Kevin Choi
Fall 2016
Final: Analysis on Webern's String Quartet, op. 28, 2nd mvmt

The prime form of the twelve-tone row used in the piece is: [0, e, 2, 1, 5, 6, 3, 4, 8, 7, t, 9].

From the outset, it is interesting to note how the row is full of patterns involving chromaticism.

For instance, subdividing the row into 6 sets of 2 (i.e. [0, e], [2, 1], ..., [t, 9]), we can see that

each set consists of two notes that are apart by a half step. All of them have the prime form of [0,

1], as a result. Subdividing the row into 3 sets of 4 (i.e. [0, e, 2, 1], [5, 6, 3, 4], and [8, 7, t, 9]),

we then see that each set consists of four notes in the chromatic scale and thus corresponds to

sc(0123), the superset of [0, 1]. Lastly, subdividing the row into 4 sets of 3 yields sc(013) and

sc(015). Because this is the case, these three set classes as well as the row itself seem to be the

ones that a composer can use as compositional motifs. To observe what happens if the row is

transposed, inverted, retrograded, or inverted-then-retrograded, I include the 12*12 matrix below.

	I_0	I_{11}	I_2	I_1	I_5	I_6	I_3	I_4	I_8	I_7	I_{10}	I_9	
P_0	0	e	2	1	5	6	3	4	8	7	t	9	R_0
P_1	1	0	3	2	6	7	4	5	9	8	e	t	R_1
P_{10}	t	9	0	e	3	4	1	2	6	5	8	7	R_{10}
P_{11}	e	t	1	0	4	5	2	3	7	6	9	8	R_{11}
P_7	7	6	9	8	0	1	t	e	3	2	5	4	R_7
P_6	6	5	8	7	e	0	9	t	2	1	4	3	R_6
P_9	9	8	e	t	2	3	0	1	5	4	7	6	R_9
P_8	8	7	t	9	1	2	e	0	4	3	6	5	R_8
P_4	4	3	6	5	9	t	7	8	0	e	2	1	R_4
P_5	5	4	7	6	t	e	8	9	1	0	3	2	R_5
P_2	2	1	4	3	7	8	5	6	t	9	0	e	R_2
P_3	3	2	5	4	8	9	6	7	e	t	1	0	R_3
	RI_0	RI_{11}	RI_2	RI_1	RI_5	RI_6	RI_3	RI_4	RI_8	RI_7	RI_{10}	RI_9	

Now, let us consider the piece itself. As a whole, the piece can be divided into 3 sections: mm. 1-18, mm. 19-36, and mm. 36-53, reflecting a da capo form. In the first section, what is perhaps unusual upon listening to it for the first time is that it lacks much rhythmic variation compared to some other pieces written by Webern. All four instruments have either a quarter note or a quarter rest per every beat. Because this is the case, we can count the total number of beats in mm. 3-16 (where the section repeats) and that of quarter notes and rests within those beats in order to guide our process of twelve-counting. That is, we first note that there are $28=2*14$ beats in mm. 3-16, because the meter of the section is in 2/4. Meanwhile, the first violin has 4 beats of rest (i.e. second beat of m. 4, first beat of m. 8, second beat of m. 10, and first beat of m. 15), which means that it plays exactly $28-4=24$ notes -- in other words, $24=2*12$ notes, allowing two twelve-tone rows to be presented. A similar math shows that the viola also has 4 beats of rest, i.e. 24 quarter notes. Interestingly, however, both the second violin and the cello have 7 beats of rest, i.e. only $28-7=21$ notes. As a result, if two twelve-tone rows were to be presented in either the second violin or the cello, $24-21=3$ notes would somehow be excluded from the presentation of the rows.

Indeed, this is exactly what happens in mm. 3-16. The first violin and the viola succeed in presenting two tone rows successively. Referring to the 12*12 matrix above, we see that the first twelve notes they present are in fact I_1 and I_5, respectively. On the other hand, the second violin and the cello fail to present two complete aggregates horizontally. Thanks to the rhythmic consistency, however, what we can do is reverse-engineer the missing notes and guess where they would fit were they present. Take the cello line, for example.

cello's mm. 2-8

Due to the nature of the given tone row of [0, e, 2, 1, 5, 6, 3, 4, 8, 7, t, 9], it is in fact not hard to guess where the missing notes would be were they present. With the case of the cello, the quarter rest in m. 3 can imply the pitch-class of 5 (put in parentheses above) while that in m. 6 can imply the pitch-class of 0. These parenthetical notes then complete the aggregate. Completing a similar procedure for the second violin as well yields the following table, which summarizes the first 24 notes that are presented by each of the four instruments.

violin 1	I_1 --> 12e087t95634 0e219t784365
violin 2	RI_5 --> 87t(9)12e0(4)365 9t780e(2)15634
viola	I_5 --> 56340e219t78 436512e087t9
cello	RI_1 --> 436(5)9t78(0)e21 563487t9(1)2e0

Note (pun intended?) that we can label the first set of 12 notes in each instrument as a row form that is a member of the row class, as shown by the 12*12 matrix above. However, such does not seem possible with the second set of 12 notes. If so, then how can we make sense of these second sets that do not belong to the row class? Notably, a pattern appears when we group the 12 notes into groups of 4. With the first violin, for example, the first 4 notes of the first set (i.e. 12e0) are in fact the retrogression of the first 4 notes of the second set (i.e. 0e21). The second 4 notes of the first set are the retrogression of the second 4 notes of the second set, and so on. In fact, this pattern is the universal one that ties the first set of 12 notes and the second set together in each of the instruments.

Because this is the case, we can perhaps benefit from a better labeling system. Breaking down the prime form of the row into 3 segments of 4 (i.e. 0e21, 5634, and 87t9), we can denote these three segments by A, B, and C, respectively, such that A for instance would be 0e21. Then let us use A', B' and C' to denote the retrogressions of A, B, and C, respectively. With these labels, the above table becomes the following one.

violin 1	A'	C	B	A	C'	B'
violin 2	C	A'	B'	C'	A	B
viola	B	A	C'	B'	A'	C
cello	B'	C'	A	B	C	A'

From this, we can see the structure of mm. 1-16 in a more apparent manner. For example, there exists a voice exchange between the first and the second violins involving A' and C in the beginning and that involving A and C' later on. Similar is a voice exchange between the viola and the cello involving A and C', then A' and C. Similar is that between the second violin and the viola involving B' and C' in the very middle. Similar is that between the first violin and the cello involving A and B in the middle as well. The crux is that this type of voice exchange abounds! Indeed, it is in this way that the four instruments interact with each other. The result is quite profound. Despite the pointillistic approach that Webern takes in the section and despite the consequent jumping major sevenths and minor ninths horizontally, the instruments seem to be engaging in a coherent conversation rather than a chaotic one. Even if the notes themselves are disjunct, the section as a whole does not sound as disjunct or disheveled as it could appear to be firsthand. Especially given the rhythmic consistency throughout, the section certainly presents a "gemachlich," or leisurely, pace, demonstrating how pointillism does not always have to sound disconnected and disjointed but can sound leisurely and fluid in fact.

Surely what adds to this sense of voice exchange is the use of arco in the strings in mm. 8-15. As the first violin starts off the first arco of the piece by an ascent in range, this gesture is quickly met by a descent in range by the viola in m. 10. Likewise, an ascent in range by the first violin in m. 11 is met by a descent in range by the second violin in the following measure. What results is a contrary motion in range, contributing a sense of counterpoint that definitely helps shape the conversation that the instruments are engaged in. Such contrary motion is particularly noticeable and thus powerful, because arco, as articulation, naturally stands out amid pools of pizzicato.

Of course, it should be mentioned that all four instruments do not start their rows at the same beat but at different beats. In other words, the first violin's initial A' does not exactly coincide with the second violin's C. Instead, there exists an offset that is presented from the very beginning where the first violin is followed by the cello, then by the second violin, and then by the viola. This is in fact the ordering that persists throughout the section. Indeed, this offset then functions to add an extra layer of complexity and interest, given the metrically monotonic nature of the section.

It also should be mentioned that the composer's initial choice of I_1, I_5, RI_1, and RI_5 is what enables the above analysis in the first place. With I_1 and say I_4, for example, the analysis will break down, because the first notes of I_4 are 4523, which does not map to any of A, B, C, A', B', or C', meaning that there would be no voice exchange that can occur between the instrument having I_1 and that having I_4. The same goes for I_2 or I_3, and so on. It is in this way that Webern's use of specific members of the row class can be made sense of.

Now, let us consider the second section of the piece: mm. 19-36. Initially, the same method of analysis seems to work. The first 4 notes of the first violin are 87t9, corresponding to

C. However, the second 4 notes are 1240, which we have not encountered from previous at all. Hence, we can discern that another musical idea is in play in the second section, which makes sense since the middle section in a da capo form often presents contrasting materials. Namely, one prominent aspect that recurs is a motif consisting of three eighth notes. Take the cello and the viola lines. The first three notes in the cello are 0e2, followed by 156 and 348. Incidentally, these three-note motifs correspond to sc(013), sc(015), and sc(015), respectively. This makes a lot of sense, because these are the aforementioned ones sheerly by looking at the prime form of the twelve-tone row and subdividing it into 4 sets of 3. Similarly, those in the viola are 12e, 087, and t95, corresponding to either sc(013) or sc(015). What is crucial to note here is that these motifs are not cherry-picked for the purpose of this analysis. In fact, *all* of the three-eighth-note figures that appear in mm. 19-36 belong to either sc(013) or sc(015).

Although sc(013) and sc(015) in the second section of the piece do present contrast from sc(0123) in the first, how the transition takes place is particularly worth probing. What is notable is that the method of twelve-counting still works initially in the cello and the viola. For instance, twelve-counting in the cello in mm. 19-26 yields 0e21563487t9, corresponding exactly to ABC, i.e. the prime form of the row. Same in the viola yields 12e087t95634, corresponding to A'CB, i.e. I_1, which is the one played by the first violin in the preceding section of the piece. Then what differentiates the presentation of the row this time around is the rhythm. Unlike the constant pulse of quarter note or rest in the first section, the second section utilizes a three-beat pattern, destabilizing what has preceded for the first time rhythmically. Nonetheless, the presented notes themselves are the same, providing a smooth transition between sections from a "gemachlich" pace to an "bewegt" one, i.e. leisurely to emotional.

Although we have touched upon the three-eighth-note motifs, there still are notes that do not belong to these. Take the very first note in the section, for instance. The soaring G# by the first violin in m. 19 is a half note that does not seem to belong to any motivic figure. Upon closer examination, however, we can in fact interpret it in a way that it is, and the method is again to count in sets of three rather than in sets of four. Before the first violin plays its first three-eighth-note figure of 40e in mm. 28-29, it plays 6 notes, i.e. 2 sets of 3 notes: 87t and 912. Indeed, these correspond to sc(013) and sc(015), respectively, confirming the predominance of these two set classes in the section. Though not as obvious to discern compared to three-eighth-note-motifs, these three-non-eighth-note-motifs do emerge in all four instruments, as the following excerpts reveal.

Interestingly, the first six notes in the first violin (mm. 19-25) and those in the second violin (mm. 20-27) are related by the operation I_5 (which happens to be one of the row forms that has been used extensively in the preceding part of the music): [8, 7, t, 9, 1, 2] and [9, t, 7, 8, 4, 3] are related by I_5. Similar is how the three-note figure in the cello in mm. 28-30 and that in the viola in mm. 30-32 are also related by I_5. Similar is how that in the second violin in mm. 32-24 and

that in the cello in mm. 34-36 are yet again related by I_5. As such, this idea of playing with I_5 is certainly brought to the fore while the more general idea of voice exchange between instruments is tinkered with, furthering the concept of conversation between instruments. Unlike the first section of the music where the conversation has taken place amid a constant rhythmic pulse, the second section definitely introduces rhythmic variety, as tossings of three-eighth-note motifs and three-non-eighth-note-motifs happen simultaneously. What results is a conversation that is certainly more emotional than leisurely.

The third section, i.e. mm. 36-53, then revives the constant rhythmic pulse involving quarter notes and rests. Overall, it is very reminiscent of the first section, except that the instruments swap roles.

	first section	third section
violin 1	I_1	RI_5
violin 2	RI_5	I_5
viola	I_5	RI_1
cello	RI_1	I_1

The first violin now has the second violin's part, and so on. Also, the range spanned by the instruments becomes slightly wider in the pitch space: the first section spans from G2 to E6 while the third spans from D#2 to F6. The section, as a result, sounds slightly more jumpy, but the conversational sense of voice exchange is still highly present, echoing the texture from the first section. Mostly recapping the movement as a whole, the section then comes to a close through a brief fermata followed by fiery blasts of notes in pizzicato that quickly diminish in dynamics, portending the next movement to follow in a curiosity-stimulating way.

To sum, the piece is in a da capo form such that the middle section provides contrast with the others. While [0, e, 2, 1, 5, 6, 3, 4, 8, 7, t, 9], the prime form of the row, is used throughout the piece, the specific use of it in 3 groups of 4 in the Gemachlich sections is shown to contrast with the use of it in 4 groups of 3 in the middle Bewegt section. In the end, striking is what this seemingly simple interplay between numbers 3 and 4 can bring about, and remarkable is how Webern has taken advantage of this interplay as a musical tool to compose a short movement that is pointillistic, yet conversational, fluid, and emotional.