Mine Doğantan

Mathis Lussy
A Pioneer in Studies of Expressive Performance
Chapter III

Lussy's Theory of Rhythm and Meter as a Foundation for Performance


Ever since the time of the ancient Greeks, writers have referred to various physiological phenomena as the origin of man's experience of rhythm and meter. Plato mentions the pulsations of the arteries; so does Mattheson in the eighteenth century. Momigny finds this origin in the rise and fall of man's walking step. The foundation of our rhythmic and metric experiences is attributed to the consciousness of the periodicity of such bodily functions.

According to Lussy, the criterion of periodic recurrence, while necessary, is not sufficient to establish the basis of rhythm and meter. He states that one must also perceive alternating strength and weakness in the phenomenon identified as the origin of a rhythmic and/or metric experience: in other words, the successive units constituting the phenomenon must be experienced as qualitatively different. Lussy argues that among the various physiological functions, only respiration displays this particularity since it involves the two qualitatively distinct spans of inhalation and exhalation. Other physiological phenomena, such as the heartbeat or successive pulses do not present such differentiation.

One could argue against this claim by pointing out, for instance, the qualitatively different processes of the systole and the diastole — the regular contraction and expansion of the heart muscles that cause the heart to beat. However, the experience of the heartbeats does not involve an awareness of clearly defined temporal units: the contractions and expansions happen too fast for the mind to be able to perceive them as qualitatively distinct processes taking place within a time-span. Rather, the heartbeats are experienced as articulations of points in time, and as such they only provide an incessant sensation of regularity. They do not

---

1 "Évidemment cette origine ne peut résider que dans un phénomène dont les mouvements réguliers offrent l'alternance de force et de faiblesse. La respiration, seule, possède cette particularité." Traité, p.168.
furnish, according to Lussy’s argument, the most fundamental requirement of a rhythmic and/or metric experience, namely the awareness of spans of time that serve as units of reference in making judgements of temporal measurement. Inhaling and exhaling, on the other hand, provide the mind with the basis for the conceptual representation of sufficiently long and definitely “shaped” spans that can function as such reference units. In this sense, man derives the model for the rhythmic and metric properties of the temporal structures he creates from the phenomenon of respiration, which according to Lussy is “the prototype of the musical measure and the generator of rhythm.”

One point in Lussy’s argument invites a question: Precisely how does the perception of “alternating strength and weakness” in respiration function as the basis of both rhythmic and metric experiences? In other words, how do rhythm and meter emerge as two perceptual structures as Lussy insists they do— from the single physical experience of respiration. The answer lies in Lussy’s use of the terms “strength/weakness” to refer to two conceptually different phenomena: on the one hand, he regards “strength and weakness” as boundary markers that delimit temporal units, such as those furnished by inhalation and exhalation. For example, the moment that starts exhalation is regarded as “strong.” On the other hand, Lussy uses the same terms to refer to the relative intensities of successive units that are part of a continuous dynamic curve— as in the case of the curve established by a complete cycle of respiration: in this sense, the whole span of exhalation is “strong” in comparison to the span of inhalation. When employed in the former sense, strength and weakness define a metric phenomenon. In the latter, they are the features of a rhythmic one.

Lussy conceives of the musical measure as a stylization of the natural measure generated by the phenomenon of respiration. Between the beginning of inhalation and the end of exhalation extends a dynamic curve, corresponding to one complete act of respiration: as inhalation makes the chest rise and exhalation lets it fall, the natural arsis-thesis pairing is generated. The moment when the lungs, filled with air, reach their utmost function is the moment that is the prototype of “strength,” and that of exhalation is the prototype of “weakness.”

This moment when the end of exhalation is reached is a point that marks the end of exhalation and the beginning of inhalation. It is the so-called “moment of measure” in the sense used by the music theorist who defines it as the moment when the span that constitutes the measure generates the measure.

Figure 3.1

Lussy argues that the musical measure of a person is in a ratio of 1:2— twice as long as a person’s natural measure.

Figure 3.2

Two features of the musical measure represents the measure between 1 and 2, involving three equal units.

Throughout his work, Lussy presents the measure of the natural rhythm and the measure of the musical rhythm as follows.

Figure 3.3

5 Throughout his work, Lussy presents the measure of the natural rhythm and the measure of the musical rhythm as follows.

6 “Ce n’est pas seulement la mesure à 1; mais aussi celle à 3 et à 4.”
utmost functional extension corresponds to the highest point of the curve. This moment is loaded with energy for action: as such it is the moment of "strength," and it marks the boundary between the span of inhalation and that of exhalation. The lowest point of the curve corresponds to the moment when the accumulated energy has been exhausted; it marks the end of exhalation and is the moment of "weakness." The musical measure symbolizes this pattern of alternating strength and weakness by the so-called strong and weak beats. Figure 3.1 shows the binary musical measure generated after the model of respiration: the dynamic accent sign locates the strongest point at the barline, which marks the onset of the span that represents exhalation.5

![Figure 3.1](image1)

Lussy argues that respiration provides the model not only for the binary musical measure but also for the ternary one.6 He points out that when a person is in a tranquil state, as in sleep, the time-span of exhalation is twice as long as that of inhalation. Figure 3.2 demonstrates the ternary musical measure.

![Figure 3.2](image2)

Two features of this example are to be emphasized: first, Lussy represents the measure by two durational values, even though its metric count involves three equal units. This is because the natural measure generated

---

5 Throughout his various publications, Lussy displays an indecisiveness as to where exactly the accent sign should be placed. Example 3.1 is from "De la culture du sentiment musical" (1906), the last publication in which this example appears. In the eighth edition of the Traité (1904), the sign actually appears below the barline as follows:

![Example](image3)

6 "Ce n'est pas seulement la mesure à 2 temps que la respiration engendre, mais aussi celle à 3 temps." Traité, p.169.
by respiration always consists only of two qualitatively distinct units, i.e. one span of arsis and one span of thesis. Secondly, the dynamic accent sign, used for the binary measure shown in figure 3.1, is left out in the case of the ternary measure, since according to Lussy a long stimulus coming after one or several short ones is by itself a factor in creating an impression of dynamic accent or stress.

The perception of the moments of strength and weakness that delineate the dynamic curve of one act of respiration is fundamental to the experience of measure and meter. The foundation of the rhythmic experience, however, lies in the perception of the two processes that define the internal shape of the curve: namely, the processes of “getting strong” and “getting weak,” or—in Lussy’s terms—of action and relaxation. The recognition of the pattern of action-relaxation originates in the perception of the intimate link that exists between the spans of inhalation and exhalation. Inhalation is experienced not only as “the span during which air is taken in and the chest rises,” but more importantly as “the span starting respiration and leading to exhalation.” Similarly, exhalation, in addition to being “the span during which air is given out and the chest falls,” is experienced as “the span following the action of inhalation and ending respiration.” In other words, inhalation, i.e. action, is experienced as unfolding towards exhalation, i.e. relaxing. Perception of such directed motion lies at the core of rhythmic experience: unlike metric experience, it requires that we assign a “beginning” and an “end” to the temporal unit, and perceive its beginning as causing its end. Hence, according to Lussy, if a span is to be experienced as rhythmic, its end needs to be recognized as an arrival, as a point of repose that follows activity. A temporal unit that merely stops unfolding, or an activity that merely ceases, is not rhythmic.

Lussy argues that the strong beat of the musical measure, which represents the onset of exhalation and thereby metric strength, also represents rhythmic repose. Yet, if repose is identified as the moment when the accumulated energy is exhausted and one cycle of respiration ends, would it not be more appropriate to represent it by the weak beat of the measure? Lussy’s use of the term “beat” to refer to both time-points and time-spans validates his argument: while strong beat in the sense of

---

7 In accordance with the last publication where this example appears, namely “De la culture du sentiment musical” of 1906, p.34.

---

8 Lerdahl (practically be referred to as follows, for...
metric "strength" refers to the time-point marking the onset of exhalation, as a time-span it represents the relaxing, the "weakening" phase of respiration; the moment of rhythmic repose can take place at any point along the time-span of the strong beat. An important implication of this idea is that "repose" according to Lussy is conceptually contingent on "relaxation;" one experiences rhythmic repose to the extent he experiences rhythmic relaxation.

As a model for the foundation of expressive performance, the phenomenon of respiration displays certain features that make it preferable to other physiological functions. For one, the directly observable effects of the emotions on the entire vocal mechanism including the pattern of breathing have been cited at least since the Baroque period: it is only appropriate that a theory, according to which expression in performance is the manifestation of the performer's affective response to music, would take respiration as a model. Secondly, the durations of the spans involved in respiration — under the influence of emotions or not — are subject to constant variation. Mechanically regular time-keeping does not appear to be in the nature of human physiology; nor is it part of expressive performance. Even though the same point can be made about the pulse and the heartbeat, the immediate perceptibility of the variations in breathing by third persons translates into the model's capacity for allowing listeners to recognize the performer's subjective timing in performance. Most important, however, is the fact that respiration by nature is hierarchical: not every breath has the same "depth," or is supported by the same amount of lung-tension. Deep breaths come only sporadically, at moments of greater relaxation. Those in between — in quiet breathing — unfold over a certain level of minimally varying fixed tension in the lungs. It is, therefore, a model based on respiration, rather than on any other physiological function, that would capture the hierarchical nature of musical rhythms.

Lerdahl (private communication) has suggested that this phenomenon can graphically be represented as waves, and is in turn amenable to a tree-notation as follows, for example:
2. The Nature of Musical Meter

The Beat and the Measure

In Lussy’s theory, meter refers to the perceptual structure of the function of which is to divide the musical surface into equal temporal units. This structure is inferred from the experience of the musical measure. The term Lussy uses for meter is “la mesure en général,” while measure is referred to as “la mesure.” He writes that “when one speaks of the measure in general, this [refers to] the inferred binary or ternary division, [to] this absolutely regular segmentation. When one speaks of a measure, it [means] a section of this segmentation.”9 Since the timing of the durational units in performed music is subject to constant variation, Lussy, in arguing that the units of the metric structure display an “absolute regularity,” assumes either that the listener in experiencing meter abstracts the durational irregularities of performed music or that the perception of meter tolerates such irregularities without disturbing the feeling of regularity.

According to Lussy, the metrical structure consists of two levels of perceptual units: the beat and the measure. The level at which the units are undifferentiated among themselves is the level of the beat. Beats are generated by a series of strokes, all having the same intensity and happening at equal intervals, and as such they are insufficient to create a metric experience.10 Meter arises only when measures are generated through the differentiation of the beats in a regular fashion by means of dynamic accent. Thus, perception of an accentual hierarchy is the necessary condition of metric experience.

In this connection, Lussy does not raise the possibility of perception of meter through the subjective grouping of stimuli that are undifferentiated in themselves. This phenomenon was experimentally demonstrated

9 “Quand on parle de la mesure en général, c’est cette division, cette fragmentation binaire ou ternaire, d’une régularité absolue qui est sous-entendu. Quand on parle d’une mesure, c’est un tronçon de cette fragmentation.” Traité, p.166. Lussy also likens meter to a “canvas with its regularly and tightly spaced holes;” accordingly, rhythms are the tonal “arabesques” designed on this canvas. The term arabesque is earlier employed by Hanslick (1854) in reference to “musical form in motion,” and displays Lussy’s link with the formalist aesthetics of the nineteenth century.
10 “[If] you strike a series of blows of equal force at equal intervals, each of them marks and represents a beat.” “Frappesz une suite de coups, d’égale force et à intervalles égaux, chacun d’eux marque et représente un temps.” Traité, p.13.
by Bolton in 1894, and was later observed by Koffka in the perception of visual stimuli.11 Carl Seashore, in *In Search of Beauty in Music*, referred to it as “subjective rhythm” and argued that

the subjective tendency is so deeply ingrained, on account of its biological service, that we irresistibly group uniform succession of sounds, such as the tick of the clock, into rhythmic measure. The supposed limping of a clock is often purely subjective.12

Whether the result of subjective grouping of identical stimuli is a metric or a rhythmic experience has not been discussed by Bolton, Koffka or Seashore. However, during the late eighteenth century, Kirnberger had already identified this phenomenon as the basis of meter. He wrote:

If one hears a succession of equal pulses that are repeated at the same time interval, as in [the following] example, experience teaches us that we immediately divide them metrically in our minds by arranging them in groups containing an equal number of pulses. And we do this in such a way that we put an accent on the first pulse of each group or imagine hearing it stronger than the others. This division can occur in three ways:

```plaintext
Either: ── ── ── ── ── ──

or: ── ── ── ── ── ──

or: ── ── ── ── ── ──
```

That is, we divide the pulses into groups of two, three, or four. We do not arrive at any other division in a natural way.13

---


According to Lussy, the relation between a beat and its sub-units is identical to the relation between a measure and its sub-units: the onset of the main unit, i.e. of the span corresponding to the beat or to the measure, is always dynamically stronger than the onset of the sub-units — provided that the subdivisions are evenly spaced. Thus, within a measure, with one sound per beat, only the first beat is strong. All beats except the downbeat are of equal strength. This means that the second beat in a 2-beat measure, second and third beats in a 3-beat measure, and second, third and fourth beats in a 4-beat measure are weak. That the second and third beats in a 3-beat measure are weak had already been recognized by other theorists.\textsuperscript{14} That the second beat in a 2-beat measure is weak follows from the essential accentual hierarchy of meter.

However, Lussy is the first — and possibly the only — theorist to argue that the 4-beat measure is a simple measure with only its first beat strong.\textsuperscript{15} Previous theorists had considered the 4-beat measure to be a compound 2-beat measure, with a strong third beat. For instance, Kirnberger, who according to the passage quoted above, admitted the possibility of perceiving a four-beat metrical pattern within a series of undifferentiated stimuli, did not acknowledge its musical counterpart, i.e. the simple 4-beat measure with a single strong beat. He argued that the third beat is relatively strong with respect to the second and fourth beats.

\textsuperscript{14} Koch, for instance, had argued that the second and third beats of 3/4 and 3/8 measures are weak.

\textsuperscript{15} Lussy defines a simple measure as one that cannot be decomposed into several measures without destroying the essence of the rhythm cast in that measure. He states that he borrows this definition from Aristoxenus: “The binary 4-beat measure is not a reunion of two 2-beat measures; it is not a compound measure. It is a sui generis simple measure, a single, indivisible entity. Following Aristoxenus, who inspired our critical [writings], measures that cannot be decomposed, subdivided into several simple measures without, of course, harming the character of the rhythmic units are compound measures.” “La mesure à 4 temps binaires n’est pas une réunion de deux mesures à 2 temps; c’est ne pas une mesure composée. C’est une mesure simple sui generis, une entité une et indivisible. D’après Aristoxène, qui a inspiré nos critiques, sont mesures composées celles qui peuvent être décomposées, dédoublées en plusieurs mesures simples, sans nuire, bien entendu, au caractère des rythmes.” \textit{Le rythme}, p.95.
Figure 3.3 shows Kirnberger's three-level accentual hierarchy within the 4-beat measure.16

\[ \text{Figure 3.3} \]

Although Lussy admits only of 2-, 3-, and 4-beat simple measures, his theory involves no obstacles for assigning perceptual reality to simple 5-, 6-, and 7-beat measures, with a single strong beat. Since the musical style he analyzes rarely offers measures with 5, 6, 7, etc. beats, Lussy does not discuss the implications of his theory of the musical measure in this respect.

If, as Lussy claims, the relation between a durational unit and its subdivisions — whether that unit is a beat or a measure — is always defined by a two-level accentual hierarchy, how does the listener determine that the unit is a beat or a measure? Lussy argues that perceptually the determination of a durational unit as belonging to the level of the beat or to the level of the measure uniquely depends on the tempo. A unit that forms a measure in a slow tempo would be perceived as a subdivided beat in a faster tempo. For instance, four successive stimuli presented at the speed of \( \text{\textfrac{4}{4}} = 48 \) would be perceived as two measures while at \( \text{\textfrac{4}{4}} = 96 \) they would rather be experienced as two subdivided beats. The validity of this argument depends, however, on the possibility of defining a fixed reference unit without recourse to the concept of absolute tempo itself. In other words, distinguishing the different levels of the durational hierarchy requires identifying a durational constant against which the length of the experienced time-spans are measured.

This “constant” corresponds, in Lussy’s terms, to the time-span measured by one “comfortable” movement of the hand or of the foot in keeping time: each such movement identifies a unit at the level of the beat.

---

16 Kirnberger, Johann Philipp. *Die Kunst des reinen Satzes in der Musik*. Berlin, 1771–1779. English translation of Volume I and the first part of Volume II as *The Art of Strict Musical Composition* by David Beach and Jürgen Thym. New Haven: Yale University Press, 1982, p.392. Kirnberger writes that “—” means accented, and “•” unaccented. These signs originally represented the long and the short syllables respectively in the scansion of Greek poetry. In eighteenth-century compositional treatises, they are used to represent sometimes the long-short (Matheson), sometimes the stress-nonstress (Koch) distinction.
According to Lussy, the listener is incited to beat time because of the irresistible entrainment produced by the strong beats (downbeats) of the measures. Lussy's employment of "hand" and "foot" movements interchangeably in this argument is a source of conceptual confusion. For, one movement of the foot, controlled by muscles larger and slower than those of the hand, would not necessarily indicate the same durational constant one hand movement represents. It may be that while the hand, operating with smaller and more agile muscles, is more prone to indicate the beats, the foot is more efficient in indicating the level of the measure.

According to Lussy, the measure constitutes the upper limit of the perceived metrical hierarchy. Successive measures present no metrical differentiation – no accentual hierarchy: "there are no strong and weak measures, but only strong and weak beats." In this sense, meter is a local phenomenon. The psychological principle behind this claim, according to Lussy, is that just as the eye cannot embrace too great a space and needs points of reference, similarly the ear is incapable of retaining the feeling of unity, of regularity, when the sound-paths are too far apart; the need for the periodic recurrence of strong sounds weakens when they are too distant from one another.

---

17 "Vous batirez la mesure, tant est irrésistible l'entrainement produit par la régularité de ces sons forts, dont chacun commence une mesure." Traité, p.10. The fact that metric experience invites physical movement has been mentioned by many writers. To my knowledge, the only author who argues against this idea is J.-J. Rousseau. In the article "Battre la Mesure" from Dictionnaire de musique (Paris, 1768) Rousseau writes: "There [is] a popular mistake that a little reflection easily dispels. People believe that a listener instinctively beats the measure of an Air he hears only because he strongly feels it; on the contrary, he beats the measure because it is not perceptible enough or because he does not feel it enough; he tries to supply, by dint of the movements of the hand or of the feet, what his ear lacks in this regard." "Il règne une erreur populaire qu'un peu de réflexion détruit aisément. On s'imagine qu'un Auditeur ne bat pas par l'instinct la Mesure d'un Air qu'il entend, que parce qu'il la sent vivement; c'est, au contraire, parce qu'elle n'est pas assez sensible ou qu'il ne la sent pas assez, qu'il tâche, à force de mouvements des mains et des pieds, de suppléer ce qui manque en ce point à son oreille."

18 "Il n'y a pas de mesures fortes et de mesures faibles. Il n'y a que des temps forts et des temps faibles." Traité, p.137.

19 "Notre oeil ne peut embrasser un tout grand espace et a besoin de points de repère; à plus forte raison notre oreille est-elle incapable de conserver le sentiment de l'unité, de la régularité, quand les sons-jalons sont trop éloignés; son besoin du retour périodique des sons forts s'affaiblit quand ils sont trop distants les uns des autres." Traité, p.37.

---

According to Lussy, the metrical terminology shifts from metric phenome-

nones that mark rhythms with rhythmic attractions. His

---

Metric Accent

In Lussy's theory, the accent is that part of the measure that marks the temporal unit or the movement of the foot. It is the special kind of emphasis that is strong in relation to specific levels of the meter or the measure. The accent is defined as the interval between the first and second beats.

---

Figure 3.4

According to Lussy, the measure above can be subdivided, with each of the two beats divided unevenly.

---

Figure 3.5
According to Lussy, a group of measures—hypermeasure—in recent theoretical terminology—while having perceptual reality, does not constitute metric phenomena. In perceiving a group of measures, the listener operates with rhythmic principles of grouping, which have their source in tonal attractions. Hypermeasure is, therefore, a rhythmic phenomenon.

Metric Accent

In Lussy’s theory, metric accent refers to the dynamic accent or stress that marks the onset of an evenly subdivided durational unit. Its function is to unify, to hold together the sub-segments of a time-span. By Lussy’s definition, metric accent assumes a durational hierarchy. The stress that marks the onset of a single undivided unit does not comprise a metric accent. Lussy states that the metric accent makes the listener feel the measure, the beat and its subdivisions. In this sense, the beginning of a measure as well as the beginning of a beat receives metric accent: it is strong in relation to its subdivisions. Thesis, according to Lussy, is a special kind of metric accent: it marks the beginning of each unit at that level of the durational hierarchy which is experienced as the measure. Thesis, in other words, is the downbeat.

Lussy argues that when a durational unit at a given level of the hierarchy—either at the level of the beat or of the measure—is not evenly subdivided, this introduces extra metric accents into the unit, which otherwise would have only its onset dynamically accented. For instance, in an evenly subdivided 2-beat measure, as shown in figure 3.4, only the first beat is strong.

![Figure 3.4](image)

According to Lussy, the accentual status of the second beat in the example above can be altered by subdividing either the first beat, or the second beat. In either case, the unit perceived as the measure would be subdivided unevenly. Figure 3.5 shows an instance of the former case.

![Figure 3.5](image)
The second beat, which now perceptually becomes a longer stimulus, receives a metric accent: length in Lussy's theory is a factor for stress, and functions as an input to the perception of metric accent. This property of length is based on a more fundamental assumption, which is not mentioned by Lussy. The second beat in example 3.5 is heard as strong because the first beat introduces a metric sublevel, interjecting a stimulus that requires a metric identification by the listener; as meter is by definition hierarchical, the second stimulus is heard as metrically weak; this renders the third stimulus metrically strong in comparison.

According to Lussy, another way of making the second beat of a 2/4 measure metrically strong is subdividing the second beat itself as in figure 3.6.

\[\begin{array}{c}
\text{S} & \text{S} \\
\end{array}\]

Figure 3.6

Lussy does not provide a principle to explain the strength of the second beat in this example. It may be that the onset of a span that involves a greater number of events than do the preceding spans of the same duration is heard as accented.

3. The Nature of Rhythm

Rhythm as Group:

Musical rhythm, in Lussy's theory, is not a fixed number of tones and in this sense is not the basic principle: rather, it is the basic principle of grouping to temporal structure. The grouping of sounds the listener is already familiar with, the complete repository of which is called a musical language.

Lussy's discussion of eighteenth-century musical language structures. He says:

The structures. He says:

...the system of grouping is organized by the listener and is recognized by the music. In line with this view is the authority of Aristotle, who in *Poetics* recognized the necessity and pleasure of rhythm, and points of repose in a piece of music are determined by rhythmic groupings. The grouping of the period in his *Poetics* is that of punctuations is determined by the listener and not by the composer.

According to Lussy, groups are boundary-markers in music; they are...
3. The Nature of Musical Rhythm

Rhythm as Grouping

Musical rhythm arises from the grouping of sounds into sense-units. In Lussy’s theory, repose, manifest in the recognition of the directionality of tones and in the perception of the degree of their attraction to the tonic, is the basic principle with which listeners operate in attributing meaning to temporal structures. Hence, a musical sense-unit is defined as “a group of sounds the last of which brings to the ear the feeling of a more or less complete repose.”20 A group that is terminated by a complete repose is called a musical phrase.

Lussy’s discussion of the nature of rhythmic groups continues the eighteenth-century tradition of establishing analogies with linguistic structures. He states that units of meaning both in language and in music are recognized through the various degrees of repose – or closure – they display. In line with the eighteenth-century theorists, who made recourse to the authority of ancient writers on the art of oratory, Lussy quotes Aristotle, who in his *Rhetoric* argued that a discourse, to be comprehensible and pleasant, needs to proceed through units clearly delineated by points of repose.21 To indicate the hierarchy of closure established by rhythmic groups, Lussy makes use of the comma, the semicolon and the period in his analyses. He writes: “Cadence in music is exactly what punctuation is in discourse ... Different cadences or repose-points correspond to different signs of grammatical punctuation.”22

According to Lussy, there are two basic cues that the listener picks up as boundary-markers of sense-units in perceiving temporal structures such as linguistic discourse and music: these are stimuli with relatively longer durations, and pauses or rests. Lussy argues that in the case of music, these two elements are not sufficient to bring about repose by themselves; they only “confirm” the repose or boundary that the tonal structure establishes. In this sense, they properly belong with the

---

20 “Group de sons dont le dernier apporte à l’oreille le sentiment d’un repos plus ou moins complet.” *L’anacrosie*, introduction.
21 See *Le rythme*, p.1–2.
22 “La cadence est exactement à la musique ce qu’est la ponctuation au discours.” *Traité*, p.52. “Les différentes cadences correspondent aux différents signes de la ponctuation grammaticale.” *Traité*, p.76.
requirements of a comprehensible delivery or performance, and not
necessarily with the conditions defining the comprehensibility of a com-
position.

Lussy argues that the length of a pause observed at the end of the
delivery of a rhythmic group is proportionate to the degree of closure
that group implies. For instance, the pause that follows a phrase is longer
than those following its sub-units. He writes that

just as the punctuation of a grammatical phrase requires shorter or longer rests
according to the more or less complete meaning each word, each group of words
separated [by punctuation] involves, similarly the more or less complete [musi-
cal] cadence [at the end of a group] requires a longer or shorter rest, a silence in
accordance with the [degree] of musical sense [this] group of notes achieves. 23

The fact that performers separate groups of sounds by introducing rests
was already recognized during the eighteenth century. Türk, for instance,
had discussed it as one of the requirements of “clarity” in performance.
He wrote that

if a musician would play through a point of rest in the music without breaking
the continuity – in one breath as it were – this would be as faulty and contrary
to purpose as if, while reading, one would read beyond the point where a phrase
or a sentence ends without interruption. 24

In reference to figure 3.7a, cited in School of Clavier Playing, Türk argued
that its proper execution would be as in figure 3.7b.

Figure 3.7a (above), 3.7b

23 “De même que la ponctuation d’une phrase grammaticale exige des repos plus
ou moins longs, selon le sens plus ou moins complet que contient chaque mot,
chaque groupe de mot qu’elle est destinée à séparer, de même la cadence plus
ou moins complète, selon le sens musical plus ou moins achevé que contient le
groupe de sons dont elle est finale, exige un repos, un silence plus ou moins long.”
Traité, p.52.

24 Türk, Daniel Gottlob. Klavierschule, oder Anweisung zum Klavierspielen für Lehre
und Lernende, mit kritischen Anmerkungen. Leipzig: Schwickeert, 1789. English
translation by Raymond H. Hagg, Lincoln: University of Nebraska Press, 1982
as School of Clavier Playing or Instructions in Playing the Clavier for Teachers and
Students, p.329.

The same point is also made by Krzysztof Kiec-
zynski who wrote that

all the theory about the pauses is succinctly covered
The pauses in the sequence of notes have an
language works essentially through the voice. 25

As an example, figure 3.8b shows its

Figure 3.8a (above), 3.8b

It is difficult to state if the pauses are
ually played by Türk.

Putting forth another argument, musicale has the
the evidence provided.

25 Kleczynski, J. Interpretation, Reeves, 1913,
26 Ibid., p.49.
The same point was expressed, during the nineteenth century, by Kleczynski who wrote in his recollections of Chopin's teaching that all the theory of the style which Chopin taught to his pupils rested on this analogy between music and language, on the necessity for separating different phrases. The pauses [in music] are of great importance: without them music becomes a succession of sounds without connection, an incomprehensible chaos, as spoken language would be if no regard were paid to punctuation and the inflexion of the voice. 25

As an example of the use of rests in grouping, Kleczynski cited the beginning of Chopin's Waltz in A-flat op.69/1, given as example 3.8a. Example 3.8b shows its proper execution.

![Example 3.8a and 3.8b](image)

Figure 3.8a (above), 3.8b

It is difficult to assess whether figure 3.8b reflects the way Chopin actually played the passage, or the influence of Lussy's teaching on Kleczynski, who wrote in reference to grouping in performance that he is "not putting forth any new doctrine, since M. Lussy, in his Traité de l'expression musicale has thrown a brilliant light upon this subject." 26 In either case, the evidence provided by various other students of Chopin confirms the

26 Ibid., p.49.
importance he attached to grouping in performance, effected by pausing and inflections of the sound.  

In accordance with the principle of pausing in delineating rhythmic groups, Lussy argues that the notated durational value of the final note of a group—unless that note is accompanied by the word *tenuto* or slurred to the next note—needs to be shortened in order to make “space” for the following rest. For instance, the groups in figure 3.9a are not notated precisely, as they do not reflect the durational values and rests employed in performance. Figure 3.9b shows the correct notation.

![Figure 3.9a (above), 3.9b](image)

According to Lussy, long stimuli and pauses, which indeed signal to the listener the existence of a group boundary in music, do not by themselves establish the boundaries. For instance, one still needs an account of why the rests in examples 3.7b, 3.8b and 3.9b should occur exactly where they do. The introduction of a rest by the performer presupposes that a group boundary has been recognized. In this connection Lussy writes:

One should not think that it is sufficient to introduce longer notes or rests regularly and fortuitously into a series of sounds to give them a meaning. In addition, the sounds must be subject to the laws of attraction, of appeal that govern our tonal system.  

---


28 “Mais il ne faudrait pas croire qu’il suffit d’introduire d’une manière régulière et fortuite des grandes valeurs, des silences, dans une suite de sons pour leur imprimer un sens. Il faut, en outre, que les sons soient soumis aux lois d’attraction, d’appellation, qui régissent notre système tonal.” *Le rythme*, p. 2.

29 “Le rythme ne peut être gardé que dans une série d’actions ou d’états, et non d’une fin d’une ligne de musique ou d’un silence.”

30 “Grâce à l’autorité que nous avons acquis, nous pouvons nous permettre de décider de la durée des sons et de la longueur d’un silence.”
Repose in music is a function not only of the durational properties of sounds, but more fundamentally of the inherent tendencies of tones for repose, of their degree of attraction to the tonic. Grouping of sounds is therefore due to “attractive forces.”

As Lussy argues, “thanks to the attraction, to the pull that the sounds, vitalized by rhythm, exert on one another, the last [note] in each group brings to the ear the sensation of the end of a more or less complete musical idea, i.e. a repose followed by a rest.”

Lussy calls the durational structure of a group of notes abstracted from their pitch content a “rhythmic schema” (schéma rythmique). He presents all examples of rhythmic schemas in a metric context, and in fact, occasionally refers to them as “metric schemas.” Figure 3.10 shows an example of a rhythmic schema. Lussy states that in accordance with the durational criterion of longer stimuli that can signal the group boundaries to the listener, this schema would be grouped as indicated by the commas.

![Figure 3.10](image)

This, in fact, is the durational structure of the first eight measures of Chopin's Mazurka op.7/2 in A minor, given as figure 3.11. Lussy argues that if durational criteria were sufficient to delineate rhythmic groups, the commas in figure 3.10 would also have to indicate the repose points that the music actually establishes. This, however, is not the case. The first rhythmic group in figure 3.11 ends on the third beat of the second measure, by the repose that the root position A minor tonic chord brings. Similarly, the second group ends on the third beat of measure 4.

---

29 “Le rythme est une force attractive.” *Traité*, p.166.
30 “Grâce à l'attraction, à l'appellation que les sons, vivifiés par le rythme, exercent les uns sur les autres, le dernier de chaque groupe procure à l'oreille la sensation d'une fin d'idée musicale plus ou moins complète, c'est-à-dire, d'un repos, suivi d'un silence.” *Lunacrouse*, p.63.
There are certainly many cases where the group boundaries implied by a rhythmic schema do in fact correspond with those that tonal criteria determine. For instance, in reference to the schema given in figure 3.10, Lussy writes that “it would be easy to find melodies following this design, melodies to which the accentuation resulting from [the grouping of] the schema would fit marvelously.”31 In deed, Chopin's Prelude op.28, no.7 in A major, shown in figure 3.12 opens with durational values very similar to those presented by the schema in figure 3.10. In this case, the tonal points of repose at the beginning of measures 2 and 4 also happen to be the longest stimulus of their respective groups.

According to Lussy, the importance of tonal factors in defining points of repose becomes more evident when rhythmic schema presents uniform elements as in figure 3.13. This is the beginning of the third movement of Beethoven's Piano Sonata op.31/2.

31 “Certs, il serait aisé de trouver des airs calqués sur ce dessin et auxquels l'accentuation resultant du schéma conviendrait à merveille.” Le rythme, p.36.
Although longer stimuli and rests occur regularly in the rhythmic schema
given above, the perception of hierarchical grouping is significantly weak-
ened, for prolonged similarity of stimuli in temporal structures weakens
the sense of beginning and end of groups above the lowest level. When
there is sufficient differentiation between the durational units, as in
example 3.10, one can still perceive a grouping hierarchy even in the
absence of tonal criteria. Hence, the degree of similarity among stimuli
becomes a crucial factor in grouping as it may facilitate or hinder the
perception of a hierarchy. At both ends of the spectrum, when successive
stimuli are either completely identical, or else barely resemble each other,
the listener's sense of "unit" becomes unclear.

Lussy uses the idea of the rhythmic schema to argue against analyzing
musical rhythms with the methods of prosodic analysis. His argument is based on the view that the absence in linguistic structures of
any parameter equivalent to the tonal attractions in music restricts the
analogy theorists have attempted to establish between poetry and music
since the eighteenth century. In response to the growing interest in sub-
jecting musical rhythm to prosodic analysis during the second half of
the nineteenth century — by theorists like Rudolph Westphal and Jules
Combarieu32 — Lussy writes that

modern theorists [of the Neo-Greek school] are mistaken in taking the rhythmic
framework of a Greek poem and arguing that such and such a modern composi-
tion must necessarily and strictly be performed according to this model. Modern
music does not yield to such servitudes ... What characterizes our modern music
is that it [exerts] attractive forces. The Neo-Greek discipline seems to occupy itself
only with the metric design, with the metric schema. We preoccupy ourselves,
above all, with the attractions the notes exert on one another, with their tendency
for repose ... People believe [that there is] identity between the schema of a verse
and that of a [musical] rhythm. [This is a] mistake; there is analogy, similarity,

Leipzig: Breitkopf & Härtel, 1880.
Combarieu, Jules. Les rapports de la musique et de la poésie considérée au points
Combarieu, Jules. Théorie de rythme dans la composition moderne. Paris:
Alphonse Picard et Fils, 1897.
but not identity. Rhythmic units present a great many particularities that verses lack. [Musical] rhythm is not enslaved to any system of versification. As represented by musical notation, rhythm is not only lengthened or shortened, but underlies Lussy's argument in the phenomenon of varying the number of syllables in a line, or in the schema of syllabic breaks. A word of caution is only lengthened or shortened with the same material as the schema: two or more different line lengths and syllabic lengths each with the same number of syllables. Lussy's argument can be analyzed musically, and the procedure of the analysis showing any one kind of poetic syntax break or represent more than one. For example, in Greek meter, the rhythm of French poetry is represented by syllable-count line: all syllables in each unit correspond to syllables per syllable, each syllable last, or the penultimate syllables in the stress. As for the verses of a verse, the latter is represented by syllable-count line: syllables per syllable, each syllable last, or the penultimate syllables in the stress. As for the verses of a verse, the latter is represented by syllable-count line: syllables per syllable, each syllable last, or the penultimate syllables in the stress.
However, precisely because a single syllable in language can be represented by more than one musical event, the schema can be assigned different kinds of verses such that the syntactic breaks do not always appear at the same locations in the schema. For example, the first syntactic break both in line A and line B happens after the word “toi.” However, since this syllable is assigned two musical events in B, the corresponding break in the schema comes after the eighth note in the second measure. This argument is based on a principle which, though not explicitly stated, underlies Lussy’s idea that linguistic structures offer no counterpart to the phenomenon of tonal attractions. When a syllable is represented by two or more different pitches, the tonal attractions necessarily establish a hierarchy and therefore a prolongational unit; the syllable itself, however, is only *lengthened* in declamation or singing through this procedure, and not *prolonged* in the Schenkerian sense. The rhythmic schema, abstracted from the tonal content, is unable to provide information as to the syntactic breaks in the music, because it cannot differentiate between syllabic lengthening and tonal prolongation: it represents both phenomena with the same notational symbols.

Lussy’s argument against the employment of prosodic criteria to analyze musical rhythm is inconclusive. For one, it is not clear whether the procedure of assigning verses to a rhythmic schema as above ends up showing anything more than the fact that the schema cannot efficiently represent musical rhythm; but this point was already demonstrated by the examples given in figures 3.10 and 3.11. Furthermore, Lussy’s use of French verse to refute the arguments of theorists who made use of Greek metrical patterns or feet in analyzing musical rhythm appears unwarranted. Even though there have been several historical attempts to attribute feet structures to the French verse, the scansion of classical French poetry involves counting the number of sounded syllables in each line: all syllables are treated as equal in respect to stress, and metrical units correspond with units of syntax. Stress is a function not of the syllables per se, but of location within the syntactic units: it is always the last, or the penultimate, when the last one is mute – syllable that receives the stress. As Lussy does not clarify the kind of scansion he has in mind for the verses assigned to the rhythmic schema given above – scansion by syllable-count, scansion by patterns of long-short or stress-nonstress – whether his argument points out further relationships between the structure of the verses, the structure of the musical rhythm, and the rhythmic schema representing both kinds of structures cannot be assessed.34
The Grouping Hierarchy: The Incise and the Rhythmic Unit

In Lussy's theory, the smallest level of the grouping hierarchy is called an incise. "Incise" and its German counterpart "Einschnitt" are among the stock terms of eighteenth- and nineteenth-century theoretical writings on phrase structure, which display considerable inconsistency concerning their conceptual designation. For example, both Mattheson and Koch use "Einschnitt" to refer to the smallest unit within the phrase, while according to Kirnberger, it indicates the level just above the smallest unit, which he calls a "Casur," i.e., a caesura. In Türk's Klavierschule, one again finds the terms "Einschnitt" and "Casur" compared. Furthermore, "incise/Einschnitt" is often used to refer both to a phrase-segment and to a cut, i.e., a point of incision in the phrase. Koch, for instance, states that "the resting points in the complete phrases are called incises," and a few lines later writes that "the incise itself is an incomplete segment of a phrase which becomes noticeable through a resting point."35

In Lussy's theory, the term "incise" has a single referent: the smallest level of the grouping hierarchy. However, the term he uses in reference to the level immediately above the incise, namely "rhythm" - or "rythme" following the official change in the orthography of the word around 1880 - presents a problem in translation. Since "rhythm" denotes a tangible segment of a phrase, its English cognate "rhythm", referring rather to the hierarchical structure of a piece resulting from the interaction of durational and tonal patterns, is inappropriate as its translation. Hence, Lussy's "rhythm" will be rendered here as "rhythmic unit." Thus, several incises form a rhythmic unit; several rhythmic units form a musical phrase. The terms "group" and "rhythmic group", as already employed

34 During the sixteenth century, Antoine Baif theorized that the French language consisted of long and short syllables. Although his theories did not gain wide acceptance, the idea of quantitative French meters continued to find advocates well into the nineteenth century. For instance, as late as 1856, Castil-Blaze in his L'art des vers lyriques argued that it is possible to reproduce in French all the metric feet of Greek and Latin prosody. The two authors Lussy cites in reference to French versification in a footnote, i.e. J.M.Lurin (Eléments du rythme dans la versification et la prose françaises), Paris, 1851) and J.A.Ducondut (Essai de rythmique française, Paris, 1856) also employ the long-short distinction in reference to syllables in French.

in the previous sections, will convey the concept of a group without any indication of size or of location within the grouping hierarchy.

According to Lussy, an incise is a fragment of a rhythmic unit and it consists of one or several notes. The most important difference between an incise and a rhythmic unit is that the end of an incise is characterized by an interruption, and not by a repose. In this sense, an incise is an incomplete, inconclusive sense-unit of the musical syntax. The end of the rhythmic unit, on the other hand, identifies a moment of melodic and/or harmonic arrival and repose. Lussy does not elaborate how the criterion of interruption as opposed to repose operates in distinguishing incises from rhythmic units.

In addition to the criteria of length and rest, Lussy identifies two other factors in locating group boundaries at the level of the incise and the rhythmic unit: parallelism and pitch proximity. Parallelism—"analogy" in Lussy's term—refers to both durational and contour similarities between groups. Accordingly, it is one of the most important structural features in music. Lussy writes that

music, the elements of which, among all the arts, are the most fugitive, least stable, require not only repose, but also repetitions, the same passages, the same elements, so that the ear and the mind can grasp the idea and the feeling hidden behind the notes of each phrase, each strophe. The principle of musical phraseology resides precisely in this necessity.

According to Lussy, parallelism often becomes an overriding determinant of grouping. In figure 3.15a, the commas indicate the boundaries reinforced by long note values and parallelism. The boundary between measure 3 and 4 is due to the durational parallelism of the last unit with the first two; the boundary that pitch proximity would have established as in figure 3.15b is overridden by the criterion of parallelism.

36 "La dernière note d'une incise est suivie d'une interruption, mais non d'un repos."
L'acrouse, introduction.
37 "La musique, dont les éléments de tous les arts sont le plus fugitifs, le moins stables exige non seulement des repos, mais encore des répétitions, des mêmes passages, des mêmes éléments, afin que l'oreille et l'esprit en puissent saisir la pensée et le sentiment cachés sous les notes de chaque phrase, de chaque strophe. C'est précisément dans cette nécessité que réside le principe de la phraséologie musicale." In "De la culture du sentiment musical," p.15.
In figure 3.16, the parallelism established by the first two groups is destroyed by the third one. Instead of hearing a boundary between the E and the C in the third measure, which would be effected by the non-proximity of the pitches, the ear chooses to pick out the “difference” of the group from the two previous ones. For according to Lussy, “each group, distinguished by its difference from or resemblance to the preceding or the following [group] evidently forms a unit, a rhythmic unit [or] an incise, depending on its length.”

Lussy presents the groups in figures 3.15 and 3.16 as examples of incises. He argues that each of them by itself does not involve sufficient elements to form a rhythmic unit. Similarly, the first four measures of Mozart’s Piano Sonata K.332 in F major, given in figure 3.17 consist of four incises, which together make up one rhythmic unit.

In discussing groups at the level of the incise, Lussy states that his analyses point out only the potential boundaries implied by the music: the

---

38 "Chaque groupe, dont on distingue la différence ou la ressemblance avec celui qui précède ou celui qui suit, forme évidemment une unité, un rythme, une incise, selon son étendue plus ou moins grande." Traité, p.54.
fact “that one can [delineate] the incises does not mean that one has
to.” 39 The performer may choose to set off larger rhythmic groups, or
only some of the incises within a group.

Figure 3.18 shows Lussy’s grouping analysis of the opening of Mozart’s
A major Piano Sonata K.331. As the first two measures present groups
that are identical in contour and durational values, they form two rhyth-
ic units. The third and fourth measures, according to Lussy, are neither
sufficiently similar nor sufficiently different to require a boundary in
between; hence they group as one rhythmic unit.

![Figure 3.18](image_url)

In reference to 3.18, the often-discussed potential boundaries following
the quarter note E in measure 1, and the quarter note D in measure 2 are
denied by Lussy, who refers to the expressive character of the phrase, in
addition to parallelism, to justify his analysis. He writes that “the melody
includes neither large intervals, nor chromatic notes, nor exceptional note
values. Each of the first two rhythmic units is accompanied by a single
chord. All these facts impart to it a great simplicity, calmness and natural-
ness.” 40 If, Lussy continues, the piece had started with an anacrusis, the
criterion of parallelism would indeed establish boundaries at the cited
locations; but then, the expressive quality of the melody—its simple and
calm character—would disappear. Lussy cites Weckerlin’s adaptation of
Mozart’s melody, given in figure 3.19, as instantiating such anacrustic
rhythmic units. 41

---

39 “Mais de ce qu’un peut faire des incises, il ne résulte pas qu’un doive en faire.” Le
rythme, p.57.
40 “L’air ne renferme ni grands intervalles, ni note chromatique, ni valeur excep-
tionnelle. Chacun des deux premiers rythmes est accompagné par un seul accord.
Tous ces faits impriment à cet air un caractère de très grande simplicité, de calme,
de naturel.” Traité, p.74.
41 Jean-Baptiste Weckerlin (1821–1910) was a French folklorist, bibliographer and
composer.