



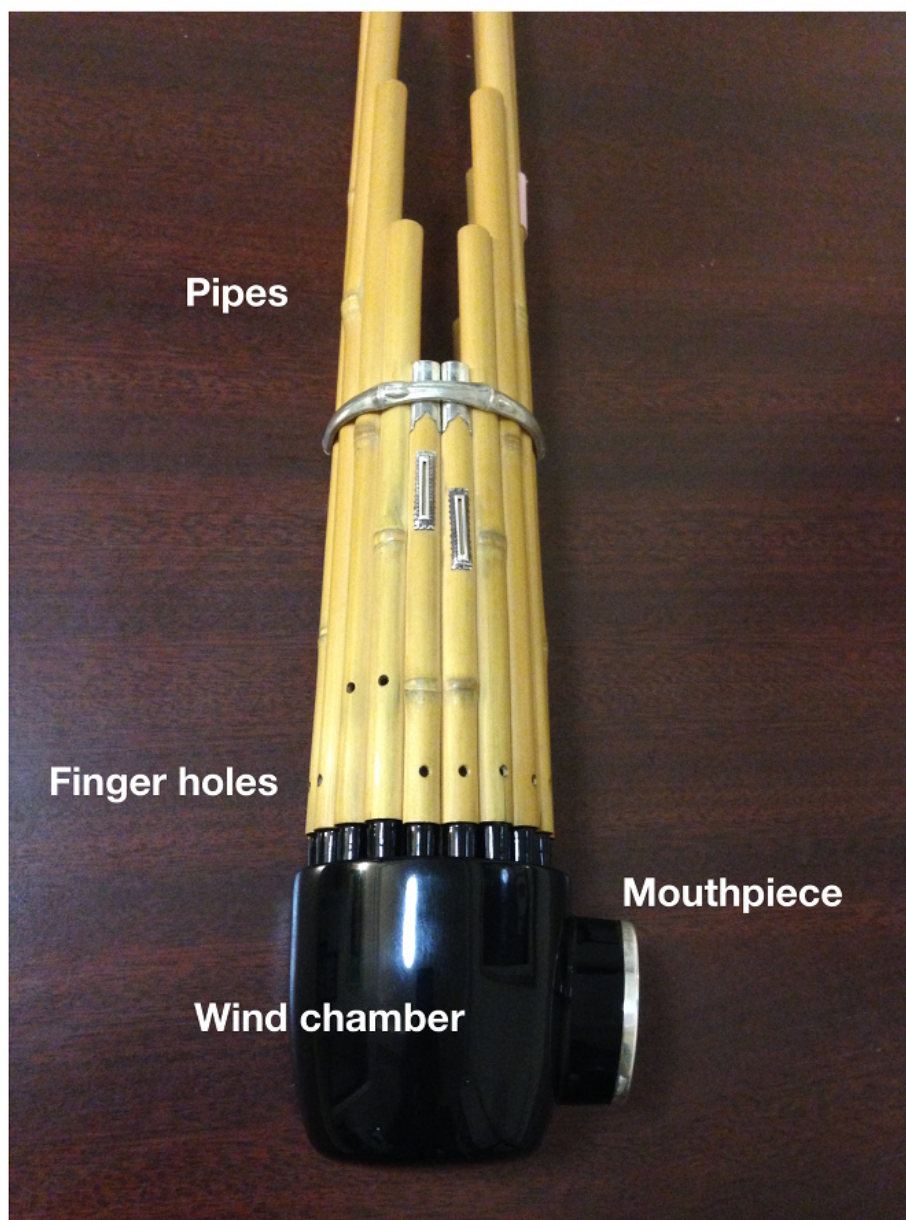
A JOURNAL OF THE SOCIETY FOR MUSIC THEORY

MTO 26.4 Examples: Momii, A Transformational Approach to Gesture in Shō Performance

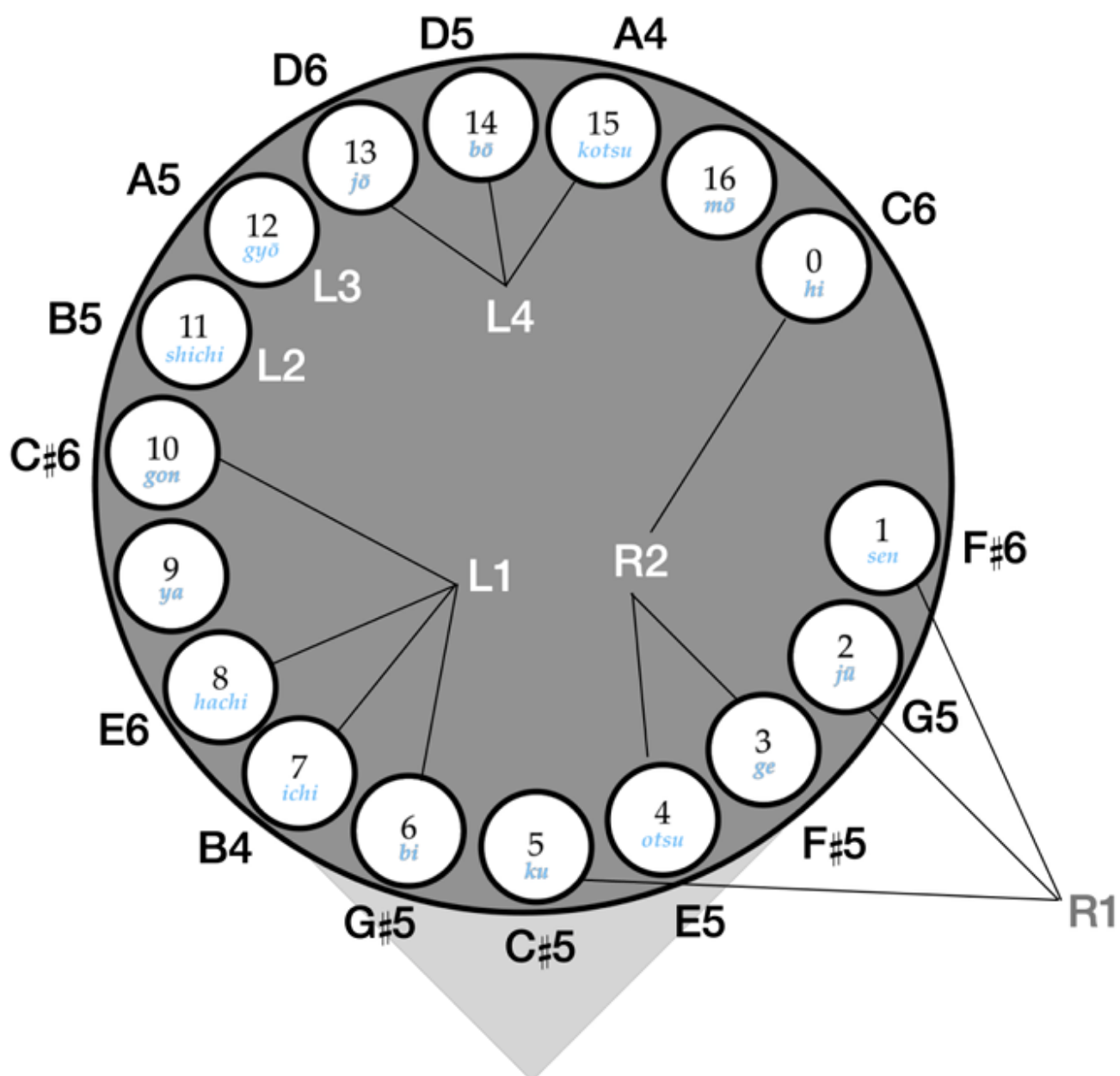
(Note: audio, video, and other interactive examples are only available online)

<https://mtosmt.org/issues/mto.20.26.4/mto.20.26.4.hannaford.html>

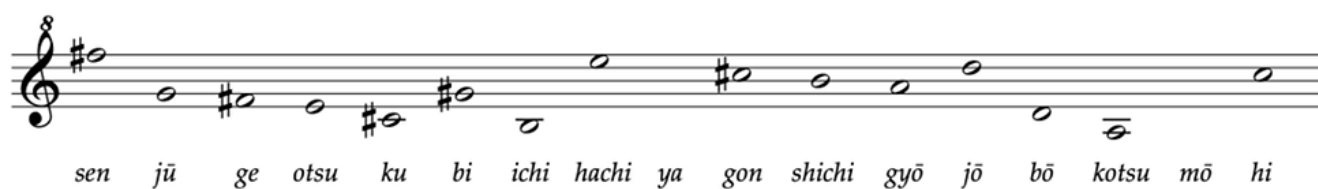
Example 1. Parts of the shō



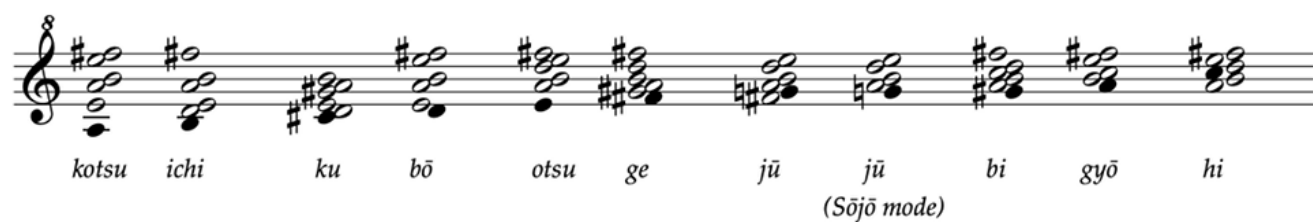
Example 2a. Pipe holes and fingerings of the shō



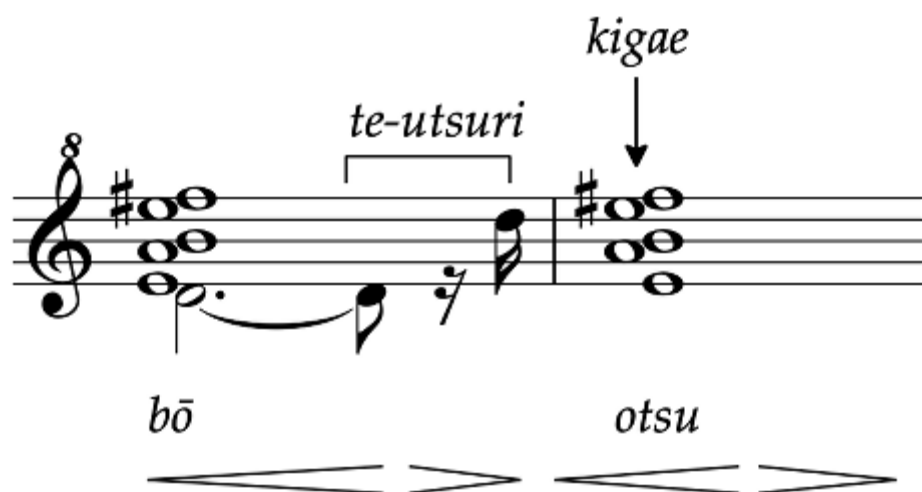
Example 2b. Pitches of each shō pipe shown in Western notation



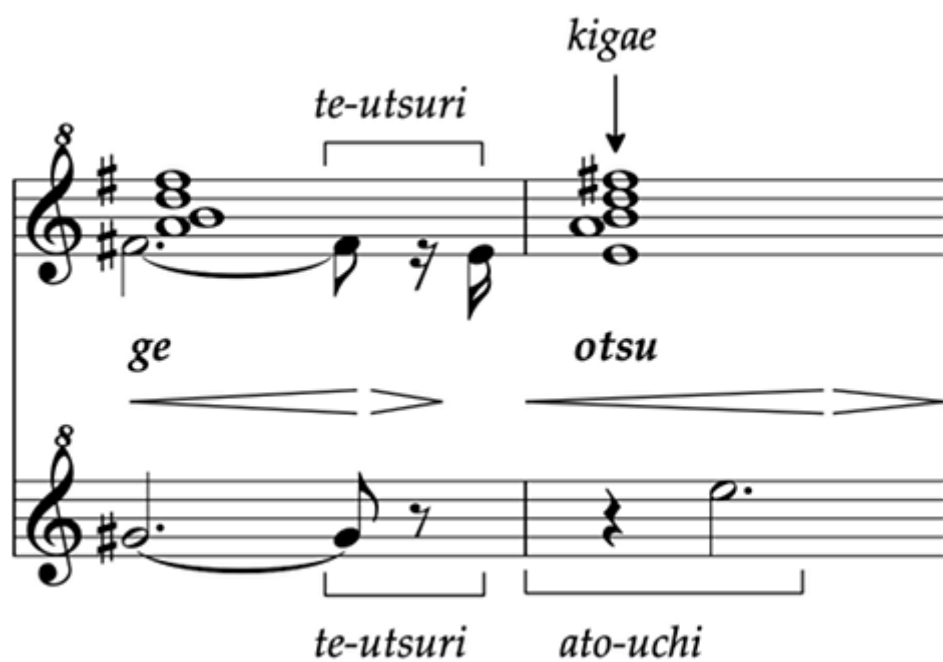
Example 3. List of *aitake*



Example 4. *Te-utsuri* and *kigae* in Western notation



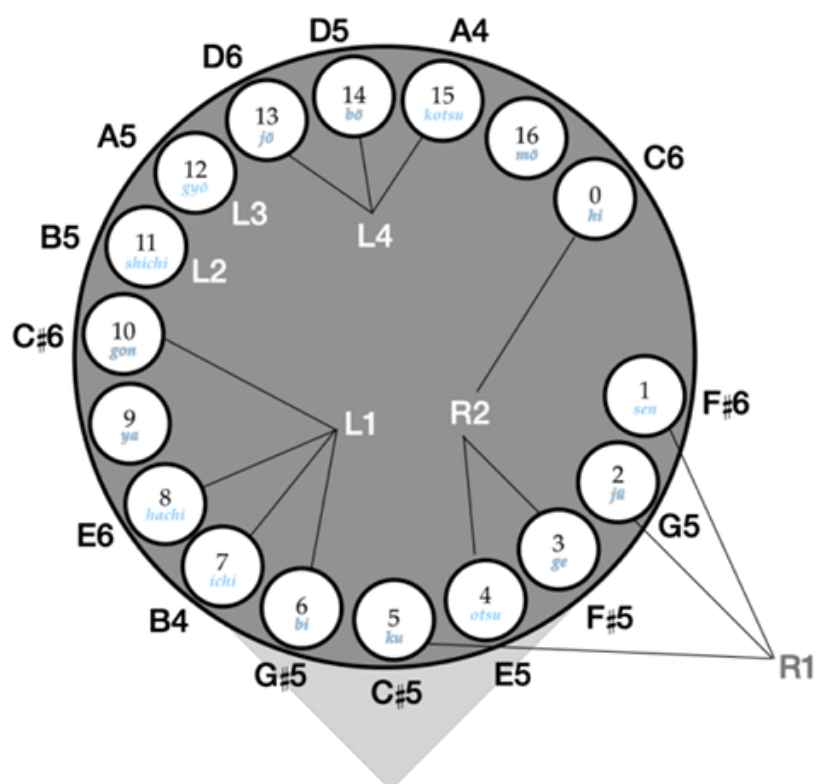
Example 5. The *ato-uchi* technique in Western notation



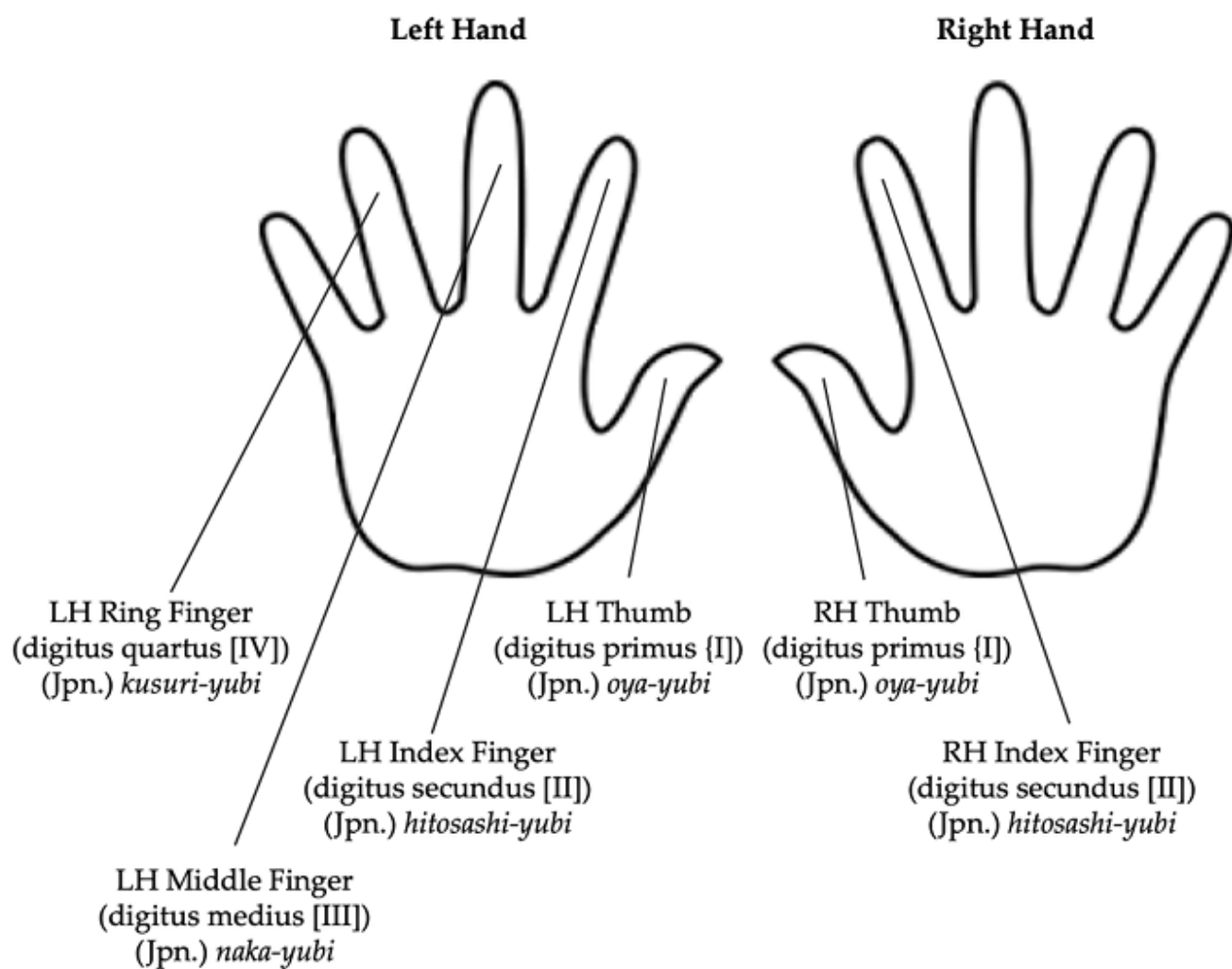
Example 6. Distribution of finger holes across the left hand (LH) and right hand (RH)

sen jū ge otsu ku bi ichi hachi ya gon shichi gyō jō bō kotsu mō hi

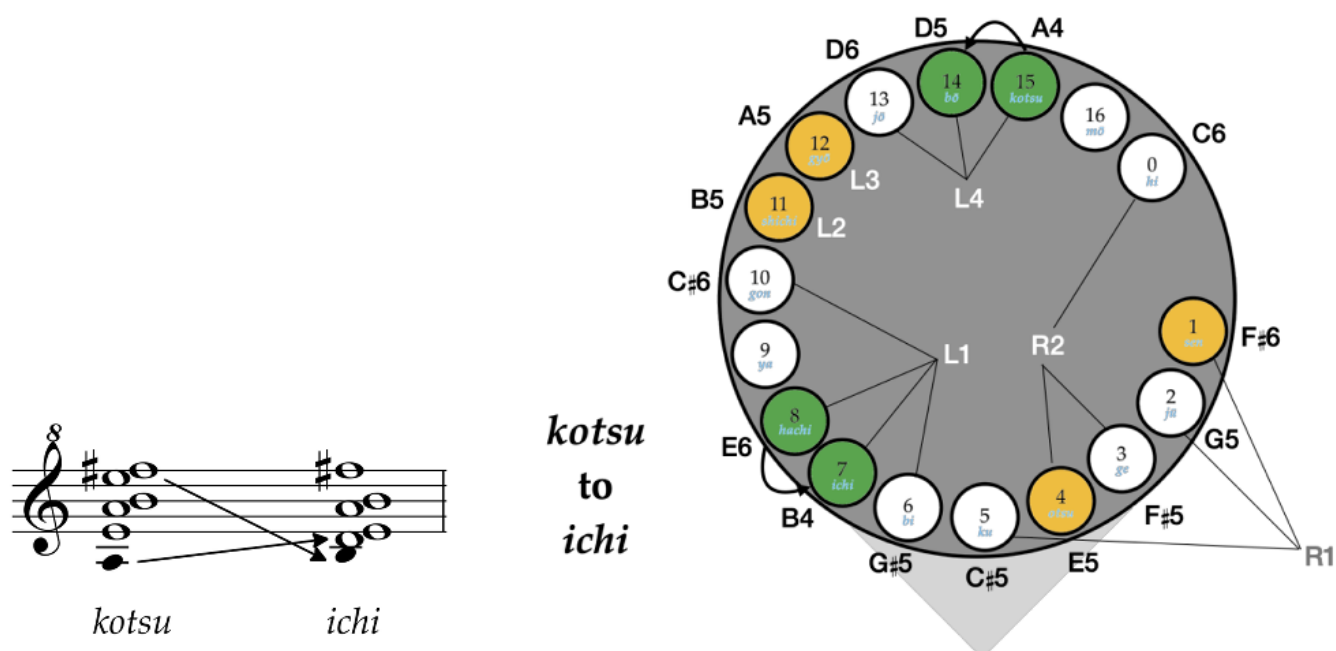
RH Thumb RH Index LH Thumb LH Middle LH Ring RH Index



Example 7. Diagram of fingers used in shō performance



Example 8. *Te-utsuri* from *aitake kotsu* to *aitake ichi*



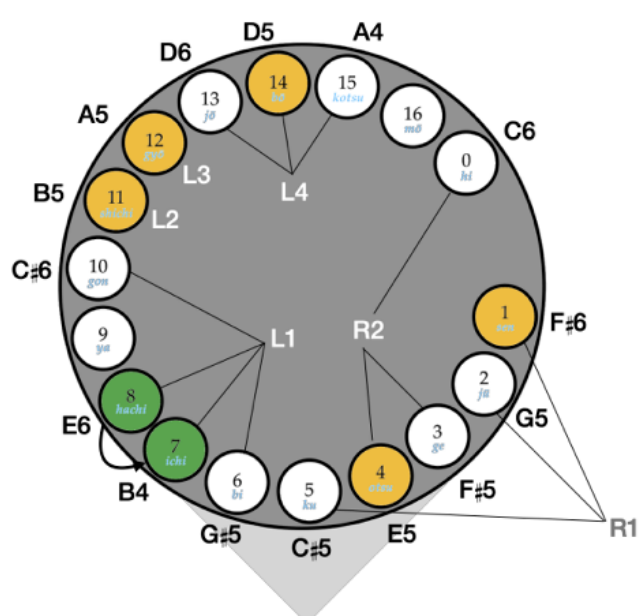
Example 9. List of *aitake* expressed in the form of (R1, R2, L1, L4)

<i>Aitake</i>	Expressed as (R1, R2, L1, L4)
<i>kotsu</i> (乞)	(1, 4, 8, 15)
<i>ichi</i> (一)	(1, 4, 7, 14)
<i>ku</i> (工)	(5, 4, 6, 14)
<i>bō</i> (凡)	(1, 4, 8, 14)
<i>otsu</i> (乙)	(1, 4, 8, 13)
<i>ge</i> (下)	(1, 3, 6, 13)
<i>jū</i> (十)	(2, 3, 8, 13)
<i>jū</i> (Sōjō)(十[双調])	(2, -, 8, 13)
<i>bi</i> (美)	(1, 0, 6, 13)
<i>gyō</i> (行)	(1, -, 8, 13)
<i>hi</i> (比)	(1, 0, 8, 13)

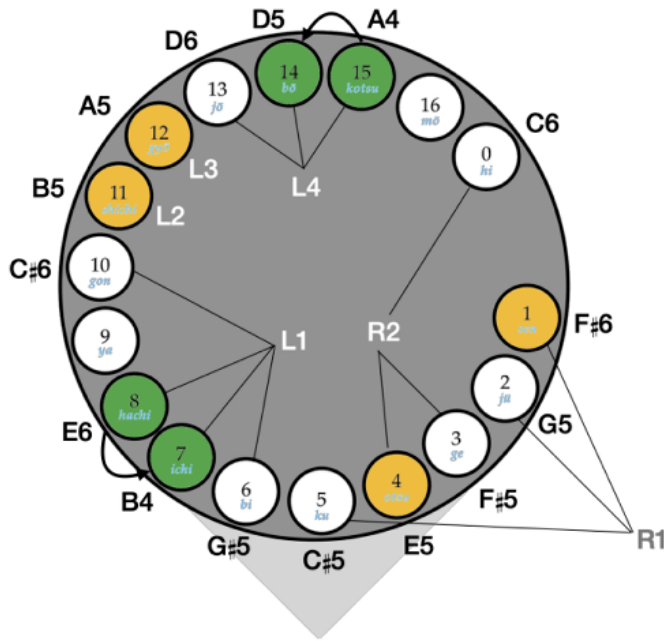
Example 10. Summary of *te-utsuri* between six-note *aitake*

		To									
		Kotsu (A)	Ichi (B)	Hi (C)	Ku (C#)	Bo (D)	Otsu (E)	Ge (F#)	Ju (G)	Bi (G#)	
From	Kotsu (A)		(0, 0, -1, -1)	(0, -4, 0, -2)	(+4, 0, -2, -1)	(0, 0, 0, -1)	(0, 0, 0, -2)	(0, -1, -2, -2)	(+1, -1, 0, -2)	(0, -4, -2, -2)	
	Ichi (B)	(0, 0, +1, +1)		(0, -4, +1, -1)	(+4, 0, -1, 0)	(0, 0, +1, 0)	(0, 0, +1, -1)	(0, -1, -1, -1)	(+1, -1, +1, -1)	(0, -4, -1, -1)	
	Hi (C)	(0, +4, 0, +2)	(0, +4, -1, +1)		(+4, +4, -2, +1)	(0, +4, 0, +1)	(0, +4, 0, 0)	(0, +3, -2, 0)	(+1, +3, 0, 0)	(0, 0, -2, 0)	
	Ku (C#)	(-4, 0, +2, +1)	(-4, 0, +1, 0)	(-4, -4, +2, -1)		(-4, 0, +2, 0)	(-4, 0, +2, -1)	(-4, -1, 0, -1)	(-3, -1, +2, -1)	(-4, -4, 0, -1)	
	Bo (D)	(0, 0, 0, +1)	(0, 0, -1, 0)	(0, -4, 0, -1)	(+4, 0, -2, 0)		(0, 0, 0, -1)	(0, -1, -2, -1)	(+1, -1, 0, -1)	(0, -4, -2, -1)	
	Otsu (E)	(0, 0, 0, +2)	(0, 0, -1, +1)	(0, -4, 0, 0)	(+4, 0, -2, +1)	(0, 0, 0, +1)		(0, -1, -2, 0)	(+1, -1, 0, 0)	(0, -4, -2, 0)	
	Ge (F#)	(0, +1, +2, +2)	(0, +1, +1, +1)	(0, -3, +2, 0)	(+4, +1, 0, +1)	(0, +1, +2, +1)	(0, +1, +2, 0)		(+1, 0, +2, 0)	(0, -3, 0, 0)	
	Ju (G)	(-1, +1, 0, +2)	(-1, +1, -1, +1)	(-1, -3, 0, 0)	(+3, +1, -2, +1)	(-1, +1, 0, +1)	(-1, +1, 0, 0)	(-1, 0, -2, 0)		(-1, -3, -2, 0)	
	Bi (G#)	(0, +4, +2, +2)	(0, +4, +1, +1)	(0, 0, +2, 0)	(+4, +4, 0, +1)	(0, +4, +2, +1)	(0, +4, +2, 0)	(0, +3, 0, 0)	(+1, +3, +2, 0)		

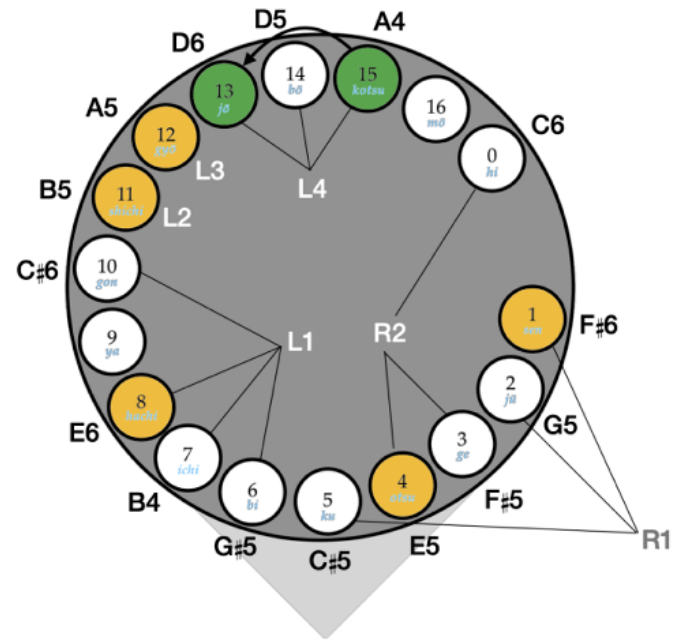
Example 11. Comparing gestural proximity between two *te-utsuri* operations



Example 12. Comparing gestural proximity between two *te-utsuri* operations with the same number of finger hole traversals



te-utsuri from *kotsu* to *ichi*: $TU_{(0, 0, -1, -1)}$
(gesturally proximate)



te-utsuri from *kotsu* to *otsu*: $TU_{(0, 0, 0, -2)}$
(gesturally distant)

Example 13. Rules for comparing the gestural proximity of multiple *te-utsuri* operations

STEP 1: Count the total number of finger hole shifts.

Example: Because the *te-utsuri* between *ichi* and *bō* requires a fewer total number of finger hole traversals (1) than the *te-utsuri* from *ichi* to *jū* (4), the former is deemed more gesturally proximate than the latter.

STEP 2: If STEP 1 yields the same number of finger hole traversals, then count the number of fingers involved in the *te-utsuri*. The *te-utsuri* with a larger number of fingers moving by smaller distances is more gesturally proximate than that with a small number of fingers moving by larger distances.

Example: Both the *te-utsuri* from *ge* to *otsu* [$TU_{(0, +1, +2, 0)}$] and from *ge* to *ichi* [$TU_{(0, +1, +1, +1)}$] require the same number of finger hole traversals (3). The *te-utsuri* from *ge* to *ichi* is more gesturally proximate, because the operation involves a larger number of fingers moving by smaller distances.

Example 14. *Te-utsuri* operations from *aitake jū* to *aitake ichi*, *kotsu*, and *hi*, listed in order of gestural proximity

	<i>Te-utsuri</i>	$TU_{(a,b,c,d)}$ operation	Number of Finger Holes Traversed ($a + b + c + d$)	Number of Shifting Fingers	Shifting Fingers (R1, R2, L1, L4)			
Most Proximate	<i>jū to ichi</i>	(-1, +1, -1, +1)	4	4	R1	R2	L1	L4
	<i>jū to kotsu</i>	(-1, +1, 0, +2)	4	3	R1	R2		L4
Least Proximate	<i>jū to hi</i>	(-1, -3, 0, 0)	4	2	R1	R2		

Example 15. *Te-utsuri* operations from *aitake ichi*, listed in order of gestural proximity

	<i>Te-utsuri</i>	$TU_{(a,b,c,d)}$ operation	Number of Finger Holes Traversed ($a + b + c + d$)	Number of Shifting Fingers	Shifting Fingers (R1, R2, L1, L4)			
Most Proximate	<i>ichi to bō</i>	(0, 0, +1, 0)	1	1			L1	
	<i>ichi to otsu</i>	(0, 0, +1, -1)	2	2			L1	L4
	<i>ichi to kotsu</i>	(0, 0, +1, +1)	2	2			L1	L4
Least Proximate	<i>ichi to ge</i>	(0, -1, -1, -1)	3	3		R2	L1	L4
	<i>ichi to jū</i>	(+1, -1, +1, -1)	4	4	R1	R2	L1	L4
	<i>ichi to ku</i>	(+4, 0, -1, 0)	5	2	R1		L1	
	<i>ichi to bi</i>	(0, -4, -1, -1)	6	3		R2	L1	L4
	<i>ichi to hi</i>	(0, -4, +1, -1)	6	3		R2	L1	L4

Minimally
Parsimonious

Example 16. Categorization of *aitake*

Category 1

Pentatonic Pitch Collection

kotsu *ichi* *bō* *otsu*

Category 2

ge *jū* *jū (Sōjō)* *gyō*

Category 3

ku *bi* *hi*

Example 17. *Te-utsuri* from *aitake ichi* to *aitake gyō*

ichi Release *Otsu* *gyō*

Example 18. List of all minimally parsimonious *te-utsuri*

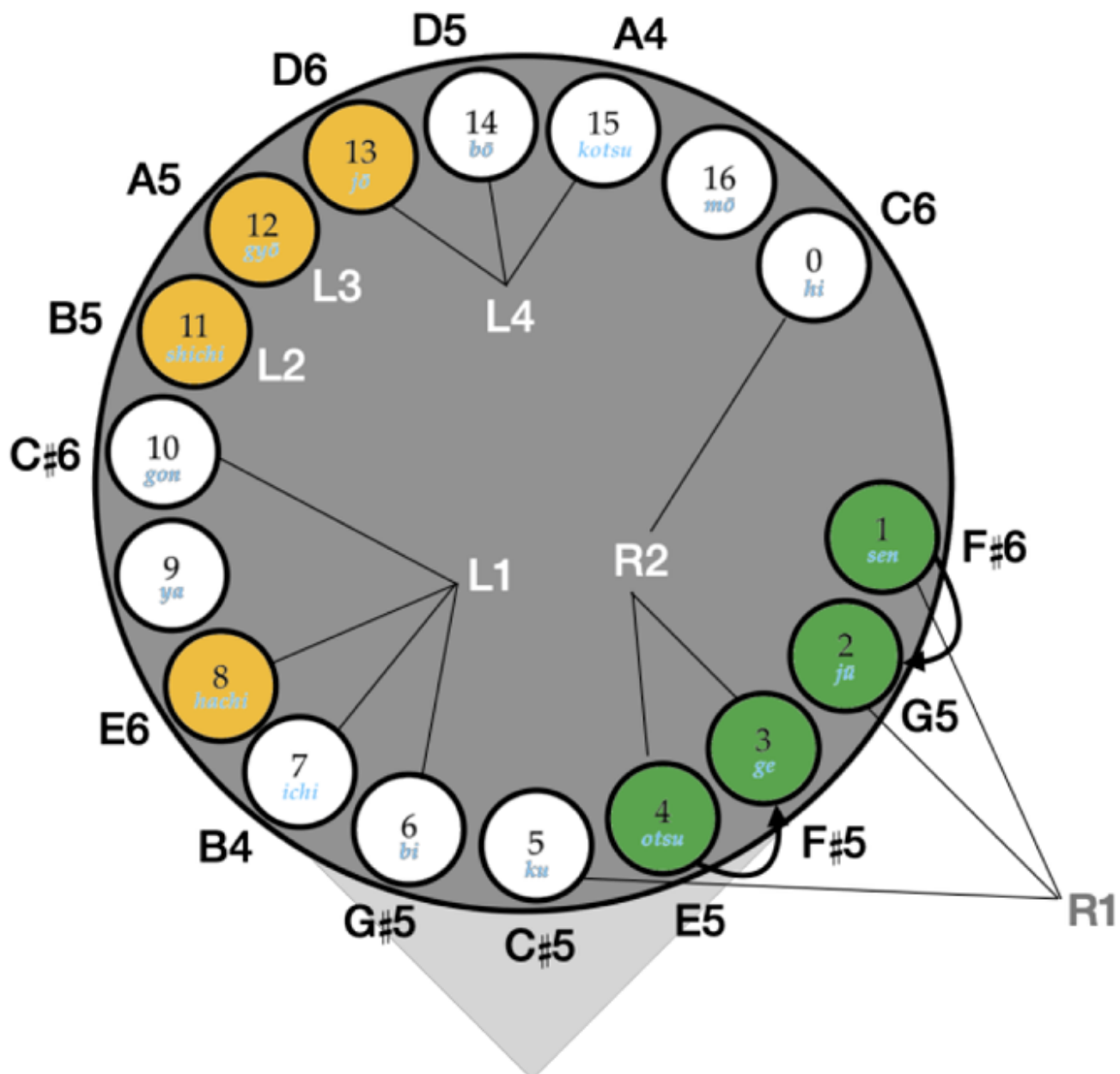
Category 1 $\rightleftharpoons$ Category 1

Te-utsuri	$TU_{(a,b,c,d)}$ operation	Fingering Shifts			
		LH Ring Finger	LH Thumb	RH Thumb	RH Index Finger
<i>bō to kotsu</i>	(0, 0, 0, +1)	<i>Bō</i> (D5) to <i>Kotsu</i> (A4)			
<i>bō to otsu</i>	(0, 0, 0, -1)	<i>Bō</i> (D5) to <i>Jō</i> (D6)			
<i>bō to ichi</i>	(0, 0, -1, 0)		<i>Hachi</i> (E6) to <i>Ichi</i> (B4)		
<i>ichi to bō</i>	(0, 0, +1, 0)		<i>Ichi</i> (B4) to <i>Hachi</i> (E6)		
<i>ichi to otsu</i>	(0, 0, +1, -1)	<i>Bō</i> (D5) to <i>Jō</i> (D6)	<i>Ichi</i> (B4) to <i>Hachi</i> (E6)		
<i>ichi to kotsu</i>	(0, 0, +1, +1)	<i>Bō</i> (D5) to <i>Kotsu</i> (A4)	<i>Ichi</i> (B4) to <i>Hachi</i> (E6)		
<i>kotsu to bō</i>	(0, 0, 0, -1)	<i>Kotsu</i> (A4) to <i>Bō</i> (D5)			
<i>kotsu to ichi</i>	(0, 0, -1, -1)	<i>Bō</i> (D5) to <i>Kotsu</i> (A4)	<i>Hachi</i> (E6) to <i>Ichi</i> (B4)		
<i>kotsu to otsu</i>	(0, 0, 0, -2)	<i>Kotsu</i> (A4) to <i>Jō</i> (D6)			
<i>otsu to bō</i>	(0, 0, 0, +1)	<i>Jō</i> (D6) to <i>Bō</i> (D5)			
<i>otsu to ichi</i>	(0, 0, -1, +1)	<i>Jō</i> (D6) to <i>Bō</i> (D5)	<i>Hachi</i> (E6) to <i>Ichi</i> (B4)		
<i>otsu to kotsu</i>	(0, 0, 0, +2)	<i>Jō</i> (D6) to <i>Kotsu</i> (A4)			

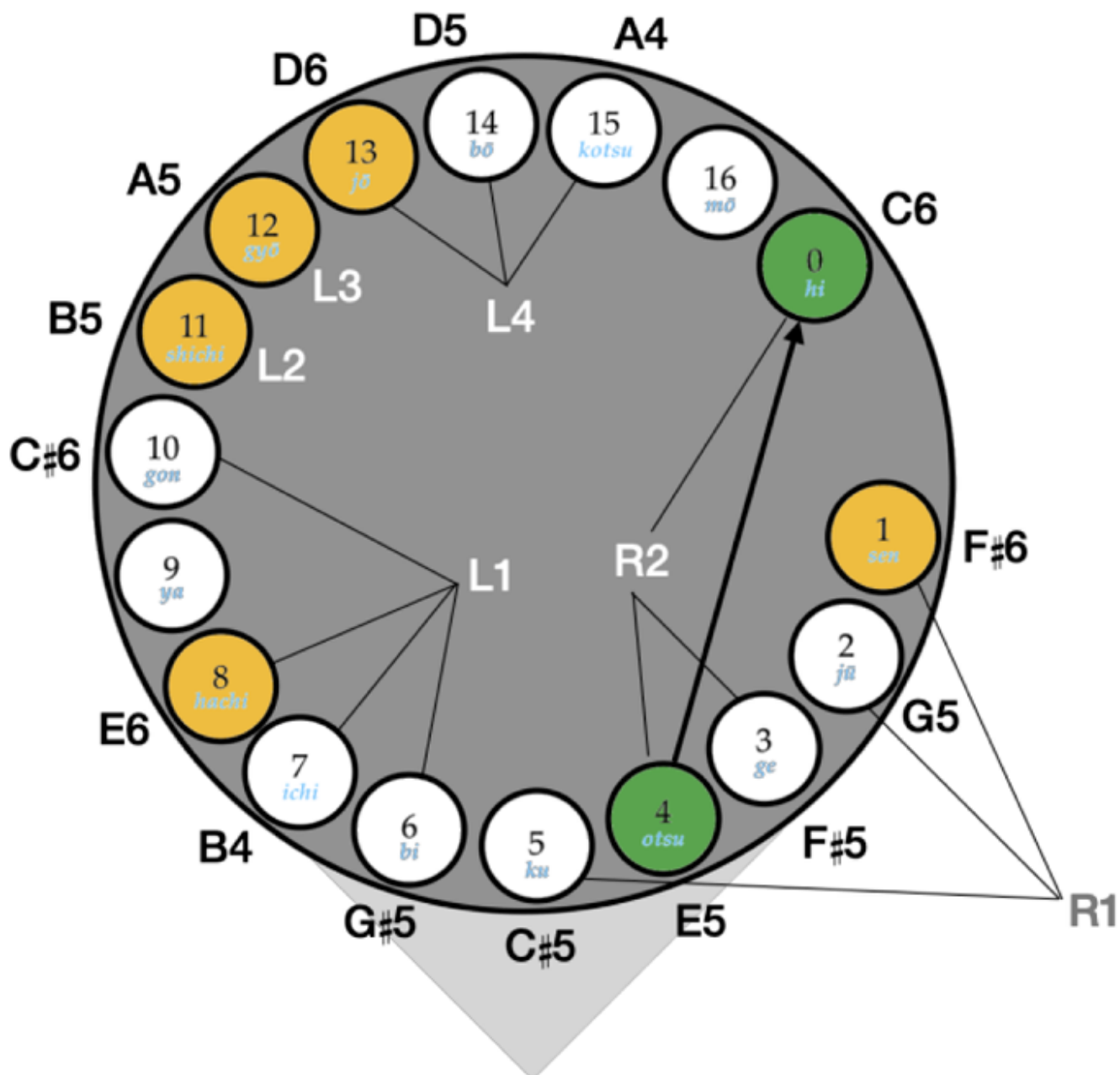
Category 2 $\rightleftharpoons$ Category 1

<i>otsu to jū</i>	(+1, -1, 0, 0)			<i>Sen</i> (F#6) to <i>Jū</i> (G5)	<i>Otsu</i> (E5) to <i>Ge</i> (F#5)
<i>jū to otsu</i>	(-1, +1, 0, 0)			<i>Jū</i> (G5) to <i>Sen</i> (F#6)	<i>Ge</i> (F#5) to <i>Otsu</i> (E5)

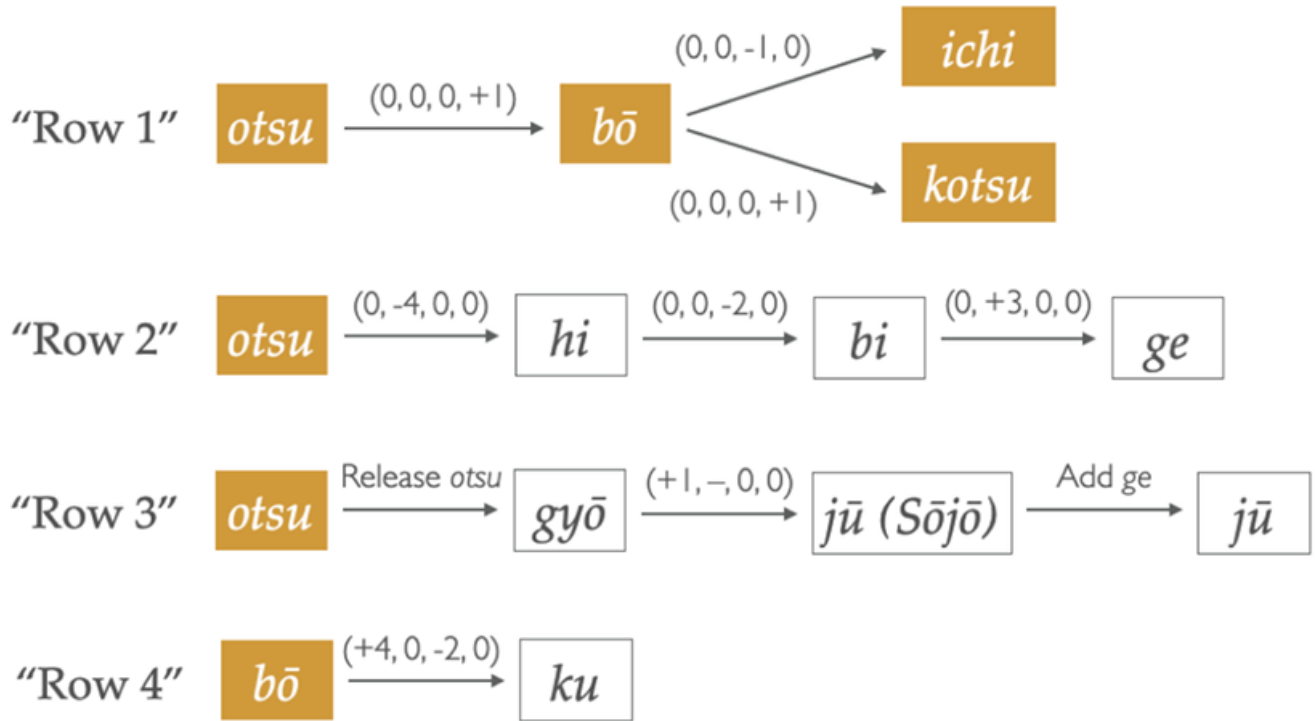
Example 19a. *Te-utsuri* from *aitake otsu* to *aitake jū*. The left-hand placement for *jū* is identical to that of *otsu*, and the right thumb and right index finger each shift by one finger hole



Example 19b. *Te-utsuri* from *aitake otsu* to *aitake hi*. The left-hand placement for *hi* is identical to that of *otsu*, and the right index finger requires each of its fingers to shift by one finger hole



Example 20. Method of organizing *aitake* as proposed by Yamanoi Motokiyo's "Te-utsuri Kudensho"



Example 21. Summary of *te-utsuri* and *aitake* in *Goshōraku-no-kyū*

(a) Summary of *aitake* and *te-utsuri* in *Goshōraku-no-kyū*

Measure	9	10	11	12	13	14	15	16	17
Category	1	1	3	1	1	1	1	1	1
pitch classes	(02479)	(02479)	(013568)	(02479)	(02479)	(02479)	(02479)	(02479)	(02479)
<i>aitake</i>	otsu	otsu	ku	bō	ichi	ichi	ichi	ichi	bō
$Te(e,f,g,h)$			(+4,0,-2,+1)	(-4,0,+2,0)	(0,0,-1,0)			(0,0,+1,0)	
			Parsimonious					Parsimonious	

Measure	17	18	19	20	21	22	23	24	25
Category	1	1	1	1	1	1	1	2	1
pitch classes	(02479)	(02479)	(02479)	(02479)	(02479)	(02479)	(0257)	(024579)	(02479)
<i>aitake</i>	bō	otsu	bō	ichi	ichi	ichi	kotsu	jū	ichi
$Te(e,f,g,h)$		(0,0,0,-1)	(0,0,0,+1)	(0,0,-1,0)		(0,0,+1,+1)	(+1,-1,0,-2)	(-1,+1,-1,+1)	(0,0,+1,-1)
		Parsimonious	Parsimonious	Parsimonious		Parsimonious			Parsimonious

Measure	25	26	27	28	29	30	31	32
Category	1	1	2	2	1	1	1	1
pitch classes	(02479)	(02479)	(024579)	(02358)	(02479)	(02479)	(02479)	(02479)
<i>aitake</i>	otsu	bō	jū	ge	otsu	otsu	otsu	otsu
$Te(e,f,g,h)$		(0,0,0,+1)	(+1,-1,0,-1)	(-1,0,-2,0)	(0,+1,+2,0)			
		Parsimonious						

(b) Western transcription of *Goshōraku-no-kyū*, mm. 9–26

9 10 11 12 13 14 15 16

otsu otsu ku bō ichi ichi

17 18 19 20 21 22 23 24

bō otsu bō ichi ichi ichi kotsu jū ichi

25 26

otsu bō

Example 22. Notation of *aitake* for the piece *Senshūroku* in *Banshiki-chō* mode (notation is read from top to bottom and right to left. Each of the characters represents an *aitake*)

ㄥ・	乙・	一・	下・	下・	千秋樂 曲 早八拍子 拍子八 末二拍子加
下・	乙・	31・	下・	一・	
下・	衍美	一・	ㄥ・	一・	
31・	下・	31・	下・	31・	
九・	ㄥ・	下・	ㄥ・	ㄥ・	
五・	下・	31・	下・	下・	
九・	一・	下・	下・	下・	
31・	下・	31・	31・	31・	
。	。	。	。	。	

Example 23. Frequency of *te-utsuri* and duration of *aitake* in *Goshōraku-no-kyū*

	Motion	Count	Category		Duration (beats)		Duration	Percentage
<i>Goshōraku-no-kyū</i> (五常楽急)	<i>jū to ge</i>	4	C2 to C2	<i>otsu</i>	44	Consonance	92	71.9%
	<i>ge to jū</i>	4	C2 to C2	<i>ichi</i>	30	Non-consonance	36	28.1%
	<i>jū to otsu</i>	4	C2 to C1	<i>jū</i>	22			
	<i>bō to ichi</i>	4	C1 to C1	<i>bō</i>	16			
	<i>kotsu to bō</i>	3	C1 to C1	<i>ge</i>	10	C1 to C1	15	37.5%
	<i>bō to otsu</i>	2	C1 to C1	<i>ku</i>	4	C1 to C2	7	17.5%
	<i>otsu to ge</i>	2	C1 to C2	<i>kotsu</i>	2	C2 to C1	6	15.0%
	<i>otsu to ku</i>	2	C1 to C3			C2 to C2	8	20.0%
	<i>ku to bō</i>	2	C3 to C1			C1 to C3	2	5.0%
	<i>ichi to kotsu</i>	2	C1 to C1			C3 to C1	2	5.0%
	<i>kotsu to jū</i>	2	C1 to C2			C2 to C3	0	0.0%
	<i>jū to ichi</i>	2	C2 to C1			C3 to C2	0	0.0%
	<i>bō to jū</i>	2	C1 to C2			C3 to C3	0	0.0%
	<i>ichi to otsu</i>	2	C1 to C1					100.0%
	<i>ichi to bō</i>	1	C1 to C1					
	<i>ichi to jū</i>	1	C1 to C2					
	<i>otsu to bō</i>	1	C1 to C1					
						Cons. to Cons.	37.5%	
						Cons. to Diss.	22.5%	
						Diss. to Cons.	20.0%	
						Diss. to Diss.	20.0%	
							100.0%	

Example 24. Pitch-class and intervallic structures of Category 1 *aitake*

<i>Aitake</i>	Category	Pitch-classes (Normal Order)	Set-class	Interval Class Vector
<i>kotsu</i> (乞)	Category 1	E, F#, A, B	(0257)	<021030>
<i>ichi</i> (一)		A, B, D, E, F#	(02479)	<032140>
<i>otsu</i> (乙)		A, B, D, E, F#	(02479)	<032140>
<i>bō</i> (凡)		A, B, D, E, F#	(02479)	<032140>

Example 25. *Aitake* organized into stacked consecutive fifths

Category	Aitake	Fundamental Tone	Consecutive Chain of Fifths (Pitch classes)
1	<i>kotsu</i> (乞)	A4	A E B F#
	<i>ichi</i> (一)	B4	D A E B F#
	<i>bō</i> (凡)	D5	D A E B F#
	<i>otsu</i> (乙)	E5	D A E B F#
2	<i>ge</i> (下)	F#5	D A B F# G#
	<i>jū</i> (十)	G5	G D A E B F#
	<i>jū</i> (<i>Sōjō</i>)(十[双調])*	G5	G D A E B
	<i>gyō</i> (行)*	A5	D A E B F#
3	<i>ku</i> (工)	C#5	D A E B C# G#
	<i>bi</i> (美)	G#5	C D A B F# G#
	<i>hi</i> (比)	C6	C D A E B F#

* Five-note *aitake*

Example 26. Six modes of *gagaku*

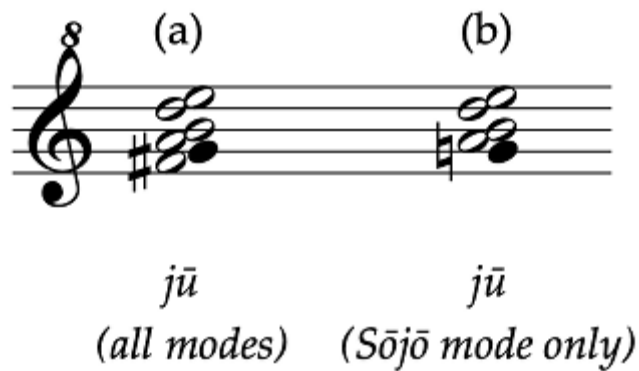
Ryo modes



Ritsu modes



Example 27. Two forms of the *aitake jū*



Example 28. Two types of the *aitake jū* in *Butokuraku* (武徳楽) (Sōjō mode)

武徳楽

小曲
早拍子
加拍子
十二

Jū specific to Sojo mode

Jū used in all modes

Example 29. Pitch-class and intervallic structures of Category 1 *aitake* and *jū*

<i>Aitake</i>	Category	Pitch-classes (Normal Order)	Set-class	Interval Class Vector
<i>kotsu</i> (𠂔)	Category 1	E, F $\sharp$, A, B	(0257)	<021030>
<i>ichi</i> (一)		A, B, D, E, F $\sharp$	(02479)	<032140>
<i>otsu</i> (乙)		A, B, D, E, F $\sharp$	(02479)	<032140>
<i>bō</i> (凡)		A, B, D, E, F $\sharp$	(02479)	<032140>
<i>jū</i> (<i>Sōjō</i>)(十[双調])	Category 2	G, A, B, D, E	(02479)	<032140>
<i>jū</i> (十)		D, E, F $\sharp$, G, A, B	(024579)	<143250>

Appendix. List of all *te-utsuri* between six-note *aitake* used in *tōgaku* performance

	<i>Te-utsuri</i>	<i>TU</i> _(a, b, c, d) operation	Number of Finger Holes Traversed (<i>a + b + c + d</i>)	Number of Shifting Fingers	Shifting Fingers (R1, R2, L1, L4)				
Most Proximate	<i>ichi to bō</i>	(0, 0, +1, 0)	1	1			L1		Minimally Parsimonious
	<i>ichi to otsu</i>	(0, 0, +1, -1)	2	2			L1	L4	
	<i>ichi to kotsu</i>	(0, 0, +1, +1)	2	2			L1	L4	
Least Proximate	<i>ichi to ge</i>	(0, -1, -1, -1)	3	3		R2	L1	L4	
	<i>ichi to jū</i>	(+1, -1, +1, -1)	4	4	R1	R2	L1	L4	
	<i>ichi to ku</i>	(+4, 0, -1, 0)	5	2	R1		L1		
	<i>ichi to bi</i>	(0, -4, -1, -1)	6	3		R2	L1	L4	
	<i>ichi to hi</i>	(0, -4, +1, -1)	6	3		R2	L1	L4	
Most Proximate	<i>kotsu to bō</i>	(0, 0, 0, -1)	1	1				L4	Minimally Parsimonious
	<i>kotsu to ichi</i>	(0, 0, -1, -1)	2	2			L1	L4	
	<i>kotsu to otsu</i>	(0, 0, 0, -2)	2	1				L4	
Least Proximate	<i>kotsu to jū</i>	(+1, -1, 0, -2)	4	3	R1	R2		L4	
	<i>kotsu to ge</i>	(0, -1, -2, -2)	5	3		R2	L1	L4	
	<i>kotsu to hi</i>	(0, -4, 0, -2)	6	2		R2		L4	
	<i>kotsu to ku</i>	(+4, 0, -2, -1)	7	3	R1		L1	L4	
	<i>kotsu to bi</i>	(0, -4, -2, -2)	8	3		R2	L1	L4	
Most Proximate	<i>otsu to bō</i>	(0, 0, 0, +1)	1	1				L4	Minimally Parsimonious
	<i>otsu to ichi</i>	(0, 0, -1, +1)	2	2			L1	L4	
	<i>otsu to jū</i>	(+1, -1, 0, 0)	2	2	R1	R2			
Least Proximate	<i>otsu to kotsu</i>	(0, 0, 0, +2)	2	1				L4	
	<i>otsu to ge</i>	(0, -1, -2, 0)	3	2		R2	L1		
	<i>otsu to hi</i>	(0, -4, 0, 0)	4	1		R2			
	<i>otsu to bi</i>	(0, -4, -2, 0)	6	2		R2	L1		
	<i>otsu to ku</i>	(+4, 0, -2, +1)	7	3	R1		L1	L4	
Most Proximate	<i>bō to kotsu</i>	(0, 0, 0, +1)	1	1				L4	Minimally Parsimonious
	<i>bō to otsu</i>	(0, 0, 0, -1)	1	1				L4	
	<i>bō to ichi</i>	(0, 0, -1, 0)	1	1			L1		
Least Proximate	<i>bō to jū</i>	(+1, -1, 0, -1)	3	3	R1	R2		L4	
	<i>bō to ge</i>	(0, -1, -2, -1)	4	3		R2	L1	L4	
	<i>bō to hi</i>	(0, -4, 0, -1)	5	2		R2		L4	
	<i>bō to ku</i>	(+4, 0, -2, 0)	6	2	R1		L1		
	<i>bō to bi</i>	(0, -4, -2, -1)	7	3		R2	L1	L4	
Most Proximate	<i>jū to otsu</i>	(-1, +1, 0, 0)	2	2	R1	R2			Min. Parsimonious
	<i>jū to bō</i>	(-1, +1, 0, +1)	3	3	R1	R2		L4	
	<i>jū to ge</i>	(-1, 0, -2, 0)	3	2	R1		L1		
Least Proximate	<i>jū to ichi</i>	(-1, +1, -1, +1)	4	4	R1	R2	L1	L4	
	<i>jū to kotsu</i>	(-1, +1, 0, +2)	4	3	R1	R2		L4	
	<i>jū to hi</i>	(-1, -3, 0, 0)	4	2	R1	R2			
	<i>jū to bi</i>	(-1, -3, -2, 0)	6	3	R1	R2	L1		
	<i>jū to ku</i>	(+3, +1, -2, +1)	7	4	R1	R2	L1	L4	

	<i>Te-utsumi</i>	<i>TU</i> _(a, b, c, d) operation	Number of Finger Holes Traversed (<i>a + b + c + d</i>)	Number of Shifting Fingers	Shifting Fingers (R1, R2, L1, L4)			
Most Proximate	<i>ge to ichi</i>	(0, +1, +1, +1)	3	3		R2	L1	L4
	<i>ge to otsu</i>	(0, +1, +2, 0)	3	2		R2	L1	
	<i>ge to jū</i>	(+1, 0, +2, 0)	3	2	R1		L1	
	<i>ge to bi</i>	(0, -3, 0, 0)	3	1		R2		
	<i>ge to bō</i>	(0, +1, +2, +1)	4	3		R2	L1	L4
	<i>ge to kotsu</i>	(0, +1, +2, +2)	5	3		R2	L1	L4
Least Proximate	<i>ge to hi</i>	(0, -3, +2, 0)	5	2		R2	L1	
	<i>ge to ku</i>	(+4, +1, 0, +1)	6	3	R1	R2		L4

Most Proximate	<i>ku to ichi</i>	(-4, 0, +1, 0)	5	2	R1		L1	
	<i>ku to ge</i>	(-4, -1, 0, -1)	6	3	R1	R2		L4
	<i>ku to bō</i>	(-4, 0, +2, 0)	6	2	R1		L1	
	<i>ku to jū</i>	(-3, -1, +2, -1)	7	4	R1	R2	L1	L4
	<i>ku to kotsu</i>	(-4, 0, +2, +1)	7	3	R1		L1	L4
	<i>ku to otsu</i>	(-4, 0, +2, -1)	7	3	R1		L1	L4
Least Proximate	<i>ku to bi</i>	(-4, -4, 0, -1)	9	3	R1	R2		L4
	<i>ku to hi</i>	(-4, -4, +2, -1)	11	4	R1	R2	L1	L4

Most Proximate	<i>bi to hi</i>	(0, 0, +2, 0)	2	1			L1		Min. Parsimonious
	<i>bi to ge</i>	(0, +3, 0, 0)	3	1		R2			
	<i>bi to jū</i>	(+1, +3, +2, 0)	6	3	R1	R2	L1		
	<i>bi to ichi</i>	(0, +4, +1, +1)	6	3		R2	L1	L4	
	<i>bi to otsu</i>	(0, +4, +2, 0)	6	2		R2	L1		
	<i>bi to bō</i>	(0, +4, +2, +1)	7	3		R2	L1	L4	
Least Proximate	<i>bi to kotsu</i>	(0, +4, +2, +2)	8	3		R2	L1	L4	
	<i>bi to ku</i>	(+4, +4, 0, +1)	9	3	R1	R2		L4	

Most Proximate	<i>hi to bi</i>	(0, 0, -2, 0)	2	1			L1		Min. Parsimonious
	<i>hi to jū</i>	(+1, +3, 0, 0)	4	2	R1	R2			
	<i>hi to otsu</i>	(0, +4, 0, 0)	4	1		R2			
	<i>hi to ge</i>	(0, +3, -2, 0)	5	2		R2	L1		
	<i>hi to bō</i>	(0, +4, 0, +1)	5	2		R2		L4	
	<i>hi to ichi</i>	(0, +4, -1, +1)	6	3		R2	L1	L4	
Least Proximate	<i>hi to kotsu</i>	(0, +4, 0, +2)	6	2		R2		L4	
	<i>hi to ku</i>	(+4, +4, -2, +1)	11	4	R1	R2	L1	L4	

GLOSSARY OF JAPANESE TERMS

Aitake: Five- to six-note clusters played by the shō in tōgaku repertoire. Aitake accompany the melodic lines played by the hichiriki and ryūteki. Each aitake contains a fundamental tone, which is usually the lowest pitch of the cluster.

Chōshi: The term for mode in gagaku. There are currently six chōshi in use: Ichikotsu-chō (modal center D), Hyōjō (E), Sōjō (G), Ōshiki-chō (A), Banshiki-chō (B), and Taishiki-chō (E). Each mode is categorized as a ryō (Ichikotsu-chō, Sōjō, Taishiki-chō) or ritsu (Hyōjō, Ōshiki-chō, Banshiki-chō) mode based on its intervallic structure. Each mode is associated with a specific season, color, direction, element, and affect.

Gagaku: Japanese traditional court music tradition originating in the eighth century. In its current form, gagaku consists of indigenous vocal genres and instrumental and vocal genres originating from China and Korea. Currently performed by the Music Department of the Imperial Household Agency, professional ensembles such as Reigakusha and Tokyo Gakuso, community groups, and at Shintō ceremonies.

Hichiriki: A double-reed flute that serves as one of the main melodic instruments in gagaku. One of the three primary wind instruments of gagaku.

Ryūteki: A transverse flute that serves as the one of the main melodic instruments in gagaku. One of the three primary wind instruments of gagaku.

Shō: A free-reed mouth organ comprised of seventeen bamboo pipes, two of which are muted today. Serves an accompanimental role to the primary melodic instruments (hichiriki, ryūteki). One of the three primary wind instruments of gagaku. Originally imported into Japan from Tang China during or prior to the Nara Period (710–94). Sound can be produced either by inhaling or exhaling into the mouthpiece. The instrument must be heated prior to and after performance to prevent the metal reeds from collecting moisture. In contemporary performances of gagaku, the shō is used in both instrumental (tōgaku) and vocal (rōei; saibara) genres.

Shōga: Mnemonic system for learning repertoire. For shō, the syllables of shōga consist of the names of aitake, which are set to a melody resembling the melody played by the hichiriki.

Te-utsuri: Standardized ordering in which the fingers must shift between holes to move from one aitake to another.

Tōgaku: A genre of gagaku that was imported into Japan from Tang China in the seventh and eighth centuries. The literal meaning of the term is “music of the Tang dynasty.” *Tōgaku* is further categorized into instrumental (*kangen*) and dance (*samai*) music, both of which feature three primary wind instruments: hichiriki, ryūteki, and shō. In tōgaku repertoire, the shō primarily plays aitake to accompany the melodic lines played by the hichiriki and ryūteki.