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NON-SERIAL ATONALITY

ATONAL MUSIC: music without a tonal center; the free atonality of the 1920s led to a more structured method called serialism or 12-tone music.

Characteristics of atonal music:
lacks a tonal center
unresolved dissonances
mixed-interval chords
pitch material derived from the chromatic scale
very contrapuntal in nature

Terms and Concepts

octave equivalence -- notes of the same name separated by an octave are equivalent (but not identical)

pitch -- a tone with a certain frequency

pitch class -- a group of pitches with the same name (such as pitch class C); named as integers from 0-11 for pitch class C - B respectively

enharmonic equivalence -- in post-tonal music, notes that enharmonically equivalent (e.g., Bb and A#) are also functionally equivalent

integer notation -- the naming of the 12 pitch classes by numbers 0-11 (C-B respectively); a type of "fixed do" notation; use numbers so that we can add and subtract intervals (to transpose a melody or sequence of notes to another pitch level).

mod(ulo) 12 -- a numerical system that contains only the numbers 0-11 (12 numbers). Therefore, -12 = 0 = 12 = 24 and -13 = -1 = 23 = 35 = 11. If the number you are working with goes outside the boundaries of 0

pitch (class) set -- a motive that can appear melodically, harmonically or some combination of the two; its pitches can appear in any order

ANALYSIS

Segmentation:

The first step to any analysis of atonal music should be to identify the pitch sets by identifying chords, melodic figures, or motives that are important. This process is known as segmentation.

segmentation -- the process of identifying and labeling the pitch sets in a composition.

Segmentation should reflect the way the music sounds and should not divide musical units such as chords, melodic figures, or motives in unmusical ways.

The next step is to identify the normal order, best normal order, prime form, and interval vector of each set identified.

Normal Order/Best Normal Order:

Normal order -- the basic form of a pitch set.

To find the normal order:
1. arrange the note of the segment as an ascending scale (include the octave of the bottom note). You can begin on any note and spell the notes enharmonically. Leave out duplicated pitch classes.

2. Find the largest interval between any 2 adjacent notes. The top note of this interval is the bottom note of the normal order. Rearrange the pitches in normal order.

3. If there are 2 or more intervals that are tied for the largest interval:

Write the 2 (or more) normal orders. Compare the bottom intervals of these normal orders. Whichever normal order starts with the smallest interval is THE normal order. If both are the same, keep comparing intervals. Whichever order has the smallest interval first, that is the normal order.

Sometimes it is impossible to break the tie -- there are two forms that are exactly the same intervallically. In this case, either set is the normal order and the set is known as transpositionally symmetrical -- it reproduces its own pitch class content under one or more intervals of transposition.

Best Normal Order -- the generic representation of all the possible transpositions and inversions of the set.

To find the best normal order:
1. Find the normal order

2. Invert the normal order.

3. Determine the normal order of the inversion of the set.

4. Compare the normal order and the normal order of the inversion of the set. Whichever is the "better" is the best normal order.

If the normal order of the set and the normal order of the inversion are the same or transpositionally equivalent, the set is known as **inversionally symmetrical** -- it reproduces its pitch class content at one or more levels of inversion.

Set Types and Prime Forms:

There are 220 total set types (combination of dyads -- two note sets-- through decachords --10 note sets).
Prime form -- the name for a pitch set.

To determine the prime form:
Apply numbers to the best normal forms follows: The first pitch is always 0. The number of the other pitches is the number of half-steps each note is above the lowest note.

Write the prime form as a series of numbers, separated by commas, and enclosed in brackets; e.g., [0,2,6].

Interval Vector:
interval vector -- a tabulation of the total number of each type of interval in the set. This includes not only intervals between adjacent notes, but intervals formed by all combinations of notes in the set.

interval classes (IC) -- the six types of intervals; there are only 6 because of the property of inversional equivalence (e.g., a m2 = M7). The ICs are:

IC	Traditional interval
1	m2, M7
2	M2, m7
3	m3, M6
4	M3, m6
5	P4, P5
6	A4, d5 (Tts)

To determine the interval vector:
1. A fast way to determine the interval vector is to take the prime form (e.g., [0,2,3,7]) and subtract the first digit from each of the others, then subtract the second digit from the others, etc. In the above example, subtract as follows: 2-0=2, 3-0=3, 7-0=7, 3-2=1, 7-2=5, 7-3=4.

2. Count up the number of each of the resulting digits; in the above there is one 1, one 2, one 3, one 4, one 5, no 6 and one 7. 7 is not a possible pitch class; subtract it from 12 to get the pitch class (12-7=5). So there are two 5s.

3. Write the counts as a series of number (in parentheses) showing the number of 1,2,3,4,5,6 ICs. For the above, the interval vector will be (111120).

You can do the subtraction in a table format as follows:

prime form:	0	2	3	7
(x-0)		2	3	7
(x-2)			1	5
(x-3)				4

Z-related sets -- pairs of sets that share the same interval vector.

Aggregates

aggregates -- a statement of all 12 pitch classes in a short period of time without regard to order or duplication.

Inversionally Symmetrical

As explained above, this means that the pitch set reproduces its pitch class content at one or more levels of inversion.

You can tell if a set is inversionally symmetrical by looking at its interval content as follows:

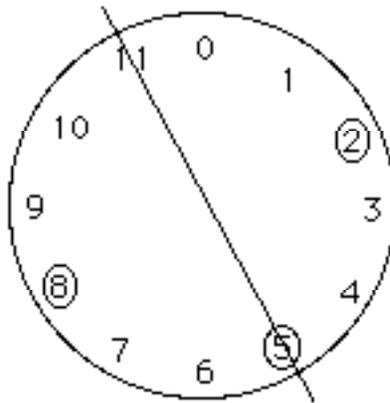| intervals:		2		1		2	
prime form:	[3,		5,		6,		8]

If the interval numbers form a palindrome, the set is inversionally symmetrical.

You can also determine if a set is inversionally symmetrical, and at how many levels, by circling the prime form pitch numbers in a clock face and looking for the axes of symmetry. See the examples below:

prime form = [3, 5, 6, 8]
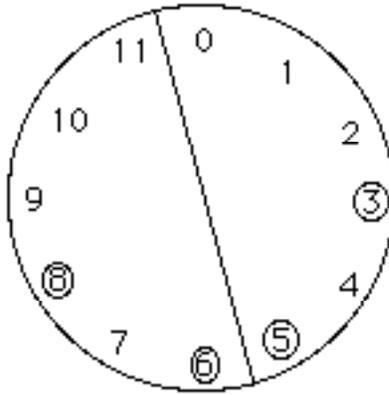
prime form = [2, 5, 8]

The axes may cut between numbers in the clock face (as in the first example above) or through numbers (as in the second example). If the axis cuts through the numbers, these notes are the axis of symmetry and may play a centric role in the composition.

Some sets, such as the octatonic scale, may have more than one axis of symmetry. (See below).

octatonic scale prime form = [0, 1, 3, 4, 6, 7, 9, 10]
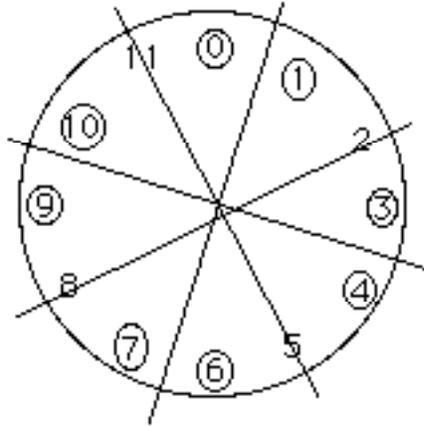
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