

Straus Ch. 1
BASIC CONCEPTS AND DEFINITIONS

Joseph Straus, *Introduction to Post-Tonal Theory*, 3rd ed. (Upper Saddle River: Prentice Hall, 2005).

| Terms & Concepts | | |
|--|--|--|
| twelve-tone equal temperament, abbr. 12tet equivalence relation - octave equivalence - enharmonic equivalence equivalence class identity relation pitch - frequency - pitch notation pitch class, abbr. <i>pc</i> - staff notation - pc letter name notation - pc integer notation + fixed-zero [C=0] + movable-zero | pc clockface diagram mod12 - modulus - mod12 arithmetic pitch space, abbr. <i>p space</i> modular pitch-class space, abbr. <i>pc space</i> Intervals - pitch interval, abbr. <i>ip</i> - traditional tonal names - ordered (directed) - adjacent/non-adjacent - simultaneity - integer notation + direction (signed) + magnitude (abs. value) | Four Interval Types - ordered pitch interval - unordered pitch interval - ordered pc interval - unordered pc interval interval class, abbr. <i>ic</i> - complement mod12 - ic scoreboard - ic content - ic vector - unique multiplicity of ic - complement mod12 |

FOUR INTERVAL TYPES

“Which one we use will depend on what musical relationship we are trying to describe.”

“The quality of a sonority can be roughly summarized by listing all the intervals it contains.”

Joseph Straus, *Introduction to Post-Tonal Theory*

| | Interval Type (Abbr.) ¹ | Abbr. ² | Range | Formula | Description |
|----|---|--------------------|---------------------|---|---|
| 1. | Ordered pitch interval (opi) | <i>ip</i> | -88-88 ³ | $ip\langle x,y\rangle = y-x$ | Distance between two pitches, direction and distance are indicated. |
| 2. | Unordered pitch interval (upi) | | 0-88 | $ip(x,y) = y-x $ | Absolute distance between two pitches, only distance is indicated. |
| 3. | Ordered pitch-class interval (opci) | <i>i</i> | 0-11 | $\text{mod}12(y-x)$ | Distance between two pitch classes, number of units <i>clockwise</i> on the pc clockface diagram. |
| 4. | Interval class (ic) or unordered pitch-class interval (upci) | <i>ic</i> | 0-6 | <i>Lesser of</i> $\text{mod}12(y-x)$ or $\text{mod}12(x-y)$ | Shortest distance between two pitch classes, shortest distance (<i>clockwise</i> or <i>counterclockwise</i>) on the pc clockface diagram. |

EXAMPLE

| Pitch Interval | opi | upi | opci | ic |
|----------------|-----|-----|------|----|
| A4-G#3 | -13 | 13 | 11 | 1 |

¹ Abbreviations we will use in class.

² Abbreviation in Straus (2005).

³ For example, the p-space modeled by a piano keyboard.

PITCH SPACE

“We locate pitches in an extended *pitch space*, ranging in equal-tempered semitones from the lowest to the highest audible tone.”

Joseph Straus, *Introduction to Post-Tonal Theory*

In post-tonal theory, a 12tet *pitch space* (*p-space*) is usually assumed. The 88 keys of a piano provide a convenient reference for envisioning this linear p-space (N.B. *enharmonic equivalence* is also assumed). The basic intervallic unit, called the *semitone*, has a magnitude of 1 and its size may be defined using the interval frequency ratio:

$$\sqrt[12]{2} : 1 = 2^{1/12} = 1.059 = 100 \text{ cents}$$

P-space may be collapsed into a *pitch-class space* (*pc-space*) under *octave equivalence*. The *pc clockface diagram* provides a convenient reference for envisioning this modular pc-space. See the *Morris on Pitch Spaces* overview for more information.

QUOTABLE

“The repertory of atonal music is characterized by the occurrence of pitches in novel combinations, as well as by the occurrence of familiar pitch combinations in unfamiliar environments.”

Allen Forte, *The Structure of Atonal Music*

“Every piece of music is unique, with idiosyncratic organizational principles and structures shared with no other piece of music.”

John Rahn, *Basic Atonal Theory*

“Most musical systems quantize the **pitch-continuum**⁴ into a finite number of pitches ordered from low to high.”

“...**pitch** is the intersubjective correlate of frequency.”

"**relative pitch**...allows equal frequency ratios to be heard as equal pitch differences, different intervals can be distinguished and grouped into classes."

Robert Morris, *Composition with Pitch-Classes*

“Varèse’s octave is symmetrically partitioned by the tritone... instead of asymmetrically by the fifth degree of the diatonic scale into a perfect fifth and perfect fourth.”

George Perle, *The Listening Composer*

“I have chosen to define a good ear as one that perceives and retains musical structures and understands their role in a musical transformation or other compositional process...”

A good ear is an ideal toward which all musicians work in some fashion.”

Michael L. Friedmann, *Ear Training for Twentieth-Century Music*

“A broad consensus has emerged among music theorists regarding the basic musical elements of post-tonal music—pitch, interval, motive, harmony, collection...”

“Even though the interval-class vector is not as necessary tool for tonal music as for post-tonal music, it can offer an interesting perspective on traditional formations.”

Joseph Straus, *Introduction to Post-Tonal Theory*

⁴ Emphasis added.