



MTO 15.5 Examples: Kuusi, Discrimination and Evaluation of Trichords

(Note: audio, video, and other interactive examples are only available online)

<http://www.mtosmt.org/issues/mto.09.15.5/mto.09.15.5.kuusi.php>

Example 1. Chords used in Experiment 1

Set-class labels are listed above each group, while chord spans (in semitones) are listed with each chord

The image displays four groups of musical notation, each consisting of a staff with a treble clef and a key signature of one flat (B-flat). The chords are represented by vertical stems with dots indicating pitch classes. The set-class labels and chord spans are as follows:

- Group 1:** Labeled [013] and [014]. The first group contains four chords with spans 15, 15, 14, and 13. The second group contains four chords with spans 16, 16, 15, and 13.
- Group 2:** Labeled [045] and [024]. The first group contains four chords with spans 17, 17, 16, and 13. The second group contains four chords with spans 16, 16, 14, and 14.
- Group 3:** Labeled [035] and [026]. The first group contains four chords with spans 17, 17, 15, and 14. The second group contains four chords with spans 18, 18, 16, and 14.
- Group 4:** Labeled [027]. It contains three chords with spans 17, 17, and 14.

Example 2. Two items from Experiment 1. The deviant chord is circled

[013]/15
[013]/14
[013]/15
[035]/14
[024]/14
[024]/16
[027]/14
[024]/16

Table 1. Huron consonance value calculated for set-class [024]

Interval-class (IC)	Set-class [024]		
	Huron index for ICs	Number of IC instances	Product
1	-1.428	0	0
2	-0.582	2	-1.164
3	0.594	0	0
4	0.386	1	0.386
5	1.240	0	0
6	-0.453	0	0
		Sum	-0.778

Table 2. Differences in Huron consonances and responses according to set class

SC-pair	Difference in the degree of consonance	Responses according to SC (without order)	Responses according to SC, the more consonant SC forming the context	Responses according to SC, the more dissonant SC forming the context
[024], [026]	0.129	35.9%	37.0%	34.8%
[045], [026]	0.847	65.2%	73.9%	56.5%
[014], [045]	1.032	18.5%	23.9%	13.0%
[024], [035]	2.030	32.6%	39.1%	26.1%
[014], [035]	2.086	65.2%	65.2%	65.2%
[013], [035]	2.668	56.5%	52.2%	60.9%
[024], [027]	2.676	69.6%	78.3%	60.9%
[013], [027]	3.314	76.1%	82.6%	69.6%
		Average	56.52	48.37
		St. dev.	21.71	20.84

Figure 1. Discrimination between set classes plotted against the differences in Huron consonances

The chance level ($p = 0$) and significance levels $p = .01$ and $p = .001$ are shown with dashes

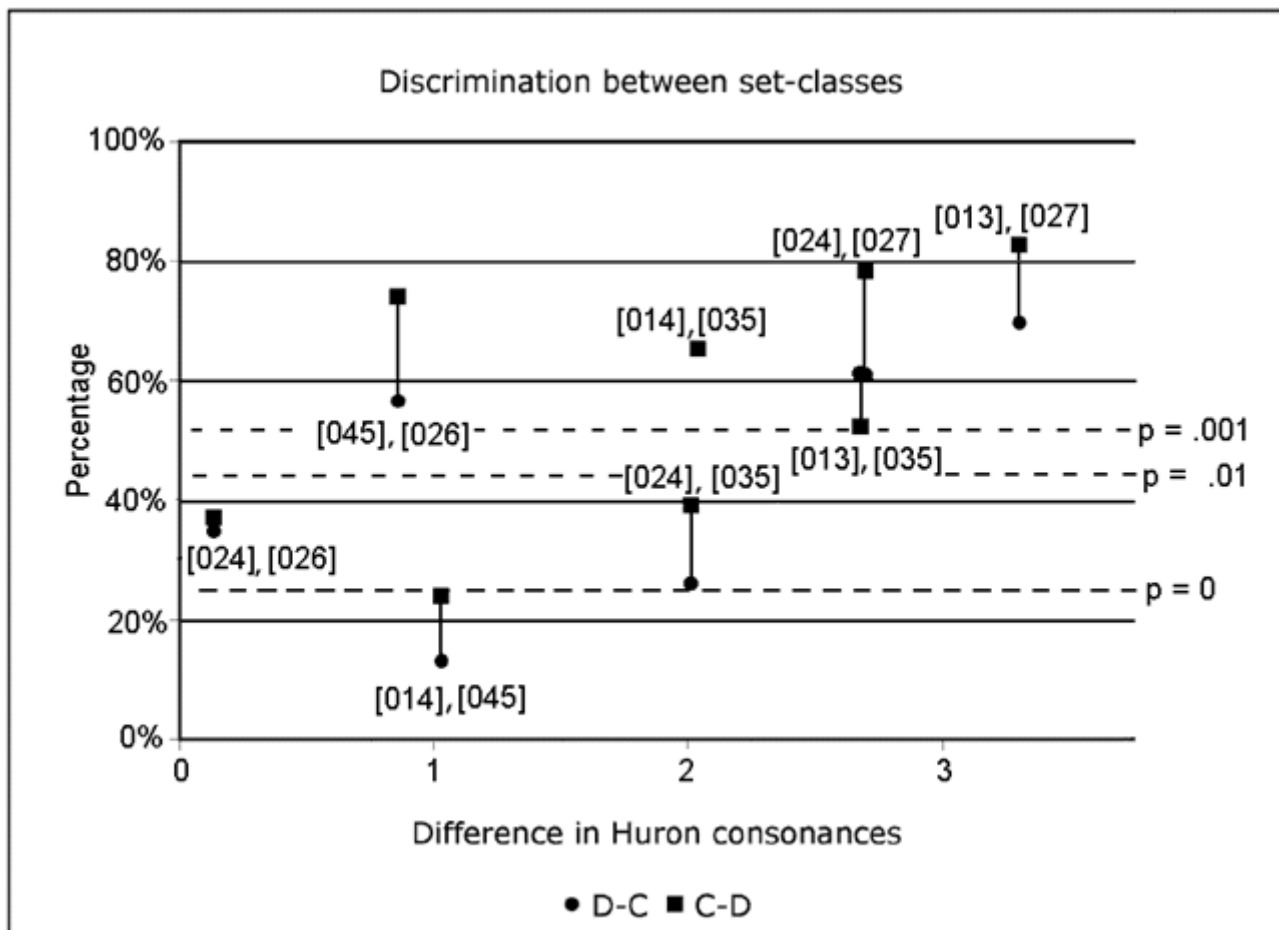
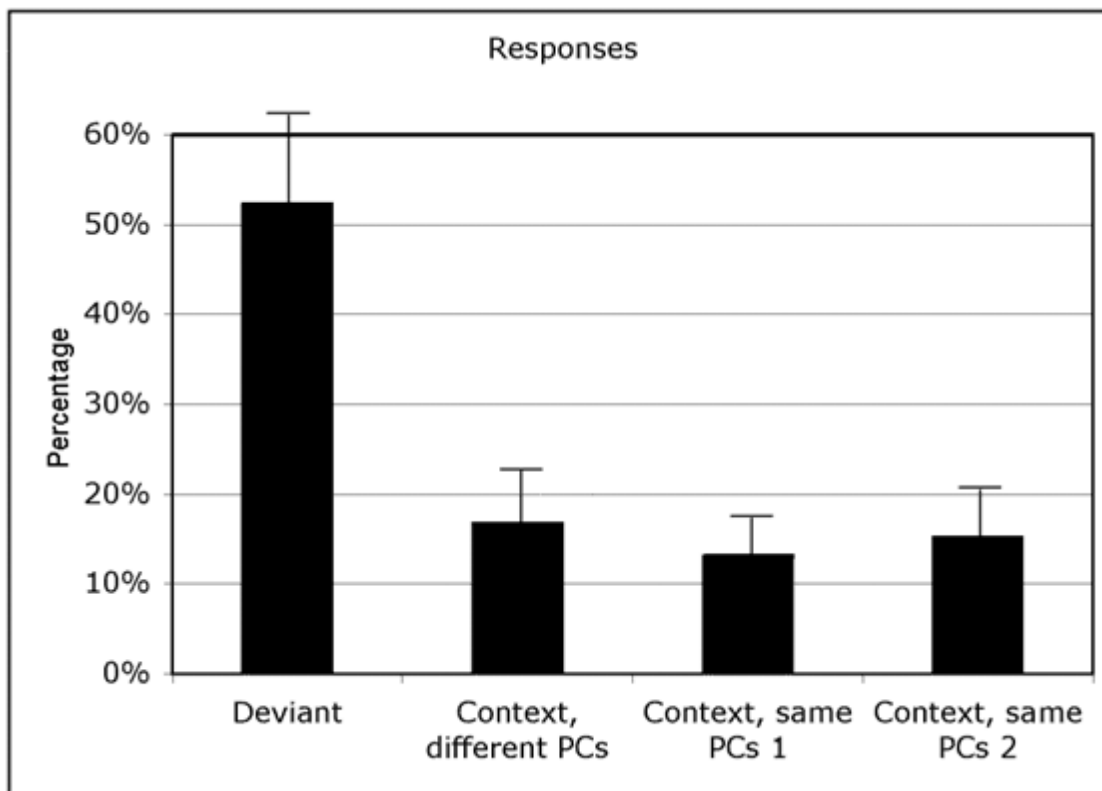


Figure 2. The participants' responses to the four chords in each sequence, expressed in percentages



Example 3. The chords in Experiment 2

Set classes and chord spans in semitones are shown below the chords

Two rows of musical notation are shown, each containing ten chords. Below each chord, its set class and chord span are indicated in the format [set class]/[chord span].

Row 1 chords and their labels: [024]/4, [045]/5, [035]/5, [027]/7, [037]/7, [047]/7, [037]/8, [047]/8, [026]/10, [014]/11.

Row 2 chords and their labels: [045]/11, [012]/13, [024]/14, [027]/14, [013]/15, [014]/15, [045]/16, [026]/16, [035]/17.

Table 3. Hutchinson and Knopff dissonance calculated for two chords representing set-class [024]

Chord [024]/4			Chord [024]/14		
	Intervals	H&K index		Intervals	H&K index
M2	F4-G4	0.2190	M3	A3-C#4	0.0692
M2	G4-A4	0.1988	M9	A3-B4	0.1024
M3	F4-A4	0.0383	m7	C#4-B4	0.0941
	Sum	<u>0.4561</u>		Sum	<u>0.2657</u>

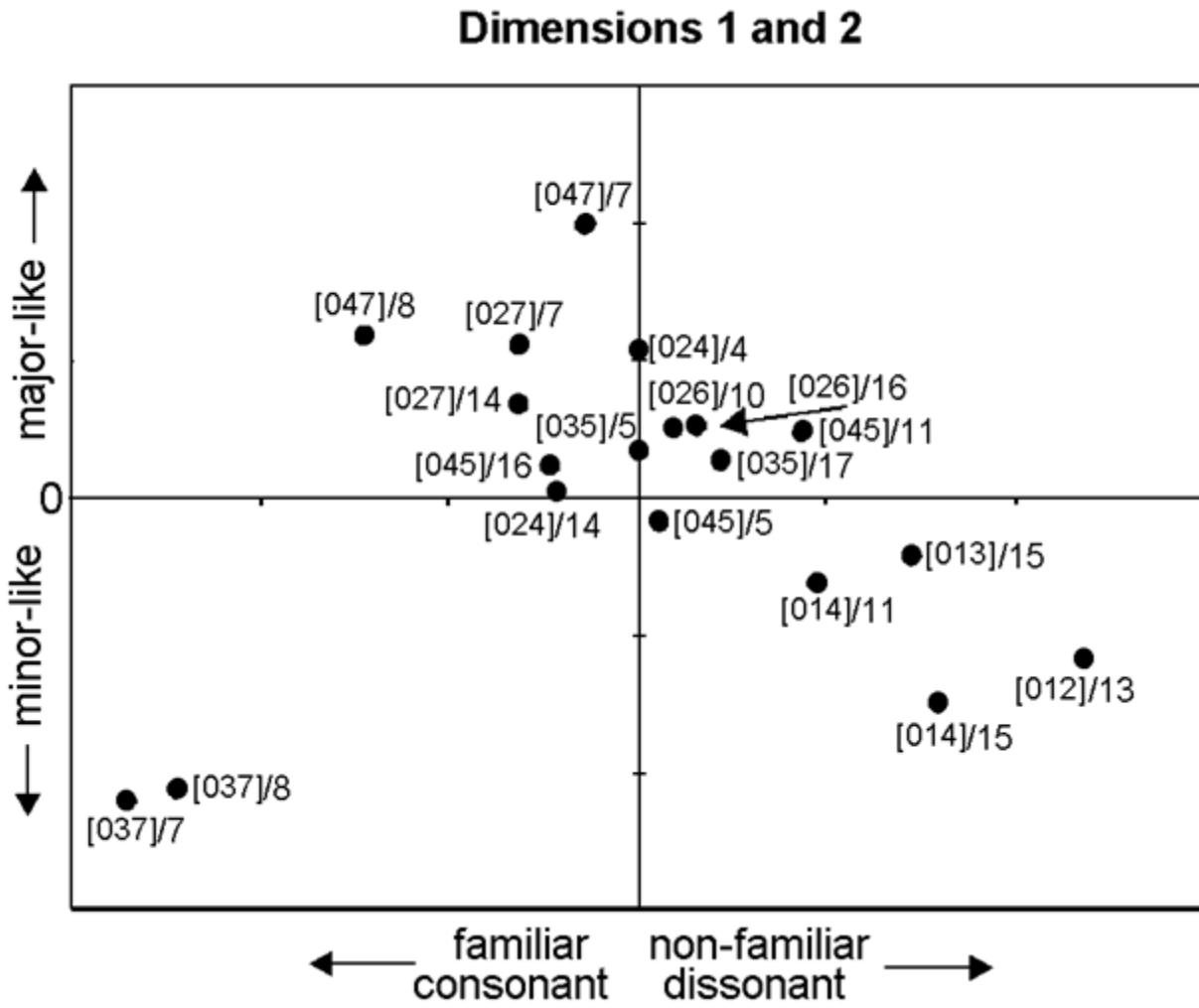
Table 4. Hutchinson and Knopff dissonance values for chords

Chord	H&K value	Chord	H&K value	Chord	H&K value
[012]/13	0.6416	[014]/15	0.3266	[047]/8	0.1993
[045]/5	0.5410	[035]/17	0.3134	[037]/8	0.1939
[024]/4	0.4561	[045]/16	0.3043	[037]/7	0.1536
[013]/15	0.4363	[045]/11	0.2874	[027]/14	0.1374
[014]/11	0.4203	[024]/14	0.2657	[047]/7	0.1152
[027]/7	0.3594	[026]/16	0.2217		
[035]/5	0.3360	[026]/10	0.2165		

Table 5. The 50 thesaurus groups in alphabetical order, their labels (given also in Finnish), and the number of words in each group

Thesaurus groups			
Label	Words	Label	Words
active (<i>aktiivinen</i>)	10	happy & joyous (<i>onnellinen, iloinen</i>)	17
alarmed (<i>levoton, pelkäävä</i>)	35	hard (<i>kova</i>)	19
beautiful (<i>kaunis</i>)	32	harmonious (<i>soiva</i>)	14
blurred (<i>samea</i>)	2	incomplete (<i>epätäydellinen</i>)	12
boring (<i>tylsä</i>)	16	lively (<i>virkeä</i>)	13
bright (<i>kirkas</i>)	43	odd (<i>outo</i>)	8
calm (<i>leppoisa</i>)	23	open (<i>avoin</i>)	19
certain (<i>varma</i>)	17	oppressive (<i>ahdistava</i>)	14
clear (<i>selkeä</i>)	16	relaxing (<i>rentouttava</i>)	2
closed (<i>suljettu</i>)	7	repulsive (<i>tympeä</i>)	6
cold (<i>kylmä</i>)	4	safe (<i>turvallinen</i>)	6
complete (<i>täydellinen</i>)	8	sad & melancholy (<i>surumielinen</i>)	42
complex (<i>monimutkainen</i>)	8	simple (<i>yksinkertainen</i>)	2
cruel (<i> julma</i>)	6	small (<i>pieni</i>)	13
dangerous (<i>vaarallinen</i>)	21	soft (<i>pehmeä</i>)	12
dark (<i>tumma</i>)	7	tender (<i>lempeä</i>)	7
dissonant (<i>riitaisa</i>)	35	tired (<i>väsynyt</i>)	11
empty (<i>tyhjä</i>)	7	traditional (<i>perinteinen</i>)	16
excited (<i>jännittynyt</i>)	29	transparent (<i>läpinäkyvä</i>)	4
expectant (<i>odottava</i>)	15	uncertain (<i>epävarma</i>)	19
familiar (<i>tuttu</i>)	11	unclear (<i>epäselvä</i>)	3
final (<i>lopullinen</i>)	4	unfinished (<i>keskeneräinen</i>)	7
fresh (<i>raikas</i>)	10	unfamiliar (<i>vieras</i>)	17
full (<i>täysi</i>)	16	ugly (<i>ruma</i>)	4
grand (<i>suuri</i>)	27	warm (<i>lämmin</i>)	8

Figure 3. Dimensions 1 and 2 of the MDS configuration



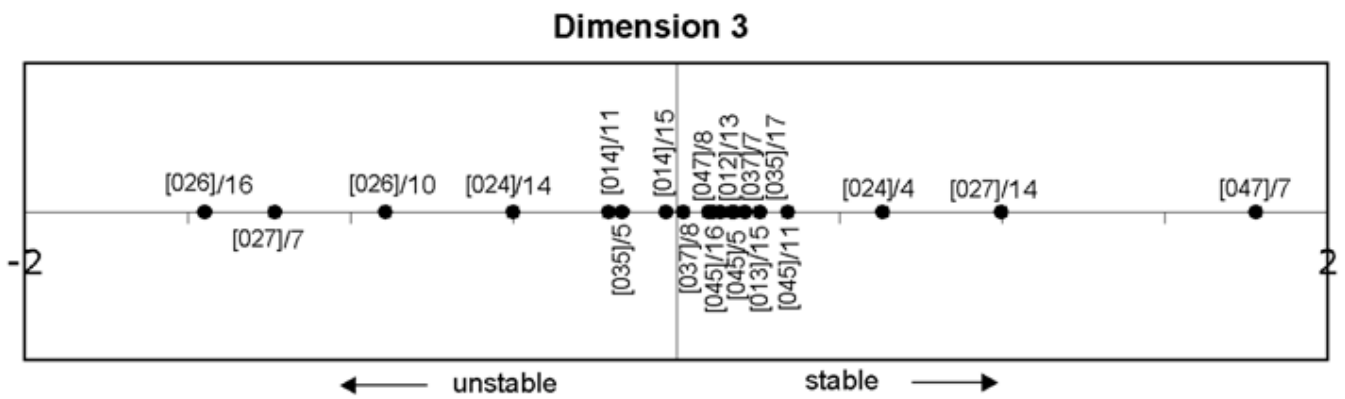
Example 4. Chord voicings at the ends of dimension 1



Example 5. Chord voicings at the ends of dimension 2<



Figure 4. Dimension 3 of the MDS configuration



Example 6. Chord voicings at the ends of dimension 3

