

Appendix B

Spanish Elicitation Items

PROMPT	GLOSS	IPA	TARGET	ENVIRON
lime	<i>'he files'</i>	['lime]	/l/	# _ /i/
rime	<i>'he rhymes'</i>	['rime]	/r/	# _ /i/
dime	<i>'give me'</i>	['dime]	/d/	# _ /i/
lema	<i>'motto'</i>	['lema]	/l/	# _ /e/
rema	<i>'he rows'</i>	['rema]	/r/	# _ /e/
tema	<i>'topic'</i>	['tema]	/t/	# _ /e/
lama	<i>'moss'</i>	['lama]	/l/	# _ /a/
rama	<i>'branch'</i>	['rama]	/r/	# _ /a/
dama	<i>'lady'</i>	['dama]	/d/	# _ /a/
loma	<i>'hillock'</i>	['loma]	/l/	# _ /o/
Roma	<i>'Rome'</i>	['roma]	/r/	# _ /o/
doma	<i>'he tames'</i>	['doma]	/d/	# _ /o/
lumbre	<i>'fire'</i>	['lumbre]	/l/	# _ /u/
rumba	<i>'rumba'</i>	['rumba]	/r/	# _ /u/
tumba	<i>'he knocks over'</i>	['tumba]	/t/	# _ /u/

TABLE B.1: Spanish elicitation items – **word-initial** environment

PROMPT	GLOSS	IPA	TARGET	ENVIRON
irina	<i>'Irina'</i>	[i'rina]	/r/	/i _ i/
irrita	<i>'he annoys'</i>	[i'rita]	/r/	/i _ i/
ilícito	<i>'ilicit'</i>	[i'lisito]	/l/	/i _ i/
idilio	<i>'idyll'</i>	[i'dilio]	/d/	/i _ i/
ere	<i>'the letter r'</i>	[i'ere]	/r/	/e _ e/
erre	<i>'the letter rr'</i>	[i'ere]	/r/	/e _ e/
ele	<i>'the letter l'</i>	[i'ele]	/l/	/e _ e/
hede	<i>'it stinks'</i>	[i'ede]	/d/	/e _ e/
para	<i>'for'</i>	[i'para]	/r/	/a _ a/
parra	<i>'vine'</i>	[i'para]	/r/	/a _ a/
pala	<i>'spade'</i>	[i'pala]	/l/	/a _ a/
capada	<i>'castrated (f.)'</i>	[ka'pada]	/d/	/a _ a/
poro	<i>'pore'</i>	[i'poro]	/r/	/o _ o/
porro	<i>'joint'</i>	[i'poro]	/r/	/o _ o/
polo	<i>'pole'</i>	[i'polo]	/l/	/o _ o/
podo	<i>'I prune'</i>	[i'podo]	/d/	/o _ o/
guru	<i>'guru'</i>	[gu'ru]	/r/	/u _ u/
acurruca	<i>'he curls up'</i>	[aku'ruka]	/r/	/u _ u/
pulula	<i>'it swarms around'</i>	[pu'lula]	/l/	/u _ u/
vudú	<i>'voodoo'</i>	[vu'du]	/d/	/u _ u/

TABLE B.2: Spanish elicitation items – **intervocalic onset** environment.

PROMPT	GLOSS	IPA	TARGET	ENVIRON
sirviente	<i>'servent'</i>	[sir.vi.'en.te]	/r/	/i _ vi/
filmina	<i>'transparency'</i>	[fil.'mi.na]	/l/	/i _ mi/
rítmico	<i>'rhythmic'</i>	[rit.mi.co]	/t/	/i _ mi/
intermedia	<i>'intermediate'</i>	[in.ter.'me.di.a]	/r/	/e _ me/
fielmente	<i>'faithfully'</i>	[fi.el.'men.te]	/l/	/e _ me/
vedme!	<i>'look at me! (Vds.)'</i>	[i'ved.me]	/d/	/e _ me/
arma	<i>'he arms'</i>	[i'ar.ma]	/r/	/a _ ma/
alma	<i>'soul'</i>	[i'al.ma]	/l/	/a _ ma/
amad mar	<i>'love the sea'</i>	[a.'mad.mar]	/d/	/a _ ma/
deformo	<i>'I distort'</i>	[de.'for.mo]	/r/	/o _ mo/
devolvo	<i>'I return'</i>	[de.'vol.vo]	/l/	/o _ vo/
argot monja	<i>'nun slang'</i>	[ar.ɣot.'mon.xa]	/t/	/o _ mo/
murmura	<i>'He whispers'</i>	[i'mur.mu.ra]	/r/	/u _ mu/
sulfura	<i>'He infuriates'</i>	[i'sul.fu.ra]	/l/	/u _ fu/
salud muchacho	<i>'Hey dude!'</i>	[sa.'lud.mu.tʃa.tʃo]	/d/	/u _ mu/

TABLE B.3: Spanish elicitation items – **intervocalic coda** environment

PROMPT	GLOSS	IPA	TARGET	ENVIRON
mil	'1000'	[mil]	/l/	/i/ _ #
gemir	'to moan'	[ge'mir]	/r/	/i/ _ #
gemid	'moan! (Vds.)'	[ge'mid]	/d/	/i/ _ #
miel	'honey'	['miel]	/l/	/e/ _ #
ver	'to see'	[ver]	/r/	/e/ _ #
ved	'see! (Vds.)'	[ved]	/d/	/e/ _ #
mal	'bad'	[mal]	/l/	/a/ _ #
mar	'sea'	[mar]	/r/	/a/ _ #
amad	'love! (Vds.)'	[a'mad]	/d/	/a/ _ #
bol	'ball'	[bol]	/l/	/o/ _ #
por	'for'	[por]	/r/	/o/ _ #
mod	''	[mod]	/d/	/o/ _ #
azul	'blue'	[a'zul]	/l/	/u/ _ #
sur	'south'	[sur]	/r/	/u/ _ #
sud	'south'	[sud]	/d/	/u/ _ #

TABLE B.4: Spanish elicitation items – **word-final** environment

Appendix C

Spanish Acoustic Data

	LATERAL			C	TRILL				TAP		
	F1	F2	F3		F1	F2	F3		F1	F2	F3
e	616	2309	2984	e	616	2341	2958	e	616	2277	2932
l	400	1935	2871	r	539	1862	2580	r	449	1991	2818
l	389	1840	2865	r	284	1607	2767	r	387	1884	2808
l	396	1834	2860	r	409	1688	2858	r	470	2112	2946
e	573	2207	2871	e	604	2143	2754	e	582	2268	2874
a	851	1626	2723	a	867	1588	2765	a	873	1562	2811
l	655	1907	2975	r	770	1794	2728	r	561	1857	2883
l	419	1851	2959	r	372	1449	2453	r	426	1786	2790
l	616	1843	2959	r	527	1505	2512	r	590	1942	2847
a	791	1676	2731	a	754	1759	2716	a	765	1782	2738
u	416	992	2804	u	408	871	2828	u	421	817	2648
l	371	1732	2603	r	273	1405	2789	r	394	1660	2522
l	313	1952	2546	r	299	1677	2476	r	260	1725	2657
l	409	1835	2732	r	374	1500	2261	r	373	1713	2614
u	405	1071	2689	u	406	1156	2728	u	410	1232	2700

TABLE C.1: Mean Formant Frequencies – Spanish Medial Onset Consonants – Subject W1. All values in Hz, averaged over two utterances of each token.

	LATERAL			C	TRILL				TAP		
	F1	F2	F3		F1	F2	F3		F1	F2	F3
e	570	2402	2830	e	501	2479	2892	e	498	2502	2862
l	358	2080	3045	r	505	1756	2657	r	450	2129	2878
l	381	2065	3503	r	512	1843	2695	r	340	1916	2751
l	405	2063	3396	r	527	1895	2683	r	468	2080	2897
e	589	2427	3040	e	601	2335	2819	e	588	2450	2986
a	953	1642	2965	a	964	1671	2894	a	966	1631	2932
l	570	1731	3025	r	735	1681	2684	r	602	1788	2888
l	453	1663	3736	r	709	1698	2654	r	489	1765	2889
l	480	1640	3000	r	743	1743	2743	r	605	1833	2890
a	897	1705	2949	a	877	1778	2755	a	842	1771	2875
u	386	862	3016	u	295	814	2862	u	419	861	3035
l	322	1270	2170	r	353	1214	2437	r	436	1357	2555
l	285	1439	2913	r	381	1309	2398	r	274	1335	3020
l	319	1376	2851	r	406	1390	2460	r	421	1455	2752
u	444	1044	2949	u	455	945	2936	u	602	1146	3398

TABLE C.2: Mean Formant Frequencies – Spanish Medial Onset Consonants – Subject W2. All values in Hz, averaged over two utterances of each token.

	LATERAL			C	TRILL				TAP		
	F1	F2	F3		F1	F2	F3		F1	F2	F3
e	518	2331	2978	e	545	2307	2959	e	527	2331	2979
l	389	1793	2802	r	393	1817	2737	r	417	2047	2937
l	400	1570	2516	r	266	1762	2767	r	279	1929	2786
l	393	1683	2617	r	385	1778	2705	r	383	2049	2900
e	533	2319	2882	e	536	2130	2802	e	519	2303	2888
a	883	1437	2916	a	843	1522	2995	a	901	1535	2968
l	541	1613	2948	r	505	1641	2727	r	658	1528	2700
l	482	1753	2897	r	451	1697	2553	r	550	1551	2648
l	465	1703	2849	r	480	1767	2696	r	681	1609	2734
a	829	1655	2870	a	690	1647	2731	a	807	1677	2810
u	380	889	2941	u	393	983	2983	u	420	857	3120
l	359	1209	2168	r	401	1199	2288	r	356	1301	2371
l	352	1355	2269	r	341	1279	2125	r	316	1233	2046
l	340	1265	2320	r	384	1222	1794	r	362	1237	2068
u	430	1024	2809	u	432	911	2953	u	360	995	2629

TABLE C.3: Mean Formant Frequencies – Spanish Medial Onset Consonants – Subject W3. All values in Hz, averaged over two utterances of each token.

	LATERAL			C	TRILL				TAP		
	F1	F2	F3		F1	F2	F3		F1	F2	F3
e	584	2268	3036	e	582	2348	2978	e	562	2315	2986
l	432	2014	2797	r	464	2044	2771	r	493	2138	2882
l	390	1894	2880	r	312	1927	2572	r	348	1877	2719
l	476	2036	2947	r	500	1768	2689	r	501	2069	2934
e	578	2263	2966	e	620	2114	2788	e	584	2288	2837
a	882	1372	2819	a	889	1448	2733	a	865	1313	2782
l	596	1653	2687	r	849	1773	2775	r	609	1535	2754
l	509	1734	2905	r	517	1540	2562	r	523	1591	2460
l	605	1599	2869	r	647	1588	2492	r	619	1505	2547
a	857	1586	2919	a	819	1660	2764	a	851	1656	2779
u	402	776	3025	u	391	879	2722	u	395	777	3115
l	370	1257	2617	r	315	1255	2396	r	434	1261	2465
l	322	1458	2847	r	357	1276	1948	r	395	1216	1809
l	363	1278	2377	r	417	1125	2160	r	435	1234	2268
u	403	967	2924	u	409	842	2937	u	449	867	3303

TABLE C.4: Mean Formant Frequencies – Spanish Medial Onset Consonants – Subject W4. All values in Hz, averaged over two utterances of each token.

	LATERAL			C	TRILL				TAP		
	F1	F2	F3		F1	F2	F3		F1	F2	F3
e	424	1875	2792	e	418	1824	2537	e	473	1987	2953
l	378	1651	3051	r	326	1596	2561	r	395	1808	2687
l	294	1575	2909	r	374	1544	2626	r	354	1696	2580
l	342	1675	3275	r	433	1583	2662	r	399	1778	2676
e	460	1783	2756	e	489	1622	2615	e	492	1832	2722
a	678	1202	2654	a	699	1280	2610	a	677	1291	2737
l	460	1297	2698	r	554	1319	2191	r	513	1230	2510
l	356	1289	2707	r	506	1214	2132	r	484	1247	2477
l	380	1330	2675	r	517	1298	2175	r	559	1241	2561
a	620	1222	3216	a	656	1278	1995	a	645	1252	3057
u	386	774	2754	u	291	836	2580	u	308	757	2512
l	317	1107	2241	r	324	796	2151	r	284	1014	2222
l	220	1153	1826	r	356	908	2157	r	286	1142	2323
l	320	986	2275	r	356	883	1795	r	332	922	2265
u	301	833	2484	u	277	771	2565	u	347	805	2532

TABLE C.5: Mean Formant Frequencies – Spanish Medial Onset Consonants – Subject M1. All values in Hz, averaged over two utterances of each token.

V-V	V TO V DURATION					CONSONANT DURATION				
	W1	W2	W3	W4	M1	W1	W2	W3	W4	M1
[ede]	0.21	0.28	0.26	0.27	0.17	0.08	0.10	0.09	0.07	0.06
[ede]	0.20	0.28	0.33	0.24	0.16	0.06	0.09	0.08	0.08	0.06
[ada]	0.20	0.30	0.22	0.15	0.19	0.05	0.07	0.08	0.05	0.10
[ada]	0.22	0.27	0.17	0.15	0.16	0.11	0.06	0.08	0.06	0.07
[udu]	0.22	0.30	0.22	0.25	0.21	0.06	0.09	0.05	0.09	0.08
[udu]	0.24	0.29	0.20	0.25	0.17	0.07	0.08	0.04	0.09	0.07
mean /d/ std.dev /d/	0.215 0.015	0.287 0.012	0.230 0.056	0.218 0.054	0.177 0.02	0.072 0.021	0.082 0.015	0.070 0.02	0.073 0.016	0.073 0.015
[ere]	0.18	0.20	0.14	0.25	0.14	0.03	0.03	0.02	0.04	0.04
[ere]	0.19	0.28	0.27	0.25	0.18	0.03	0.03	0.02	0.05	0.04
[ara]	0.20	0.33	0.23	0.23	0.17	0.03	0.02	0.03	0.04	0.04
[ara]	0.22	0.24	0.20	0.24	0.12	0.03	0.02	0.02	0.04	0.04
[uru]	0.22	0.26	0.25	0.25	0.18	0.03	0.02	0.03	0.05	0.05
[uru]	0.26	0.24	0.29	0.22	0.17	0.02	0.02	0.08	0.03	0.04
mean /r/ std.dev /r/	0.212 0.029	0.258 0.044	0.230 0.054	0.240 0.013	0.160 0.024	0.028 0.004	0.023 0.005	0.033 0.023	0.042 0.008	0.042 0.004
[ere]	0.30	0.28	0.29	0.30	0.20	0.15	0.05	0.09	0.08	0.06
[ere]	0.31	0.34	0.36	0.34	0.23	0.13	0.05	0.12	0.12	0.09
[ara]	0.29	0.31	0.29	0.31	0.19	0.09	0.14	0.10	0.10	0.06
[ara]	0.29	0.27	0.31	0.31	0.17	0.10	0.06	0.11	0.13	0.10
[uru]	0.24	0.20	0.20	0.26	0.13	0.09	0.04	0.04	0.10	0.12
[uru]	0.26	0.21	0.15	0.23	0.19	0.09	0.05	0.03	0.12	0.08
mean /r/ std.dev /r/	0.282 0.026	0.268 0.055	0.270 0.077	0.292 0.040	0.185 0.033	0.108 0.026	0.065 0.037	0.082 0.038	0.108 0.018	0.086 0.023
[ele]	0.24	0.31	0.23	0.25	0.24	0.08	0.08	0.05	0.08	0.11
[ele]	0.21	0.32	0.32	0.28	0.23	0.06	0.06	0.11	0.13	0.10
[ala]	0.23	0.30	0.28	0.25	0.17	0.09	0.08	0.08	0.09	0.07
[ala]	0.22	0.21	0.33	0.22	0.18	0.07	0.06	0.08	0.07	0.09
[ulu]	0.19	0.21	0.21	0.21	0.22	0.08	0.09	0.06	0.09	0.08
[ulu]	0.19	0.23	0.17	0.21	0.19	0.07	0.08	0.06	0.09	0.07
mean /l/ std.dev /l/	0.213 0.021	0.263 0.052	0.267 0.064	0.237 0.028	0.205 0.029	0.075 0.010	0.075 0.012	0.073 0.022	0.092 0.020	0.087 0.016
mean all C std.dev all C	0.230 0.037	0.269 0.043	0.247 0.061	0.247 0.044	0.182 0.03	0.071 0.033	0.061 0.03	0.065 0.031	0.079 0.03	0.072 0.024

TABLE C.6: **Durations of Spanish Intervocalic Consonants** Left five columns: duration between acoustic centers of pre- and post-consonantal vowels (sec); Right five columns: duration of consonantal closure interval (sec).

#rV	WORD-INITIAL RHOTICS						VrV	INTERVOCALIC TRILLS						All Onsets
	W1	W2	W3	W4	M1	Mean		W1	W2	W3	W4	M1	Mean	
ri	1	3	1	2	3		iri	3	2	2	2	2		
ri	2	2	1	3	3	2.10	iri	3	2	1	4	2	2.30	2.20
re	1	2	1	3	3		ere	4	2	1	3	3		
re	1	2	1	3	2	1.90	ere	3	2	1	3	3	2.50	2.20
ra	1	2	1	2	2		ara	2	1	1	2	2		
ra	1	1	1	3	2	1.60	ara	2	2	1	3	2	1.80	1.70
ro	2	1	1	3	2		oro	2	2	1	3	3		
ro	1	2	1	3	3	1.90	oro	2	2	1	4	3	2.30	2.10
ru	2	1	1	2	2		uru	3	1	1	3	2		
ru	2	1	1	1	2	1.50	uru	3	1	1	3	2	2.00	1.75
mean	1.40	1.70	1.00	2.50	2.40	1.80	mean	2.70	1.70	1.10	3.00	2.40	2.18	1.99
s.d.	0.52	0.67	0.00	0.71	0.52	0.28	s.d.	0.67	0.48	0.32	0.67	0.52	0.15	0.25

TABLE C.7: **Number of Coronal Closures:** Spanish rhotics in onset positions.

VrC	WORD-MEDIAL CODA RHOTICS						Vr#	WORD-FINAL RHOTICS						All Codas
	W1	W2	W3	W4	M1	Mean		W1	W2	W3	W4	M1	Mean	
ir	2	1	1	1	1		ir#	1	1	1	1	1		
ir	1	1	1	1	1	1.10	ir#	1	1	1	1	1	1.00	1.05
er	2	1	1	1	2		er#	1	0	1	1	2		
er	2	1	1	1	2	1.40	er#	1	2	1	1	2	1.20	1.30
ar	2	1	2	1	2		ar#	3	1	1	1	3		
ar	2	2	1	2	2	1.70	ar#	1	2	1	1	2	1.60	1.65
or	2	2	1	1	2		or#	1	1	1	2	2		
or	2	2	1	1	2	1.60	or#	2	1	1	2	2	1.50	1.55
ur	2	2	1	1	1		ur#	1	1	1	1	2		
ur	2	2	1	1	2	1.50	ur#	1	2	1	1	2	1.30	1.40
mean	1.90	1.50	1.10	1.10	1.70	1.46	mean	1.30	1.20	1.00	1.20	1.90	1.32	1.39
s.d.	0.32	0.53	0.32	0.32	0.48	0.10	s.d.	0.67	0.63	0.00	0.42	0.57	0.27	0.23

TABLE C.8: **Number of Coronal Closures:** Spanish rhotics in coda positions.

Appendix D

Russian Elicitation Items

TOKEN	IPA	TARGET	ENVIRON	TOKEN	IPA	TARGET	ENVIRON
иры	/irɨ/	/r/	[i _ ɨ]	ири	/irʲi/	/rʲ/	[i _ i]
эрэ	/ere/	/r/	[e _ e]	эре	/erʲe/	/rʲ/	[e _ e]
ара	/ara/	/r/	[a _ a]	аря	/arʲa/	/rʲ/	[a _ a]
уру	/uru/	/r/	[u _ u]	урю	/urʲu/	/rʲ/	[u _ u]
илы	/ilɨ/	/l/	[i _ ɨ]	или	/ilʲi/	/lʲ/	[i _ i]
элэ	/ele/	/l/	[e _ e]	эле	/elʲe/	/lʲ/	[e _ e]
ала	/ala/	/l/	[a _ a]	алья	/alʲa/	/lʲ/	[a _ a]
улу	/ulu/	/l/	[u _ u]	улю	/ulʲu/	/lʲ/	[u _ u]
иды	/idɨ/	/d/	[i _ ɨ]	иди	/idʲi/	/dʲ/	[i _ i]
эдэ	/ede/	/d/	[e _ e]	эде	/edʲe/	/dʲ/	[e _ e]
ада	/ada/	/d/	[a _ a]	адя	/adʲa/	/dʲ/	[a _ a]
уду	/udu/	/d/	[u _ u]	удю	/udʲu/	/dʲ/	[u _ u]

TABLE D.1: Russian elicitation items – intervocalic environments.