# OCR AoS6: serialism

KS5

## David Kettle

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### Introduction

Mention the names Arnold Schoenberg, Alban Berg or Anton Webern to many music lovers – or indeed many music teachers – and you're likely to receive a roll of the eyes, or even a recoil of disapproval. Their reputation precedes them. There's no denying that they're divisive figures, profoundly influential in the history of 20th-century music, yet also responsible for some profoundly thorny, challenging pieces of music that many listeners still struggle with, even a century after they were written.

OCR has three works by those three notorious composers among its suggested repertoire for AoS6, Innovations in Music 1900 to the present day:

- Berg: Violin Concerto (1935)
- Webern: String Quartet, Op. 28 (1938)
- Schoenberg: *A Survivor from Warsaw* (1947)

There's actually a four piece, too: the board includes Schoenberg's earlier Chamber Symphony No. 1 from 1906, which we'll consider in passing but in less depth. The three works above are based on the serial principles devised by Schoenberg in the early 1920s and developed in different directions by Berg and Webern.

In this resource, we'll look into those three pieces, and also put them in their historical and musical context. Taken together, they offer a valuable opportunity for students to consider an alternative framework within which to create music. We'll consider what serialism is and where its ideas came from, as well as the more extreme musical developments it later gave rise to. But we'll look not only at its influence, but also at the expressive possibilities it offers in these three key pieces from the mid-20th century.

### Why study serialism?

It's a good question, especially since musical tastes and trends have moved on so dramatically since the heyday of the musical avant-garde in the decades after the Second World War.

Nonetheless, serialism remains one of the most influential musical frameworks conceived in the 20th century, one whose far-reaching impact is still felt in music being composed today. As we'll see later in the resource, while some later composers applied serialist ideas to many elements of music, others fought back against what they saw as an increasingly dry, abstract and complex musical style that lost touch with listeners, writing works of far greater simplicity and immediacy.

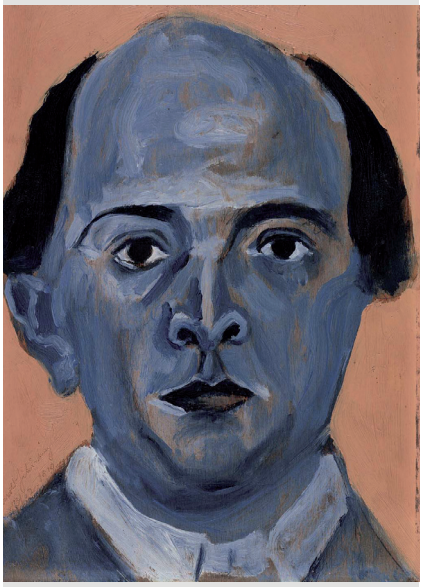
Serialism also offers a very specific approach to musical creation and analysis – quite a mathematical one, it has to be said – that students may find compelling. It's certainly a way of viewing music and how it's constructed that stands in stark contrast to the rules and conventions of functional tonality, with which they're probably more familiar.

Importantly, however, it's crucial to appraise serialist works not only in terms of their construction, but also using many of the same criteria as other music: their expressive power, the themes and ideas they're attempting to convey, their historical context, their impact on the listener.

### Historical background

Before we look at the three specific pieces in OCR's AoS6 suggested repertoire, let's think about what was happening in music in the run-up to their composition.

In the closing years of the 19th century and the very start of the 20th, Romantic composers seemed to have pushed things about as far as they could go. That's in terms of performing forces – just think of a piece like Mahler's Symphony No. 8 (**www.youtube.com/watch?v=OtOXEB2N-SE**), not nicknamed the 'Symphony of a Thousand' for nothing, or even the vast number of musicians required for Schoenberg's own early *Gurrelieder* (**www.youtube.com/watch?v=xPXuHs3Ksow**). But it's also



*Self-portrait by Arnold Schoenberg, 1910*

in terms of the music itself, especially its harmony: that harmony had become so rich and chromatic, with so many complex twists and turns, that any claim of it serving a traditional 'function' had been considerably weakened.

Earlier composers had already experimented with abandoning or weakening traditional ideas about tonal harmony:

- Franz Liszt wrote a deeply unconventional 'Bagatelle sans tonalité', which refuses to settle into any particular key: **www.youtube.com/watch?v=yc_HjEa8k5k**
- Richard Wagner famously laid the ground for future developments with the unprepared dissonances, 'forbidden' harmonies and lack of harmonic resolution in the Prelude to his opera *Tristan and Isolde*: **www.youtube.com/watch?v=-QX7dgBqfgw**

There was clearly an appetite to push things further still, abandoning tonal harmony completely, and embracing the expressive possibilities suddenly made possible by no longer obeying its rules. Many composers followed that route, producing music in many different styles. One of those composers was Vienna-born Arnold Schoenberg, whose own music developed rapidly across a relatively short period of time.

**Listening activity**

Listen to these four works by Schoenberg with your students, or at least excerpts from them:

- *Verklärte Nacht* (1899): **www.youtube.com/watch?v=vqODySSxYpc**
- Chamber Symphony No. 1 (1906): **www.youtube.com/watch?v=m_hMVzPT9f4**
- *Six Little Piano Pieces* (1913): **www.youtube.com/watch?v=jE7RvUn1Sas**
- Variations for Orchestra (1928): **www.youtube.com/watch?v=iL1XzH6gpAY**

Now consider these questions:

- How would you describe the harmony that Schoenberg uses in them?
- What kind of relationship does it have with tonality, and how close is that relationship?
- Can you sense any organising principle behind the harmony, whether it's based on tonality or not? If the music is dissonant, does it maintain a more-or-less constant level of dissonance throughout?

Schoenberg's early music sometimes sounds quite similar to that of Mahler, and occupies a similar sound world of extended and expanded tonal harmony (for example in *Verklärte Nacht*). He quickly loosened links with traditional 'functional' tonality, exploring other ideas such as harmony based on 4ths (for example in the Chamber Symphony No. 1), and later abandoned tonality entirely in 'expressionist' works such as the *Six Little Piano Pieces*. By the time Schoenberg came to write his Variations for Orchestra, however, his style had changed again.

The problem with freely atonal pieces is the very freedom that atonality offers. With no restrictions, no limits and no underlying framework to replace those of tonality, anything goes – and it's down to an individual composer in an individual piece to define the elements that will provide a sense of structure (often small musical cells that would recur or develop as the piece progresses). It's a paradox that Schoenberg himself became acutely aware of, and it's what lead him to devise a system to replace the framework of keys, relationships and modulations that tonality offers. That system became known as serialism, although the terminology used to describe it can itself be quite confusing (we'll return to that later).

Schoenberg was already beginning to establish himself as an important composer when, aged 30, he placed an advertisement in a Vienna newspaper in 1904, hoping to attract composition students (he claimed he could teach them to be composers in just six lessons). Two of his earliest pupils to sign up were Alban Berg and Anton Webern, and, though increasing frustration with some of the other students led Schoenberg to curtail his formal classes after just a year, those two young men continued to work with him privately, Webern until 1908 and Berg until 1911.

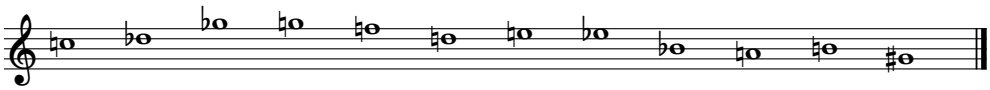
The three composers are usually collectively called the Second Viennese School: they were a school in that Schoenberg was teacher and Berg and Webern his students; and their activities took place in Vienna. The 'second' part is more controversial, however: it's meant to contrast them with the 'first Viennese school' of Haydn, Mozart, Beethoven and Schubert, though it's hard to justify calling those composers a 'school' in any meaningful sense, despite clear influences and inspirations between their outputs.

The three composers in the Second Viennese School, however, developed very different musical and personalities – as we'll see when we come to look at the three pieces suggested by OCR.

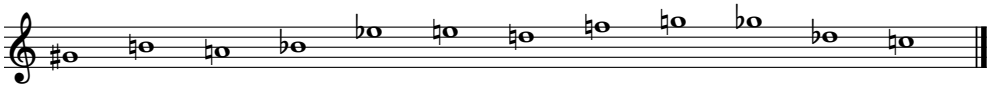
## How serialism works

The ideas that Schoenberg came up with for his 'alternative' system to replace the framework of tonality are essentially very simple – although they can create music of enormous complexity.

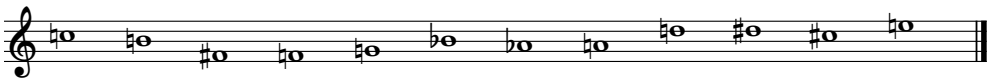
At its heart, serialism involves a particular ordering of all 12 notes of the chromatic scale, so that none are repeated. This is the prime row, and here's an example:



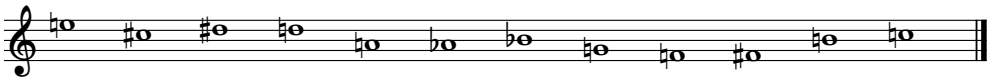
The row can then be reversed (to produce what's called the retrograde):



It can also be turned upside down (to produce what's called the inversion): simply start on the same note as the prime row, count the semitones between it and the next note, and go the same distance in the opposite direction. For example:



And, of course, the inversion can itself be reversed (to produce what's known as the retrograde inversion):



All four of those variants – prime, retrograde, inversion and retrograde inversion – can then be transposed to begin on any of the 12 pitches of the chromatic scale, producing a grand total of 48 possible rows in total (in theory, at least). Once you have those 48 rows, what you do with them is very much up to you: use them horizontally as melody, or stack the notes up on one another vertically as harmony (or, better still, do a bit of both).

The basic rules, however, remain the same:

- You must use all 12 notes of the chromatic scale.
- No note can be repeated until all the other 11 notes have been used (with the exception of expressive repetitions of note, or trills, for example).
- The row can be manipulated by turning it back to front, upside down, and both together, as well as transposing it.
- The order of notes must not change.
- Notes can be played in any octave, and as melody or harmony.

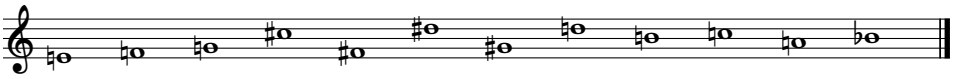
**A note on tuning**

This kind of mathematical system of manipulating pitches relies, of course, on using Western-style equal temperament, in which the distances between semitones are the same wherever they occur. That kind of tuning, and the assumption that each pitch is absolute and unmoving, is something of a given in Western classical music (although it's also something that string ensemble players and choral singers, who often minutely adjust their pitches depending on the surrounding harmony, might have issues with). But it's harder to apply, of course, to musics that use different tuning systems, or that employ more limited musical modes – just think of the expressive inflections of the scales in Indian ragas, for example, or the five- and seven-note modes of Javanese gamelan.

**Activities**

This kind of mathematical system of pitch ordering lends itself easily to activities. Try this one with your students.

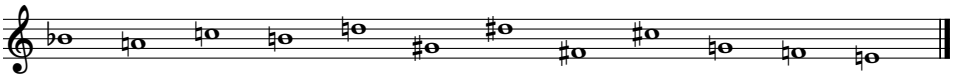
This is the prime row for the new piece you're composing:



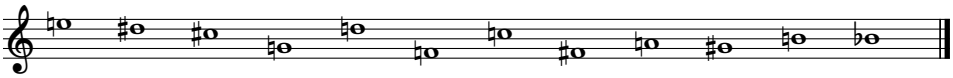
Now produce the retrograde, inversion, and retrograde inversion of this row.

Answers:

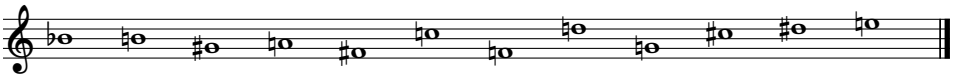
Retrograde:



Inversion:



Retrograde inversion:



So far, so straightforward. Now imagine you've decided to break the first rule of serialism, and not use all 12 pitches in the chromatic scale in your prime row (as many composers, including Stravinsky, did). Select the pitches you'd like to use in your prime row: they may be a smaller subset of the 12 pitches, or a subset that looks more like a recognised church mode, or even an expanded version that itself repeats certain pitches. Then produce retrograde, inversion and retrograde inversion versions of that row.

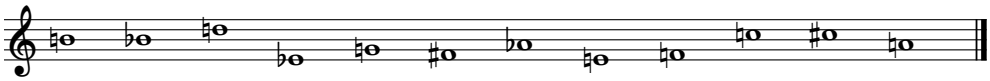
Let's take things further in a brief composing activity. First order your pitches to create a prime row (ideally all 12 in the chromatic scale, although you could try fewer or more). Then create your retrograde, inversion and retrograde inversion versions of the row. Choose one of them, and add durations to the notes to form an overall rhythm. Choose another and do the same, so that the overall lengths match. You now have two complementary melodic lines, which can be played together – perhaps on a keyboard, or perhaps by two different instruments. Use your remaining two versions of the row to create harmony: stack their notes in groups of two, three or four to complement the two melody lines you've produced.

You may find you're rather limited in what you can achieve, and how much freedom you have to adjust elements of the music. If you're unhappy with how it sounds, how can you change it? Don't forget you can raise or lower any of the pitches to any octave (remember to make it playable by whatever instruments you're using, though), and feel free to change the rhythm if needed so that different pitches coincide.

Is it a frustrating process to be restricted by pitch in this way? Does it allow you to focus on other elements of the music?

Let's take things to a slightly more complicated level. The initial ordering of pitches – the prime row – is obviously the basis for everything in a piece of serial music, and has a huge influence on everything that flows from it. That also means, however, that by setting up that row in a particular way in the first place, you can move the music in specific directions.

One option is to make the row itself obey mathematical principles. For example, here's the prime row from Webern's Concerto, Op. 24:



You can break this row down into four subsets of three notes each, and each of those subsets has relationships of a minor 2nd, major 3rd and minor 3rd between its notes. In fact, you could even claim that the prime row itself follows similar ideas to those of retrograde, inversion and retrograde inversion that are normally used for the whole row – it's almost as if it has miniature versions of those

transformations embedded within it already. One by-product of creating a row like this is that you limit the transformations you can make (a quality called invariance): since the intervals within the row are themselves so similar, by turning it upside down or back to front, and then transposing it, you run the risk of simply re-creating the same row all over again. But using a row like this – called a derived row – can also create a strong sense of unity and cohesion within a piece, since the same intervals (sometimes even the same notes) keep returning again and again.

Derived rows take us further towards musical abstraction. Another alternative for setting up your prime row in a specific way is to order the notes so that they imply some sense of tonality – which might feel dangerously like breaking the rules of serialism. Nonetheless, Berg did just that with the row he created for his Violin Concerto, as we'll see shortly.

## Terminology

The words we use to talk about this style of music can themselves lead to some confusion, not least because different terminology is used in different parts of the world, terms have been translated back and forth between different languages, and different aspects of this method of composition are being referred to.

Strictly speaking, the terms 'serial' or 'serialism' can apply to the ordering of *any* aspect or element of music, but they're commonly used to refer to the ordering of pitches. Schoenberg's way of ordering pitch is often called his '12-note', '12-tone' or 'dodecaphonic' method (and, again strictly speaking, it's a *type* of serialism). Calling the music '12-tone', however, can itself be confusing since it might imply it's music that involves 12 whole tones, especially when we're focusing so strongly on pitches and intervals.

As we'll see shortly in the resource, later composers used some of Schoenberg's ordering methods across additional musical elements, including rhythm, duration, attack, timbre and even form. 'Total serialism' is a common term for this approach, although 'integral serialism' is often used (and sometimes, even more confusingly, it's simply called 'serialism').

For the purposes of this resource, however, we'll call Schoenberg's method 'serialism', and the more extended method used by later composers 'total serialism'.

## Berg: Violin Concerto

MAX FENICHEL

*Alban Berg in 1930*

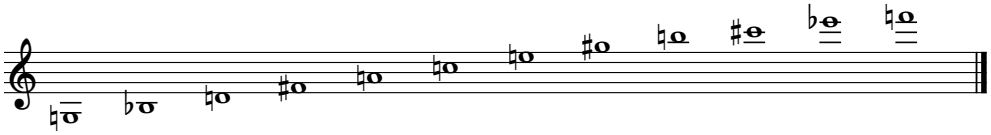
Let's now move on to consider the three specific serial works that OCR has included in its AoS6 suggested repertoire. We'll start with Alban Berg's Violin Concerto, written in 1935.

Both Berg and Webern proved to have very individual musical voices, ones that were distinctively different from the style of their teacher, Schoenberg, and from each other. Berg's music is particularly rich and expressive. Even in his freely atonal music – for example his 1915 *Three Pieces for Orchestra* (**www.youtube.com/watch?v=q6U8AqRNyU8**) – he brings together impressionistic colour, sometimes grotesque fantasy, and huge sonic power in music that seems intent on going one bigger and better than Mahler. His 1922 opera *Wozzeck* – still regularly performed in opera houses worldwide – is deeply expressive in its music, although the match between the work's harrowing storyline and Berg's dissonant music feels like quite a natural one. It's significant, too, that even in this relatively early piece, Berg was searching to ways to exert control over his freely atonal music. In the case of *Wozzeck*, he achieves that through his use of established musical forms transplanted from the concert hall to the opera house: Act I is formed from five 'character pieces', Act II is a five-movement 'symphony', and Act III comprises six inventions.

Even in Berg's serial pieces, however, that sense of expression continued. A work such as his 1925 Chamber Concerto (not strictly speaking a serial piece, although it employs note rows) uses an ordering of pitches to refer to himself, Arnold Schoenberg and Anton Webern, embedding the three men's names into the piece's very musical fabric.

Berg's Violin Concerto has a back story that's almost more famous than the piece itself. Rising-star violinist Louis Krasner approached the composer in February 1935 with a request for a violin concerto, convinced that serial music needed a properly audience-friendly, sincerely expressive piece to win over the listening public. Berg was at first unconvinced, but then spurred into action by the sudden death of Manon Gropius from polio, at the age of just 18. She was the daughter of Berg's close friends Alma Mahler Werfel (widow of Gustav Mahler) and Bauhaus architect and designer Walter Gropius, and Berg had known Manon since she was a small child. Deeply shocked, he resolved to write her a musical memorial – and to fulfil Krasner's request at the same time.

To do so, Berg came up with a row that itself combines serial thinking, tonality and also a reference to the violin itself. It looks like this:



For a start, it's a traditional serial 12-note row, which Berg subjects to the usual transformations and treats according to serial principles in the Concerto.

But it's also based around the four violin open strings – G, D, A and E (which occur as its first, third, fifth and seventh notes) – and it's indeed those very notes that form the violin's first entry at the very beginning of the Concerto.

Most importantly, however, it combines four interlocking tonal triads – G minor, D major, A minor and E major – with a four-note whole-tone sign-off right at the end. Berg exploits those tonal triads in (for example) bars 11 to 14 in the opening movement, played by a double bass, violas and bassoons, which serve to introduce the solo violinist playing the complete row in its prime form for the first time (bars 15-18). And that whole-tone ending to the row corresponds with the first four notes of Bach's chorale 'Es ist genug!' ('It is enough!') from his Cantata No. 60, whose text expressing depair and resignation at the inevitability of death feels entirely appropriate for this musical memorial, and which Berg quotes verbatim in the Concerto's second movement.

Berg's Violin Concerto is in an unusual two-movement form, but each of those movements itself falls into two larger sections – it's effectively a four-movement piece condensed into two. The first movement represents life, and Berg indicated that it's a musical portrait of Manon – the first section is nostalgic and dreamy, while the second is more cheerful, even mischievous at times.

The second movement represents Manon's death and transfiguration. It begins loudly and violently, with almost a Mahlerian scream of despair at Manon's death, and quickly becomes fixated on a single, immovable rhythm, which returns again and again, building to a shattering climax. Out of that emerges the Bach chorale itself, heard at first on clarinets evoking a village church organ, before the violin soloist takes it on. The Concerto ends with a statement of its entire row as the violinist soars into their highest register, and even its final harmonies continue the piece's sense of tonality – even if it's a tonality that's 'enriched' by other dissonant notes.

While functioning as a musical memorial for Manon, Berg's Violin Concerto also proved his own final completed work. He finished it during the summer of 1935, but died on Christmas Eve that same year, from blood poisoning caused by what was probably an insect bite.

## Webern: String Quartet, Op. 28

GEORG FAYER

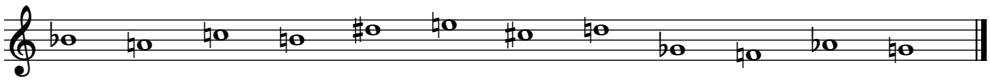
*Anton Webern in 1927*

After the expressive power and vivid musical storytelling of Berg's Violin Concerto, the austerity and abstraction of Webern's Op. 28 String Quartet might come as quite a shock to students – and, it has to be said, the piece might well encapsulate more clearly any preconceived ideas about 'difficult' serial music. Taken together, however, the two pieces also serve to demonstrate how Schoenberg's two most prominent students took his serial ideas in very different directions. If Berg manipulated serialism in the service of expression, even constructing his note row in order to do so, Webern's approach was more about clarity and objectivity, so that the music's construction is in many ways its purpose and function.

Webern's String Quartet is also a very brief piece: although cast in three movements, it lasts barely eight minutes in total, and its music is extremely compressed and concise as a result. That's a description that can be applied to much of Webern's later music (his entire lifetime's musical output can be listened to in around two or three hours). The composer once notoriously remarked: 'I had the feeling that once all 12 notes have gone by, the piece was over.' He was talking about his freely atonal Bagatelles for string quartet, Op. 9, during a series of Vienna lectures in the early 1930s in this instance, but his observation holds true for many of his later pieces, and is particularly relevant to his serial works.

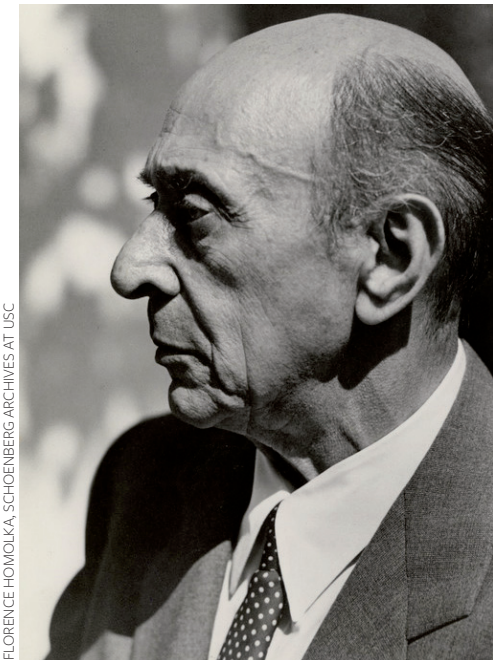
The fact, too, that there's hardly any back story to the Quartet serves to focus attention on its music. Webern began work on the piece in November 1936, and a year later received a commission from the American patron and philanthropist Elizabeth Sprague Coolidge, originally for a work for wind quintet. Webern managed to change the request to a string quartet, and the piece was premiered in Massachusetts in September 1938. It would be Webern's final piece of chamber music: he was inadvertantly shot and killed in September 1945, shortly after the end of World War II, by a US soldier visiting the family home to investigate his son-in-law's black market activities.

While Berg in his Violin Concerto manipulated his row to allow connections with tonality, and also included a reference to Bach, the row in Webern's String Quartet, Op. 28, has similar Bachian references (although no connections with tonality). The row itself is based on the name BACH transliterated into musical notes as B flat-A-C-B natural (B-A-C-H in German notation), together with two more transposed versions of the same intervals. It's an example of a derived row, which we encountered earlier in the resource. In this case, it comprises not only six two-note segments (each made up of a semitone), but also three four-note segments, each based on the BACH shape:



Webern's first movement is a theme and variations. His theme is built from a chain of four connected note rows, with overlaps between them, and he follows it with six variations, each section being roughly 16 bars long. Webern described his second movement as a 'scherzo in miniature', and it contains arguably the Quartet's most immediately accessible music: its outer sections function as a four-part canon, while its central 'trio' is more playful. Webern's final movement is a more complex structure, with many changes in mood and texture, built around a complex double fugue.

## Schoenberg: A Survivor from Warsaw



FLORENCE HOMOLKA, SCHOENBERG ARCHIVES AT USC

*Schoenberg in Los Angeles, around 1948*

Written in July and August 1947, Schoenberg's *A Survivor from Warsaw* is the most recent of the three serial works in OCR's AoS6 suggested repertoire list. The composer had long lived in Vienna, and taught for several years in Berlin, but emigrated to the USA in 1933 following the Nazis' rise to power, becoming an American citizen in 1941. Schoenberg had been raised as a Jew, but had converted to Protestantism in 1898 (and even baptised), though he reconverted to Judaism in 1933 just before his departure for America.

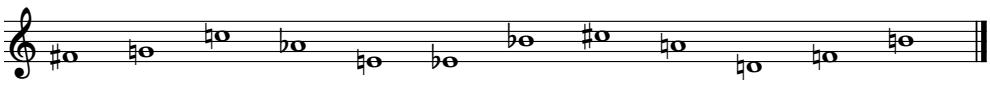
Schoenberg wrote *A Survivor from Warsaw* as a tribute to those murdered in the Holocaust, and it's a piece that take an unusual form, and uses unusual forces. It's written for orchestra, narrator (whose text is spoken, never sung, but given specific written rhythms) and a men's chorus (who only sing at the end of the piece). Its unusual form is of a short scene, initially narrated and then enacted by the chorus, told by a survivor from the Jewish Ghetto in Warsaw. Following the Nazi annexation of Poland, around half a million Jews were rounded up and effectively imprisoned in a former Jewish quarter of Warsaw – first enclosed by barbed wire, later by a brick wall – where conditions quickly deteriorated. Many died from disease or starvation, and many others were transported to the death camp at Treblinka. Schoenberg based his work on an authentic witness account he recalled being told: a survivor from the Ghetto remembers Nazi guards holding an early-morning roll-call of Jews, beating the elderly and infirm who did not join the line of prisoners quickly enough. The count is taking place to identify who will be sent to the death camps that day. The victims are forced to count increasingly quickly until they spontaneously break into the Jewish sung prayer 'Shema Yisroel'. This is one of the central prayers of Judaism, a sung text that expresses praise and hope alongside its affirmation of Jewish beliefs, but which is also often uttered as the last words of the dying.

Schoenberg wrote the work's text himself, and later wrote to a friend about its meaning: 'Now, what the text of the *Survivor* means to me: it means at first a warning to all Jews, never to forget what has been done to us, never to forget that even people who did not do it themselves, agreed with them and many of them found it necessary to treat us this way. We should never forget this, even such things have not been done in the manner in which I describe in the *Survivor*. This does not matter. The main thing is, that I saw it in my imagination.'

*A Survivor from Warsaw* has been celebrated as one of the profoundest and most compelling artistic responses to the Holocaust. But it has also been criticised for its historical inaccuracy (since it essentially came from Schoenberg's imagination), its apparently melodramatic style, and even for offering listeners an apparently 'happy ending' of resilience and defiance, thereby letting them off the hook in terms of acknowledging responsibility.

In terms of its music, *A Survivor from Warsaw* is, like sections of Berg's Violin Concerto, a work that uses serialist techniques to create music of violence, turmoil, anger and despair. Schoenberg employs intentionally extreme sonorities in his music, adding military drums and trumpet fanfares to suggest its setting.

The piece opens with one such trumpet fanfare (using the notes F sharp, G, C and A flat), followed by a dissonant E natural and E flat high in the first and second violins. These notes form the first half of Schoenberg's prime row:



But he doesn't go on to complete the row at the beginning of the piece. Those opening sounds are followed by another trumpet fanfare (using the notes B natural, B flat, F and A), and a dissonant C sharp and D from the double basses. This answering gesture uses pitches taken from a transposition of the row's inversion: it's not until the Hebrew prayer at the end of the piece that Schoenberg allows his row to be heard in full.

**Talking points**
Now that we've considered all three serial pieces in OCR's AoS6 suggested repertoire, you might like to ask your students to consider the following points:

- What kind of emotions or ideas do you think the three composers are intending to convey in these pieces? Do all three have the same level of emotional engagement, do you think?
- What aspects of the music convey feelings of anger, trauma, sadness and stress, and are there aspects that convey hope, optimism or joy? Why might that be?
- If you feel this technique for creating music is better at conveying negative emotions rather than positive ones, is this because of something natural and intrinsic to the music, or is it because of our learnt associations (i.e. nature or nurture)? If we listened to dissonant music all the time, would we feel more strongly that it can convey happiness and optimism? Does that mean we might be missing out on expressive possibilities we can't quite grasp?

## Taking things further

So far, we've looked at the background to the serial method of composition developed by Schoenberg, and three pieces by that composer and his students Berg and Webern that employ that method, in different ways, and with different results. But if you can apply serialism's quite complex mathematical rules to pitch, then why not also to other elements of music? That's what composers began asking themselves in the years immediately after the Second World War. That historical context is important, too: they were working in a Europe traumatised by the six-year conflict, and a world that was asking profound questions about the purpose and meaning of civilisation and culture. In classical music, there was a temptation to wipe the slate clean entirely, and to begin afresh with music that was objective and rigorous, with few connections to the excesses of the past and the enormous decimation and turmoil those earlier values had brought.

Olivier Messiaen is often cited as the first composer to explore applying numerical organisation not only to pitch, but also to duration (i.e. rhythm), dynamics and attack (or articulation/timbre). His 'Mode de valeurs et d'intensités', one of his *Quatre études de rythme* from 1950, isn't strictly serial, as such, but uses modes of 36 pitches, 24 durations, 12 attacks and seven dynamics: **www.youtube.com/watch?v=S3xEnDpM1mU**

The influence of Webern, and in particular his more abstract, even clinical way of treating his musical material, ultimately proved stronger than that of his teacher Schoenberg. Messiaen's student Pierre Boulez was one of the first composers to explore what came to be known as 'total serialism'. In the year of Schoenberg's death, 1951, Boulez wrote an incendiary article (called 'Schoenberg is Dead' – both literally and, Boulez argued, in terms of his musical importance) in which he argued that younger composers should look to the radical musical visions of Webern rather than what he felt was the more backward-looking music of Schoenberg.

Here's a section from Boulez's 'Schoenberg is Dead' in which the younger composer speculates on expanding serial procedures far beyond simply pitch: 'Perhaps one could enlarge the serial domain with intervals other than the half-tone: microdistances, irregular intervals, complex sounds. Perhaps one could generalise the serial principle to the four sound-constituents: pitch, duration, intensity and attack/timbre. Perhaps... perhaps... one could demand from a composer some imagination, a certain dosage of asceticism, even a little intelligence, and, finally, a sensibility that will not be toppled by the least breeze.'

In one of Boulez's earliest works – *Structures* for two pianos, written in 1952 – pitch, rhythm, dynamics and attack are all subject to serial procedures. The first part, *Structures 1a*, pays overt homage to Boulez's teacher Messiaen in using elements from the elder composer's 'Mode de valeurs et d'intensités' as its underlying core row: **www.youtube.com/watch?v=6sfGLoF5IUY**

In Germany, Karlheinz Stockhausen also took serial ideas further in several of his early works. In *Gruppen* (1957) for three orchestras (**www.youtube.com/watch?v=_ie56qP742w**), for example, Stockhausen expands serial procedures across a vast canvas of three large instrumental groups spread out around an audience, using those processes to influence not only pitch but also tempo, division of material across his groups, and duration. It led to some frighteningly precise metronome markings of 63.5 and 113.5, for example (which Igor Stravinsky acidly described as 'a sign of German thoroughness'). *Gruppen* is a hugely complex, very dissonant and challenging work, but nonetheless, its expressive power is arguably a long way from the austere rigour of Boulez's *Structures*.

Stockhausen was also an early pioneer in electronic music, and applied total serialist procedures to electronic sounds in his *Kontakte* (1960), which exists in versions for electronics alone, and with piano and percussion (**www.youtube.com/watch?v=l_UHaulsw3M**). The composer felt it was the first piece in which he was properly able to bring all musical properties until a single unified control. *Kontakte*'s most famous example of that single control is a particular passage about halfway through that blends together pitch and rhythm: a single tone descends lower and lower until it can no longer be heard as pitch, becoming instead a series of pulses that transform into a rhythm (**https://youtu.be/l_UHaulsw3M?feature=shared&t=1038**).

Read more about Messiaen in his own *Music Teacher* resource, May 2017.

**Talking points**

Applying serial principles to musical elements other than pitch raises some difficult questions, which you might like to discuss with students:

- If you're going to create a series of dynamic levels (from, say, *ppp* to *fff*) and treat them according to serial ideas, what's the precise difference between them? Is the difference between, for example, *ppp* and *pp* as clear as the difference between C sharp and D?
- The same question applies to issues of articulation: are there really clear differences between an accent, a staccato accent, a marcato mark and a tenuto accent?
- To what extent are these kinds of musical elements – dynamics and accents – more to do with a performer's subjective interpretation, and related to expressing a piece of music's ideas?

**Listening activity: Boulez and Cage**

Listen again to some of Boulez's *Structures* for two pianos:
**www.youtube.com/watch?v=6sfGLoF5lUY**

Now listen to some of the 1951 *Music of Changes* by American composer John Cage:
**www.youtube.com/watch?v=B_8-B2rNw7s**

The Boulez piece is for two pianos, while the Cage is for one piano. But apart from the instrumentation, how similar or different do the two pieces sound?

Cage built his *Music of Changes* entirely on chance procedures derived from the *I Ching*, a Chinese text used for divination. It's from that book's charts, taken entirely at random, that Cage derived his pieces' pitches, durations, dynamics, tempos and much more.

Do the two pieces sound strikingly similar? In terms of their philosophy and construction, they couldn't be more different. Boulez's *Structures* is rigorously controlled down to its last detail, while Cage's *Music of Changes* is based entirely on chance. Why might it be that the end results sound so similar to the listener?

It's an irony that wasn't lost on either Boulez or Cage: both men became firm friends, despite their contrasting perspectives on music, and arguably drew on influences from each other in their later music.

As music employing total serialist procedures became ever more complex, even composers who had once been strong advocates for this way of composing music began to relax their opinions. Stockhausen, for example, embraced improvisation and even chance procedures, for example in his 1968 'intuitive' text composition *Aus den sieben Tagen* (**www.youtube.com/watch?v=e9nJIY407lo**), and even assembled sonic collages of music that already existed in works such as *Hymnen* (1967), inspired by national anthems (**www.youtube.com/watch?v=zDxpa-XPMTo**). Even Boulez himself admitted in 1999: 'Perhaps we did not take sufficiently into account the way music is perceived by the listener.'

In reaction, however, it's hardly surprising that composers such as Philip Glass and Steve Reich (and, earlier, LaMonte Young and Terry Riley) began stripping music back to its most basic constituent parts in a style that became known as minimalism. Though ironically, Glass himself composed some serial works early in his career, and Reich was a student of iconic avant-garde composer Luciano Berio.