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Stravinsky's Serial Games

ABSTRACT

Even after Stravinsky developed the trademark twelve-tone techniques that distinguish his last works, he continued to experiment. Many of these serial explorations seem more like compositional games of which, as Joseph Straus proposes, Stravinsky was both inventor and player. Offering evidence from analyses of the composer's sketches for *The Flood*, *Abraham and Isaac*, *Requiem Canticles*, and an unfinished work, I present instances of Stravinsky's serial 'games' that in their innovations go beyond his well-known hexachordal arrays and even further from the practices of classic serialism. These serial games appear to depend upon spontaneously invented sets of rules, from which the composer could derive in a systematic manner new pitch resources from those already established. Through these new resources, he could create the sounds presumably desired for composition but unavailable within existing pitch structures. Uncovering some of Stravinsky's hitherto unknown serial techniques enriches our view of his creative practice and offers solutions to analytical puzzles posed by passages in the late music whose pitch structures could not otherwise be explained.

1. INTRODUCTION

Even after Igor Stravinsky developed the trademark twelve-tone techniques that distinguish his last works, he continued to experiment. Many of these serial experiments act like compositional games of which, as Joseph Straus proposes, Stravinsky was both inventor and player (Straus 2001, 44). To my knowledge, Stravinsky never stated the rules of such games or even mentioned their existence. Nonetheless, study of the resulting music and of the composer's manuscripts allows us to infer the compositional play that occurred behind the scenes.

In this essay, I offer four examples of Stravinsky's serial games. Two of the examples, generated by a virtually unknown innovation, belong to published works. The other two result from serial experiments that never made it out of the lab. Together these four examples enhance our view of Stravinsky's compositional practice and offer clues for solving the analytical mysteries of passages with currently unclear serial derivations.

2. ROTATIONAL ARRAY AS GAME BOARD

In the two examples from published scores, Stravinsky treats his well-known rotational arrays as if they were game boards on which the player can move only in accordance with the game's rules. Before discussing this technique, I'll provide a brief overview of Stravinsky's standard rotational array, itself a significant innovation that is first used in *Movements* (1958–1959). More detailed discussions of these arrays are available elsewhere (Straus 2016, 328–32; Roig-Francolí 2008, 221–3; Straus 2001, 64–71; Phillips 1984, 70–3).

Stravinsky began by devising a twelve-tone series, which he typically labeled 'O', likely for 'original'. From the original, he

derived other basic series forms, including the inversion, retrograde, and inversion of the retrograde. For most of his late works from *Movements* on, he divided every basic form into two hexachords, each of which served as the basis of a rotational array.

Creation of an array would begin with the notation of one such hexachord. Immediately below this initial hexachord its five transposed rotations appear. That is, the hexachord is rotated so that its second pitch class begins the array's second row, which is transposed so that the first pitch of this row is the same as that of the original hexachord. This procedure is repeated for the hexachord's third through sixth pitch classes.

The result is a six-by-six array containing six rows, each beginning with the same pitch class, and six columns, which Stravinsky termed 'verticals'. The verticals of his rotational arrays exhibit notable symmetries, including that the first vertical acts as the axis of symmetry for all six (Straus 2001, 154). Stravinsky's standard usage of an array was to employ the rows as ordered melodic entities and the verticals as harmonies. When games were involved, however, Stravinsky's practice was anything but standard.

2.1 Game-Board Technique in *The Flood* (1961–1962)

Stravinsky's treatment of a rotational array as a game board produced the distinctive *flautando* dyads in the opening measures of 'The Flood (Choreography)', the movement that depicts the great deluge itself in *The Flood*. A brief, bi-layered passage sounds from the second eighth note of bar 399 through the end of bar 400. The monophonic lower layer contains bass clarinet, contrabass tuba, and contrabasses, which play the second through twelfth pitch classes of the inversion of the work's series. (The first pitch class is provided by the last pitch of the series retrograde, heard during the first eighth of bar 399.) The higher layer, comprising violins and violas, plays the succession of descending *flautando* dyads, which arise from an unconventional sequence of zigzagging moves through the first two rows of *The Flood*'s O β array, based on the second hexachord of the work's original series. Here, the first pitch of row 1 (E₅) sounds with the second of row 2 (C₆). The next three dyads maintain the diagonal relationship between rows, producing harmonic dyads D₅ and B₅, A \sharp ₅ and A₄, and A₅ and A \sharp ₄.

This derivation is supported by notations that Stravinsky made on his short score of the movement.¹ He wrote O and β immediately before the entrance of the violins and violas. Next to each new pitch, he notated the numerals '1' and '2', corresponding to the row that constitutes that pitch's source.

The consistency of the pitches in the violins and violas in bars 399–400 implies the allowed moves of the game and their sequence: start in row 1, move diagonally to the next order position in row 2 to create a simultaneity, then move up within

¹ All compositional materials cited in this essay are found in the Igor Stravinsky Archives, housed at and owned by the Paul Sacher Stiftung in Basel, Switzerland.

the same order position to start a new dyad. The *flautando* layer stops with the fourth diagonal. The remaining pitches of the zigzag sound in other parts: G and F-sharp in the bass layer at the end of bar 400, where they also complete that layer's series, and G-sharp in contrabass clarinet at the beginning of bar 401 to begin a new passage and series form.

The zigzag path yields two notable features not available through standard uses of the array: the diatonic parallel sixths sounded by the initial dyads E_5/C_6 and D_5/B_5 , and the upper voice's chromatic descent from C_6 in bar 399 through the A_5 in bar 400.

2.2 Game-Board Technique in *Abraham and Isaac* (1962–1963)

The second example of Stravinsky's game-board technique is found in the first six bars of the somber instrumental passage preceding the sacrificial scene in *Abraham and Isaac*. The composer's use of this technique is so intricate in bars 91–6 that a justification for their pitch organization could probably not have been deduced from analysis of the score alone. Stravinsky's sketch for the passage provides clues essential for solving the mystery.

Bars 91–6, like the entire passage to which they belong (bars 91–104), present a succession of harmonic dyads in a low register, mixed with the occasional single pitch. The sketch for bars 91–6 contains these sonorities and an 'I', which indicates that the inversion of the series is their source. Above the pitches, Stravinsky wrote a sequence of numerals that denote columns and rows of the rotational array based on the first hexachord of the inversion ($I\alpha$). These numerals serve as coordinates for specific locations — and thus, pitch classes — on the array.

The coordinates trace three paths through the array, one in bars 91–2, another in bars 93–4, and the last in bars 95–6. According to the rules implied by Stravinsky's consistent treatment of the array as a game board, each path begins with a square comprising the four pitches occupying two adjacent columns in two adjacent rows. For example, the first path begins with the square formed by the pitches in the first two rows of columns 1 and 2. After establishing this two-by-two square, the path moves diagonally to the closest two-by-two square occupying different rows and columns. Completion of the path occurs with one more diagonal move in the same direction to the next two-by-two square, which occupies yet another set of rows and columns. Thus, no matter where the first two-by-two square is located, the diagonal path will define two other squares so that members of each of the six rows and columns participate.

The first path moves from the top left through the bottom right of the $I\alpha$ array; however, the other two in this passage do not begin in a corner of the array. They are best understood if one envisions the array as if its bottom edge were attached to its top edge and its right edge to its left edge. In effect, we imagine the array gameboard as a torus so that the paths can start at any location on the array and continue beyond what we would normally consider its outer edges.

Playing by these rules on the $I\alpha$ array permitted melodies and strings of simultaneities that could not have been achieved through Stravinsky's usual employment of an array. For example, by treating each vertical not as a fixed entity but rather as a column of discrete dyads, the passage's harmonies completely avoid interval classes 1 and 6, despite their presence in the array's columns.

3. GAMES FOUND ONLY IN THE SKETCHES

Two other examples of Stravinsky's serial games remained at the experimental stage, never making it into a published work. The first game combines existing series forms to create a new twelve-tone series. The second suggests a new kind of rotational array.

3.1 The 'Hybrid' Series

A sketch page from 1965 for the Interlude from *Requiem Canticles* (1965–1966) reveals Stravinsky's attempt to derive a new twelve-tone series from the original and inversion of the second of the work's two series. On this sketch, the composer attached a label 'O' or 'I' to each segment of the resulting 'hybrid' series.

The contents of the sketch suggest the strict alternation of dyadic segments from the two different row forms as the underlying rule for this game. For example, to create the hybrid series, the first two pitch classes of the original series are followed by the third and fourth pitch classes of the inversion. A secondary rule allows a violation of the first to prevent the repetition of a pitch class already stated, as at the penultimate position, where an additional pitch class is taken from the original series to avoid the repetition that would have arisen from the expected return to the inversion at this point.

One can imagine the attraction of the hybrid series, which arises directly from two existing forms and retains fragments of each while also offering different pitch and intervallic adjacencies. On the same sketch page, Stravinsky sketched a passage based upon this hybrid series; his arrows and lines leading from the hybrid row to the notes in the passage document the derivation.

Stravinsky revised the passage on the same sketch page and, in a later draft, assigned it to bassoons. Nonetheless, this duet — the only known music based upon the hybrid series — does not survive to the published score.

3.2 A New Direction for the Rotational Array?

A final example of a serial game offers a potentially exciting, but incompletely realized, variant of Stravinsky's standard rotational array. It is found on a sketch page for the unfinished piece that he worked on during 1966.

On the page, Stravinsky notated the series form IR, the inversion of the retrograde. Below the first six pitches of IR, he labeled order positions 1 through 6. To the right of the series, he wrote the numeral 1 and notated the pitches from the first six order positions of IR. Directly underneath, numeral 2 precedes pitches in order positions 2 through 7. He repeated this procedure until finishing with line 6, which contains the pitches in order positions 6 through 11. In sum, Stravinsky moved his hexachordal lens progressively through the series form, using each pitch class of the first hexachord as a beginning note. The result is a six-by-six array, identical in dimensions, but not in structure or contents, to his standard rotational arrays.

In effect, this moving hexachordal lens replaced the rotation used to build Stravinsky's standard arrays. To make the stacked 'progressive' hexachords into a usable array comprising rows and columns that differ in their contents, Stravinsky would have needed to transpose each row so that the leftmost column contained only one pitch, as in his standard arrays. He did not complete this step. Had he done so, the result would have been a new type of array that lacked the symmetries inherent in his standard arrays, and yielded instead a greater variety of intervallic structures for both rows and verticals. Unfortunately,

there are no clues as to the music he might have written with such an expansion of his palette.

4. CONCLUSION

Stravinsky's apparent penchant for inventing games and following rules can be discerned as early as *The Rite of Spring*, where his chromatic harmonizations of diatonic melodies are often generated by algorithms of his own invention (Rogers 2017, 380–401). Thus, the serial games discussed here boast a distinguished lineage. These games were likely improvised on the spur of the moment as inspired by a specific work or passage; nonetheless, the logic of the rules and Stravinsky's consistent adherence to them allow us to detect their presence in retrospect and thereby to enrich our picture of his practices. Viewing Stravinsky as a creator and player of serial games may help us to imagine the musical and intellectual joy that accompanied his compositional discoveries.

KEYWORDS

Stravinsky, Serialism, Compositional Process, Array.

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