's vowel coincides in time with the beginning of the note. This precludes many-to-one associations between notes and syllables and between syllables and notes.

3.4. Prominence matching and the patterning of line gender

In addition to their being the site of rhyming, another remarkable property of line ends in songs is their special status with respect to prominence matching. Prominence matching is a general preference for settings that associate linguistically prominent syllables with strong metrical positions.²⁶ In TF, this preference is strictly enforced only at the end of lines, where it takes the form of the following categorical requirement:

²⁶ See, e.g., Hayes and Kaun 1996, Hayes 2009a,b, Dell and Halle 2009, Proto and Dell 2013.

(30) ENDPROMIN: The grid position associated with the last stressed syllable in a line is metrically stronger than the positions associated with its adjacent syllable or syllables in the same line.²⁷

In (27), for instance, the first syllable of *branche*, which is the last stressed syllable in the line, is associated with a metrical position that is stronger than those of the adjacent syllables *la* and *-che*. Readers may check for themselves that the lines in (17), (20) and (24) all satisfy ENDPROMIN.

ENDPROMIN, in interaction with a fixed pattern of vacant and nonvacant notes, is responsible for a feature of song stanzas that I will call “gender respension”: the patterning of line gender is uniform across stanzas. If the rightmost stress in a linguistic sequence falls on its penultimate syllable, let us say that the sequence is feminine; if it falls on the last syllable, let us say that the sequence is masculine. A consequence of ENDPROMIN is that the melic templates for lines fall into two categories, depending on which of the last two nonvacant notes is metrically stronger: some templates require a feminine line while others require a masculine line.

Consider for instance the template in (27). Its last two nonvacant notes are G and E, and G is on a stronger grid position than E. Consequently this template can only accommodate feminine lines (for verification, see (28)). Mapping a masculine line to the template results in a violation of ENDPROMIN which grates on the ear of experienced listeners, as happens if in (27) the three-syllable paroxytonic sequence *la branche* is replaced by the three-syllable oxytone *l'amandier* ‘the almond’. In the first line of (17), on the other hand, the last note (G) is metrically stronger than the

²⁷ See Dell and Halle 2009 for some discussion.

penultimate (A) and the template can only accommodate masculine lines. Replacing the oxytone *maman* by the paroxytone *Lise* yields a composite that is unacceptable.

Note that it is melic templates, not bare melodies, that require lines of one gender to the exclusion of the other. Deleting the mark on F[#] in (27) results in a template in which the penultimate nonvacant note is F[#], not G. F[#] is metrically weaker than the last nonvacant note (E), and so we expect this template to require masculine lines, which is in fact the case. While it is acceptable to use the bare melody of (27) as a carrier for the 9-syllable masculine sequence *l'alouett' est sur le pigeonnier*,²⁸ combining it with the 9-syllable sequence *l'alouett' est sur la barrière*,²⁹ which is feminine, yields a composite that sounds awkward.

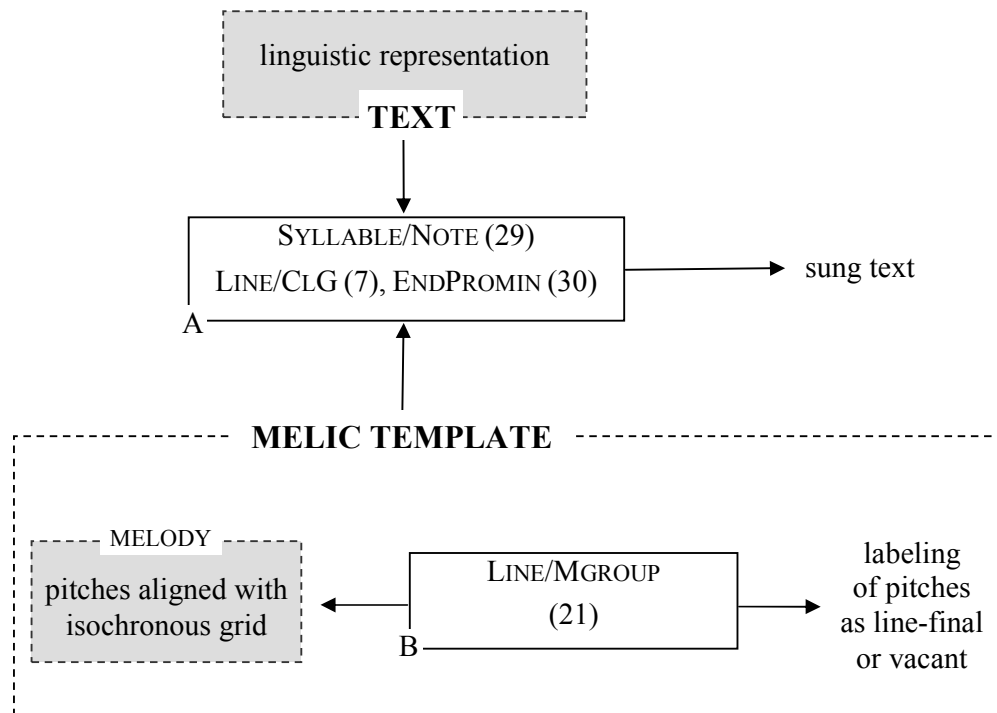
An example of gender respension is provided by the song *Ah! vous dirai-je, maman*, where every stanza shows the same alternating pattern of two masculine lines followed by two feminine followed by two masculine (see (15)). This song is fully rhymed (*aabbcc*); despite appearances, however, it is not rhyming that is responsible for gender respension, as shown with nonrhyming examples in section 4.1.

3.5. A first outline of text-to-tune alignment in traditional French songs

The general scheme for text-to-tune alignment in TF was outlined in (9b). A more detailed picture is given in (31). The solid boxes contain the names of conditions formulated in the previous sections.

²⁸ The lark is on the roof of the pigeon house.

²⁹ The lark is on the fence.



(31) TEXT-TO-TUNE MAPPING IN TRADITIONAL FRENCH SONGS

In (31) the conditions in box A concern the relation between properties of the linguistic representation and features of the melic template; those in box B concern the internal organization of the melic template. As in (1), the linguistic representation and the musical representation are contained in shaded boxes.

As portrayed in (31), textsetting shows deep similarities with text-to-meter alignment in literary verse. It is these similarities that explain the prima facie plausibility of the traditional stance on the structure of song lyrics. Let us briefly review them.

Lineation is central both to literary scansion and to textsetting. Three of the four conditions in (31) make reference to the unit “line”. Lines are not linguistic constituents, nor are they musical constituents, but conditions LINE/CLG and LINE/MGROUP demand that lineation be congruent with the linguistic and the musical representation at the same time. In addition, ENDPROMIN requires that linguistic prominence and musical prominence be aligned at the end of lines.

Among the four conditions in (31), the only one that does not involve some feature of the linguistic representation is LINE/MGROUP (21), and this condition is the only one that does not have an analogue in literary scansion. LINE/CLG (7) is common to literary scansion and textsetting. Although they make reference to features of the melody, SYLLABLE/NOTE and ENDPROMIN both have counterparts in literary scansion. The analogue of SYLLABLE/NOTE (29) in literary scansion is the requirement (illustrated in (5)) that, setting extrametricality aside, every syllable be associated with a position of the abstract metrical template. As explained in section 2, in French literary verse, if a line ends in a paroxytonic word, its last syllable is extrametrical, that is, it is not associated with a position in the template. Extrametricality does not exist in songs: pursuant to (29a), every syllable must be associated with a note in the template. Note, however, that extrametricality and ENDPROMIN (30) are related, in that both involve the stress relationship between the last two syllables in a line. The

exact nature of the connection between extrametricality and ENDPROMIN has yet to be worked out.³⁰

LINE/CLG is rarely violated in TF. Violations are virtually nonexistent in folk songs but they occur occasionally in commercial songs. They do not escape the listeners' notice when they occur and they sometimes make the text difficult to understand. Violations of ENDPROMIN are only found in enjambments that break up Clitic Groups;³¹ in other contexts ENDPROMIN is inviolable. So are SYLLABLE/NOTE, or LINE/MGROUP.

One feature of (31) that may seem outlandish is the fact that lineation is primarily seen as a property of melic templates. According to (31), it is only through their mapping to melic templates that texts get divided up into successive lines. This is in contrast with the commonly accepted view, which takes lineation in songs to be an intrinsic property of texts. But if the text of a song is lineated independently of its mapping to the melody, its lineation must come from an abstract metrical template analogous to those of literary verse. This is what I have dubbed the traditional stance on the structure of song lyrics, which is diagrammed in (1).

According to the conception portrayed in (1), the text of a song must simultaneously satisfy two sets of conditions, those for mapping it to the melody and those for mapping it to an abstract template that specifies stanza form without making

³⁰ In literary verse, the formal analogue of a vacant note is an empty position, i.e., a position of the abstract metrical template that does not have an associated syllable. At present it is not clear that there is any real insight lurking behind the formal analogy between empty positions and the vacant notes of melismas. One thing seems clear, though: French literary verse has no use for empty metrical positions.

³¹ See the end of section 5 for an example.

any reference to the melody. When one examines these two sets of conditions, one cannot fail to observe that the putative text-to-meter mapping of (1) duplicates to a large extent the formal apparatus that is in any event necessary to account for text-to-tune mapping.

Consider for instance the patterning of gender in the song *Ah! vous dirai-je, maman*; see (15). If stanza form is to be defined by an abstract metrical template that does not make any reference to the melody, the metrical template for that song must specify that each stanza is made up of six lines with syllabic lengths 7,7,8,8,7,7, and that lines 3 and 4 are feminine and the others, masculine. But why should the template require precisely this patterning of gender?

The answer is easy to see in (14), which shows the correspondence between the text and the melody in the first stanza. Since notes 7, 14, 37 and 44 are metrically stronger than the preceding note, they must be matched with a stressed syllable in order to conform to ENDPROMIN (30), i.e. they must be the last in a masculine line. Notes 22 and 30, on the other hand, are metrically weaker than the preceding note, and so they must be matched with unstressed syllables, i.e. they must be the last in a feminine line. The crucial point here is that ENDPROM, which aligns prominence in the text and in the melody at the end of lines, is necessary in any analysis. In an analysis along the lines of (1) the specification of line gender in the abstract metrical pattern merely duplicates information that is already present in the melody.³²

³² Similarly, in Kiparsky's account of English folk ballads along the lines of (1), the constraint MATCH STRESS, which regulates the correspondence between linguistic prominence and musical rhythm, is duplicated by a similar constraint that regulates the correspondence between linguistic prominence and the meter; see Kiparsky 2006: 33.

4. Differences between songs and literary verse

Some important features are missing from the picture of textsetting in TF that was painted in the preceding section. To complete this picture, I continue my comparison with literary verse. Up to this point, the emphasis was on resemblances; I was presenting an alternative to the traditional view, portrayed in (1), which explains these resemblances by assuming that song lyrics and literary verse both follow an abstract metrical template. I now turn to the differences, which enhance the support for the alternative view. According to (1), the text of a song must meet constraints on text-to-meter mapping, and in addition it must meet constraints on text-to-tune mapping. In literary verse, on the other hand, texts are only subject to constraints on text-to-meter mapping. Consequently we would expect the texts of songs to be more severely constrained than those of literary verse. However, we shall see that TF is actually in general more permissive than literary verse in the restrictions it imposes on the linguistic material. The only exception to this generalization is gender respension. Let us first look at this exception.

4.1. The patterning of line gender

In TF, the patterning of line gender is uniform across stanzas, and this is a consequence of ENDPROMIN (30); see section 3.4. It might at first be thought that gender respension is a simple consequence of rhyming. Most TF songs are rhymed, at least partially, but gender respension is found even in songs in which there is no

Autant qu'un roi je suis <u>heureux</u> ;	m
L'air est pur, le ciel <u>admirable</u> ...	f
Nous avons un été <u>semblable</u>	f
Lorsque j'en devins <u>amoureux</u> .	m

As shown by this poem, which is a sequence of *abba* quatrains, one can have rhyme (2b) without gender responsion. Rhyming lines show matching gender by definition, but in corresponding lines in successive stanzas, gender does not match. In fact, the alternation between *fmmf* and *mffm* stanzas seen here continues throughout the poem. When gender responsion does occur in literary verse, it arises from the interaction between the rhyme pattern and a general condition called Gender Alternation, according to which adjacent lines that do not rhyme must also differ in gender (thus reinforcing the contrast between them).³⁶ The *abab* rhyme pattern of Musset's stanzas in (3) is a case in point. Gender Alternation applies to all adjacent lines within a poem, including lines that belong to different stanzas. With the *abab* rhyme pattern, Gender Alternation forces successive stanzas to have the same *fmfm* or *mfmf* pattern — gender responsion — so that the last line of one stanza will contrast with the first line of the next stanza. With other rhyme patterns, the same condition leads to an alternating pattern across stanzas. The rhyme pattern *abba* of (35) is one such pattern, leading as it does to . . . *mffm fmmf mffm* In contrast to literary verse,

³⁶ On Gender Alternation, see Cornulier 1995: 144-148, Chevrier 1996. Gender Alternation is predicated on the fact that in literary poems every line rhymes with at least one other line.

Gender Alternation is not a requirement in songs. The gender respension seen in TF songs is a different phenomenon.

Gender respension should be an eye-opener for upholders of the traditional stance on the structure of song lyrics. It is a striking example of a textual regularity that does not come from an abstract metrical template, but from a condition on text-to-tune alignment (ENDPROMIN). Any theory of TF must have as one of its components the condition ENDPROMIN or an analogue of it. Once it is agreed that in (1), the component responsible for gender respension is text-to-tune alignment rather than the abstract metrical template, the question arises whether other textual regularities could also be due to text-to-tune alignment.

4.2. Range of viable stanza forms

In French the length pattern of a literary stanza can be characterized by a sequence of numbers in which each number represents the length of one line of verse; for instance, the length pattern of the four-line stanzas in (3)-(4) can be represented as 6-6-2-6.³⁷ The number of length patterns that are logically possible is astronomical, but only a tiny minority are attested. Consider stanzas composed of between 3 and 10 lines whose length ranges between 1 and 13 syllables. While the total number of such stanzas that are logically possible is close to $15 \cdot 10^9$, the number of attested ones listed in the “Répertoire général” at the end of Martinon 1912 is around one thousand,

³⁷ This is a simplified view that glosses over caesuras in long lines, but this simplification will do for the purposes of this article.

which amounts very roughly to one attested pattern out of every ten million logically possible ones.

This is not the place to get into the details of line-length patterning in stanzas.³⁸ It is sufficient to make the general point that length patterns are severely restricted in literary stanzas, more so than in songs. An example of a constraint on length patterning in literary verse is the Discrimination Constraint, which forbids lines whose lengths differ by only one syllable from coexisting in the same stanza.³⁹ During the classical period, violations of this constraint are found only in songs or in literary poems that imitate songs.⁴⁰ While at any moment of the classical period one finds length patterns that are attested only in sung verse, there don't seem to exist literary poems of strophic form that are unfit to be set to music.

In my view, the main reason for the greater restrictiveness of literary verse has to do with perception. Subjecting the abstract metrical patterns of literary verse to severe constraints is necessary if these patterns are to be perceived at all. It is rather easy for the listeners of a song to grasp its stanza form because the melody, which is perceptible on its own terms, provides powerful clues. The clues provided by the layout of literary verse on the printed page are much weaker. In order to reconstruct the shape of the abstract scaffolding over which the linguistic material is draped, the readers' minds depend to a larger extent on patterns that are inherent in the text itself.

³⁸ See Cornulier 1993, Chauveau and Cornulier 1994, Gouvard 1999: 249-267.

³⁹ Cornulier 1995: 73.

⁴⁰ For examples of such violations, see Gouvard 1999: 252 and Buffard-Moret 2006: 149. These two authors mention many other instances of length patterns that are attested only in songs.

These patterns are presumably easier to perceive if they are fewer and farther apart in the space of logically possible ones.

The scheme diagrammed in (31) for text-to-tune mapping in TF songs implies that for a melic template to be able to give rise to a viable stanza form, it is sufficient that its melody be well-formed and that its lineation be congruent with that melody's Grouping Structure, i.e. that it satisfy LINE/MGROUP (21). Obviously, a lot hinges on LINE/MGROUP, a condition that raises conceptual issues of a rather different nature than those involved in characterizing viable metrical templates in literary verse.⁴¹

4.3. Template invariance

Unlike literary verse, TF allows occasional departures from length responson. The score of the first line of the song *Le Roi Renaud* is displayed in (36); the grids in (37a,b,c) are those of the initial lines of stanzas 1, 2 and 11.⁴²

(36) 

le roi Re- naud de guer- re re- vient

⁴¹ In a more complete version of (31), box B must contain restrictions on the occurrence of vacant notes, which lack of space prevents me from discussing here.

⁴² Yves Montand, *Chansons populaires de France*. CD Columbia 471025-2, track 1. (a) King Renaud returns from war; (b) Renaud, Renaud, rejoice! (c) Ground, split asunder! Ground, open up!

(37)

			x				x				x	
		x	x		x		x		x		x	
	x	x	x	x	x	x	x	x	x	x	x	x
	D	D	D	A			A	c		B ^b	A	G
a	le	roi	Re-	naud			de	guer-		re	re-	<u>vient</u>
b	Re-	naud,	Re-	naud,			ré-	jou-		—	is-	<u>toi</u>
c	ter-	re,	fends-	toi,			terr'			ou-	vre-	<u>toi</u>

The text sung to the nine-note melody has nine syllables in (37a), but only eight in (37b), where the second syllable of *ré-jou-is* ‘rejoice’ is melismatic: its vowel [u] is sung to the pitch c over the first two-thirds of its duration, and to the pitch B^b over the remaining third. The representation of line (37c), which is also eight syllables long, has been conflated with those of (37a) and (37b) to save space, but its melody is a slightly different one derived from that of (37a,b) by deleting the second pitch in the sequence AA. In terms of the general scheme advocated here, the three lines have different melic templates, which are represented in (38).

(38)

		x					x					x
		x	x		x		x		x		x	x
	x	x	x	x	x	x	x	x	x	x	x	x
a	D	D	D	A			A	c		B ^b	A	G
b	D	D	D	A			A	c		<B ^b >	A	G
c	D	D	D	A				c		B ^b	A	G

Taking (38a) as the basic template, one derives (38b) by marking the antepenultimate note as vacant, and (38c) by deleting the fifth note. Length discrepancies like those in *Le Roi Renaud* are rather infrequent in TF, but when they do occur, they do not sound awkward to listeners, who often do not notice them. In literary verse, by contrast, length discrepancies are strictly out of bounds: there is no way for an 8-syllable linguistic string to be fitted to a 9-position metrical template.

Let us posit the following general condition:

(39) Template Invariance: In a strophic composition, all stanzas are based on an invariant template.⁴³

French literary verse conforms strictly to Template Invariance, and so it does not tolerate any departure from length responson. TF is more permissive. Melic templates form families of closely related variants. Template Invariance incurs occasional violations; when this happens, several variants coexist in the same song, as happens in *Le Roi Renaud*. In my view, this difference between TF and literary verse has the same source as that concerning stanza forms that was commented on in the previous section: most of the information contained in a melic template resides in its melody, and melodies are perceptible on their own terms, independently of texts that may be mapped to them. In literary verse, by contrast, most of the information that readers rely upon in order to retrieve the abstract metrical template resides in the text itself. Rhyming aside, the only property of lines that is specified by the metrical

⁴³ Template Invariance supersedes the condition P-Parallelism of Dell and Halle 2009.

template is their syllable count. Variations in syllable count would presumably make the template too difficult to perceive as a stable form.

English folk songs routinely violate Template Invariance, to a much greater degree than TF.⁴⁴ Dell and Halle 2009: 76 suggest that English and French represent different outcomes of a tug-of-war between Template Invariance and stress-to-beat matching. They conjecture that strictly enforcing both requirements would leave too narrow a range of well-formed settings, which would make songs too difficult to compose. While TF is lax in enforcing stress-to-beat matching, which is a categorical requirement only at the end of lines, English strictly enforces it in all positions, but is rather lax in its observance of Template Invariance.

To be complete, a theory of textsetting in TF must be supplemented with a detailed account of the conditions that two different tunes must satisfy in order for listeners to perceive them as variants of the same tune, as is the case with (38a) and (38c). These conditions fall in the purview of music theory, which deals with the contents of the box labeled “melody” in (31). One such condition is Melodic Contour Conservation, on which see Dell and Halle 2009 and the references therein.

4.4. Syllable count

Besides the fact that prominence matching is strictly enforced only at the end of lines, another feature of TF that allows a wide range of well-formed settings is flexibility of syllable count. Here the contrast between song and literary verse is

⁴⁴ For cases in point, see examples (6) and (10) in Hayes and MacEachern 1996, and example (19) in Hayes and MacEachern 1998.

particularly striking. In French literary poetry, syllable count is based on an abstract representation that only bears an indirect relationship to the pronunciation of the line when it is read aloud. Once the location of line ends is known, every sequence of words has a unique syllabic parse. In songs, on the other hand, syllable count is based on the vowels that are actually pronounced and serve as carriers for the musical pitches. A sequence of words may have several acceptable syllabic parses, in which case each alternate syllable sequence counts as a different text for the purposes of textsetting. The main factor responsible for the existence of alternate realizations is the vowel schwa, the so-called *e caduc*, which is represented by an unaccented *e* in standard spelling.

Consider for instance the sequence *de la musique avant toute chose* ‘music above all things’, a well-known line by Verlaine. Taken as a line of verse, this sequence has nine metrical syllables, as shown in (40), where the schwas that contribute to the syllable count are boxed, and those that do not count are crossed out.

(40) D~~e~~ la musique avant tout~~e~~ ch~~o~~s~~e~~
 1 2 3 4 5 6 7 8 9

For the purposes of text-to-tune alignment, on the other hand, this sequence generates 8 alternate texts with syllable counts ranging from seven to ten syllables. While the *e* of *musique* may not be pronounced because it is followed by a vowel,⁴⁵ the three others can each be realized or not. Freely combining the options for these

⁴⁵ See below and note 49.

three schwas yields eight different pronunciations that are listed in (41) along with their syllabic parses. (A ‘1’ indicates that the schwa above it in the text at the top of the table is realized, and a ‘0’ indicates that it is not.)

(41)	De	toute	chose	1	2	3	4	5	6	7	8	9	10
a	1	1	1	də	la	my	zi	ka	vã	tu	tə	<u>f</u> o	zə
a'	1	1	0	də	la	my	zi	ka	vã	tu	tə	<u>f</u> o ^z	
b	1	0	1	də	la	my	zi	ka	vã	tut	<u>f</u> o	zə	
b'	1	0	0	də	la	my	zi	ka	vã	tut	<u>f</u> o ^z		
c	0	1	1	dla	my	zi	ka	vã	tu	tə	<u>f</u> o	zə	
c'	0	1	0	dla	my	zi	ka	vã	tu	tə	<u>f</u> o ^z		
d	0	0	1	dla	my	zi	ka	vã	tut	<u>f</u> o	zə		
d'	0	0	0	dla	my	zi	ka	vã	tut	<u>f</u> o ^z			

The pronunciations listed in (41) are all acceptable in singing, i.e. every one of them may occur in a composite that people familiar with TF find acceptable. For instance, the result of singing the seven syllables of (41d') to the melody of the first line in (17) is acceptable; so is that of singing the eight syllables of (41d) to the melody of (27); and so is that of singing the nine syllables of (41a') to the melody of (38a).

In Standard French only (41b') and (41d') are acceptable outside of singing and poetic diction. This example illustrates the fact that the range of alternate pronunciations allowed in singing is much wider than in any other style of delivery, which greatly facilitates the fitting of words to melodies.

Prevocalic gliding is another phenomenon that provides more options in singing than in any other style of diction. Take *violon* 'violin', for instance. In Paris the everyday pronunciation of this word is always disyllabic ([vjɔ-lɔ̃]), but singing also allows a trisyllabic pronunciation ([vi-jɔ-lɔ̃]). The options involving prevocalic gliding combine freely with those involving schwa. Take for instance *violette* 'violet'. In addition to its everyday pronunciation [vjɔ-lɛt], this word has three other realizations that are acceptable in singing: [vjɔ-lɛ-tə], [vi-jɔ-lɛt] and [vi-jɔ-lɛ-tə].

There is an intimate connection between schwa and line gender. The rule for stress placement in French can be formulated as follows: if an expression ends in a polysyllabic word whose last syllable contains a schwa, its rightmost stress falls on the penultimate; otherwise its rightmost stress falls on its last syllable. This is not the place to discuss the rules that govern the behavior of schwa in TF.⁴⁶ Suffice it to say that at the end of a line, a polysyllabic word whose last vowel is *e caduc* has two acceptable pronunciations depending on whether the *e caduc* is pronounced or not. This gives song composers considerable elbow room for satisfying ENDPROMIN (30): any word of the language is fit to be the last in a masculine line, and any polysyllabic word that ends with schwa can end a feminine line. This can be seen in (41), where

⁴⁶ For a brief summary, see Dell 1989: 122-124.

pronunciations are arranged in pairs. The members of each pair differ only in the pronunciation of the last word, resulting in either a feminine or masculine line.

5. Lineation and minimal lines

Up to this point, it has been taken for granted that songs are composed of lines. In French literary verse the status of lines as structural units is not in doubt. Literary poems are fully rhymed, and rhyming is a relation between lines. Extrametrical syllables are allowed only at line ends. The situation is different in TF. Songs may be rhymed only in part or not at all, and there are no extrametrical syllables. Rather than constituents in a universal hierarchy of categories (Stanza, Line, Colon, etc.), I believe that lines in TF songs are simply stretches that abide by ENDPROMIN and that best satisfy the conditions that define congruence between musical structure and grammatical structure.⁴⁷

When listening to a song, one cannot help perceiving certain points of the unfolding melody and lyrics as natural joints that divide the flow of the song into successive chunks. The layout of lyrics printed in song books can be considered a repository of intuitive judgments about such natural joints. In the course of this research, LINE/MGROUP, LINE/CLG and ENDPROMIN first arose as descriptive generalizations obtained by examining these natural joints in several hundred songs. Once established, such generalizations can be used as analytical tools. A song can now be scrutinized for all the possible ways it can be partitioned so that in a given

⁴⁷ I am following here, *mutatis mutandis*, a suggestion made for English folk verse in Hayes and MacEachern 1996: 139-140.

partition all the sections simultaneously satisfy LINE/MGROUP, LINE/CLG and ENDPROMIN. Let me illustrate with the folksong *J'ai lié ma botte*.⁴⁸

In this song the second half of each stanza is a refrain that need not concern us. The first half-stanza is sung to a melody whose score is displayed in (42). The song has six of these half-stanzas. The complete lyrics of all six are given in (43).

(42)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

⁴⁸ Berthier 1979: 149.

(43)

Au bois voi <u>sin</u> l'y a des vio <u>lette</u> s,	4-7	<i>In the woods nearby there are violets,</i>
de l'aubé <u>pin</u> ' et de l'églant <u>ier</u> .	4-5	<i>hawthorn and eglantine.</i>
J'y vais le <u>soir</u> pour y fair' la cueill <u>ette</u> ,	4-7	<i>I go there in the evening to harvest,</i>
en gros sab <u>ots</u> et en tabli <u>er</u> .	4-5	<i>wearing heavy clogs and an apron.</i>
J'en cueillis <u>tant</u> , j'en avais plein ma <u>hotte</u> ;	4-7	<i>I gathered so much, my basket was full;</i>
pour les port <u>er</u> j'ai dû les li <u>er</u> .	4-5	<i>to carry them I had to bundle them up.</i>
En reven <u>ant</u> j'ai rencontré un <u>prince</u> ;	4-7	<i>On my way back I met a prince;</i>
avec mes <u>fleurs</u> je l'ai salu <u>é</u> .	4-5	<i>with my flowers I greeted him.</i>
M'a deman <u>dé</u> de venir à la <u>ville</u>	4-7	<i>Asked me to come to the city</i>
et d'habite <u>r</u> dans un grand <u>palais</u> .	4-5	<i>and to live in a large palace.</i>
Mais j'aime <u>mieux</u> la maison de mon <u>père</u> ,	4-7	<i>But I prefer my father's house,</i>
le bois jol <u>i</u> et ses églant <u>iers</u> .	4-5	<i>the pretty woods and their eglantines.</i>

In (43) the vertical bars represent major breaks in P-structure and the numbers indicate the syllable count on either side of a medial break. As these numbers indicate, the breaks occur at the same location in all six half-stanzas. Here is for instance the syllable count in the first line:

(44) Au bois voi-sin | l'y a des vi-o- let-tes
 1 2 3 4 5 6 7 8 9 10 11

verify that the partitioning of the melody by (45) has the following properties: (i) it abides by LINE/MGROUP, (ii) all six texts in (43) are such that they can be mapped to the melody in conformity with LINE/CLG and ENDPROMIN, and (iii) P/Q/R/S is the partition that divides the melody into the maximum number of sections compatible with (i) and (ii): when the melody in (42) is divided into more than four sections, whatever the partition chosen, the texts in (43) cannot be mapped to it in conformity with LINE/MGROUP, LINE/CLG and ENDPROMIN.

Listeners divide the song into lines because of regularities (i)-(iii) above, but the lines that they perceive may be made up of more than one line in the template. Let us refer to the four sections in (45) as MINIMAL LINES (henceforth, m-lines). When one perceives the half-stanzas of (43) as quatrains, each perceived line corresponds to one m-line in (45), and when one perceives the half-stanzas as couplets, each perceived line is coextensive with a sequence of two m-lines. While lines represent listeners' intuitions about acceptable ways of partitioning a song, m-lines are constructs that are hypothesized in order to account for regularities in songs and for listeners' intuitions about them.

In a strophic song, let us say that a partition of the stanza melody is m-compliant when it meets the following conditions: (i) it satisfies LINE/MGROUP and (ii) all the stanzas have texts that can be mapped to the melody in conformity with LINE/CLG and ENDPROMIN.

It is a fact that lineations that listeners find acceptable are m-compliant. In the example at hand, PQ/RS, the lineation for couplets, and P/Q/R/S, the lineation for quatrains, are m-compliant, but these are not the only partitions of the melody that are m-compliant. The composite (42)-(43) admits of other partitions of the melody that

are m-compliant, e.g., P/Q/RS or P/QR/S. Why is it that these partitions do not yield intuitively satisfying lineations? To answer this question we need to know more about congruence between lineation and P-structure and about congruence between lineation and Grouping Structure. As first indicated when LINE/CLG and LINE/MGROUP were introduced in (7) and in (21), congruence is a matter of degree, but these conditions only define minimal congruence. A task for further research will be to flesh these conditions out.

Consider first congruence with Grouping Structure. The partitions of the melody (42) that are m-compliant are all listed in (46).

- (46)
- | | |
|---|----------------------|
| A | P/Q/R/S, PQ/RS, PQRS |
| B | P/Q/RS, PQ/R/S |
| C | P/QRS, P/QR/S, PQR/S |

The partitions in (46) all meet LINE/MGROUP, but their degree of congruence with Grouping Structure varies. In the partitions in row A, the sections are musical groups that all belong to the same level in Grouping Structure. In the partitions in row B, the sections are all musical groups but these groups are not all of the same level. Finally, the partitions in row C are those in which not all sections are musical groups. The acceptable lineations of (42)-(43) are both of type A, presumably the highest degree

of congruence,⁴⁹ but in TF acceptable lineations are not always of type A; type B is also attested. This lower degree of congruence with Grouping Structure can yield an acceptable lineation, provided the other cues for lineation are sufficiently strong. The same is true of type C, see (20).⁵⁰

Concerning congruence between lineation and P-structure, I will limit myself to the following point, which is directly relevant to the preceding discussion: as indicated earlier, LINE/CLG is violated on rare occasions in commercial songs. If the definition of m-compliance given above is to be applicable to songs that contain enjambments that break up Clitic Groups, condition (ii) in that definition must be weakened: instead of requiring that the lines in a song all satisfy LINE/CLG, it must only require that most of them meet the condition.

Enjambments that break up Clitic Groups also pose a problem for the formulation of ENDPROMIN. The song *Le Vin* by Georges Brassens is a case in point.⁵¹ Stanzas consist of sextets in which the rhyme pattern is *aabccb* and the pattern of line lengths 5-5-3-5-5-3. Here is the first sextet:

⁴⁹ According to partition PQRS in row A, each half-stanza would consist of a single line. This lineation would violate a prohibition that the TF idiom shares with literary verse and that makes crucial reference to lines: feminine schwa may not be metrical before a vowel that belongs to the same line. In (43), syllable 11 ends with a feminine schwa in every half-stanza. If syllable 11 and syllable 12 belonged to the same line, syllable 12 would always have to begin with a consonant, while in fact in the second, fourth and fifth half-stanzas the second typographic line begins with a vowel-initial word (*en, avec, et*).

⁵⁰ Type C is also attested in Tashlhiyt Berber; see Dell and Elmedlaoui 2008: 209-222 for a detailed example.

⁵¹ Brassens 1973: 134, 146.

The second line of (49) violates LINE/CLG, since it ends with *des*, an indefinite article that goes with *harangues* in the next line. As a result of the enjambment, the line also violates ENDPROMIN (30): *fair'*, the rightmost stressed syllable in the line, is metrically weaker than the line-final syllable *des*. The violations of ENDPROMIN that occur in TF songs are all concomitant with a violation of LINE/CLG. It is as though line ends always counted as the ends of regular Clitic Groups for the purposes of stress assignment, in which case *des* would be the last stressed syllable in the second line in (49). This problem will be taken up elsewhere.

Enjambments are mismatches between lineation and P-structure, and so they present a serious challenge to an account of TF songs in which the correspondence between P-structure and Grouping Structure would be a direct one not mediated by lineation.⁵² Let us explain briefly why enjambments cannot be equated with mismatches between Grouping Structure and P-structure.

In (49), in addition to an enjambment there occurs a mismatch between Grouping Structure and P-structure: the last note of a musical group (the note F) falls inside a tightly-knit prosodic constituent (the Clitic Group *des harangues*). Most enjambments that are found in TF songs are accompanied by mismatches between Grouping Structure and P-structure, because most of the time the last note of a line is also the last note of a musical group, as is the case in (49). However, the presence of a mismatch between Grouping Structure and P-structure is neither necessary nor sufficient for listeners to experience the special feeling of dislocation that is

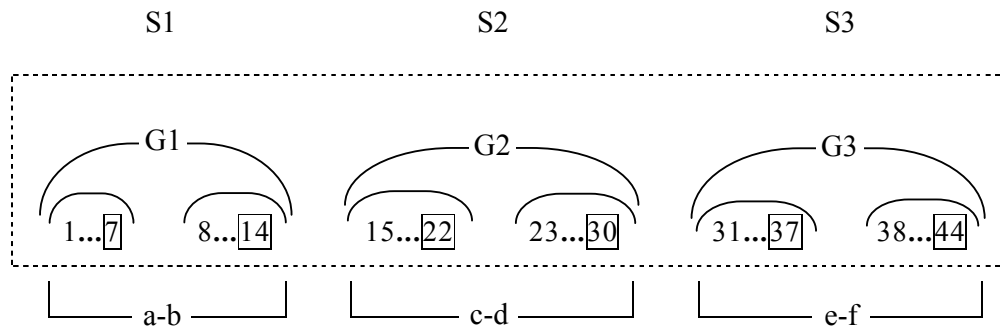
⁵² An argument against such an account was already presented in section 3.2. The argument had to do with short lines that are entirely contained within a minimal musical group; see the comments that follow (20).

6. The structure of stanzas above the line level

Stanzas are not mere concatenations of lines. Lines combine into groups, and these groups may in turn combine to form larger groups. Let us call any such line grouping a sub-stanza. Parallelism requirements between sub-stanzas put severe restrictions on the range of well-formed melic templates that can be based on a given melody, as I will now briefly explain.

Preliminary observations suggest that sub-stanzas are always coextensive with musical groups. To illustrate, let us return to (14) and (15), which give the tune of the song *Ah! vous dirai-je, maman* and the text of its first two stanzas.

In this song, the stanzas are composed of three sub-stanzas each consisting of two lines. These sub-stanzas are labeled S1, S2 and S3 in the diagram in (51), which represents the organization of a stanza. Let us first concentrate on the contents of the dashed box, which represents the relevant aspects of the melic template. The numbers stand for the notes of the melody in (14) and the tie symbols represent Grouping Structure. (They are labeled for ease of reference.)



(51) STANZA STRUCTURE IN THE SONG *Ah! vous dirai-je, maman*

The diagram (51) shows that each sub-stanza is coextensive with a musical group. In the melic template there are special marks that identify line-final notes, but there are none to represent the grouping of lines into sub-stanzas. It appears there is no need for such marking; preliminary observations suggest that stanza structure above the line level simply follows Grouping Structure. If this initial hypothesis is confirmed by further investigation, it would mean that the location of vacant notes and line ends is all the nonmusical information that needs to be included in melic templates; it is not necessary to add information about the articulation of stanzas into sub-stanzas, because this can be derived from Grouping Structure.

Like lineation, the division of a stanza into sub-stanzas requires a certain degree of congruence between the text and the melody. In (51) the brackets beneath the dashed box represent the linguistic sequences in (15) that are coextensive with musical groups G1, G2 and G3. In stanza (15-ii) the correspondence with the text is particularly easy to state: each sub-stanza is coextensive with a sentence. The correspondence is not always so straightforward, however; see for instance stanza (15-i).

Most melodies in the TF idiom contain many sub-melodies that are rhythmically parallel to each other, including sub-melodies whose notes are not the same. By saying that two melodies or sub-melodies are RHYTHMICALLY PARALLEL I mean that the distributions of their notes along the metrical grid are identical, that is, corresponding notes align with grid positions of identical strength, and corresponding pairs of adjacent notes are separated by the same number (zero or more) of vacant grid positions. The melodies on the two staves in (19) are a case in point. They are

composed of different pitches but their pitches are aligned in identical ways with the metrical grid.

In TF songs, sub-stanzas that are rhythmically parallel always have parallel lineations as well, that is, line breaks fall in the same places. We can formalize this by saying that a note marked as line-final in one sub-stanza corresponds to a line-final note in the other sub-stanza:

(52) LINEPARALLEL: If two sub-stanzas are rhythmically parallel, the distribution of line-final notes within them is identical.

The two composites displayed in (19) are the first two tercets of a song in which each stanza is composed of six tercets grouped in pairs. The two tercets, which are rhythmically parallel, have identical lineations, as one can see by comparing (20), which is a representation of (19A), with (53) below, which is a representation of (19B): notes 4, 8 and 11 are line-final in both composites.

(53)

	1	2	3	4	5	6	7	8	9		10	11			
	x				x				x			x			
	x		x		x		x		x		x	x	x		x
	F	F	D	F	B ^b	B ^b	D	F	F		E ^b	D		x	x
	⏟										⏟				
	⏟														
	[sin-	gu-	liè-	re]	[du	bré-	vai-	re]	[de		l'ab-	bé]			

Let me give an example of what is excluded by LINEPARALLEL. Readers may recall that the lineation [1...4][5...8][9...11] is not the only one compatible with the melody of (19A); another lineation compatible with it is [1...6][7...11], which is instantiated in the construct displayed in (24). Now imagine a song that has the same tune as *La Marguerite*, but that contains both (24) and (53). Suppose that the pattern of lineation is consistent from stanza to stanza: the part of the melody given in (19A) is always lineated like (24) and its rhythmically parallel counterpart (19B) is lineated like (53). Such a song would abide by LINE/MGROUP, like the original song, but it would violate LINEPARALLEL. No such songs can be found in the TF idiom.

It is impossible to overstate the importance of the role that LINEPARALLEL plays in shaping stanzas in TF songs. The melodies of the TF idiom are teeming with rhythmical parallelisms and LINEPARALLEL seems to be enforced very strictly. A violation of it has yet to come to my attention.

7. The meters of literary poetry as impoverished melic templates

Fabb 1997: 94 draws a distinction between “meter” and “performance template”. A meter specifies the conditions that a stretch of text must meet if it is to count as a well-formed line of verse of a certain type. Meters do not specify how texts are to be performed. Performance templates, on the other hand, do precisely that. In Fabb’s terms, the abstract metrical templates of diagram in (1) are meters and the melodies are performance templates. The distinction between meters and performance templates is an instance of a more general distinction, ubiquitous in linguistics, between abstract structures and their implementation.

Fabb's distinction seems unproblematic as long as it is not taken to imply the following proposition:

- (54) All periodicities pertaining to syllable count, syllable weight and stress that are found in sung texts have their source in a meter.

This assumption is commonplace in metrical studies,⁵⁵ but it is unwarranted. I have argued here that except in songs composed by setting pre-existing metrical verse to a tune, the texts of traditional French songs do not have meters in Fabb's sense. In TF songs the patterning of syllable count (section 3.3) and line gender (section 3.4) cannot be described in an insightful way without taking into account the melodies, and in Fabb's dichotomy melodies are parts of performance templates.

Assuming (54) naturally leads one to view the melody of songs as something added to an inherently metrical text. Inverting that view, the architectural approach portrayed in (31) allows us to treat literary meters as melic templates of a degenerate sort. Here is a sketch of the general idea.

In TF songs, melic templates regulate both pitch and timing, but other traditions exist that regulate only certain aspects of the audible rendition of texts. In the collective chants of street demonstrations, for instance, timing is regulated, but not pitch; on the other hand, Tashlhiyt Berber has a "free rhythm" singing style in which pitch is regulated at least in part, while timing seems free (it is akin to the rhythms of everyday speech).⁵⁶ Seen in the light of these other attested variations on fully

⁵⁵ It is for instance implicit throughout Fabb and Halle 2008.

⁵⁶ Dell and Elmedlaoui 2008: 136.

regulated textsetting, the meters of literary verse appear as melic templates divested of all the specifications that control pitch and timing. These impoverished melic templates lack a pitch tier; they have grids, but these grids differ from those of musical tunes in important ways: they are not isochronous, they place severe restrictions on empty positions — if they allow them at all — and they have fewer gridlines.⁵⁷

Literary meters and melodies share deep similarities that are captured in current theorizing by assuming that both have a metrical grid as their backbone. Why should it be so? Under the traditional view depicted in (1), this similarity is to a large extent an arbitrary fact. Viewing literary meters as a limiting case of melic templates of the kind depicted in (31) would get us a long way toward understanding the common basis of literary verse and song.

⁵⁷ On this last point, see Proto and Dell 2013.

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