Data columns and values

Subject: Numerical code for subject, total of 20 S's included

Diph_num: Numerical code for the diphone

Diph_name: two-character string making up the diphone (transcription system below)

Sylltype: consonant-vowel structure of the diphone (CC, CV, VC, VV)

SoundFile: Filename of stimulus presented

Prec_Context: Preceding context presented on the screen, if any, in transcription system presented to the subjects (see below)

gate: Number of gate, 1-6

four_gate: Binary variable coding whether 4 gates or 6 were presented for this diphone (0=six-gate-diphone, 1=four-gate-diphone)

seg1_stress: Categorical variable coding stress of first segment of diphone (0=unstressed vowel, 1=stressed vowel, 2=consonant)

seg2_stress: Categorical variable coding stress of second segment of diphone, same values as seg1_stress

CorrAns1:   Identity of first segment of diphone, in transcription system presented to subjects (=correct answer to first segment)

CorrAns2:   Same for second segment of diphone

Resp1:   Response given by subject to first segment of diphone, in transcription system presented to subjects

Resp2:   Same for second segment of diphone

Seg1Accur: Binary variable coding accuracy of subject's response for first segment of the diphone (0=incorrect, 1=correct)*

Seg2Acc: Same for second segment of the diphone

Prec_context_binary: Binary variable coding absence (0)/presence (1) of preceding context that is not part of the diphone

wrong_preccontext: the preceding context that was actually displayed on the screen for the very few cases where the wrong preceding context was presented because of experimental error (See methods notes)

replacedSeg1Data: Subjects' actual response to the first segment for the very few stimuli where data had to be replaced because of

experimental error. (See methods notes.) Data in this column should not be used for typical analyses.

replacedSeg2Data: Same for second segment

* For a few segments, the symbol giving the identity of the segment (CorrAns1 or CorrAns2 columns) is not the (only) response counted as accurate. For example, subjects could not be asked to identify sounds as a flap, since naïve listeners are not aware of "flap" as a sound category. Therefore, both "t" and "d" were counted as accurate responses for flap. Subjects were also not asked to identify syllabic as opposed to non-syllabic /l/, so the response "l" was counted as accurate for both. Similarly, we did not ask listeners to distinguish in their responses between (unstressed) schwa and (stressed) [ʌ], so "uh" was counted as the accurate response to both "x" (schwa) and "uh" ([ʌ]). In the same way, subjects were not asked to distinguish stressed from unstressed rhotic vowels, so "er" was counted as the accurate response to both "R" (stressed) and "X" (unstressed). The use of separate symbols to identify the stressed and unstressed stimulus vowels in these two cases stems from the presence of separate symbols for them in the electronic dictionary used to generate the diphone list. All of these mappings are included in Table I below.

Transcription system conversions

Because the transcription systems used in electronic dictionaries are not readily learnable as response categories for experiment subjects, and do not match standard IPA usage, several transcription systems are relevant. Table I shows the mapping between the symbols used in the columns Diph_name and SoundFile, those used in the columns CorrAns1 and CorrAns2, and those presented as response options for the subjects. IPA conversion is also given for clarity.

IPA	Diph_name, SoundFile	CorrAns1, CorrAns2	Response counted as accurate
æ	@	ae	ae
a	a	ah	ah
eʲ	e	ay	ay
aʲ	Y	aye	aye
b	b	b	b
tʃ	C	ch	ch
d	d	d	d
ð	D	dh	dh
i	i	ee	ee
ɛ	E	eh	eh

ɚ	R, X	er, X	er
f	f	f	f
ɾ	F	F	t, d
g	g	g	g
h	h	h	h
ɪ	I	ih	ih
ʤ	j	j	j
k	k	k	k
l	l	l	l
m	m	m	m
n	n	n	n
ŋ	G	ng	ng
oʷ	o	oh	oh
u	u	oo	oo
aʷ	W	ow	ow
oʲ	O	oy	oy
p	p	p	p
ɹ	r	r	r
s	s	s	s
ʃ	S	sh	sh
t	t	t	t
θ	T	th	th
ʌ/ə	ˆ, x	uh, x	uh
ʊ	U	uu	uu
v	v	v	v
w	w	w	w
j	y	y	y
z	z	z	z
ʒ	Z	zh	zh
l̩	L	L	l

Table I. Transcription conversions between IPA and the columns of the raw data file.

<u>Notes on exceptions to the general dataset</u>

In an experiment of this size and duration, some minor exceptions to the overall methods may occur. Notes on these cases are provided here for full replicability, however, because of the quantity of data, there is no reason to think any of these points would affect the results.

Missing or mistaken stimuli, with data replaced

For approximately 0.2% of the data, there were errors in experimental setup that created a need to replace data with the best matched substitution available in the dataset. The original responses in these cases are documented in the columns replacedSeg1Data and replacedSeg2Data. Where the error involved the preceding context, the incorrect preceding context that was presented is documented in the column wrong_preccontext. By providing well-matched replacement data for this very small proportion of the dataset, the dataset retains its usefulness for modeling perception of any sound sequence of English.

- Subjects occasionally clicked twice in the left half, twice in the right half, or first in the right and then the left half. In all cases, their first click was taken as their Segment 1 response and second click as their Segment 2 response. Examination of practice results verified that no subjects who finished the experiment systematically made such errors.

- During data analysis, it was determined that Gate 6 of two diphones was presented to two listeners with an incorrect preceding context or without the preceding context. These two listeners' responses at Gate 5 of the diphone were substituted. An additional 3 diphones had one gate each presented with preceding context on the screen that was not present in the stimulus, to 1-2 listeners, but responses show the listeners were able to ignore the excess preceding context. These errors in the program were fixed before other subjects participated.

- One diphone (/bə/) for Gates 1 and 5 was presented to all listeners without its preceding context written, so that listeners interpreted the preceding context as Segment 1. For Gate 1, responses from /ba/ (unstressed) were substituted, since at Gate 1 no information about a following /a/ vs. /ə/ is likely to be available. For Gate 5, second segment responses were used as first segment responses, as examination of results verified that listeners had simply interpreted the preceding context as Segment 1. For the second segment, responses were replaced with those from the /də/ diphone.

- During data analysis, it was determined that five diphones, /aʌ, eʲʌ, uʌ, oʷʌ, aʷʌ/ intended to have unstressed-stressed pattern, had been mistakenly recorded with a different stress pattern. The responses (all gates) were replaced with listeners' responses to the corresponding vowel-ə (unstressed-unstressed) diphone for Segment 1, and with the vowel-ʌ (stressed-stressed) responses for Segment 2.

Choice of stimuli

- We attempted to err on the side of including marginally possible diphones, rather than excluding them. æ-vowel diphones were included, as a few marginal words such as /dædæ/ (describing a baby's speech) may allow æ-final syllables.

Procedures for running subjects

- One listener's practice performance could not be evaluated because, due to a computer error, his practice data were not stored. However this subject was one of

the two whose data was later excluded because of poor performance on the full dataset.

- One subject was studying abroad in France when the other subjects were run on the additional 25 stimuli that had initially been omitted. She listened to the additional stimuli on her own computer and responded to them on a typed worksheet, in order to avoid excluding her data.