

**Of Serial Music and Composition in the Twentieth-
Century**

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Abstract

This dissertation presents a beginner's guide to serial music. It briefly places twelve-tone music in historic context and discusses the evolution of music following the late romantic period. It then gives an overview to the basics behind the tone row; its derived forms, the pitfalls awaiting the composer and finally discusses the importance of tension control when composing a serial piece.

Table of Contents

INTRODUCTION	4
HISTORIC CONTEXT.....	5
THEORY AND PRACTICE OF SERIAL MUSIC.....	10
CONCLUSION	21
BIBLIOGRAPHY	22

Introduction

It is important to have a broad knowledge of as many different styles and histories of music as possible. Even though a composer may wish to adopt one style in preference to others, he or she is likely to want to appreciate other styles, to learn what they have to offer and to be prepared to incorporate their techniques as a tool for composition as and when it would be beneficial. This paper will give a composer the ability to understand and use simple serial techniques as well as enabling him better to understand its application in the music of others.

To that end, this essay will present a musical and historical perspective behind one of the most important and influential techniques of composition in the twentieth-century. It will give a simple introduction of how to write in the twelve-tone style created by Arnold Schoenberg and championed by many composers, in particular his pupils Alban Berg and Anton Webern, who collectively became known as the Second Viennese School, along with their successors.

As with all musical forms, serial techniques evolved through time; points will be covered from different stages in its evolution, from before its beginning through until the 1950's.

Historic Context

The development of any new style of music is best appreciated when put into an historic context since musicians, as with any other profession, are living at that time and are naturally influenced by it. At the end of the nineteenth-century, the period that is now called "The Romantic Period" was drawing to a conclusion. History was moving forward at an unprecedented pace with the start of the period that is often now called by the rather loose term "Modern Times". Similar cusps had arisen in the past, for example the Enlightenment and Renaissance Periods. Arguably, what differed this time was the speed of the change.

This was the time when Einstein was about to publish his Special Theory of Relativity, Freud was working on *The Interpretation of Dreams* and Plank was formulating Quantum Theory. The invention of the telegraph brought news of the events at Mafeking almost in real-time, a pace that would have been impossible 100 years earlier. In politics the Socialist Movement was gaining ground in the UK, Russia and the US and since the end of the Franco-Prussian war in 1871 Europe had for the first time seen an extended, seemingly never ending, period of peace. These events and a belief in science bought a new optimism at the start of the twentieth-century, optimism that was to be shattered only 14 years later.

This struggle for the future was prominent in the Arts, Wassily Kadinsky was exhibiting abstract paintings and Georges Braque was to say, "Paint not what you see, but what you know is there". Indeed, it is worth noting that Schoenberg was an accomplished amateur painter.

Whilst the discoveries in Psychology and Physics were breakthroughs showing how mankind was starting to control his environment, they also undermined his faith in what he

saw around him and what he had come to accept as given facts. Psychoanalysis demonstrated how mankind is led by irrational and sexual behaviour; Special Relativity questioned our understanding of space and time; and Quantum Mechanics and the Uncertainty Principle were soon to undermine our common sense view of the world.

With the breakdown of tonality, Music felt the trend as keenly as Science and the Arts. Many composers in the Austro-German tradition of Western European music felt they had stretched the limits of music to breaking point and could explore no more using the existing framework of melody, harmony and counterpoint that had been in use from Bach to Wagner. The breaking of old rules, which had been the method of moving music forward for over 500 years, would no longer suffice. Composers felt that to move forward they now had to produce a complete new set of rules for the twentieth-century.

For the previous 300 years, music had been based predominantly on one of two modes of scale, the major and minor modes and their consequent key signatures. Music based on these scales could be said to have an identifiable melody on top of clearly defined harmony which followed rules that were in effect set in stone by conventions that had been built up over the years. Melodies built from the seven notes of a scale would be generally simple and based around a specific key and although music modulated to other keys, it would, as a norm, return to base. This gave composers a tonality that when accompanied by rhythm, form and often programme notes, formed the basis of all 'serious' music of around 1400-1900.

This dilemma came at end of the nineteenth-century principally through the works of composers such as Richard Wagner. Tonality can be seen to have been stretched to breaking point most famously through the prelude to his opera Tristan und Isolde and later by the music of Gustav Mahler. When listening to this prelude it is often difficult to

pinpoint the key: though undoubtedly tonal it is continually modulating, has few cadences and uses the dominant seventh as a resolution from more complex chords rather than as a chord that must itself resolve. This succeeds in the ear of the listener because the dominant seventh chord is less dissonant than previous chords (*Example 1*) even though this flies in the face of classical harmonic theory.

Example 1 - Wagner: Tristan und Isolde, Prelude

The image shows a musical score for Wagner's Tristan und Isolde, Prelude. The score is in 3/4 time and is marked 'Slow and Languishing'. It features a treble and bass clef. The first bar starts with a piano (*pp*) dynamic. The second bar contains a discord, marked with an arrow and the word 'discord'. The third bar shows a resolution, marked with an arrow and the word 'resolution'. The dynamic changes to piano (*p*) in the third bar. The score is written in a style typical of 19th-century musical notation.

From the point of view of musicologists, these unresolved dominant sevenths are some of the most important chords ever to have been written; the discord at the start of the second bar is important enough to be referred to as *The Tristan Chord*. The dilemma produced by this piece was then: 'where does music go from here?'

Composers, concerned that music using traditional scales and harmony had been fully exploited, were left with some choices. They could break the rules entirely (Scriabin, Satie, *etc.*), define their own set of rules (Debussy, Schoenberg, *etc.*) or continue to explore the possibilities of tonality (Sibelius, R. Strauss, *etc.*) perhaps using other means such as folk music or non-Western influences. Some, notably Stravinsky, were to have phases during which they wrote using different styles including the serial technique.

Debussy followed Wagner by investigating the possibilities of the dominant seventh, even though he despised both him and his music (witness the use of Tristan's prelude in his Golliwog's Cakewalk). Debussy felt that the seventh need not resolve to the tonic chord,

instead he developed a style which instead of resolution included successions of dominant sevenths resolving onto a further sevenths (*Example 2*).

Example 2 - Debussy: Images, Gigue (Bars 49-50)

The musical score for Example 2, Debussy's Images, Gigue (Bars 49-50), is presented in three staves. The top staff is for Flute (Fl.), the middle for Violin/Viola (Vl/Vk), and the bottom for Cello (Cb). The Flute part consists of a melodic line with slurs and accents. The Violin/Viola part is marked 'p' and features a series of chords. The Cello part features a series of notes with slurs.

Schoenberg, however, was to go on to invent a complete new system of music with its own rules that other composers could, and did, follow. It is this new system that he formulated in 1921 as a result of years of development through evolution that is to be described here. The method developed out of Schoenberg's earlier works, such as his Five Orchestral Pieces Op. 16, which stretched tonality to the limit. It was first fully utilised in a full orchestral work in his Orchestral Variations Op. 31.

Many musicologists call music of this period, where it seems that each chromatic note has equal weight, "atonal". MacDonald¹ says, however, that it would be better called "totally chromatic", since atonal means without tones and by definition, all music consists of tones. The system is variously called twelve-tone, serialism, pan-tonality (all tonalities), beyond tonality, and atonality (no tonalities). The most accurate label is twelve-tone, and it is that term that will be preferred in this paper. The word atonal was used at the time as a derogatory term. Not surprisingly, Schoenberg did not like the word when used to describe his compositional style.

¹ M. MacDonald, Schoenberg (London: J. M. Dent and Sons, 1976), p. 72.

Even though he would still write many conventional works, often in his favourite key of D minor, this system was to prove to be as much a catalyst for Schoenberg to help him over his compositional difficulties as it would be for music as a whole, pointing the way forward for both the person and the art. The first twelve-tone piece, Suite for Piano Op. 25, was the natural culmination of years of music that increasingly saw the equal importance of each of the twelve chromatic notes.

Theory and Practice of Serial Music

"The sheer mechanics of serialism are easy enough to learn, but to turn the system into well-sculptured music is quite another matter" (Brindle²).

In its simplest form, the twelve-tone method covers melody alone; it does not cover counterpoint, rhythm, texture, form, the use of tone colour or any other aspect of music. Indeed Schoenberg was very conservative in these other areas: his time signatures tended to use simple meters and his use of rhythm was rarely complex. Whilst the method does not specifically cover harmony, more advanced harmony (sevenths, ninths and diminished fifths) naturally drops out as a side-effect of the system and its melodic structure, furthermore new forms of cadence replace the older four (perfect, imperfect, interrupted and plagal). Some harmony is more suited to serial music than others are because of the issues covering the control of tension that will be discussed below. Indeed, it may also be argued that serial music does not contain harmony in the horizontal sense, that is progressions of chords and cadences, as well as the vertical sense, that is one sound against others.

² R. Smith-Brindle, Serial Composition (Oxford: Oxford University Press: 1966), p. 139.

Before discussing the theory, rules and essence of twelve-tone music, there is a need to appreciate that Schoenberg understood his system to be a means of composing music - it is not the rules that count, it is the use to which the composer puts them. If one were to say "the notes of the scale of G minor are G, A, B \flat , C, E, D, F \sharp , G", one would not mean that Mozart's 40th Symphony will drop out of that scale or that an arpeggio of E \flat major inevitably leads us to the Eroica Symphony of Beethoven. In the same way, producing music from a tone row is not mechanical; it can be as technically challenging to write as a Bach fugue. It is true that a particular tone row, however, may suggest melodic ideas or harmonic progressions, even though it does not remove the creative effort required by the composer.

With the thoughts of Reginald Smith Brindle in mind, this paper will present a beginner's guide to the rules and theory of twelve-tone music, note some of the pitfalls into which a new composer may fall and discuss how some composers have overcome them. In a dissertation as short as this, however, one can do no more than to attempt to whet the appetite, re-iterate the word "overview" and demonstrate that the style concerned is not as obscure as one may have been led to believe.

The fundamental essence of any piece written in the twelve-tone form is its tone row. This row consists of each of the twelve notes of the chromatic scale appearing once; from this row comes the entire work. At the start of a work or movement, each of the notes of the row is introduced in succession. With the exception of repeated notes that help formulate a melody, no note should appear more than once before all of the notes have been introduced. Effects such as trills do not count as an extra or repeated note. The last note of the piece need not necessarily be the last note of the row. The clearest way to demonstrate a row is through an example (*Example 3*).

Example 3 - Schoenberg: Tone Row from Wind Quintet Op 26



When listing the members of a tone row, for example to illustrate the row from which a piece of music has been composed, the row is notated without rhythm, since its member notes form a sequence of intervals, not a melody. This is the same as writing all the notes of a scale that has been used in a symphony, by convention the scale is written without a rhythm, usually in semibreves.

As with the notes of any melody composed from its tone row and derived forms, unless specifically required care needs to be taken to ensure that every chord does not introduce an unexpected or undesired tonality that may often appear to the listener even if it is not perceived on paper. Chords such as simple major or minor triads will always have this effect, as will perfect intervals, thirds and sixths. It would be best to use seconds or sevenths if the implied key centre is not expected or desired; even a tritone (a diminished fifth) could be said to imply a tonality with its expected resolution.

The twelve notes of an example row were set out in example 3, this set of notes is then called the basic set, original set or prime set. It is quite likely that the same row will be utilised in all of the movements of a piece of music, rather than using a different row for each movement. This particular basic set was used in each of the movements of Schoenberg's Wind Quintet Op. 26 (*Examples 3 and 4*).

Example 4 - Schoenberg: Wind Quintet, 4th Movement (Rondo)



The basic set 'O' can then be inverted 'I' (presented upside down starting on the same note as the original), retrograde 'R' (presented in reverse order starting on the last note of the original), retrograde-inverted 'RI' (upside down in reverse order starting on the last note of the inverted set), or transposed. These new tone rows can then be used either for development of the original or for new material (*Example 5 – octaves changed for the sake of clarity*).

Example 5

Original (O) - see example 3



Inverted (I)



Retrograde (R)



Retrograde Inverted (RI)



The total of each of the O, R, I and RI forms (4), including each of their possible transpositions (12 each), gives $12 \times 4 = 48$ rows, though some may be identical depending on the original set. Not all of the 48 rows need be used in a piece!

When using the retrograde and retrograde inverted forms, some composers have experimented with reversing rhythm of the original series as well as the intervals. Whilst this is by no means the normal practice, it does present an interesting avenue for experimentation.

It is important to underline a point mentioned earlier: a tone row is not a set of notes; it is a set of intervals. It is these intervals that will be inverted or presented in retrograde form to create derived rows. When creating a tone row some analogy with strict counterpoint can be drawn: just as one would not present the same rhythm in more than three consecutive bars, so it is wise not to present the same interval more than three times on the trot.

It is possible to introduce several notes of the tone row at once by using a chord is used in the accompaniment (*Example 6*).

Example 6 - Schoenberg: Violin Concerto

The image shows a musical score for Example 6 from Schoenberg's Violin Concerto. It consists of two staves: the top staff is for the Solo Violin and the bottom staff is for the Div. Cello. The key signature is two flats (B-flat and E-flat) and the time signature is 3/2. The Solo Violin part begins with a piano (*p*) dynamic and features a melodic line with notes numbered 1 through 11. The Div. Cello part also begins with a piano (*p*) dynamic and features a bass line with notes numbered 3 through 11. The notes in the cello part are grouped into chords, with some notes appearing in multiple staves.

Schoenberg was against over analysis of his music; he understood the importance of a good melody, bass line, rhythm, form and so on. He also believed that it was acceptable to break these rules when the music dictated, since it is always the music that must come

first. Indeed nearly all of his works break the rules at some time. If he felt that repeating a note before all twelve have been used would create a smoother line (see later for a discussion of this rule), he would. When writing a melody in a serial composition, he realised that structures such as the shape of phrases and the different characteristics of intervals between consecutive notes of that melody are just as important as they are in tonal music. Furthermore, just as different keys have differing qualities, so different rows have different qualities and a given composer will tend to lean more towards some of the rows and the style and opportunities that are peculiar to that row than others. Some rows have more tonal properties than others and can even be capable of hinting of a tonal centre especially with perfect intervals that imply a cadence or a succession of minor thirds that imply a diminished chord; whereas some rows lead to more dissonant harmonies than others and so on.

There are various sub-classes of tone row available to the composer: all-interval (where all the possible intervals appear once), symmetrical (the second set of six intervals is equal and opposite to the first - starting on a minor second drop would mean a rise of a minor second to the last note and so on), and symmetrical, all-interval. Whilst these forms may appeal on paper however, each of them has its own limitations that in practice tend to restrict the composer either melodically or harmonically, implying that they will need skilful use.

When designing a tone row, one also needs to consider the properties of the derived rows such as the inverted form. For example, if the basic set has no tonal centre but the inverted form has the sequence B, G, C that strongly suggests a tonal centre, the level of tonality in final work will be confused. There is a sliding scale from tonality to chaos and it is usually important to pitch the work at a consistent level on this sliding scale, if it meanders from tonality to pan-tonality the effect on the listener is confusing. Implied key

signatures, need to be avoided since the tonic of the implied tonal centre will have more weight than the other eleven notes, one of the foundation stones of serial music is that each of the twelve chromatic notes should be equal. These tonal centres are often avoided by using the note that is furthest from the implied tonic on the classic circle of fifths, that is the note that is a diminished fifth away.

Furthermore, since the inverted form is often used concurrently with the original form, the intervals then produced will also need to be carefully considered. Just as with tonal music, some intervals are more dissonant than others are and a succession of the same or similar intervals will become monotonous.

Depending on the tone row in use, concurrent use of the original set with its derived forms can lead to pitfalls such as false octaves or implied key signatures. Care needs to be used on the part of the composer when crafting the original tone row. False octaves occur when a note appears in one part while it is still sounding in another part, or when a second part sounds a note as the first part moves off (*Example 7*) and are often avoided by missing non-essential notes from the series, usually in the accompaniment rather than the melody. These examples of possible problems also demonstrate how the composer must be careful not to let the series dominate the music.

Example 7 - False Octaves

The image shows three musical examples on a single staff, each with a treble clef and a key signature of one flat (B-flat). Example a) is labeled 'a) Bad' and shows a sequence of notes: B-flat, C, D, E-flat, F, G, A, B-flat. Example b) is labeled 'b) Bad' and shows a sequence of notes: B-flat, C, D, E-flat, F, G, A, B-flat, with a double bar line after the first two notes. Example c) is labeled 'c) Good' and shows a sequence of notes: B-flat, C, D, E-flat, F, G, A, B-flat, with a double bar line after the first two notes.

With the exception of Integral Serialism, which is covered below, the theory of serial composition does not cover rhythm or dynamics. Rhythm is at least as important in twelve-tone writing as it is in tonal music where tension can be increased or released by harmony

and melodic shape alone. While melodic and harmonic tension does increase and decrease in twelve-tone music, the complexities of this music compared with that of tonal music means that a composer is more likely to turn to rhythm as the mechanism to overcome the problem of controlling tension. In other areas the serial composer will share many tools with the traditional composer: use of orchestral colours, textures and doubling of parts will be similar disciplines, as will the results that will be achieved by using them.

Gaining its name from a method of painting championed in the late nineteenth-century by Georges Seurat, one new technique of composition that was developed was Pointillisme. Seurat painted using dots of primary colours where the final picture could only be appreciated from a distance. In the musical technique of Pointillisme, tone colours are exploited to their maximum: an instrument contributes no more than two consecutive notes in a melody. The affect on the listener is the opposite of looking at a Seurat painting, the music sounds less coherent, one finds that the overall effect is built up from a series of disjointed sounds that the brain is less able to reconstruct into music.

The first movement of Webern's Concerto Op. 24 consists almost entirely of instruments playing three notes, whereas the second movement goes one further when the number is reduced to two (*Example 8*).

Example 8 - Webern: Concerto Op 24, 2nd Movement

The musical score for Example 8, Webern's Concerto Op. 24, 2nd Movement, is presented in a score format. It features five staves: Tpt. - mute, Vla - mute, Vl - mute, Cl, and Fl. The Piano part is shown in a grand staff (treble and bass clefs). The music is in 3/4 time and consists of five measures. Each instrument plays a single note in each measure, creating a pointillistic texture. The notes are: Tpt. (A4), Vla (G4), Vl (F4), Cl (E4), Fl (D4) in the first measure; Tpt. (B4), Vla (A4), Vl (G4), Cl (F4), Fl (E4) in the second measure; Tpt. (C5), Vla (B4), Vl (A4), Cl (G4), Fl (F4) in the third measure; Tpt. (D5), Vla (C5), Vl (B4), Cl (A4), Fl (G4) in the fourth measure; and Tpt. (E5), Vla (D5), Vl (C5), Cl (B4), Fl (A4) in the fifth measure. Dynamics range from *pp* to *mp*. The score includes various musical notations such as slurs, accents, and dynamic markings.

Brindle, however, feels that whilst it can be effective, Pointillisme is a device that is often used to cover up the inadequacies of what would otherwise be dull music³.

In vocal music, use of the tessitura of a voice also controls tension: as discussed above, the melodic shape will tend to rise more at points of tension in both tonal and serial music. There is often a key difference against tonal music however: as a generalisation one may observe that in serial music the individual word is paramount, whereas in tonal music it is often the mood of the words that set the mood (known as the *effect* in baroque music). Traditionally music would more often than not take precedence over the words, whereas in serial music it is the other way around. As an aside it is worth noting that it is not until recent that vocal serial music has become more popular because of the difficulties presented in singing a piece written in that style unless the singer possesses perfect pitch.

In serial music, when a composer wants to increase tension, he is more likely to turn to an increase of rhythmic complexity than he would when composing a tonal piece. This point was understood better by later composers such as Webern who used the technique, than by its earlier developer Webern's tutor Schoenberg, or by his fellow pupil Berg. Indeed in later composers' works there is often a complexity of rhythm so advanced that the meter of the piece is as difficult to discern for the listener as the key. To help break down the barrier of the meter composers have experimented with the possibility of relating rhythm directly to the intervals of a tone row, for example the note before a semitone would be held on for a semiquaver, the note before a major third for a crotchet and so on. Inversions will help to reduce or lengthen notes; a major seventh is equivalent to a minor second and so on. Many composers will find difficulty with such music, where the rules dictate the outcome too much and leave too little creativity in the hands of the composer.

³ R. Smith-Brindle, Serial Composition (Oxford: Oxford University Press: 1966), p. 131.

In this particular technique, known as Serialism by Rhythm, rests and silences seem to present the only opportunity to the writer to be creative. The only advantage to the more *avant garde* serial writer is the complete breakdown of rhythmic structure and meter, a goal to which some may aspire. The 1950's saw composers take Serialism by Rhythm to its limit with the development of Integral Serialism, also known as Total Serialism. This technique is a mathematical rule lead approach to composition. It gives a similar predominance to mathematics over the creation of music that was given by Art in the earlier Cubism Movement. Each note in each register is given a predefined dynamic, method of articulation, length and so on; a method that may or may not use tone row techniques. Messiaen, who was not a composer of serial music, used a similar method in his piano work Mode de Vaelurs et d'Intensités. Though no composer can ever be free from rules, they should be used to provide a framework upon which to build rather than to constrain the creativity of the composer.

The importance of rhythmic control comes in to specific effect when thinking about the shape of the entire piece, in particular the ebb and flow of its tension. An increase in rhythmic complexity or dynamics leads to an increase in tension, or *vice-versa*, just as it would in tonal music.

Tension in a passage of music can be manipulated by varying the degrees of harshness of the chords or intervals used. Harshness, in turn, can be increased or reduced by incorporating different chord inversions, by spreading a chord out or putting consonant intervals in the bass. For example, a minor second is harsher than a minor ninth, whereas a major 14th (compound major seventh) will sound almost consonant by comparison. By adjusting the chords of a phrase so that each chord is more dissonant than the previous, the music will gradually increase in tension. The listener will perceive this as an *even* increase through the phrase; he or she will hear an acceptable, well-constructed and therefore well-

controlled increase in tension. In contrast, a period of music of equal tension can be created by a series of chords of equal dissonance, for example a series where the harshest dissonance is one and always exactly one semitone.

Purists will argue that if the first chord introduces notes top down (or bottom up), then all subsequent chords should introduce notes in the same order, a practice known as strictly ordered chords. However many composers will break this rule if it impedes creativity. Strict ordering often compromises tension, for example one can find that a dissonant chord can be followed by a less dissonant chord whose dissonance could be increased if the ordering of the notes in the chord were to be changed. As discussed earlier, the composer needs to control tension with care. When the tension of a piece falls out as a consequence of the use of notes which follow rigid rules, rather than the use of notes crafted to control tension, the result is excessive quick contrasts between dissonance and consonance that sounds like music that is out of control of the composer and is as a result less satisfactory. An alternative approach is for a composer to create a tension plan or map which shows the structure of a piece, and modify the tone row as necessary best to produce the desired effect. For example if the tension is less than desired when the original form is played against the inverted the composer should be willing to change the original tone row.

Conclusion

This essay has only touched the surface of the technique of using the twelve-tone row to create music. It has attempted, however briefly, to mention many of the possibilities that have been explored by Schoenberg and his followers through to Stockhausen and beyond. Serial composition is a complex technique to learn, let alone master, and is by no means the sole outcome of the "New Music" experiments from the start of the twentieth-century; it is, in the opinion of the author however, the most influential style to come from that period.

It has demonstrated that the control of tension is perhaps the most important aim of the composer of serial music, a discovery that one can hope to put into practice in any future compositions as well as one to use when listening to some recordings of the music mentioned in this essay and other pieces of a similar style.

Bibliography

- [1] MacDonald M (1976), Schoenberg, J. M. Dent and Sons, London
- [2] Morgan R (1991), Twentieth Century Music, W. W. Norton and Company, New York
- [3] Oliver M (Editor) (1999), Settling the Score, Faber and Faber Ltd., London
- [4] Smith Brindle R (1966), Serial Composition, Oxford University Press, Oxford
- [5] Smith Brindle R (1987), The New Music, Oxford University Press, Oxford
- [6] Walden D (1999), How to Listen to Modern Music Without Earplugs, Sound and Vision, Toronto
- [7] Whittall A (1999), Musical Composition in the Twentieth Century, Oxford University Press, Oxford