BAIN MUSC 525
Post-Tonal Theory

Straus Chapter 1

Basic Concepts of Pitch and Interval

Joseph N. Straus, *Introduction to Post-Tonal Theory*, 4th ed. (New York: Norton, 2016), pp. 1-18.

"To appreciate [a] painting fully, you have to be willing to move from place to place.
One of the specially nice things about music is that you can hear a single object like an interval in many ways at once."

– Joseph N. Straus, *Introduction to Post-Tonal Theory*

TERMS & CONCEPTS

Chromatic scale
Twelve-tone equal temperament, abbr. *12tet*:

$$\sqrt[12]{2} = 2^{1/12} \approx 1.059$$

Semitone = 1, the unit interval

Equivalence
Octave equivalence
Enharmonic equivalence
Equivalence class[1]

Pitch
Frequency
Staff notation
American Standard Pitch Notation (C4 is middle C)

Pitch class
Pitch class, abbr. *pc*, pl. *pcs*
- Letter notation
- Integer notation
  - Fixed-zero [C=0]
  - Movable-zero: e.g. [A=0]

Pitch-class clockface
Modular arithmetic: *a* (mod *n*)
- Modulus *n*
- mod 12
  e.g., 11 + 2 (mod 12) = 1
- Congruence (≡)

Pitch Spaces
Linear pitch space, abbr. *p space*
Modular pitch-class space, abbr. *pc space*

Intervals
Traditional intervals: P8, P5, M3, m3, A4, d5, etc.
Melodic intervals (ordered)
Harmonic intervals (unordered)
Pitch interval, abbr. *pi*

Four Interval Types
1. Ordered pitch interval (*opi*)
2. Unordered pitch interval (*upi*)
3. Ordered pc interval (*opci*)
4. Unordered pc interval (*upci*)

Interval Class
Interval class, abbr. *ic*
Collection of pitch classes
Interval-class content
Straus ic scoreboard
Interval-class vector, abbr. *ic vector*
Unique multiplicity

Spacing & Register
Registral orders
Spacing intervals
Permutations, or arrangements

INTERVAL TYPES

Space	Interval type (abbr.)	Range[2]	Description
p space	1. *Ordered pitch interval* (opi)	–87 to 87	**Directed distance between two pitches** Direction (+/–) and magnitude (in semitones)
	2. *Unordered pitch interval* (upi)	0 to 87	**The space between two pitches** Magnitude only
pc space	3. *Ordered pitch-class interval* (opci)[3]	0 to 11	**Directed distance between two pitch classes** Clockwise distance on the clock
	4. *Unordered pitch-class interval* (upci), also called *interval class* (ic)	0 to 6	**The space between two pitch classes** Shortest distance on the clock

Straus says: "Which one we use will depend on what musical relationship we are trying to describe."

EXAMPLE

	p space		*pc space*	
Pitch interval (pi)	**opi**	**upi**	**opci**	**ic**
A4–G♯3	–13	13	11	1

[1] For mathematical definitions, see *Mathematical Terms & Concepts* on the course website.
[2] The range of values for a *linear pitch space* modeled by a 12tet piano keyboard (C4 = 0, with boundary conditions A0 = –39 & C8 = 48), and a *modular pc space* modeled by a pc clockface diagram.
[3] We will NOT use the *opci negative equivalents* that Straus introduces on p. 10: i.e., 7 (–5), 8 (–4), 9 (–3), 10 (–5), & 11 (–1).