Appendix I

List of stimuli used in the switching in production word naming experiment. English words were taken from the MRC Psycholinguistic Database (Coltheart, 1981) using the indices of word frequency (Kucera & Francis, 1967) and concreteness (Coltheart, 1981); Italian words were taken from the *Corpus e Lessico di Frequenza dell'Italiano Scritto* - CoLFIS **(**Laudanna, Thornton, Brown, Burani, & Marconi, 1995). Words were split in two groups of 15 by their class, i.e., singles, cognates and homographs, and used as a switch and non-switch according to the presentation order. Words were balanced by their length, frequency and concreteness within each language (t-tests always non-significant: $p>.05$). n/a = no rating in database.

ITALIAN SINGLES								
No.	Words	Length	Frequency	Concr.	Words	Length	Frequency	Concr.
1	BENE	4	500	297	MONDO	5	500	532
2	MORTE	5	500	365	BAMBINO	7	500	589
3	BURRO	5	91	500	CUCINA	6	271	n/a
4	GIOVANE	7	500	n/a	TERRA	5	500	580
5	SANGUE	6	473	613	DOMANDA	7	500	387
6	AZIENDA	7	500	389	CANZONE	7	330	514
7	SALIRE	6	500	355	SORELLA	7	332	575
8	VENDERE	7	482	342	MELA	4	66	620
9	EBETE	5	1	354	REMO	4	15	n/a
10	FICO	4	16	n/a	RENE	4	24	n/a
11	SPOSA	5	91	n/a	TELA	4	97	n/a
12	AMO	3	24	500	BUCA	4	27	485
13	FOSSA	5	29	500	ALGA	4	25	593
14	TAPPO	5	22	608	EREMO	5	7	367
15	RUPE	4	9	500	ORMA	4	25	464
	Median	5	91	445		5	97	532

ENGLISH SINGLES							
Words	Length	Frequency	Concr.	Words	Length	Frequency	Concr.
TIME	4	500	343	BECAUSE	7	500	196
BECAME	6	246	273	SAME	4	500	248
CABBAGE	7	4	611	CLOVE	5	1	565
COMRADE	7	4	497	BRIBE	5	1	367
DESPISE	6	7	314	ACHE	5	4	433
RESTORE	7	9	275	TASTE	5	59	464
SLICE	5	13	433	ELSE	4	176	222
LOSE	4	58	299	SURFACE	7	200	447
MOUSE	5	10	624	ENGINE	6	50	586
FAILURE	7	89	282	OUTCOME	7	26	318
SMILE	5	58	514	FIRE	4	187	595
GIVE	4	391	326	FIVE	4	286	365
SEA	3	95	596	RULE	4	73	286
FRAME	5	74	562	SORE	4	10	502
GAME	4	123	477	NINE	4	81	452
Median	5	58	433		5	73	433

ITALIAN COGNATES							
Words	Length	Frequency	Concr.	Words	Length	Frequency	Concr.
ME	2	500	511	IDEA	4	500	259
CINEMA	6	500	n/a	HOTEL	5	61	591
MINE	4	5	452	ZOO	3	31	583
DOSE	4	133	n/a	FINALE	6	294	n/a
SOFA	4	11	629	VETO	4	36	326
VILE	4	18	379	COSTUME	7	179	544
SCENARIO	8	93	n/a	ORCHESTRA	9	168	578
MEDICINE	8	57	192	RARE	4	199	327
FORMULA	7	149	n/a	VOLUME	6	199	418
MISSILE	7	70	597	PAUSE	5	109	306
SCENE	5	500	408	ACETONE	7	2	n/a
NOTE	4	2	525	ROSE	4	2	608
BASE	4	372	441	AREA	4	483	384
SANE	4	122	290	CURE	4	2	325
ZONE	4	3	392	AUDIO	5	4	n/a
Median	4	93	441		5	109	401

ENGLISH COGNATES							
Words	Length	Frequency	Concr.	Words	Length	Frequency	Concr.
ME	2	500	511	ZOO	3	9	583
AREA	4	323	384	SOFA	4	6	629
RARE	4	4	327	ZONE	4	11	392
NOTE	4	127	525	SANE	4	8	290
AUDIO	5	2	n/a	SCENE	5	106	408
PAUSE	5	21	306	VOLUME	6	135	418
FINALE	6	6	n/a	HOTEL	5	126	591
COSTUME	7	10	544	FORMULA	7	59	n/a
VILE	4	5	379	ORCHESTRA	9	60	578
MEDICINE	8	30	517	CURE	4	28	325
MINE	4	59	452	BASE	4	91	441
IDEA	4	195	259	ROSE	4	86	608
MISSILE	7	48	597	VETO	4	10	326
CINEMA	6	3	n/a	DOSE	4	11	n/a
SCENARIO	8	1	n/a	ACETONE	7	4	n/a
Median	5	21	452		4	28	429

Appendix II

A model of language switching in bilingual production needs to specify control structures to activate or inhibit L1 and L2 output lexicons. An asymmetry of the costs of switching between languages, with greater costs to switch into L1 than L2, can be simulated by building an asymmetry into assumptions about control dynamics, rather than as an emergent effect of differential experience with the two languages. We did not pursue this option in our modelling, because we would get out of the model only what we put into it, and implementation would add no explanatory power. However, for completeness, in this appendix we give an example of the type of asymmetric assumptions about control dynamics that would be sufficient to produce asymmetric switch costs. We assume that (1) L1 production can take place in the absence of supporting activation from control structures (i.e., it is automatic); (2) L2 production must be supported by activation from control structures; (3) L1 production requires inhibition from control structures in order not to function; (4) conversely, L2 production does not require inhibition from control structures in order not to function; (5) a switch into L1 primarily involves turning inhibition from control structures off; (6) a switch into L2 primarily involves turning activation from controls structures on. Let us now assume that the size of the switch cost is determined primarily by the status of the NEW language that is being switched into (rather than the previous language). Note, this is likely to be implementation dependent, and will not be true of all model implementations. In other implementations, continuing competition effects from the previous language may contribute to the cost. Given these assumptions, the switch cost asymmetry will arise if we simply assume that turning inhibition off takes longer than turning activation on. In this case, the switch cost asymmetry would arise from an asymmetry in the time course of excitatory versus inhibitory processes.

Appendix III

English and Italian words used as training sets in the computational modelling. Per the empirical data, words were split into Cognates, Homographs, and Singles. Unlike the empirical data, Singles were additionally split by whether they had language-specific orthography or not. For example, as the Italian alphabet does not include the letters K, W, Y, X, and J, all the words containing these letters were specific to English language). Half of the words were encoded as high frequency and half as low frequency for the purposes of the simulations, but this distinction was arbitrary with respect to the actual frequencies of the words in the native languages.

Non-specific Singles Low frequency	
English	Italian
GRACE	AMO
FIVE	BAGNO
GAME	BARCA
NINE	BELLE
RULE	CIBO
TIME	COSA
BRIBE	DIRE
CLOVE	DITO
FRAME	FIORI
MOUSE	FRANA
SLICE	FUMO
SMILE	GRANO
RAIN	MANO
SPICE	MELA
MAIN	MOSCA

Language-specific Singles Low frequency	
English	Italian
BREAK	CACIO
COCK	CAIO
CRACK	CIECO
JAB	CIELO
JADE	CIRIO
JIB	CIUCO
JIVE	CIURMA
JUG	CUFFIE
KETCH	DISCO
KILL	GATTO
KRISS	GIAFFA
MATCH	GIURIA
MAX	GRUPPI
MOCK	MUFFA
PACK	OCCHIO

Non-specific Singles High frequency	
English	Italian

Language-specific Singles High frequency	
English	Italian

BAND	PELLE
BLAZE	PENNA
CUP	PEPE
FIRE	PERA
GAIN	PESI
HATE	PIEDE
HOUR	POLLO
MOON	RAMO
MUG	RANA
PART	SEDIA
PLAIN	SETE
RACE	VELO
SAIL	VENA
SOUND	VERDE
TRACE	VITA

SIX	PACCO
TWICE	PAZZO
TWIN	PIZZO
WAG	PREZZO
WAGE	QUANDO
WASTE	QUINTO
WEEK	RAFFA
WHALE	RAZZO
WHAT	SCACCO
WHILE	SFONDI
YACHT	SOQQUA
YALE	SOZZO
YAWN	TACCO
YIELD	TAFFA
YUCK	TRAFFO

English / Italian Cognates	
Low Frequency	High Frequency
BASE	NOTE
CARE	PALE
CURE	PIPE
DIVA	RADE
DOSE	RARE
DUNE	ROSE
FARE	SCENE
GUIDE	SODA
HOTEL	SOFA
LAMA	TOGA
LIDO	VETO
LIME	VICE
MARE	VILE
MINE	VIVA
NOSE	ZOOM

English / Italian Homographs	
Low Frequency	High Frequency
CANE	MITE
CORE	MOLE
CASE	MORE
CHINA	PACE
COME	PAME
CUTE	PANE
DARE	PILE
DATA	RAPE
DOVE	RATE
FAME	RIPE
FATE	RUDE
FILE	SALE
FRESCO	SCALE
MALE	SCOPE
MILE	SOLE

Appendix IV

Phonological representations

The 28-bit distributed phonological code extended the 19-bit articulatory code for English phonemes of Thomas & Karmiloff-Smith (2003) to accommodate Italian phonology (as described in Rogers & D'Arcangeli, 2004).

CONSONANT/VOWEL	OBSTRUENT/SONORANT	SYLLABIC	CONTINUANT	STOP (PLOSIVE)	VOICED/UNVOICED	LABIAL	INTERDENTAL	ANTERIOR	ALVEOLAR	POST ALVEOLAR	+' CORONAL	BACK (VELAR)	GLOTTAL	AFFRICATE	FRICATIVE	NASAL	LATERAL	HIGH	MID	LOW	ROUNDED	TENSE/LAX	DIPTHONG	TRILL (ITA)	LIQUID	APPROXIMANT	CENTRAL	IPA	ENGLISH	ITALIAN
1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	/p/'	spill	pane
1	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	'/b/'	bill	bare
1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	'/m/'	mill	male
1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	'/f/'	feel	fare
1	0	0	1	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	'/v/'	veal	avare
1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	'/8/'	thigh	n/a
1	0	0	1	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	'/5/'	thy	n/a
1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	'/sh/'	shop	sciali
1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	'/3/'	measure	n/a
1	0	0	0	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	'/t/'	still	tale
1	0	0	0	1	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	'/d/'	dill	dare
1	1	0	0	0	1	0	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	'/n/'	nil	nome
1	0	0	1	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	'/s/'	seal	sali
1	0	0	1	0	1	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	'/z/'	zeal	osare
1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	'/ch/'	church	cialda
1	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	'/d3/'	June	n/a
1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	'/k/'	skill	care
1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	'/g/'	gill	gare
1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	/n/'	ring	n/a
1	1	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	'/h/'	high	n/a
1	1	0	1	0	1	0	0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	'/l/'	leaf	larghe
1	1	0	1	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	'/r/'	reef	n/a
1	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	'/j/'	you	ione
1	1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	'/w/'	witch	uomo
1	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	/gn/	n/a	gnomo
1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	/ts/'	n/a	pazza
1	0	0	0	0	1	0	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	/dz/'	n/a	gazza
1	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	/dg/'	n/a	giallo
1	1	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	/Y/'	n/a	gliene
1	1	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	/R/	n/a	rare
0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	'/i/'	beet	bile
0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	'/e/'	bait	bere
0	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	'/u/'	boot	buio
0	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	'/o/'	boat	borgo
0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	'/ae/'	bat	n/a
0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	'/^/'	but	n/a
0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	'/aj/'	bite	n/a
0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	'/oi/'	boy	n/a
0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	'/I/'	bit	n/a
0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	/E/'	bet	bene
0	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	'/U/'	foot	n/a
0	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	'/O/'	bought	boia
0	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	'/au/'	bout	n/a
0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	'/o-/'	dog	n/a
0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	'/a:/'	bath	n/a
0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	'/u8/'	tour	n/a
0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	'/E8/'	hair	n/a
0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	'/&/'	about	n/a
0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	/a/'	n/a	bara