



A JOURNAL OF THE SOCIETY FOR MUSIC THEORY

MTO 32.1 Examples: Jenine L. Brown, Daphne Tan, Victoria Boerner and Yeonju Lindsey Lee, A Context-Sensitive Analysis of the Pre-Dominant Function

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

<https://www.mtosmt.org/issues/mto.26.32.1/mto.26.32.1.brown.html>

Example 1. Pre-dominant power up in Mozart, Piano Sonata, K. 545/i (last PAC of exposition/recapitulation).

Exposition

22

G: ii^6 $V^8_6_4$ I

Recapitulation

67

C: ii^6 $[vii^{\circ 7}]V$ $V^8_6_4$ I

Example 2. An excerpt of the dataset. Rows contain all dominant harmonies along with the three chords preceding each dominant in K. 545/i.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	 Sonata No.	Movement No.	Time signature	Key of movement	Formal section	Formal subsection	3rd last chord before V	3rd last chord onset	3rd last chord length	2nd last chord before V	2nd last chord onset	2nd last chord length	Last chord before V	Last chord onset	Last chord length	Type of V	V chord beat onset	V chord length	Mm. of V arrival	Key at V arrival	Cadence type	Last chord before V, bass scale degree	Last chord before V, cardinality: 3-note chord (0) or 4-note chord (1)
645	K. 545	1 C	C	major	Exposition	MT1	-	-	-	-	-	-	I	b1	4	V4/3	b1		2 m2	C	NC	1	0
646	K. 545	1 C	C	major	Exposition	MT1=>TR	I	b3	2	IV6/4	b1	2	I	b3	2	V6/5	b1		2 m4	C	NC	1	0
647	K. 545	1 C	C	major	Exposition	TR	-	-	-	IV	b1	4	I6	b1	4	V6/5	b1		4 m7	C	NC	3	0
648	K. 545	1 C	C	major	Exposition	TR	ii6	b1	4	IV	b1	3.5	[V6/5]V	b4.5	0.5	V	b1	7 [or 8 with rest]	m11	C	HC	#4	1
649	K. 545	1 C	C	major	Exposition	ST1	-	-	-	-	-	-	I6	b1	4	V4/3	b1		4 m15	G	NC	3	0
650	K. 545	1 C	C	major	Exposition	ST1	-	-	-	-	-	-	I6	b1	4	V4/3	b1		4 m17	G	NC	3	0
651	K. 545	1 C	C	major	Exposition	ST1	iii	b3	2	vi6	b1	2	ii6	b3	2	V6	b1		2 m21	G	NC	4	0
652	K. 545	1 C	C	major	Exposition	ST1	-	-	-	I	b3	2	ii6	b1	8	Cad6/4	b1		8 m24	G	PAC	4	0
653	K. 545	1 C	C	major	Exposition	Codetta	-	-	-	-	-	-	I	b1	3	V7	b4		1 m26	G	NC	1	0
654	K. 545	1 C	C	major	Exposition	Codetta	-	-	-	-	-	-	I	b1	3	V7	b4		1 m27	G	NC	1	0
655	K. 545	1 C	C	major	Development	Core	-	-	-	-	-	-	i	b1	3	V7	b4		1 m29	Gm	NC	1	0
656	K. 545	1 C	C	major	Development	Core	-	-	-	-	-	-	i	b1	3	V7	b4		1 m30	Gm	NC	1	0
657	K. 545	1 C	C	major	Development	Core	-	-	-	-	-	-	-	-	-	V7	b4		1 m33	Dm	NC	n/a	n/a
658	K. 545	1 C	C	major	Development	Core	-	-	-	-	-	-	-	-	-	V7	b4		1 m34	Dm	NC	n/a	n/a
659	K. 545	1 C	C	major	Development	Core	[V6/5]iii	b1	2	iii	b3	2	IV6	b1	2	V7	b3		2 m41	F	D arrival	6	0
660	K. 545	1 C	C	major	Recapitulation	MT1	-	-	-	-	-	-	I	b1	4	V4/3	b1		2 m43	F	NC	1	0
661	K. 545	1 C	C	major	Recapitulation	MT1=>TR	I	b3	2	IV6/4	b1	2	I	b3	2	V6/5	b1		2 m45	F	NC	1	0
662	K. 545	1 C	C	major	Recapitulation	TR	-	-	-	IV	b1	4	I6	b1	4	V6/5	b1		4 m48	F	NC	3	0
663	K. 545	1 C	C	major	Recapitulation	TR	ii7	b1	3	viiø6	b4	1	I	b1	8	V6	b1		4 m51	F	NC	1	0
664	K. 545	1 C	C	major	Recapitulation	TR	ii6	b1	4	IV	b1	3.5	[V6/5]V	b4.5	0.5	V	b1	7 [or 8]	m56	C	HC	#4	1
665	K. 545	1 C	C	major	Recapitulation	ST1	-	-	-	-	-	-	I6	b1	4	V4/3	b1		4 m60	C	NC	3	0
666	K. 545	1 C	C	major	Recapitulation	ST1	-	-	-	-	-	-	I6	b1	4	V4/3	b1		4 m62	C	NC	3	0
667	K. 545	1 C	C	major	Recapitulation	ST1	iii	b3	2	vi6	b1	2	ii6	b3	2	V6	b1		2 m66	C	NC	4	0
668	K. 545	1 C	C	major	Recapitulation	ST1	I	b3	2	ii6	b1	4	[viiø7]V	b1	4	Cad6/4	b1		8 m69	C	PAC	#4	1
669	K. 545	1 C	C	major	Recapitulation	Codetta	-	-	-	-	-	-	I	b1	3	V7	b4		1 m71	C	NC	1	0
670	K. 545	1 C	C	major	Recapitulation	Codetta	-	-	-	-	-	-	I	b1	3	V7	b4		1 m72	C	NC	1	0

Example 3. Frequency and percentages of V-1 based upon whether the chord is or is not at a cadence. (“Other” includes iii, vii°, bII, CT°, and moments of harmonic ambiguity such as unisons. “Applied of V” includes both applied dominants and applied leading-tone chords of V.)

	Before Non-Cadential V		Before Cadential V		Total (Non-Cadential + Cadential)	
Chord Type	Count	%	Count	%	Count	%
Tonic	471	62.38%	31	8.29%	502	44.46%
Supertonic	88	11.66%	172	45.99%	260	23.03%
Subdominant	49	6.49%	52	13.90%	101	8.95%
Submediant	18	2.38%	0	0.00%	18	1.59%
Applied of V	48	6.36%	84	22.46%	132	11.69%
Augmented sixth	8	1.06%	25	6.68%	33	2.92%
Other	28	3.71%	4	1.07%	32	2.83%
No chord	45	5.96%	6	1.60%	51	4.52%
Total	755	100.00%	374	100.00%	1,129	100.00%

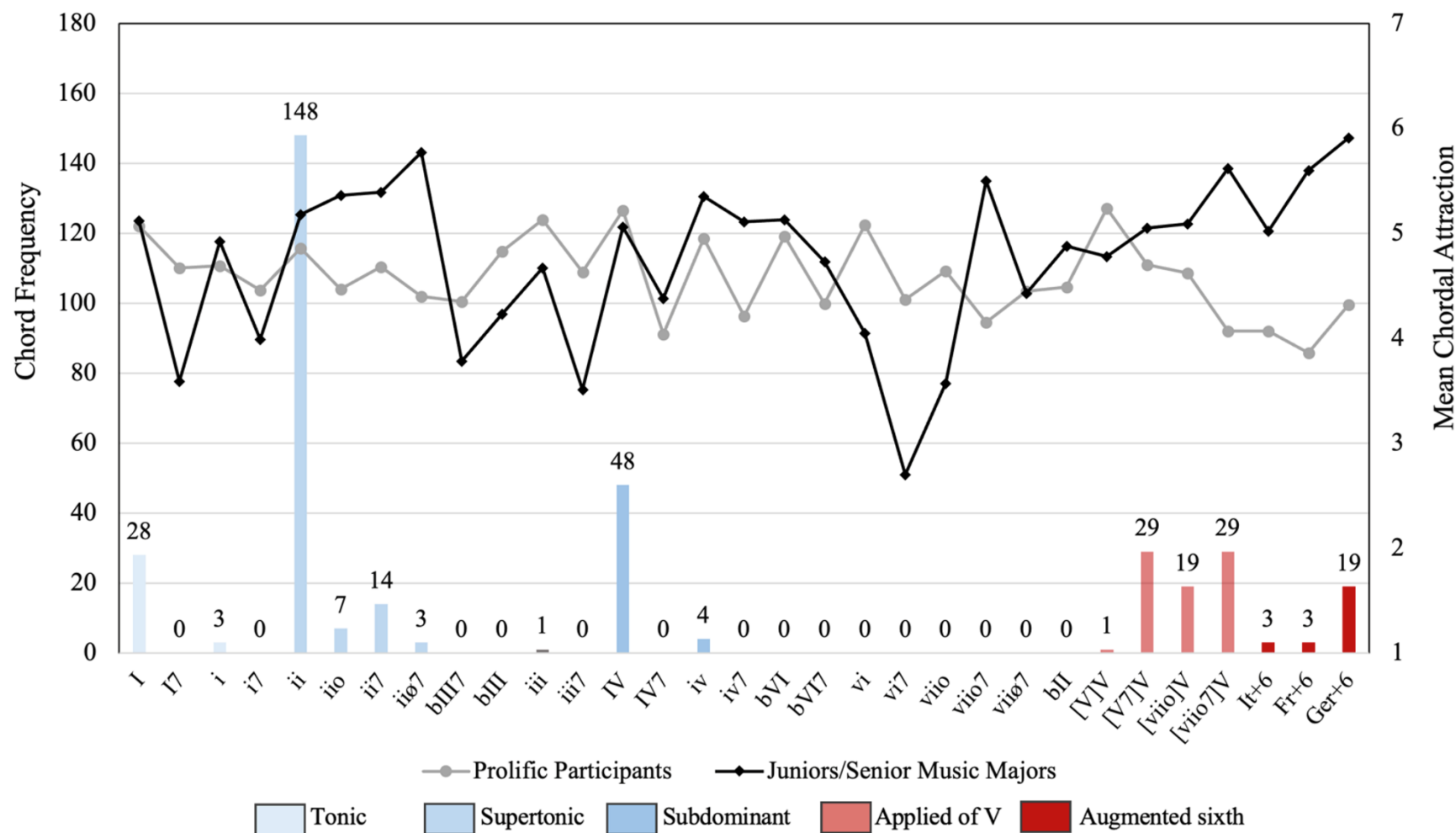
Example 4. Frequency and percentages of bass scale degrees in V-1 based upon whether the chord is or is not at a cadence.

	Before Non-Cadential V		Before Cadential V		Total (Non-Cadential + Cadential)	
Scale Degree	Count	%	Count	%	Count	%
1	370	49.01%	18	4.81%	388	34.37%
#1	1	0.13%	0	0.00%	1	0.09%
b2	1	0.13%	0	0.00%	1	0.09%
2	53	7.02%	24	6.42%	77	6.82%
b3	21	2.78%	2	0.53%	23	2.04%
3	113	14.97%	13	3.48%	126	11.16%
4	52	6.89%	194	51.87%	246	21.79%
#4	11	1.46%	65	17.38%	76	6.73%
b6	14	1.85%	25	6.68%	39	3.45%
6	53	7.02%	24	6.42%	77	6.82%
#6	2	0.26%	0	0.00%	2	0.18%
7	0	0.00%	0	0.00%	0	0.00%
None	64	8.48%	9	2.41%	73	6.47%
Total	755	100.00%	374	100.00%	1,129	100.00%

Example 5. Chord types before V in the dataset along with their frequency at various locations, arranged by how often they lead to a cadence (rightmost column).

	# that the chord occurs before any V (b)	# that the chord leads to a cadence (a)	% that the chord leads to a cadence (a/b)
Augmented sixth	33	25	75.76%
Applied leading-tone chord of V	81	54	66.67%
Supertonic	260	172	66.15%
Applied dominant of V	51	30	58.82%
Subdominant	101	52	51.49%
Infrequent chords: iii, vii ^{04/3} , Neapolitan, CT ⁰⁷	6	1	16.67%
“-”	51	6	11.76%
Melody, unisons, harmonic ambiguity	26	3	11.54%
Tonic	502	31	6.18%
Submediant	18	0	0.00%

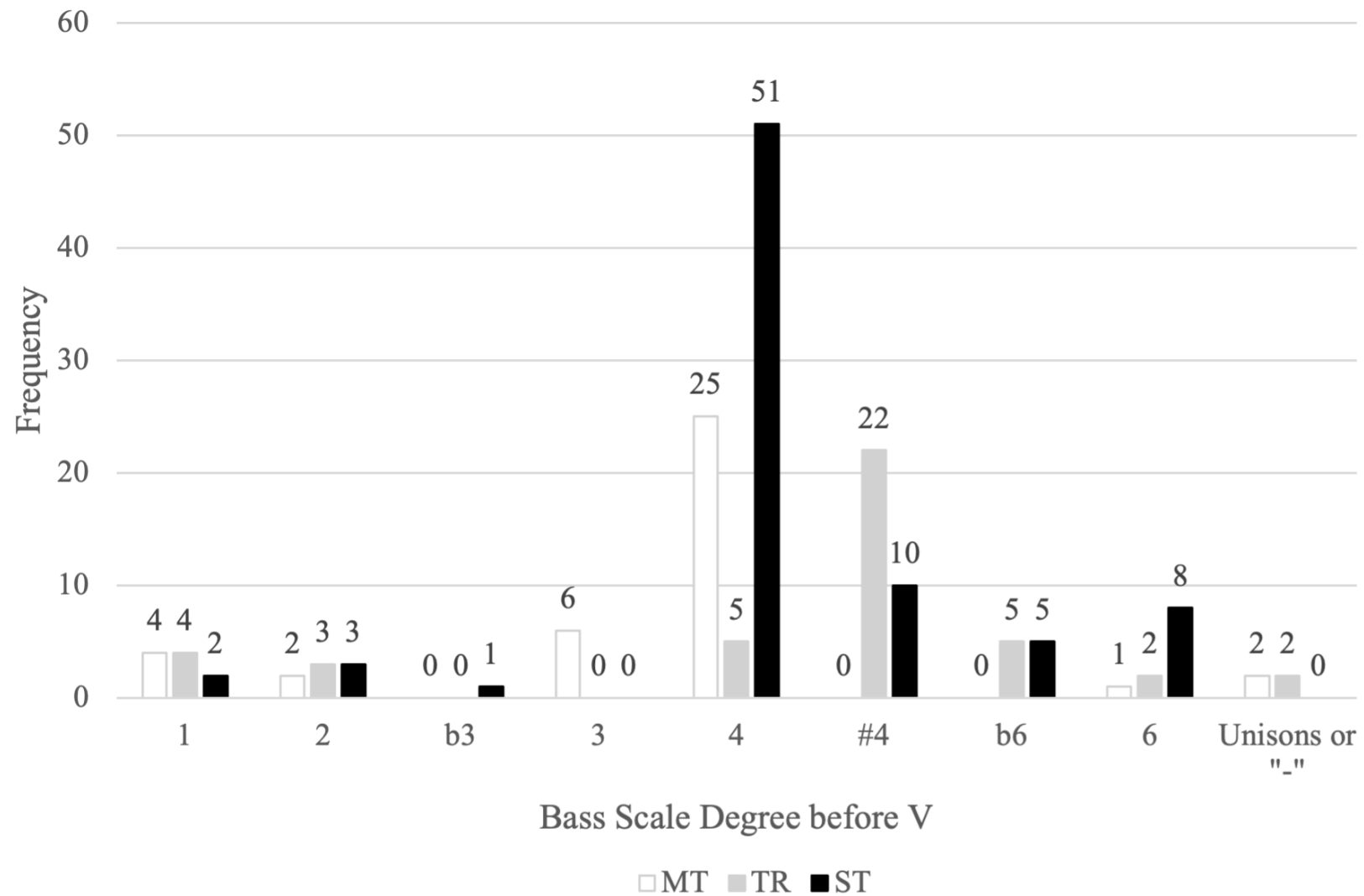
Example 6. Raw counts of chords in V-1 at a cadence (y-axis, left) for the 31 rated chords (x-axis) in Brown, Tan, and Baker (2021), with perceptual ratings (1–7 scale) superimposed (y-axis, right).



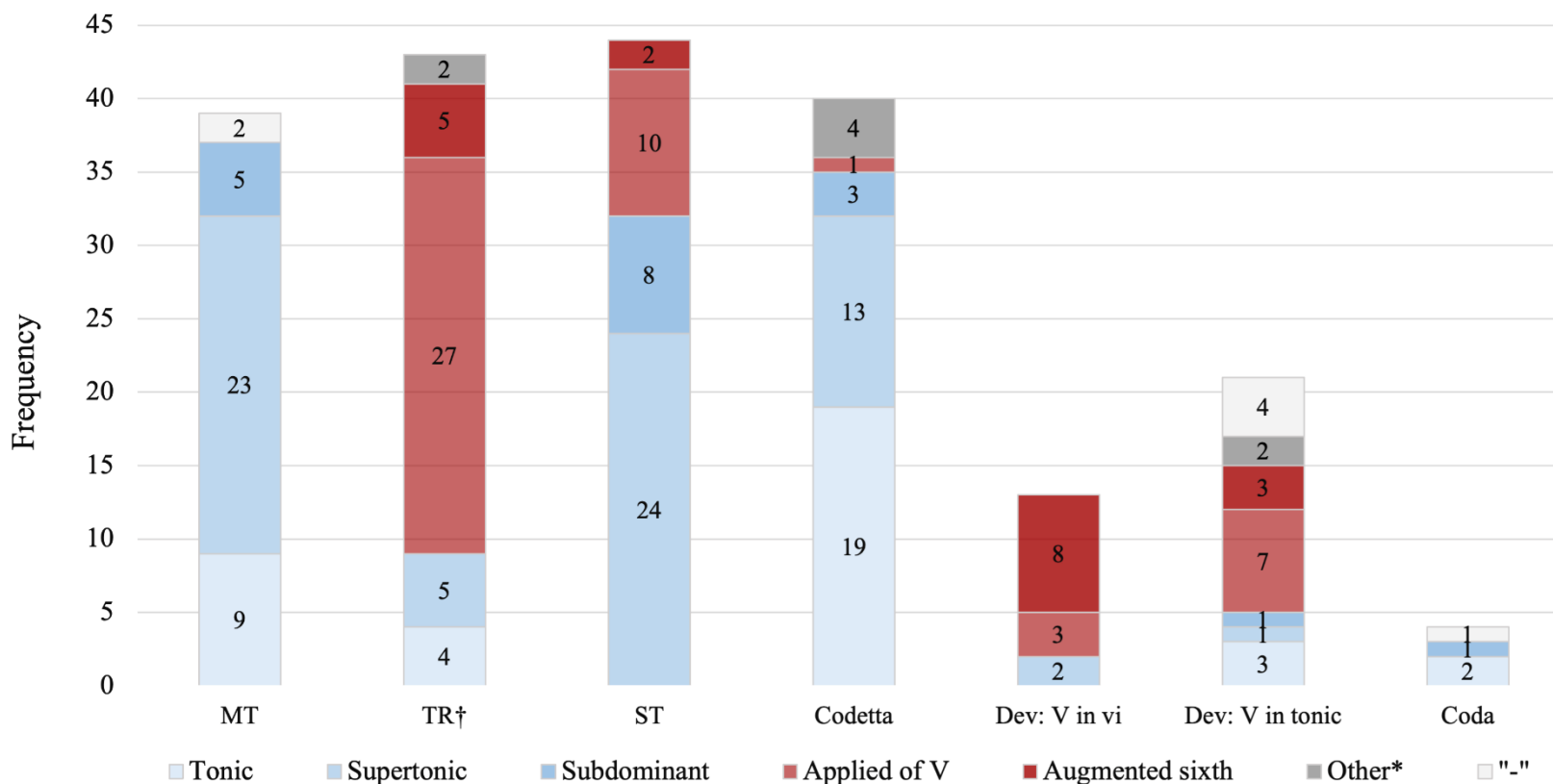
Example 7. Chord types in V-1 at the cadences ending main themes (MT1 and MT2), transitions (TR), and subordinate themes (ST1, ST2, and ST3) in both expositions and recapitulations.

	MT		TR		ST		Total	
Chord Type	Count	%	Count	%	Count	%	Count	%
Tonic	10	25.00%	4	9.30%	2	2.50%	16	9.82%
Supertonic	23	57.50%	5	11.63%	41	51.25%	69	42.33%
Subdominant	5	12.50%	0	0.00%	16	20.00%	21	12.88%
Submediant	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Applied of V	0	0.00%	27	62.79%	16	20.00%	43	26.38%
Augmented sixth	0	0.00%	5	11.63%	5	6.25%	10	6.13%
Unisons or “-”	2	5.00%	2	4.65%	0	0.00%	4	2.45%
Total	40	100.00%	43	100.00%	80	100.00%	163	100.00%

Example 8. Bass scale degrees that occur in V-1 at all cadences ending main themes (MT1 and MT2), transitions (TR), and subordinate themes (ST1, ST2, and ST3) in both expositions and recapitulations.



Example 9. Chord types in V-1 at section-ending cadences in sonata form. For the main theme (MT), transition (TR), and subordinate theme (ST), the final V-1 chord was counted in the last section-ending cadence for these themes in the exposition and recapitulations. For codettas and coda, V-1 before the final V is counted. For the development, the V-1 chord before the final cadence in the submediant key (when present) and tonic key were counted.



*Other includes iii, unisons, I-V oscillations. †Tr includes MT⇒TR.

Example 10. (A) Heatmap illustrating the frequency of transitions from the chord occurring two chords before V (“V-2” on the y-axis) to one chord before V (“V-1” on the x-axis) in the dataset. (B) Heatmap illustrating the frequency of transitions at cadences from V-2 (y-axis) to V-1 (x-axis) in the dataset.

To →													
From ↓	V-1												
V-2	“,”	Tonic	Supertonic	Mediant	Subdominant	Submediant	Leading tone†	Applied of V	Augmented sixth	bII	CT ⁹⁷	Other††	Total
“,”	51	405	13	0	13	12	0	18	5	1	1	18	537
Tonic	0	47	121	0	62	0	0	33	8	0	2	0	273
Supertonic	0	8	17	0	3	0	0	26	1	0	0	0	55
Mediant	0	0	0	1	4	0	0	0	0	0	0	0	5
Subdominant	0	29	30	0	4	0	0	33	8	0	0	1	105
Minor v	0	0	0	0	0	0	0	0	1	0	0	0	1
Submediant	0	0	34	0	1	0	0	10	3	0	0	0	48
Diatonic LT	0	12	2	0	0	4	0	1	1	0	0	0	20
Altered LT*	0	0	0	0	3	0	0	0	1	0	0	0	4
Applied of ii	0	0	41	0	0	0	0	3	0	0	0	0	44
Applied of IV	0	1	2	0	11	0	0	2	0	0	0	0	16
Applied of V	0	0	0	0	0	0	1	2	1	0	0	0	4
Applied of vi	0	0	0	0	0	1	0	1	0	0	0	0	2
bII ⁽⁹⁾	0	0	0	0	0	0	0	2	0	0	0	0	2
Gerl 6	0	0	0	0	0	0	0	0	1	0	0	0	1
Unisons	0	0	0	0	0	0	0	0	0	0	0	7	7
Oddballs**	0	0	0	0	0	1	0	1	3	0	0	0	5
Totals	51	502	260	1	101	18	1	132	33	1	3	26	1129

*Altered leading tone (LT) chord includes bVII and bvii6/4.

**Oddballs includes #vii⁹⁷ (2), [V⁷]V of V (1), [V]bII (1), [V]bVII (1).

† Leading tone is vii⁹⁴/3.

†† Other (V-1) includes unisons, melodies, and harmonic oscillations (I-V).

To →												
From ↓	V-1											
V-2	“ ² ”	Tonic	Supertonic	Mediant	Subdominant	Submediant	Applied of V	Augmented sixth	bII	CT ^{o7}	Other †	Totals
“ ² ”	6	16	7	0	0	0	7	1	0	0	1	38
Tonic	0	4	93	0	45	0	17	8	0	0	0	167
Supertonic	0	0	10	0	0	0	23	1	0	0	0	34
Mediant	0	0	0	1	1	0	0	0	0	0	0	2
Subdominant	0	8	21	0	2	0	25	6	0	0	1	63
Submediant	0	0	23	0	0	0	5	2	0	0	0	30
Diatonic LT	0	3	0	0	0	0	1	1	0	0	0	5
Altered LT*	0	0	0	0	2	0	0	0	0	0	0	2
Applied of ii	0	0	18	0	0	0	0	0	0	0	0	18
Applied of IV	0	0	0	0	2	0	2	0	0	0	0	4
Applied of V	0	0	0	0	0	0	2	1	0	0	0	3
Applied of vi	0	0	0	0	0	0	0	0	0	0	0	0
bII ^(s)	0	0	0	0	0	0	2	0	0	0	0	2
Ger+6	0	0	0	0	0	0	0	1	0	0	0	1
Unisons	0	0	0	0	0	0	0	0	0	0	1	1
Oddballs**	0	0	0	0	0	0	0	4	0	0	0	4
Totals	6	31	172	1	52	0	84	25	0	0	3	374

*Altered leading tone (LT) chord includes bVII and bvii6/4.

**Oddballs includes v (1), #vi⁹⁷ (2), [V⁷]V of V (1), [V]bII (1), [V]bVII (1).

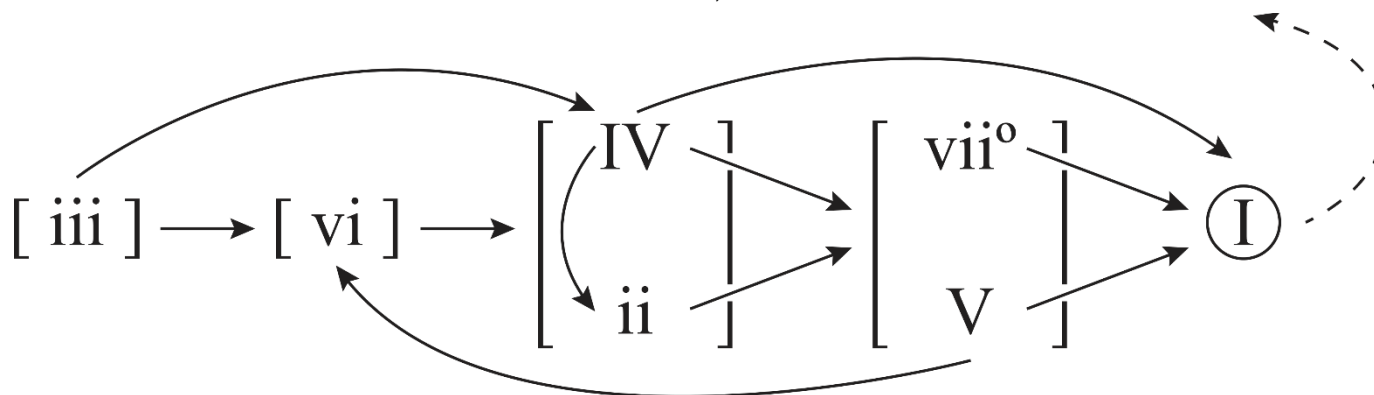
† Other (V-1) includes unisons, melodies, harmonic oscillations (I-V) and leading tone chords.

Example 11. Heatmap organized by cadence type, illustrating progressions between all V-2 (y-axis) to V-1 (x-axis) chords.

(Link to enlarged example: https://www.mtosmt.org/issues/mto.26.32.1/brown_ex11.php)

[illegible]

Example 12. A reproduction of frequent chord progressions in the major mode as illustrated in the Kostka and Payne textbook (2009, 111).



Example 13. The seven most frequent V-2 chords (first leftmost column) and their minor-mode counterparts if present in the dataset (in grey), followed by subsequent V-1 frequencies (third column). All chords in V-2 are presented in descending order of frequency, based on major-mode appearances. All chords in V-1 are presented in descending order of frequency.

V-2 Chord	Total	V-1 Chord	Count	Percentage
I ⁶	135	ii ⁶	55	40.74%
		IV	35	25.93%
		I	21	15.56%
		[vii ⁰]V	7	5.19%
		ii	6	4.44%
		IV ⁶	3	2.22%
		ii ^{6/5}	2	1.48%
		CT ⁰⁷	2	1.48%
		ii ⁷	1	0.74%
		ii ^{4/3}	1	0.74%
		[V ⁷]V	1	0.74%
		[vii ⁰⁷]V	1	0.74%
i ⁶	10	ii ⁰⁶	2	20.00%
		iv	2	20.00%
		Ger+6	2	20.00%
		i	1	10.00%
		[V ⁷]V	1	10.00%
		[vii ⁰⁷]V	1	10.00%
		Fr+6	1	10.00%
I	106	ii ⁶	37	34.91%
		I ⁶	23	21.70%
		IV ⁶	10	9.43%
		IV	8	7.55%
		ii	7	6.60%
		ii ⁷	4	3.77%
		IV ^{6/4}	4	3.77%
		[vii ⁰]V	4	3.77%
		[V ^{4/3}]V	3	2.83%
		ii ^{6/5}	2	1.89%
		[vii ⁰⁶]V	2	1.89%
		[V ^{6/5}]V	1	0.94%
		[vii ⁰⁷]V	1	0.94%
i	11	[vii ⁰⁷]V	4	36.36%
		ii ⁰⁶	2	18.18%
		Ger+6	2	18.18%
		ii ⁰	1	9.09%
		[vii ⁰⁶]V	1	9.09%
		It+6	1	9.09%

(Example 13, continued)

IV	63	I^6	13	20.63%
		ii^6	10	15.87%
		ii	7	11.11%
		I	6	9.52%
		$[vii^{o7}]V$	6	9.52%
		$[V^{6/5}]V$	4	6.35%
		$[vii^o]V$	4	6.35%
		$[vii^{o4/3}]V$	4	6.35%
		IV^6	2	3.17%
		$[V]V$	2	3.17%
		$[vii^{o7}]V$	2	3.17%
		$ii^{4/3}$	1	1.59%
		$[V^{4/3}]V$	1	1.59%
		Unisons implying ii	1	1.59%
		ii^{o6}	3	60.00%
iv	5	ii^o	1	20.00%
		$[vii^{o7}]V$	1	20.00%
		$[V^{6/5}]V$	13	36.11%
ii^6	36	ii	8	22.22%
		$[vii^o]V$	3	8.33%
		I^6	2	5.56%
		$ii^{6/5}$	2	5.56%
		IV	2	5.56%
		$[V^{4/3}]V$	2	5.56%
		$[vii^{o7}]V$	2	5.56%
		$[vii^{o7}]V$	2	5.56%
		$[vii^{o7}]V$	2	5.56%

(Example 13, continued)

vi	32	ii ⁶	23	71.88%
		[vii ^{o6}]V	3	9.38%
		ii ^{6/5}	2	6.25%
		[V ⁷]V	2	6.25%
		ii	1	3.13%
		IV ⁶	1	3.13%
bVI	7	ii ^{o6/5}	4	57.14%
		[vii ^{o7}]V	1	14.29%
		It+6	1	14.29%
		Ger+6	1	14.29%
IV ⁶	15	Ger+6	6	40.00%
		ii ⁶	4	26.67%
		IV	2	13.33%
		[vii ^{o7}]V	2	13.33%
		[V ^{6/5}]V	1	6.67%
iv ⁶	12	ii ^{o4/3}	4	36.36%
		[V ^{6/5}]V	2	18.18%
		[vii ^{o6}]V	2	18.18%
		Fr+6	2	18.18%
		[vii ^{o7}]V	1	9.09%
		[vii ^{o4/3}]V	1	9.09%
		I	6	50.00%
ii	12	[V ^{4/2}]V	3	25.00%
		ii ⁶	2	16.67%
		IV ^{6/4}	1	8.33%

Example 14. Location and frequency of all 36 augmented sixth chords in the dataset (in V-3, V-2, and V-1 positions).

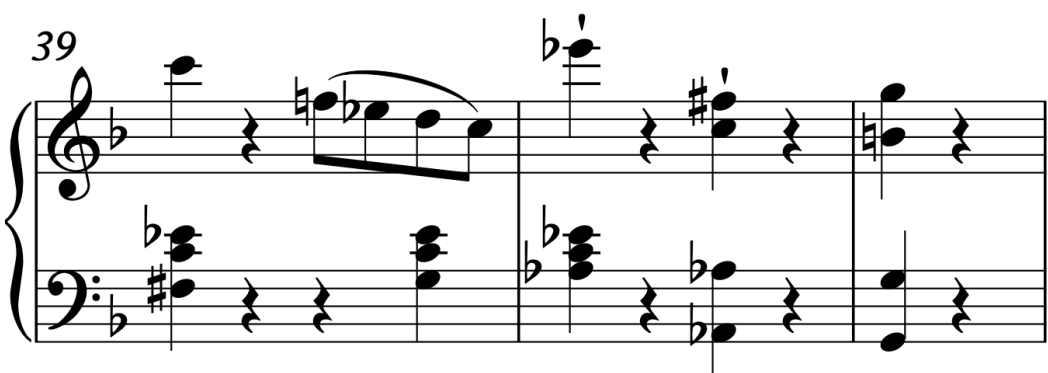
Location of augmented sixth		Frequency	%
Exposition		6	100.00%
	MT	0	0.00%
	TR (3 HCs)	3	50.00%
	ST1 (2 HCs)	2	33.33%
	ST2 (1 PAC)	1	16.67%
	Codetta	0	0.00%
Development		19	100.00%
	Leading to V in v (1 HC)	1	5.26%
	Leading to V in vi (4 NCs, 9 HCs, 1 PAC)	14	73.68%
	Leading to V in tonic (1 NC, 3 HCs)	4	21.05%
Recapitulation		11	100.00%
	MT	0	0.00%
	TR (1 NC, 3 HCs)	4	36.36%
	ST1 (2 NCs, 3 HCs)	5	45.45%
	ST2 (1 NC, 1 PAC)	2	18.18%
	Codetta	0	0.00%
Coda		0	-

Example 15. Location and frequency of mode mixture in the dataset.

Location of mode mixture		Frequency	%	Movement
Exposition		5	100.00%	
	MT	1	20.00%	K. 332/iii
	TR	2	40.00%	K. 332/i, K. 533/i
	ST	2	40.00%	ST1: K. 332/iii, ST2: K. 332/i
	Codetta	0	0.00%	
Development		11	100.00%	
	Opening	5	45.45%	K. 533/i, K. 280/iii, K. 282/iii, 283/iii, K. 332/iii
	Leading to V in vi	2	18.18%	K. 332/i, K. 282/iii
	Leading to V in tonic	4	36.36%	K. 284/i, K. 330/i, K. 330/iii, K. 332/iii
Recapitulation		10	100.00%	
	MT	2	20.00%	K. 309/i, K. 332/iii
	TR	3	30.00%	K. 279/i, K. 332/i, K. 533/i
	ST	5	50.00%	ST1: K. 311/i, K. 533/i, K. 570/i, K. 332/iii; ST2: K. 332/i
	Codetta	0	0.00%	
Coda		0	-	

Example 16. A pre-dominant power up in Mozart, Piano Sonata, K. 533/i (end of TR).

Exposition



39

C: $\flat$ VI V

Recapitulation



166

F: Ger⁺⁶ V

Example 17. A pre-dominant power up with added measures in the recapitulation in Mozart, Piano Sonata, K. 332/iii (end of TR).

44

Exposition

C:

vii^{o6} V⁶ I _____ V

178

Recapitulation

F:

I⁶ IV⁶ V⁶ V

Example 18. A pre-dominant power down in Mozart, Piano Sonata, K. 283/i (last PAC of exposition/recapitulation).

48

Exposition

D: ii^6 $V \begin{smallmatrix} 8 & 7 \\ 6 & 5 \\ 4 & 3 \end{smallmatrix}$ I

115

Recapitulation

G: IV $V \begin{smallmatrix} 8 & 7 \\ 6 & 5 \\ 4 & 3 \end{smallmatrix}$ I