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Nondirected Linearity and Modulatory Networks in Webern's Op. 10/4

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Resumo

Num livro recente que reúne um conjunto de notas e ensaios sobre música, Eduardo Lourenço apresenta uma leitura poética penetrante de duas obras de Webern – op.10 e op.21 – acentuando o carácter fragmentário, não direccionado e descontínuo destas composições (LOURENÇO 2012, 45-6), uma perspectiva que entra em ressonância com algumas das abordagens analíticas já desenvolvidas sobre este compositor. A partir de BERRY (1976) e KRAMER (1988), pretendo mostrar como as ideias de Lourenço podem ser complementadas com uma abordagem mais fluída e processual, focando aspectos dinâmicos igualmente relevantes na sintaxe musical de Webern.
Como exemplo, apresento uma análise detalhada do op. 10/4, destacando um certo número de tendências progressivas e recessivas (no sentido que lhes dá BERRY) que surgem nesta peça ao nível da textura, da métrica e da estrutura intervalar. Pretendo demonstrar também que estas tendências não têm geralmente uma finalidade previsível, gerando situações de tempo linear não direccionado (na acepção de KRAMER). Ao nível métrico, por exemplo, uma organização clara e uniforme é gradualmente substituída por outra mais ambígua e estratificada, enquanto que ao nível intervalar observa-se uma mudança gradual da ênfase na *set-class* (015) para a *set-class* (012). Como fundamento para a análise intervalar, introduzo dois conceitos teóricos – combinação intervalar e rede modulatória – que permitem organizar as progressões de conjuntos de classes de alturas (*set-class progressions*) segundo o papel mediador das classes intervalares. Isto representa uma nova forma de abordar a estrutura de conjuntos deste andamento, distinta – mas complementar – das abordagens clássicas de FORTE (1973) e LEWIN (1993).

Palavras-chave

Tendências progressivas e recessivas; Tempo linear não direccionado; Combinação intervalar; Rede modulatória.

Abstract

In his recent book collecting short notes and essays about music, Eduardo Lourenço gives an insightful poetic account of two pieces of Webern—op. 10 and op. 21—that stresses the fragmentary, directionless and discontinuous character of such compositions (LOURENÇO, 2012, 45-6), an approach that resonates fairly well with a number of analytical views on this composer. Drawing from BERRY (1976) and KRAMER (1988), I argue that Lourenço's ideas can be complemented with a more fluid, process-oriented approach that focuses on dynamic aspects that are also relevant to Webern's musical syntax.

As an example of that, I present a detailed analysis of op. 10/4, highlighting a number of either progressive or recessive tendencies (in BERRY's terms) that occur in this piece at the textural, metrical and intervallic levels. I also show that the ultimate goal of such tendencies is generally not predictable, creating instances of nondirected linear time (in KRAMER's terms).

At the metrical level, for instance, a clear and uniform organization is gradually replaced by a much more ambiguous and stratified one, whereas at the intervallic level one notes a gradual shift of emphasis from set-class (015) to set-class (012). Supporting the intervallic analysis, I introduce two theoretical concepts—intervallic combination and modulatory network—which allow us to conceive set-class progressions in light of the mediating role played by given interval-classes. This represents a new way of looking at this movement's set structure, different from—but complementary to—classic approaches such as FORTE's (1973) and LEWIN's (1993).

Keywords

Progressive and recessive tendencies; Nondirected linear time; Intervallic combination; Modulatory network.

Introduction: Fragmentation and Discontinuity

> NOTHING WALKS THROUGH these phosphorescent pathways, nobody walks in this labyrinth of echoes, except this silence ascending from the nonexisting well where we think it is buried, in the distressing multitude of sound calls forever without centre. […] Webern […] belongs to that time of the ultimate wisdom that has learned that a table is a stellar desert composed of myriads of fulgurations standing light years apart from each other. He settles down in this henceforth familiar *discontinuum*.[1] (LOURENÇO 2012, 45-6)

Thus Eduardo Lourenço described two specific works of Webern—the *Five Pieces for Orchestra*, op. 10, and the *Symphony*, op. 21—in his recently published book *Tempo da música, música do tempo*.[2] However personal, Lourenço's poetic—and aesthetic—account resonates fairly well with common analytical views on these two works and on Webern in general. For instance the fragmentary and eminently colourful character of Webern's musical textures—suggested by such expressions as 'myriads of fulgurations standing light years apart from each other' and 'phosphorescent pathways'—is commonly identified as a landmark of his style, as when Richard Taruskin notes that Webern's 'kaleidoscopic fragmented texture(s) (have) often been compared with the painterly technique known as pointillism' (TARUSKIN 2009, 731). In fact, Webern's textures are often split into a multitude of small figures, such as isolated notes or two or three-note

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[1] In French in the original (my translation): 'Rien ne chemine au long de ces allées phosphorescentes, personne dans ce labyrinthe d'échos, sauf ce silence qui monte du puits inexistant où nous croyons qu'il est enselevi, dans la multitude désolante des appels sonores à jamais sans centre. […] Webern […] appartient à ce temps de la dernière sagesse qui a appris qu'une table est un désert stellaire composé de quelques myriades de fulgurations séparées par des années-lumière. Il s'y installe dans ce *discontinuum* désormais familier'. Eduardo LOURENÇO, 'Webern, *5 pièces, op. 10, 2ème symphonie, op. 21*', *Tempo da música, música do tempo*, pp. 45-6 (undated excerpt).

[2] This book collects many small notes and essays about music that Eduardo Lourenço wrote throughout his life.

melodic gestures, which are somehow akin to individual points or tiny dots in a pointillist painting. Such a fragmentation involves also a kaleidoscopic sense, as each of such figures usually has its own particular timbre and therefore new sonority combinations keep appearing over the course of a piece, implying an unusual degree of timbral volatility.

Lourenço's remark that the 'sound calls' have no centre is also quite insightful. In contrast to temporal progression in tonal music, which depends on a perceptible and conventional determined tonal center as the ultimate goal of harmonic motion; or in contrast to other post-tonal languages (such as Bartók's or Stravinsky's) which contain referential or centric harmonies, in Webern's case there seems to be no sense of progression toward an expected tonal centre. Actually, Lourenço's observations seem to reach one step further, suggesting that the notion of movement is practically of no use here: 'Nothing walks through these phosphorescent pathways'. The motionless, static character Lourenço attributes to the music seems therefore to be implied by the fragmentation and discontinuity of the musical texture, as the centreless sound calls—or 'fulgurations'—are kept separated 'light years apart from each other' and therefore cannot really move.

Silence becomes essential for Lourenço in the context of fragmentation and discontinuity, as he adds: '[the music] makes silence sing, the silence to which the emergence of the sonorous fulgurations seems to serve as a safeguard'[3] (LOURENÇO 2012, 45). It is as if silence (or emptiness) were the fundamental basis of Webern's music—a basis only occasionally interrupted (and coloured) by short musical figures. To Lourenço's perspective one might add that the way metre usually operates in this music also contributes to giving such a role to silence. Metrical structures in Webern tend to be quite ambiguous and volatile, and some of his music might even be described as a-metrical.[4] Even though the composer uses traditional time signatures, it is frequently impossible from a perceptual point of view to differentiate upbeats from downbeats; furthermore, it is not even possible, many times, to perceive a steady beat or pulse. This is usually implied by the sparseness of the texture, as well as by the irregularity of the rhythms. As a result of that we might hear musical sounds as isolated from each other, thus giving more prominence a neutral (and silent) background that, so to speak, is only occasionally coloured by sounds. As Barbara Aniello states in her prologue to Lourenço's book, the author has correctly intuited that 'the Webernian silence is not only an insertion of pauses in between the notes, but rather a sign of a valorization of emptiness that takes possession of the musical score, replacing the musical sounds in that role'[5] (LOURENÇO 2012, 25).

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[3] In French in the original (my translation): '[la musique] fait chanter le silence auquel le surgissement des fulgurations sonores semble servir de rempart'.

[4] This issue is discussed in more detail below.

[5] In Portuguese in the original (my translation): 'o silêncio weberniano não é apenas a inserção de pausas entre as notas, mas sinal de uma valorização do vazio que toma posse da pauta, substituindo-se aos sons'.

Tendencies and Nondirected Linearity

This short essay by Eduardo Lourenço raises many important issues regarding the temporal structure of Webern's op. 10 and op. 21. In particular, it stresses its fragmentary, directionless and discontinuous character. In spite of the undeniable pertinence of these ideas (easily extendable to virtually all Webern's works), I argue that by placing too great an emphasis on ideas of stasis and discontinuity one runs the risk of leaving behind many dynamic and process-oriented aspects that are relevant to Webern's musical syntax. In fact, one is often able to detect temporal tendencies in the behaviour of texture, rhythm, metre and intervallic pitch structure in this repertoire. That is, any of these musical parametres can originate an evolving pattern over time, moving from one initial state toward a final one. By definition, these evolving patterns—or tendencies—have a dynamic and process-oriented (not static) character, and they often imply an underlying continuity.

As an example of such dynamic processes, numerous authors have traced the tendency for the gradual unfolding and filling out of chromatic pitch space in the music of Webern (as well as other Second Viennese School composers), such that chromatic completion serves a stabilizing, cadential function. Such saturation process happens not only in the serial period, in which this tendency is implied by the compositional method itself, but also in the previous free atonal period. Thus, 'in Schoenberg's music after 1908, […] the filling out of the chromatic space is clearly a movement toward stability and resolution' (ROSEN 1975, 69). Webern himself wrote something along the same lines apropos the *Sechs Bagatellen*, op. 9, by asserting that he had 'the feeling that when the twelve notes have been played the piece is over' (WEBERN 1960, 51). It comes as no surprise, then, that many Webern analyses have dealt with the gradual filling out of the chromatic space and with the implied issue of complementation (the combination of sets to produce the chromatic aggregate).[6]

An example of a more thorough process-oriented analytical approach to Webern's music comes from Wallace BERRY's (1976) book *Structural Functions of Music*. There he analyses a number of pieces by Webern within the wider framework of his general theory about the musical structure, which he defines in dynamic terms: 'musical structure may be said to be the punctuated shaping of time and "space" into lines of growth, decline, and stasis hierarchically ordered' (BERRY 1976, 5). These lines of growth and decay correspond to progressive and recessive tendencies respectively, which can appear in different musical elements such as melody, harmony, tonality, metre, texture or timbre. An increasing density, for instance, is a progressive tendency at the textural level; and a movement of return to the tonic is a recessive tendency in the harmony. On the basis of this theory, Berry analyses a wide corpus of works (from medieval to contemporary music), including no fewer

[6] This analytical strategy is explored, for instance, in MARVIN (1983), KABBASH (1984) and LEWIN (1993).

than seven Webern analyses, in which he focuses on progressive and recessive tendencies at the tonal, textural and metrical levels.[7]

No matter how undeniable the existence of such tendencies in the music of Webern seems to be, it also seems to be true that their ultimate goal is in most cases not predictable. In other words, the music follows certain evolving patterns but we cannot really anticipate what their final goal is. In his book *The Time of Music*, Jonathan KRAMER (1988) calls this sense of temporality nondirected linearity, defining nondirected linear time as the 'temporal continuum determined by progression toward unpredictable goals' (KRAMER 1988, 455). He further opposes nondirected to directed linearity, defining the latter—typical, though not exclusive, of tonal music—as follows: 'goal-directed (linear) time [is the] temporal continuum in which events progress toward predictable goals' (KRAMER 1988, 455). According to Kramer, nondirected linearity is particularly characteristic of the Second Viennese School atonal music. He notes:

> Music exhibiting this special time sense, which I am calling 'nondirected linearity', is, like tonal music, in constant motion, but the goals of this motion are not unequivocal. […] Such music carries us along its continuum, but we do not really know where we are going in each phrase or section until we get there (KRAMER 1988, 39-40).

Drawing upon Berry's and Kramer's theoretical approaches, I propose to analyse a single movement—op. 10/4—taken from one of the pieces commented on by Eduardo Lourenço. My analysis discusses a number of instances of nondirected linearity, where either progressive or recessive tendencies occur at the textural, metric and intervallic levels.[8] It should be noted that the analytical emphasis on process-oriented and dynamic aspects of Webern's music is not intended to refute Lourenço's ideas about fragmentation and discontinuity; on the contrary, I fully recognize that they are crucial for the musical character and that they may even represent the main element of disruption from nineteenth century notions of phrase and form (and in this aspect Webern is certainly more radical than either Schoenberg or Berg). I argue, however, that despite the discontinuity and stasis on the musical surface there is also a more continuous and dynamic (perhaps even organic) logic governing the piece as a whole.

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[7] Some aspects of these analyses will be summarized below.

[8] This means I will be more focused on intervals than notes, and I shall not discuss the issue of the gradual filling out of the chromatic space. Concerning these (undeniably important) pitch-related issues, see JOHNSON (1978) and LEWIN (1993).

Analysis: Nondirected Linearity in Op. 10/4

Figure 1. Webern 'Fünf Stücke für Orchester op. 10/4' © Copyright 1923, 1951 by Universal Edition A.G., Wien/PH 449

Texture

Webern's op. 10/4 is clearly divided into three sections (see the full score in Figure 1, and a formal diagram in Figure 2).[9] A brief silence in bar 1 separates the first from the second section, the former dominated by plucked string timbres (mandolin and harp), the latter by sustained sounds and

[9] This formal division is shared by FORTE (1973), JOHNSON (1978) and LEWIN (1993).

melodic lines (mostly) in the winds. The separation between the second and the third sections takes place around the second beat of bar 4, as a slow, descending gesture in the trombone terminates (clearly inducing a cadential feeling), while a number of faster, more rhythmic figures start in the snare drum, harp, celesta and mandolin (bringing about a major change in the texture).

There are two main textural elements in this piece: melodic gestures (implying motion between two or more notes); and static figures (one single, motionless note). The latter further subdivide into sustained figures (a single, more or less long note) and articulated figures (a repeated note). Articulated figures can be either continuous (no pauses in between the various attacks) or discontinuous (with pauses). Figure 2 represents the textural structure of the movement according to this taxonomy, making clear its fragmented and volatile character as discussed by Eduardo Lourenço.[10]

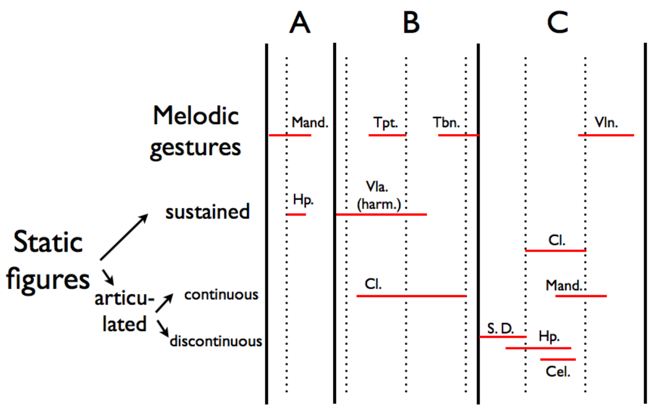

Figure 2. Webern, op. 10/4: formal and textural structure[11]

Two examples of nondirected linearity at the textural level are immediately apparent from this diagram. One notices, first, an increase in the number of static figures per section: only 1 in the first section; 2 in the second; and 5 in the third. This progression—1-2-5—bespeaks a clear linearity, more specifically (in Berry's terms) a progressive tendency. However, this linearity is nondirected, since the final goal of this progression is not predictable in advance. One could not anticipate, in fact, that the progression would stop at number 5: it could have finished at a bigger, or at a smaller number. It is only when we get to number 5, and stop there, that we realize that this was the final goal of the progression. Such a goal, therefore, is unpredictable, implying (in Kramer's terms) a nondirected linearity.

[10] The trill in the clarinet can be interpreted either as a sustained or as an articulated, continuous figure. Hence its position in the diagram.

[11] Continuous lines represent sections, whereas dotted lines represent bars.

The second example regards the temporal position of the melodic gestures within each section. In the first section, the melodic gesture appears at the outset—only later does the static figure appear. In the second section, the static figures appear before the melodic gestures—the latter, nevertheless, still appear at a relatively early point in the section. In the third section, the melodic gesture comes only at the very end. In order to calculate more rigourously the entrance point of the melodic gesture in each section, one can start by noting that in section A, made up of seven quavers, the melody appears at the very beginning of the section; in section B, made up of sixteen quavers, the melody appears at the beginning of the fourth quaver; and in section C, made up of fourteen quavers, it appears at the start of the second third of the ninth quaver. If one now normalizes the temporal extension of each section to a common scale (0 to 1), one concludes that the melodic gesture begins at point 0, in section A; at point 0.19, in section B; and at point 0.62, in section C. This progression—0-0.19-0.62—evidences a nondirected linearity, for the same reasons as the previous example did.

Metre

(a) Introduction

Addressing the problem of rhythmic organization in Webern's music, Allen Forte declares that 'the traditional concept of metre, which is closely linked with tonal music, may not be especially useful in approaching the problem and might even hinder a fruitful investigation of pitch-rhythm organization' (FORTE 1980, 91). Thus he forgoes the traditional categories of upbeat and downbeat, elaborating his analysis in durational terms exclusively.

Not all authors, however, share such a radical approach. For example, many analyses of the metrical structure of Webern's *Variations*, op. 27, were published in the 1960s. Some authors argued for the relevance of the notated metre (CONE 1960; LEWIN 1962), whereas other authors claimed the music is ruled by an alternative metre, different from the notated one (JONES 1968).

More recently, two other authors have investigated more thoroughly the issue of metre in Webern's music: the already mentioned Wallace Berry, in *Structural Functions of Music*, and Christopher HASTY (1997), in *Meter as Rhythm*. Both of them trace metrical structures in pieces that, for most theorists, would most likely be seen as entirely a-metrical, especially those pieces that do not even project a steady, regular beat: such is the case of Webern's op. 11/3 (analysed in BERRY 1976, 397-401), and op. 22 (analysed in HASTY 1997, 257-75). To be sure, both of them acknowledge the high degree of ambiguity and volatility displayed by such structures: according to Berry, 'That Webern's music is a language of often elusive definition is apparent in almost any of his works' (BERRY 1976, 400); and regarding op. 22, Hasty states that 'the metrical grouping of sixteenth notes is highly variable and often ambiguous, with the result that in many cases it is difficult to say whether a sixteenth note is beginning or continuation' (HASTY 1997, 257). Actually, if they regard such pieces as metrical at all, it is because their concept of metre differs from the more conventional one.[12] Thus, for Berry, metre is a particular type of grouping determined by accent (*accent-delineated grouping*), in which each metrical unit has a main impulse (*iniciative impulse*), 'in relation to which surrounding impulses […] can be seen as "reactive", "anticipative" (anacrustic), or "conclusive"' (BERRY 1976, 320). In this theoretical framework, 'metric structure is neither necessarily regular nor necessarily coincident with notated bar-lines' (BERRY 1976, 318). Hasty, for his part, raises objections to the traditional view of metre as a predetermined structure, as something independent of the music. Drawing upon the concept of projection, he proposes to regard metre as a dynamic, real-time process, and he concludes: 'It is the directed movement away from one moment and toward another which constitute meter' (HASTY 1981, 188; quoted in KRAMER 1988, 93). Thus he replaces the traditional opposition of strong *versus* weak beats by a new pair of metrical functions: beginning *versus* continuation.

It is not necessary fully to embrace these two theories to be able to trace metrical elements in Webern's op. 10/4. In my analysis, I intend to show that metre is at first relatively clear, becoming more and more complex and ambiguous as the piece proceeds. The main theoretical assumptions guiding my analysis are taken from Jonathan Kramer's *The Time of Music*, more specifically its fourth chapter ('Meter and Rhythm'). They may be summarized as follows:

1) Metre is 'an essentially regular […] punctuation of time by timepoints that are accented to varying degrees' (KRAMER 1988, 98). Such durationless timepoints (analogous to points in the geometric space) are usually referred to as beats, and, therefore, the concept of metre is linked to a (potentially multileveled) hierarchy of strong *versus* weak beats.

2) Metre and rhythm are different musical structures: the former is cyclic and comprised of beats, whereas rhythmic groups, in general, are not cyclic, and are comprised of musical notes. In sum, metre is a more stable and abstract structure, whereas rhythm is more variable and concrete. In Kramer's own words: 'Rhythm is a force of motion, while meter is the resistance to that force' (KRAMER 1988, 83).

3) Metre is not independent of the music, nor a mere abstract grid. As Kramer says, 'Meter is not separate from music, since music itself determines the pattern of accents we interpret as meter' (KRAMER 1988, 82). This determination usually takes place at the beginning of a piece. After that, the metre tends to perpetuate itself, unless it is considerably (and persistently) contradicted by the music. In such cases, the metre may change, become ambiguous or even disappear.

[12] The more conventional view requires metre to be regular, or at least fundamentally regular, with only occasional irregularities (see LERDHALL and JACKENDOFF 1983).

4) Therefore, in ambiguous contexts the perception of metre is especially sensitive to accentual patterns on the musical surface.

(b) Analysis

Figure 3 shows how I interpret the metric structure of this movement, taking into account the two basic textural components I have identified above (melodic gestures and static figures). In the diagram, I distinguish the notated metre, represented with dotted lines, from what I consider to be the real metre, represented with continuous lines. When they coincide, as at the beginning, I use a continuous line only. The notated metre (3/4) is constant and applies to all instruments; the real metre, however, varies and is not always the same in all textural components at a given moment. The three successive (real) metres are marked as ‘Metre 1’, ‘Metre 2’ and ‘Metre 3’. In them, I have placed dots above certain notes: smaller dots represent beats (the timepoints that punctuate the flow of the music), whereas larger dots represent downbeats (relatively accented beats). I have also put question marks around some of these dots, marking cases of ambiguity; the more questions marks there are, the greater the ambiguity. Let us then characterize the metric structure of this movement, in each of its sections.

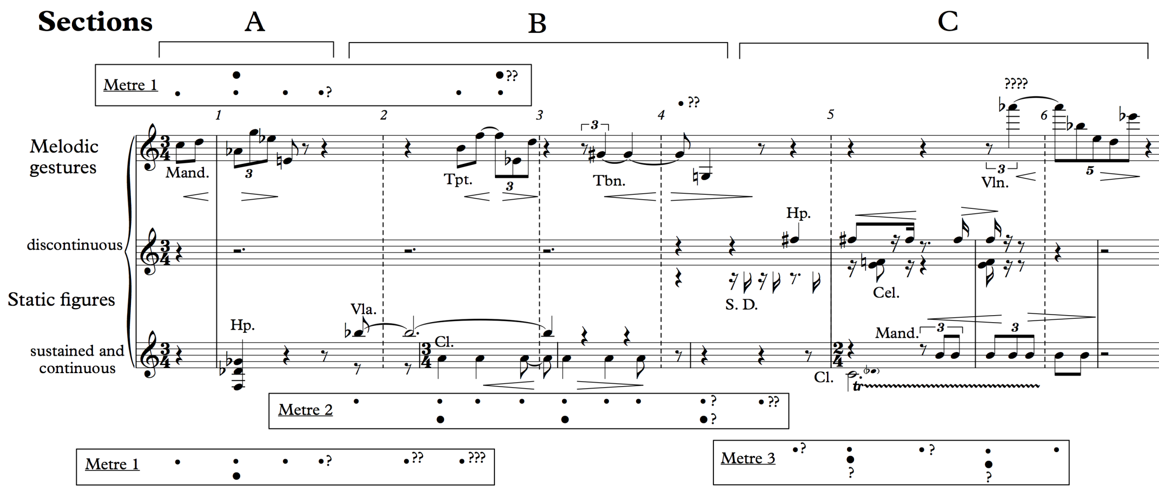

Figure 3. Webern, op. 10/4: metric structure

In the first section, one clearly senses a crotchet beat, as what happens on the notated beat (the C, A♭ and E in the mandolin, as well as the chord in the harp) is clearly perceived as more accented than what happens elsewhere (the remaining notes in the mandolin). Furthermore, an accentual hierarchy among such beats is suggested. The first beat in particular (at bar 0) is clearly sensed as weak (as an upbeat) and the following beat as strong (as a downbeat). There are two basic reasons for that: first, the crescendo to the A♭ in the mandolin, creating a local climax there; second, the fact that the chord in the harp coincides with that climax. Both factors create a strong sense of direction toward that beat, giving it a clear metric accent, which coincides with the notated metre. After that, the second beat in bar 1 is clearly perceived as weak, as receding from the previous impulse. This is the first metric situation to emerge in the piece ('Metre 1', in the diagram).

As the first section has introduced a steady crotchet beat, we expect it to continue; therefore, a new musical event on the third beat of bar 1 is predictable. That does not happen, however, as the next event (the viola harmonic) starts one quaver later. At first, one may regards this as a syncopation. However, when bar 2 starts without any articulation, the steadiness of the initial beat seems to be put into doubt: one may wonder whether the initial metre is still operative (hence the question marks in the diagram). The first articulation in this bar is heard in the clarinet, again one quaver later. Actually, all six articulations in the clarinet happen in the second quaver of the notated beat. As a consequence, a new crotchet beat seems to emerge, one, however, that does not coincide with the notated metre, as the real beat lags behind the notated metre by one quaver. This metre, identified as 'Metre 2' in the diagram, applies to all the articulations in the static figures (that is, to the viola harmonic and to the repeated notes in the clarinet).

One may ask whether there is an accentual hierarchy among this metre's beats. On the one hand, the music seems to be too undifferentiated, too homogeneous for a hierarchical structure to be projected: there is just one sustained note in the viola, and all the notes in the clarinet are equal in terms of pitch and duration (except the last note, which is shorter). On the other hand, one certainly hears a crescendo in the clarinet from the second to the fourth note, and a diminuendo subsequently. One may argue that this makes the fourth note in the clarinet relatively more accented. Also, one might feel the first note as relatively accented, for the simple reason that it initiates the clarinet gesture. One would thus hear such beats as strong, and all the others as weak. This suggests a 3/4 metre: again, not the notated 3/4, but one that lags behind it by one quaver ('Metre 2', in the diagram). In this context, one might even hear the final note in the trombone as the beginning of a new bar (despite the fact that its crescendo and diminuendo do not confirm such an interpretation, as they are now aligned with the notated metre). To sum up, if a steady beat still seems to be perceivable in this section, the differentiation between strong and weak beats is now less clear, more ambiguous. In any case, one can surely say that a sort of metric modulation has occurred (the progression from 'Metre 1' to 'Metre 2'), as the new musical information has forced us to hear a new metre gradually replacing the previous one.[13]

[13] For the previous metre to have continued, it would have to have been much more solidly established and confirmed. Only in such a case would it attain enough stability not to be disrupted by the irregularity in the rhythmic writing, allowing us to hear the notes in the viola and clarinet as syncopations. The initial metre, however, is not even established in a fully unambiguous way. To be sure, the succession weak-strong-weak is quite clear, but the notated 3/4 is never entirely perceptible.

However, this new metre does not apply to the melodic gesture in the trumpet, which seems to be more aligned with the notated metre, especially as its rhythm is heard as a variation of the previous rhythm in the mandolin. In both rhythms, in fact, one finds two quavers and a triolet, the difference being that the trumpet (unlike the mandolin) ties the second quaver to the first note in the triolet.[14] All the same, compared to the first section, the sense of beat (and downbeat) is now much weakened, especially due to the lack of a new articulation at the beginning of the melody's second beat (the very beat that was previously more accented).

To sum up, as one compares the first and second sections one senses a much greater degree of metric complexity and ambiguity in the latter. First, whereas a single metre applied to the whole texture in the first section, metre now becomes stratified: static figures have one metre, the melodic gesture in the trumpet another one. Second, both second section metres are more ambiguous, less clear than the first section's, as the differentiation between strong and weak beats is now less evident; in the case of the trumpet, even the sense of beat is weakened. Third, it is not clear whether the trombone's gesture, and particularly its last note, is aligned with 'Metre 2' (as the rhythm suggests) or with 'Metre 1' (as the dynamics suggest).

The stratification of metre among static figures and melodic gestures is kept in the third section (Figure 3). Regarding the static figures, one notices a much greater rhythmic complexity, as well as a denser texture. More specifically, one hears a variety of rhythmic patterns superimposed on top of each other, some of them quite irregular and unpredictable (especially so in the case of the snare drum, harp and celesta). Such complexity notwithstanding, one still seems to be able to perceive a crotchet beat, actually coincident (as in the first section) with the notated beat. This happens because there are important articulations at the beginning of (almost) all notated beats: for example, on the third beat of bar 4 (the first note in the harp), as well as on the first beat of bar 6 (initiating the final group of two quavers in the mandolin). Even more importantly, whenever two or more instruments join together playing notes simultaneously, we invariably find ourselves on a notated beat: clarinet and harp, on the first beat of bar 5; harp, celesta and mandolin, on the third beat of bar 5.[15] Because of that, one might even hear such beats as particularly accented—that is, as downbeats—giving rise to a 2/4 metre ('Metre 3', in Figure 3). Still, the sense of beat (as well as beat hierarchy) is definitely less evident (and more disputable) than it was before, not only because of the rhythmic complexity, but also because the initial gesture in this section (in the snare drum)

[14] We can apply here one of LERDHAL and JACKENDOFF's (1983) rules of preference for the determination of metric accent: 'Where two or more patterns of note durations repeat, they should preferably receive the same metric interpretation each time they are heard' (quoted in KRAMER 1988, 108)—obviously adapting the rule for this case in which the pattern of note durations is not exactly the same, but very similar.

[15] The importance of this moment is further reinforced by the fact that both the celesta and the harp end their gestures here.

does not have any clear metric structure at all. Besides, there is one beat (the second beat of bar 5), which does not receive any articulation, creating additional uncertainty.

As far as the melodic gesture in the violin is concerned, its articulations seem to be completely out of phase with the prevailing beat: in fact, not a single of its five notes is articulated on a notated beat. There is, to be sure, a certain rhythmic regularity, as the last four notes all have the same duration. This does not seem to be enough, however, for us to perceive a new beat. Actually, we had crotchet beats in all previous cases, which makes it very difficult for any different beat—such as this one would be—to emerge.

To summarize, a number of linear tendencies at the metric level is detectable in this movement, leading us from an initial situation of substantial clarity and uniformity, toward a final one, much more complex, ambiguous and multiple:

1) While a clear and unique metre governs the first section, subsequent metres are gradually more ambiguous and become stratified into two textural levels.

2) Regarding the static figures, their rhythms become increasingly more complex, both individually as well as taken as a group. Not only does this create an increasing density in the texture, but also it makes the perception of a regular (crotchet) beat less clear, especially when one compares the second to the third section.

3) Regarding the melodic gestures, after a clear metric structure at the beginning, one finds an increasing ambiguity, as the second melodic gesture (in the trumpet), although connected to the first one (in the mandolin), has the sense of beat (and beat hierarchy) considerably weakened, and as the last melodic gesture (in the violin) is totally out of phase with the prevailing metric schemes.

All these processes are clearly nondirected, as their specific goal is not predictable in advance. The metrical disintegration could have actually gone still further, or it could have stopped earlier. One can feel that the metre is becoming more ambiguous, but one cannot predict how much change will there be. Hence, in Kramer's terms, these tendencies reveal a nondirected linearity.

Intervallic Structure

(a) Theoretical Introduction

Nondirected tendencies are also traceable at the intervallic level. I shall argue, more specifically, that three set-classes play an essential role in this movement—(012), (015) and (026)—and that their relative emphasis varies as the piece proceeds, allowing us to define three set-class progressions: from (026) to (012); from (026) to (015); and from (015) to (012). Common interval-classes play an important mediating (or modulatory) role in such progressions, as I intend to show: for instance, interval-class (01) plays an important mediating role as we move from (015) to (012), being common to both of them; the same goes for interval-class (02) as we move from (026) to (012), and for (04) as we go from (026) to (015). Needless to say, such interval-classes (01), (02) and (04) could have also played a mediating role in the inverse progressions: (012) to (026), (012) to (026), and (015) to (026), these progressions, however, are not explored compositionally in this movement.

Prior to the analysis, it will be useful to explore these relationships at a purely theoretical level. Let us start by representing them on an equilateral triangle (Figure 4): the set-classes appear at the vertices, the common interval-classes (linking such set-classes) at the respective edges. The diagram is redesigned in Figure 5, swapping the content of vertices and edges: set-classes now appear at the edges, and common interval-classes at the vertices. This allows us to see, for instance, that set-class (026) combines interval-classes (04) and (02), whereas (015) combines (01) and (04). Putting it somewhat differently, one could say that set-class (026) is generated by the interval-classes (04) and (02), or that (012) is generated by (01) and (02). Interval-classes (01), (02) and (04) would, then, be seen as generating—through various combinations—the main set-classes in the piece.

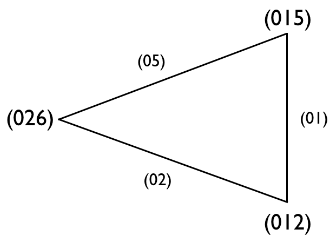

Figure 4. Webern, op. 10/4: the three main set-classes connected by common interval-classes

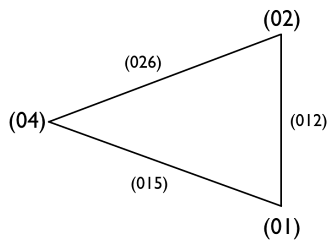

Figure 5. Webern, op. 10/4: The three main set-classes generated by interval-class pairs

This discussion evokes Richard Cohn's notion of transpositional combination—particularly the idea of generating a higher-cardinality set-class by combining lower-cardinality set-classes (in this case dyadic set-classes, that is, interval-classes). Cohn defines transpositional combination as 'a binary operation which takes as its operands two set-classes, and adds the value of each element in the prime form of the first operand to that of each element in the prime form of the second operand'

(COHN 1988, 27-8). For example, if we take (01) and (04) as the two operands, we get set-class (0145) (Figure 6a). What this means is that whenever one combines an interval belonging to (01)—a minor second, major seventh, or their compounds—with its transposition by any interval belonging to (04)—major third, minor sixth, or compounds—one always gets a member of (0145). Figure 6 shows two examples: in (b), a minor second is combined with its transposition by a major third; in (c), a major seventh is combined with its transposition by a minor sixth. In both cases, the resulting pitch-class set—[G A♭ B C], in (b), and [A B♭ C♯ D], in (c)—is a member of set-class (0145). The general result would be represented, in Cohn's terms, as follows: (01)*(04) = (0145).[16]

*	0	1
4	4	5
0	0	1

(a)

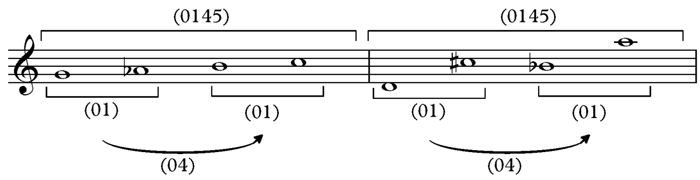

Figure 6. Transpositional combination of interval-classes (01) and (04)

According to Figure 5, however, what would result from combining interval-classes (01) and (04) would be the (015) trichord—not the (0145) tetrachord. In what sense, then, can we understand (015) to be generated by (01) and (04)? The answer is simple: by transposing only one element of the original dyad, instead of transposing them both, as in Cohn's transpositional combination. Depending on which element is transposed, however, and also on the (ascending or descending) direction of such transposition, different results arise (Figure 7). For instance, if we combine the dyad [B C] with the transposition of its second element—the C—by four ascending semitones, one gets [B C E], a member of set-class (015) (Figure 7a); however, if the second element is transposed by four descending semitones, one gets a member of (014), namely [B C A♭] (Figure 7b); should the same dyad, [B C], be combined with the transposition of its first element—the B—the results would be inverse, as we would get a member of (014), [B C D♯], when B is transposed by four ascending semitones (Figure 7c), and a member of (015), [B C G], when B is transposed by four descending semitones (Figure 7d). In general, whenever one combines any interval belonging to (01) with the transposition, by four ascending semitones, of the element represented by '1' in (01)—that is, the note that stands one minor second above or one major seventh below the other note—one gets a member of set-class (015). This operation can be represented as follows: (01) * *[0+]* (04) = (015)

[16] In fact, Cohn simplifies this notation when the operands are interval-classes (that is, dyadic set-classes). This particular operation would be represented as follows: 1*4 = (0145).

(Figure 7a), in which *[0+]* specifies how the transpositional interval (04) is applied to the initial (01) set: that is, by leaving the first element unchanged (hence the '0') and transposing the second element by four ascending semitones (hence the '+'). Likewise, the formula (01) * *[-0]* (04) = (015) (Figure 7d) indicates that whenever one combines any interval belonging to (01) with the transposition, by four descending semitones, of the element represented by '0' in (01)—that is, the note that stands one minor second below or one major seventh above the other note—one gets a member of set-class (015). The formulae (01) * *[0-]* (04) = 014 and (01) * *[+0]* (04) = (014) (Figure 7b-c) can be read in the same fashion. This reasoning shows that (014) and (015) can both be generated by combining interval-classes (01) and (04), suggesting a strong affinity between those trichords.

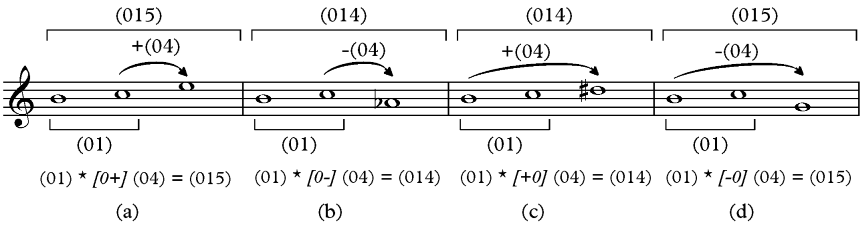

Figure 7. Several combinations of (01) and (04), transposing only one element of the initial dyad

These formulae can be adapted to the case of Richard Cohn's transpositional combination. Figure 6b is, then, a particular case of the formula (01) * *[++]* (04) = (0145), showing that whenever one combines any interval belonging to (01)—in this case, [G A♭]—with the transposition of both its elements by four ascending semitones, one gets a member of set-class (0145)—in this case, [G A♭ B C]. Likewise, Figure 6c is a particular case of the formula (01) * *[--]* (04) = (0145), showing that whenever one combines any interval belonging to (01)—in this case, [C♯ D]—with the transposition of both its elements by four descending semitones, one also gets a member of set-class (0145)—in this case, [A B♭ C♯ D].

These two situations—Figures 6 and 7—can be seen as two different types of *intervallic combination*, that is, different ways of combining two interval-classes, X and Y—or, more rigourously, of combining one interval belonging to interval-class X with the transposition of (one or two of) its elements by an interval belonging to interval-class Y. Let us call the case in which only one element is transposed as intervallic combination of Type A (as in Figure 7); and Type B when both elements are transposed (as in Figure 6).[17] Actually, one could still envisage another type of intervallic combination—Type C—in which the interval of transposition would be applied to

[17] Evidently, the latter type matches Cohn's transpositional combination with dyads.

both elements in the original dyad—as in Type B—but in opposite directions. In the case of interval-classes (01) and (04), for instance, such an intervallic combination could be represented as follows: (01) * *[-+]* (04) or, otherwise, (01) * *[+-]* (04). Figure 8 shows an example for each of these formulae, showing that they yield different results: (0158), in the first case; and (0347), in the second one.

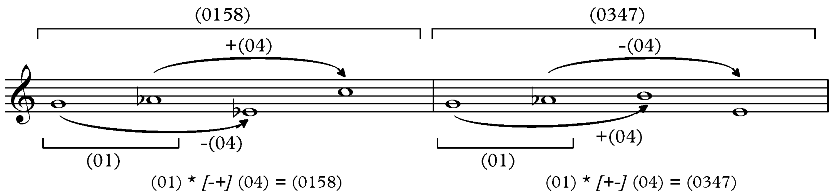

Figure 8. Type C combinations between (01) and (04)

A summary of all these results is given in Table 1, showing all possible intervallic combinations between (01) and (04)—that is, (01)*(04). The results of the inverse process—(04)*(01)—are also presented, revealing that they are not always the same: they are the same for types A and B, but different for type C. One could actually demonstrate, in general terms, that intervallic combinations of type A and B are commutative (X*Y = Y*X), whereas those of type C, in most cases, are not.

	Type A				**Type B**		**Type C**	
	[0+]	*[0-]*	*[+0]*	*[-0]*	*[++]*	*[--]*	*[-+]*	*[+-]*
(01)*(04)	(015)	(014)	(014)	(015)	(0145)	(0145)	(0158)	(0347)
(04)*(01)	(015)	(014)	(014)	(015)	(0145)	(0145)	(0156)	(0134)

Table 1. Summary of the intervallic combinations between (01) and (04)

Table 2 shows the results of intervallic combinations of type A and B for all possible interval-class pairs.[18] Two important conclusions can be drawn from this table. First, a given pair of interval-classes can generate different set-classes, suggesting a strong affinity between the set-classes thus formed. For instance, there is a strong affinity between (015), (014) and (0145), as all of them can be generated by combining (01) and (04). Second, a given set-class can be generated in many ways: for instance, (015) can be generated either combining (01) and (04), (01) and (05), or (04) and (05).

[18] Since type A and B are commutative, the results can be read in the opposite direction as well. For example, the results of (01)*(02) are the same as those of (02)*(01).

Interval-classes (generators)	**Intervallic combination of type A—*[0+]* or *[-0]***	**Intervallic combination of type A—*[0-]* or *[+0]***	**Intervallic combination of type B—*[++]* and *[--]***
(01) * (01)	(012)	(01)	(012)
(01) * (02)	(013)	(012)	(0123)
(01) * (03)	(014)	(013)	(0134)
(01) * (04)	(015)	(014)	(0145)
(01) * (05)	(016)	(015)	(0156)
(01) * (06)	(016)	(016)	(0167)
(02) * (02)	(024)	(02)	(024)
(02) * (03)	(025)	(013)	(0235)
(02) * (04)	(026)	(024)	(0246)
(02) * (05)	(027)	(025)	(0257)
(02) * (06)	(026)	(026)	(0268)
(03) * (03)	(036)	(03)	(036)
(03) * (04)	(037)	(014)	(0347)
(03) * (05)	(025)	(037)	(0358)
(03) * (06)	(036)	(036)	(0369)
(04) * (04)	(048)	(04)	(048)
(04) * (05)	(037)	(015)	(0158)
(04) * (06)	(026)	(026)	(0268)
(05) * (05)	(027)	(05)	(027)
(05) * (06)	(016)	(016)	(0167)
(06) * (06)	(06)	(06)	(06)

Table 2. Intervallic combinations of type A and B

Now, if a set-class can be generated in many ways, which one of these is the most relevant? How should one choose the interval-classes that generate a given set-class? From a theoretical point of view, all forms are equally valid: for example, it is a property of set-class (015), as an abstract entity, to be able to be generated by any of the above identified interval-class pairs. What about in compositional or analytical terms? Richard Cohn addresses this very issue:

> When we say that an abstract entity […] bears a certain property […], we mean that this property has the potential to be presented by a given compositional realization. It is useful to view such an entity, and each of its realizations, as bearing its properties *implicitly*, and to assess each realization independently for the degree to which it makes such a property *explicit* (COHN 1988, 30).

Applying Cohn's words to our case, one concludes that it is not reasonable to invoke the property of intervallic combination in all analytical contexts, but only in those which make 'such a property explicit'. Likewise, among the many possibilities of intervallic combination that yield a particular set-class, one should choose the one that appears more explicitly in the music, taking into account both local and global factors.

In my analysis, I shall take special notice of how intervallic combination allows the most important (trichordal) set-classes to be connected via common interval-classes. This allows us to establish a *modulatory network,* of which Figure 5 is an example that—as we shall see—can be applied to Webern's op. 10/4. In Figure 9, I present examples of other possible modulatory networks: in (a), the most important set-classes—(012), (014), (048), (016) and (026)—are generated by combinations of (01), (04) and (06); in (b), the same interval-classes generate a bigger number of set-classes, as trichords and tetrachords are both included. Many other modulatory networks, of course, could be imagined. In general terms, a modulatory network presents a number of trichords and/or tetrachords which are generated by different combinations of interval-classes; whenever a given interval-class is involved in the generation of more than one set-class a modulatory connection is created between such set-classes.

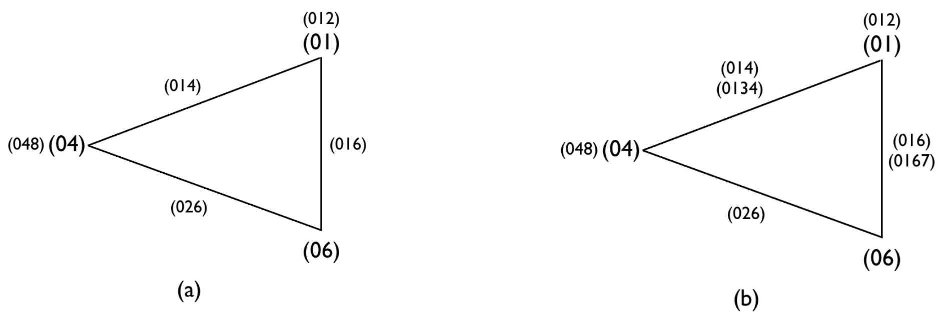

Figure 9. Some modulatory networks

(b) Analysis

First section (bar 0-1)

When it appears at the onset of bar 1, the harp's chord stands as clearly opposed in terms of intervallic content to what we have heard so far of the mandolin's melody (that is, its first three notes). In fact, the chord contains the interval-classes (01), (04) and (05)—being, as a whole, a member of set-class (015)—whereas in the melody we have heard an instance of (02)—a major second from C to D—and one of (06)—a tritone from D to A♭. The intervallic opposition between the chord and the melody could hardly be greater. That opposition, however, is rapidly eroded, as the melody starts assimilating intervallic elements that belonged to the chord. Thus, the first three notes in the melody that are heard from the moment the chord is articulated—A♭, G and E♭—define, as a whole, an instance of (015) (Figure 10). Besides, if one also takes into account the following

E—the last note in the mandolin's melody—one notices that all intervals between successive notes belong either to interval-class (01)—A♭ to G, and E♭ to E—or to interval-class (04)—G to E♭ (Figure 11). These interval-classes had already been heard in the chord, but not in successive notes of the melody. In brief, from the moment the harp's chord is heard, the melody becomes dominated by interval-classes (01) and (04). This idea is further reinforced if we take the last four notes in the melody as a non-ordered pitch-class set in normal form—[E♭ E G A♭]—and notice that it can be generated by combining a minor second interval—an instance of (01)—with its transposition by a major third—an instance of (04) (Figure 11). This is obviously an example of Cohn's transpositional combination, or of intervallic combination of type B, as I have defined it above.

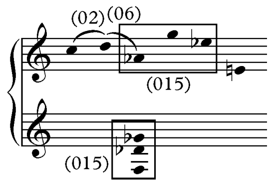

Figure 10. Webern, op. 10/4 (bars 0-1): intervallic structure of the chord and of the melody

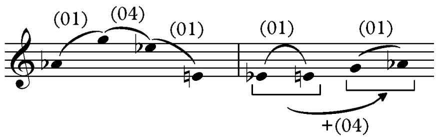

Figure 11. Webern, op. 10/4 (bar 1): intervallic organization of the last four notes of the melody

Despite the undeniable opposition, in terms of intervallic content, between the first three notes in the melody and the chord, there is also an intervallic link between them: interval-class (04). As we have seen, the first two interval-classes that appear in the melody are (02), between the first and the second note, and (06), between the second and the third. Interval-class (04), however, is also present, specifically between the first and the third note (C and A♭, respectively). Even though it does not appear between successive notes, (04) is nevertheless very important, since it connects the two notes that receive more metric accent. Actually, in the context of the first section—in which, as we have seen, one clearly feels a steady crotchet beat—one can even trace a larger (sequential) progression by descending major thirds linking the three notes that appear on the beat: C, A♭ and E. This shows that interval-class (04) plays a crucial role in the structure of the mandolin's melody, doing so from its very beginning. Interval-class (04) is, then, an important pivotal element in this section, as it links the two textural elements (the melody and the chord). In addition, one notices that (04) is common to (026)—the set-class of the first three notes in the melody—, and to (015)—the set-class of the harp's chord, as well as of the next three notes in the melody. These conclusions are summarized in Figure 12, in which we can also see the important role of interval-class (01), contained in the harp's chord as well as very prominent in the final part of the melody.

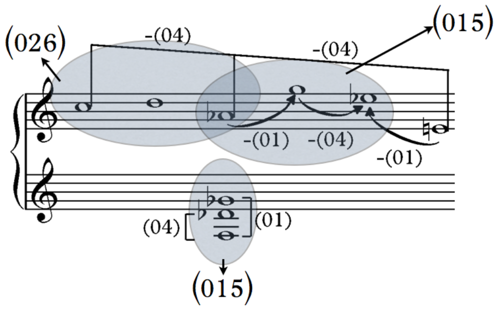

Figure 12. Webern, op. 10/4, first section: intervallic structure

Second Section (bars 1-4)

The second section starts with two static figures: a sustained B♭ in the viola and a repeated A in the clarinet. A new instance of interval-class (01) is thus created, both diagonally (as the two instruments enter independently), as well as vertically (as the two sounds are superimposed). This works as a textural background against which one hears a (four-note) trumpet melody, which seems, after a brief interruption, to be continued by the trombone (with two more notes). As in the first section, the melody starts with a (026), in this case <B F E♭>. Actually, as Figure 13 shows, there are many similarities between the two melodies (the first one in the mandolin and the second one in the trumpet and trombone). First, their contour is similar, both regarding their first three notes—the contour segment of which is <120>—and their final three notes—the contour segment of which is <210>.[19] Second, both melodies present two instances of (01) after the initial (026), in both cases from the third to the fourth and from the fifth to the sixth notes.[20] Third, the (04) sequence found across the more metrically accented notes in the first melody (<C A♭ E>) is kept in the corresponding notes of the second melody. Indeed, if one takes the latter's first, third and sixth notes, one gets the succession <B E♭ G>, obviously a new (04) sequence, now in ascending

[19] In a contour segment, a number is given to each note according to its position in pitch space: 0 for the lowest note, 1 for the middle one, 2 for the higher one. This analytical tool comes from contour theory, which is briefly summarized in STRAUS (1990, 99-102).

[20] To be sure, the interval from the fourth to the fifth note differs: it is a (04), in the first melody; and a (06), in the second one. It is interesting to note, however, that this is the least perceptible interval in the second melody, as the two notes are separated by a pause and they occur in different instruments. All the same, if one takes the last four notes in the second melody as a non-ordered pitch-class set in normal form—that is, [D E♭ G A♭]—one realizes that such set can be generated by combining a minor second interval—an instance of (01)—with its transposition by a perfect fifth—an instance of (05). This is, obviously, a new example of transpositional combination, comparable to the one already mentioned with regard to last four notes of the first melody: as we have seen, [E♭ E G A♭] results from combining (01) and (04). Curiously enough, both combinations of interval-classes—(01) and (04), in the first melody, and (01) and (05), in the second one—involve interval-classes contained in set-class (015), thus revealing a more hidden affinity between the two melodies.

direction (in pitch-class terms). Because of the (above analysed) process of metrical dissolution, however, not all these notes appear now in a metrically stressed position.

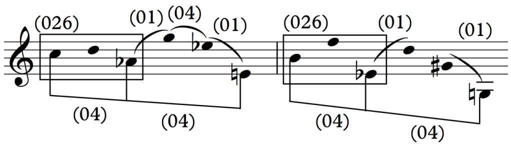

Figure 13. Webern, op. 10/4 (bars 0-1/2-4): similarities between the first and the second melody

Not much seems to change, therefore, as we go from the first to the second section: the role of interval-class (01) is reinforced in the static figures, whereas in the melodic gestures (026) reappears at the beginning, (01) occurs after that, and (04) keeps a more structural function (less perceptible in the second melody).

Nevertheless, a new set-class does actually emerge in this section: (012), perceivable in the relation between the static figures and the melodic gestures. Specifically, as one hears the <B♭ A> static dyad, the trumpet starts with a B; and also, after that, the trombone enters with a G♯. In both cases, an instance of (012) is created: <B♭ A B>, first; and <B♭ A G♯>, later. The former set, moreover, is heard vertically, at the beginning of the second beat of the second bar.

Set-class (012) is related to (015) and (026)—the other two prominent trichords in this movement. As it contains interval-classes (01) and (02), set-class (012) connects both with (015)—via the common (01)—and with (026)—via the common (02). Hence the complete modulatory network, already presented in Figure 5, is now fully established. In the first section, a common (04) connects (026) and (015); in the second section, (01) and (02)—interval-classes that differentiate (015) from (026)—are combined with each other, leading to (012). This is clearly audible at the beginning of the second section, as the first (012) appears in the order <B♭ A B>: initially, one hears the (01) between the two static figures; after that, one hears the (02) between the A in the clarinet and the B in the trumpet, a particularly perceptible interval due to the close proximity of these two notes in terms of pitch (they are only two semitones apart in registral space) and timbre (both of them are wind instruments).

Third Section (bars 4-6)

Static figures become profuse in the third section, as we have seen above. They can be divided into continuous (clarinet and mandolin) and discontinuous (snare drum, harp and celesta). The former, as a whole, present the set [B C D♭], and the latter, [E F F♯]—both of them members of set-class (012). In Figure 14, I present the evolution of the intervallic structure of the static figures, from the initial (015) to the final two instances of (012); in the middle section, only (01)—the common interval-class between those two trichords—appears. This progression is then represented in the modulatory network (Figure 15).

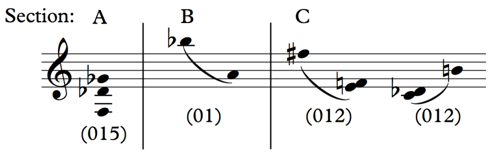

Figure 14. Webern, op. 10/4: intervallic organization of the static figures

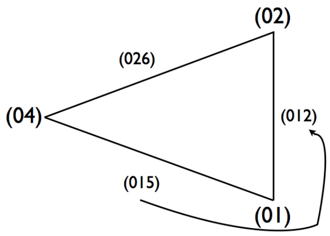

Figure 15. Webern, op. 10/4: evolution of the intervallic organization of the static figures

As far as the melody is concerned, the first three notes present, once again, a (026): <A♭ B♭ E>.[21] Unlike before, however, there is no (01) between the third and the fourth notes, but rather a (02), from E to D. After that, the expected (01) comes at last, from D to E♭. Thus is a (012) trichord formed in the three last notes of the melody, establishing a progression from (026) to (012), in which (02)[22] plays a mediating (or modulatory) role.[23] Figure 16 shows the evolution of the intervallic structure of the melodic gestures, making it clear that the initial (026) is always kept, whereas the intervallic structure of the final notes is gradually changed. Such a change is actually similar to that of the static figures: in the first section, one hears a (015); in the second section, several instances of (01); in the third section, a (012). Thus, the evolution of the final part of the melodic gestures mirrors that of the static figures and, therefore, it can also be represented by Figure 15.

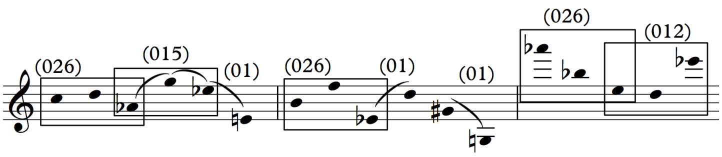

Figure 16. Webern, op. 10/4: intervallic organization of the melodic gestures

[21] This segment is a simple pitch-class transposition (T8) of the first melody's initial trichord.
[22] Interval-class (02) is very prominent in the musical surface, as it appears twice between successive notes.
[23] In addition, the melodic segment <E D E♭> is replicated structurally in the final notes of the three main melodic interventions: E is the final note of the mandolin, D of the trumpet, and, of course, E♭ of the violin.

The following summarizes this movement's intervallic behaviour:

1) Set-class (026) initiates all melodic gestures.

2) A gradual progression from (015) to (012) happens in the static figures, as well as in the final notes of the melodic gestures. Interval-class (01) plays a mediating (or modulatory) role in that progression (Figures 14, 15 and 16).

3) A progression from (026) to (015) is noticeable in the first melody. Interval-class (04) plays a modulatory role in it (Figure 17).

4) In the final melody, (026) moves to (012) via the common (02) (Figure 18).

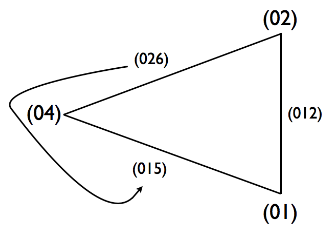

Figure 17. Webern, op. 10/4: intervallic progression in the first melody

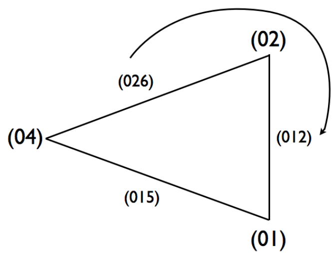

Figure 18. Webern, op. 10/4: intervallic progression in the final melody

It should be noted that the goal of these progressions is not predictable. Even within the circumscribed limits of the modulatory network, nothing forces us to stop in (012), after we have arrived there from (015)—to take Figure 15's progression as an example. (012) could have still moved to (026), for instance. There is actually no sense of hierarchy in the modulatory network: in other words, no set-class is intrinsically more stable than any other. Therefore, no set-class can work as a predictable goal. The progression from (015) to (012) is, thus, a clear example of nondirected linearity—and the same goes for all the other progressions identified above.

(c) Forte's and Lewin's Analyses

Allen FORTE (1973) presents a brief analysis of Webern's op. 10/4 in his seminal book, *The Structure of Atonal Music*. He stresses the prominent role of hexachord 6-Z43—(012568)—noting that it appears once in each of the three sections. David LEWIN (1993) expands Forte's analysis in

Musical Form and Transformation, understanding the relationship among those (and closely related) hexachords in transformational terms. The three occurrences of (012568) are marked in Figure 19. Following Lewin, I call these hexachords H1, H2 and H3.

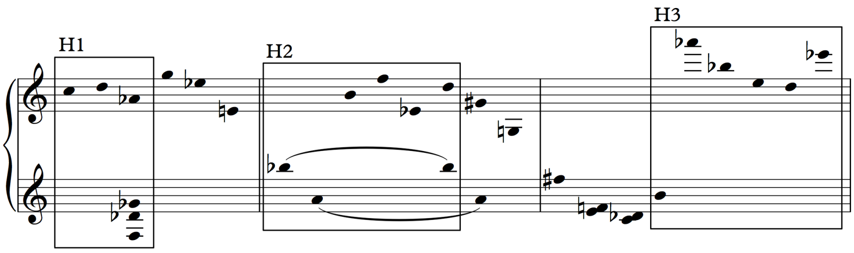

Figure 19. Webern, op. 10/4: occurrences of the (012568) hexachord, according to FORTE (1973) and LEWIN (1993)

Even though both these analyses are obviously very different from my own—for instance, they focus on hexachords, not dyads and trichords—they can still be related to my analysis. One can start by noting that my most prominent trichords—(012), (015) and (026)—are subsets of Forte/Lewin's hexachord, (012568). (012), for example, occurs once in any (012568), as Figure 20 shows for H1, H2, and H3. These three hexachords are obviously equivalent in abstract terms. There are differences, however, as to how prominently (012) is presented in the musical surface in each one of those hexachords. For instance, the (012) trichord is not very perceptible in H1, as it results from joining together the two first notes of the mandolin (C and D) and the inner note of the harp's chord (D♭), the latter not even sounding simultaneously with the former. (012) is, however, much more audible in H2, as it appears in the first three notes of this section (the static B♭ and A, and the melodic B), and, also, as it sounds vertically (in the first half of the second beat of bar 2). Finally, (012) is even more perceptible in H3, as it is heard in three successive notes of the violin's melody. In brief, (012) gets an increasingly prominent position in the musical surface, as one goes through the successive appearances of the (012568) hexachord. At first, (012) is almost hidden; then, it appears more clearly, but still between two different textural levels (static figures and melodic gestures); at last, it appears in a single textural level (melodic gesture) and very prominently (in successive notes). All this matches my previous analysis, as it confirms the idea that (012) becomes more important as the piece proceeds.

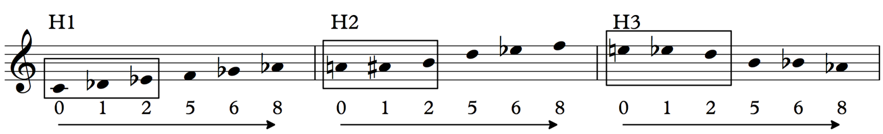

Figure 20. Webern, op. 10/4: occurrences of (012) in Forte/Lewin's hexachords

For their part, (015) and (026) appear a number of times as subsets of (012568). They are, actually, the most frequent trichordal subsets within that hexachord, as Table 3 shows.[24]

Trichord	Occurrences as a subset within the (012568) hexachord	Number of occurrences
(012)	[012]	1
(013)	[568]	1
(014)	[125], [256]	2
(015)	[015], [018], [126], [156]	4
(016)	[016], [056], [128]	3
(024)	—	0
(025)	[025]	1
(026)	[026], [028], [068], [268]	4
(027)	[168]	1
(036)	[258]	1
(037)	[058], [158]	2
(048)	—	0

Table 3. Webern, op. 10/4: occurrences of each trichord in the (012568) hexachord

One can now ask, for example, how does the textural prominence of (015) evolve as the piece goes along. Figure 21 shows all the four occurrences of (015) in each of the Forte/Lewin's hexachords. In H1, there is one (015) that is obviously very prominent in the texture: [D♭ F G♭], the harp's chord. In H2, no (015) is as prominent as that: none of the four can be directly heard in the static figures, nor among successive notes in the melody. Still, [A B♭ D] is heard vertically at the end of bar 2, joining the two sustained, static notes (A and B♭) and the final note of the trumpet's melody (D); likewise, [A B♭ F] can also be heard vertically as we join the same sustained notes and the highest note in the melody (F). Finally, in H3, none of the occurrences of (015) can be heard directly in the musical surface, neither vertically nor among successive notes. In brief, as a subset of (012568), (015) becomes increasingly less prominent in the musical texture as the piece proceeds. At first, it stands out very clearly, as a verticality heard in a single textural level (the harp's chord); then, it becomes less obvious, appearing as a brief verticality involving two different textural levels (the sustained notes and the melody); finally, in H3, it becomes almost hidden. Evidently, this temporal process is exactly the reverse of that of (012), reinforcing the previous analysis, which likewise revealed a gradual change of focus from (015) to (012).

[24] The digits in this table's middle column match those of Figure 20.

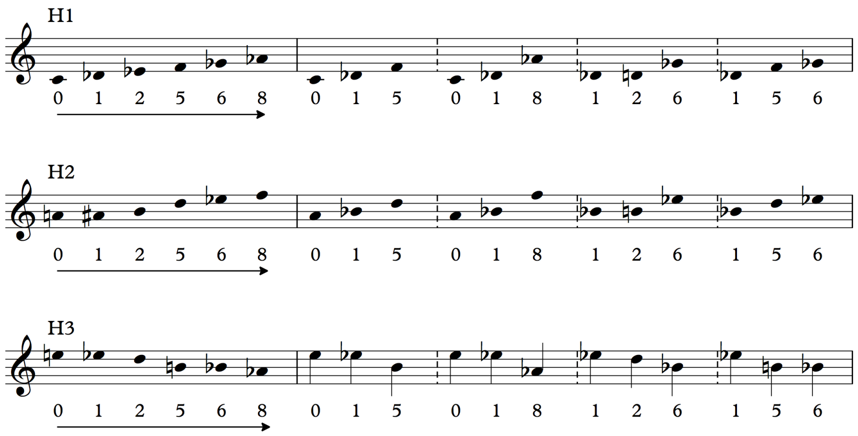

Figure 21. Webern, op. 10/4: occurrences of (015) within the Forte/Lewin's hexachords

Conclusion

Webern's *Five Orchestral Pieces*, op. 10, still strike us today—over a century after their composition—by the spareness and fragmentation of their textures, by the discontinuity in the articulation among the different gestures and by their extreme timbral volatility. As we have seen, Eduardo Lourenço gives an admirable account of all these aspects in his short essay. The temporality of these pieces, however, is not exclusively static nor discontinuous. In the case of op. 10/4, for instance, one can trace a number of evolving tendencies in many musical elements, notably the textural, the metrical and the intervallic. The goal of such tendencies (or progressions), however, is generally not predictable: they are instances, in Jonathan Kramer's terms, of a nondirected linearity. Thus, at the textural level, one finds that the static figures become increasingly abundant as the piece goes along, and, also, that the melodic gestures start entering ever later (relative to each section). The metric organization changes as well, as a clear and uniform metre gradually gives way to a much more ambiguous and stratified organization; at the end of the piece, metre seems to dissolve almost entirely (at least in part of the texture). Finally, there are also a number of intervallic tendencies: for instance, a gradual shift of emphasis from (015) toward (012). To describe the latter aspect, I have introduced the concepts of intervallic combination and modulatory network, which allow us to understand set-class progressions in the light of the mediating (or modulatory) role played by given interval-classes.

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