

Does Language Match Exist?

Language-Specific Aptitude & Phonological
Short-term Memory

Vita V. Kogan

The University of Edinburgh

2016



Does language aptitude exist?

- John Carroll's research in the 60s
 - Modern Language Aptitude Test (Carroll & Sapon, 1959)
 - phonetic coding ability, grammatical sensitivity, rote learning ability & inductive learning ability

Does language aptitude exist?

- John Carroll's research in the 60s
 - Modern Language Aptitude Test (Carroll & Sapon, 1959)
 - phonetic coding ability, grammatical sensitivity, rote learning ability & inductive learning ability
- New take on language aptitude
 - acquisitional stages matter (Skehan, 2002, 2015)
 - dynamic perspective (Robinson, 2001, 2002)
 - general cognition (Hi-LAB; Doughty et al., 2010)

Aptitude for specific languages?

- U.S. Foreign Service Institute's Ranking
 - levels of learning difficulty for a native speaker of English
 - greater learning difficulty requires greater learning aptitude

Levels of learning difficulty

Category I	
Dutch French	Norwegian Spanish
Category II	
German	
Category III	
Hebrew Malay	Swahili Russian
Category IV	
Arabic Cantonese	Japanese Pashto

Greater aptitude required



Aptitude for specific languages?

- U.S. Foreign Service Institute's Ranking
 - levels of learning difficulty for a native speaker of English
 - greater learning difficulty requires greater learning aptitude
- MacWhinney's "language reversals" (1995)
 - psycholinguistic study of individual differences + contrastive linguistic analyses

Language reversals

Category I

Dutch
French

Norwegian
Spanish



Category II

German

Category III

Hebrew
Malay

Swahili
Russian





Category IV

Arabic
Cantonese

Japanese
Pashto

But most commonly we see this

Category I		
Dutch French	Norwegian Spanish	
Category II		
German		
Category III		
Hebrew Malay	Swahili Russian	
		
Category IV		
Arabic Cantonese	Japanese Pashto	

Language diversity

- Evans and Levinson (2009)

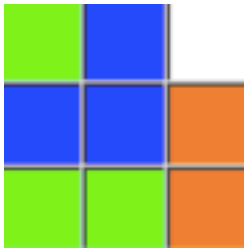
“Talk of linguistic universals has given cognitive scientists the impression that languages are all built to a common pattern. In fact, there are vanishingly few universals of language in the direct sense that all languages exhibit them. Instead, diversity can be found at almost every level of linguistic organization.”

Language diversity

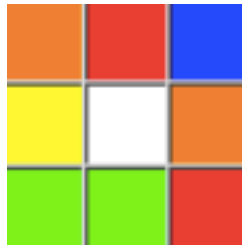
- The World Atlas of Language Structures
- 192 language features, each one absent or existing in a language to a certain degree
 - consonant-vowel ratio, indefinite articles...

Language diversity

- 192 language features, each one absent or existing in a language to a certain degree
 - consonant-vowel ratio, indefinite articles...



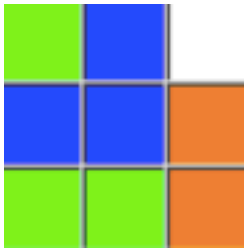
Language A



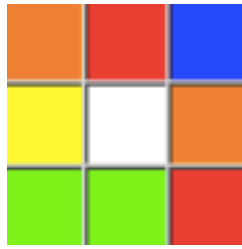
Language B

Language diversity

- 192 language features, each one absent or existing in a language to a certain degree
 - consonant-vowel ratio, indefinite articles...



Language A



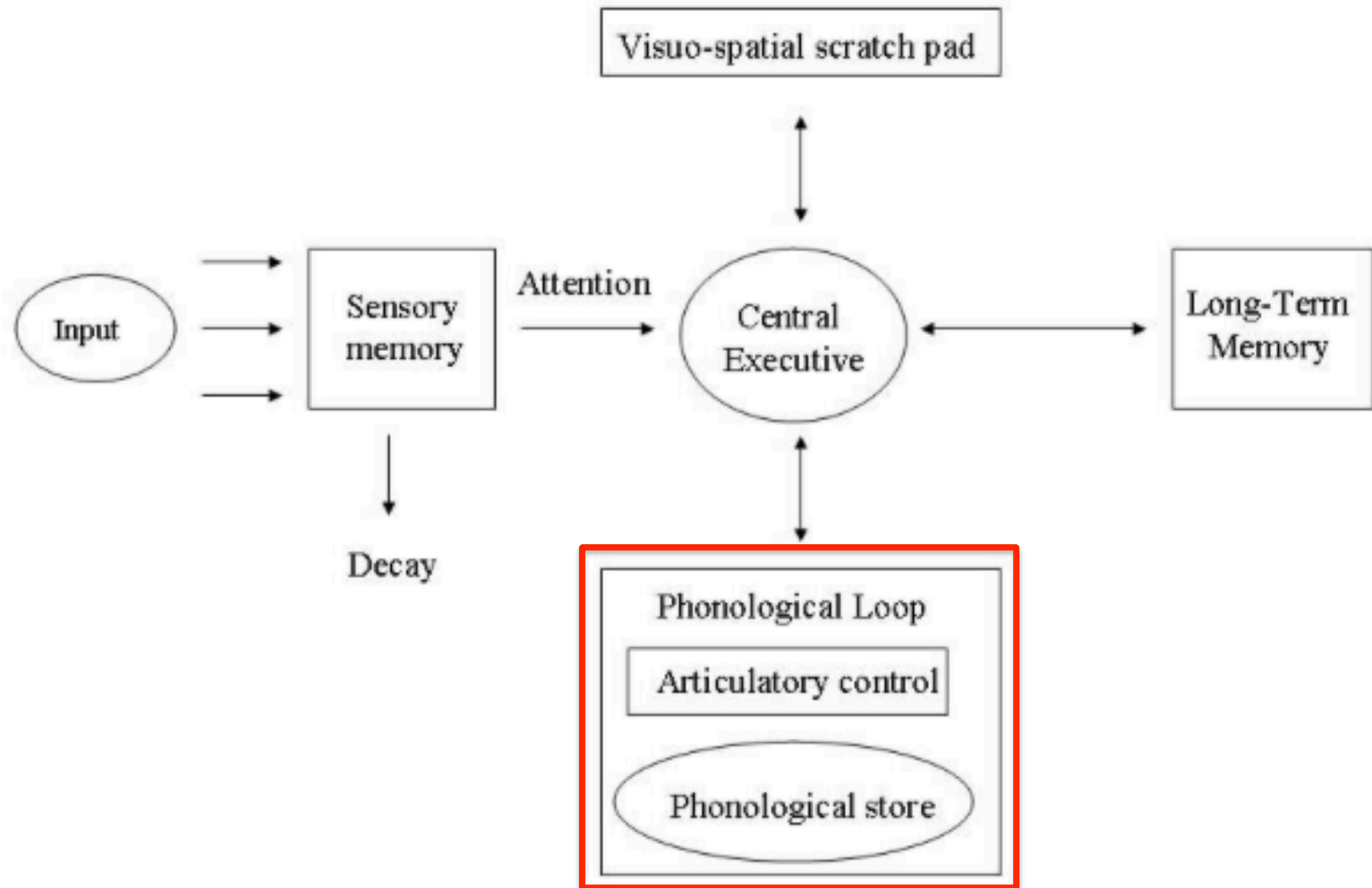
Language B



Phonological level of aptitude

- Phonological short-term memory
 - subset of working memory (Baddeley & Hitch, 1974)
 - processes verbal information (Baddeley, 1986)
 - plays a central role with L1 and L2 acquisition (Baddeley, 2003; Kormos & Sáfár, 2008a)

Working memory components (Baddeley, 2000)



Nonword repetition task

Diller
Hampent
Commerine

Diller
Hampent
Commerine



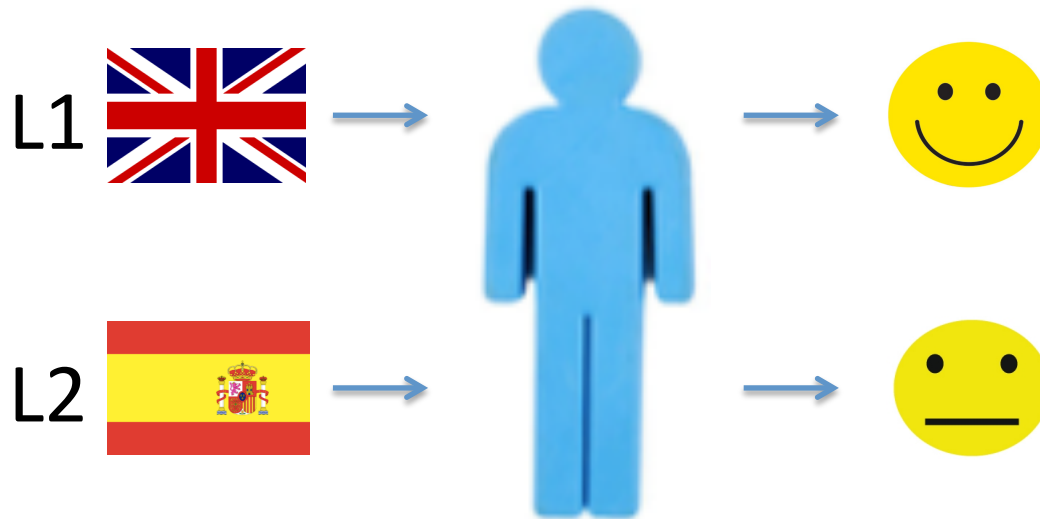
Nonword repetition task

- Language-specificity
 - specific language phonotactics



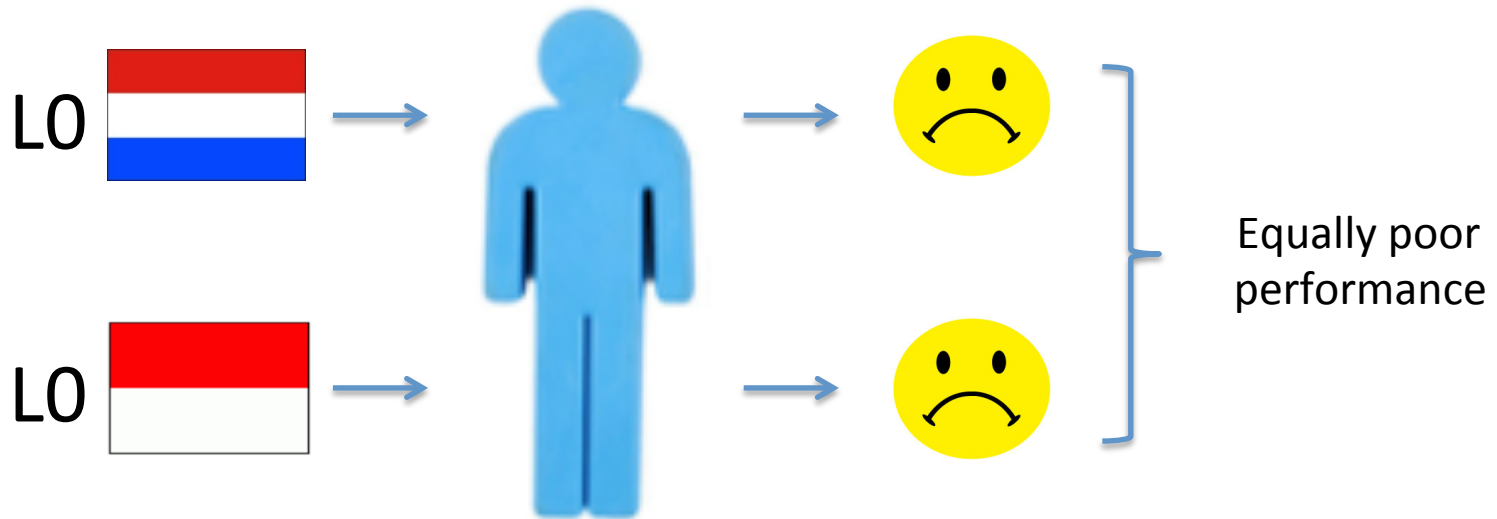
Familiar languages

- “a native language advantage” (Gathercole, 2006)



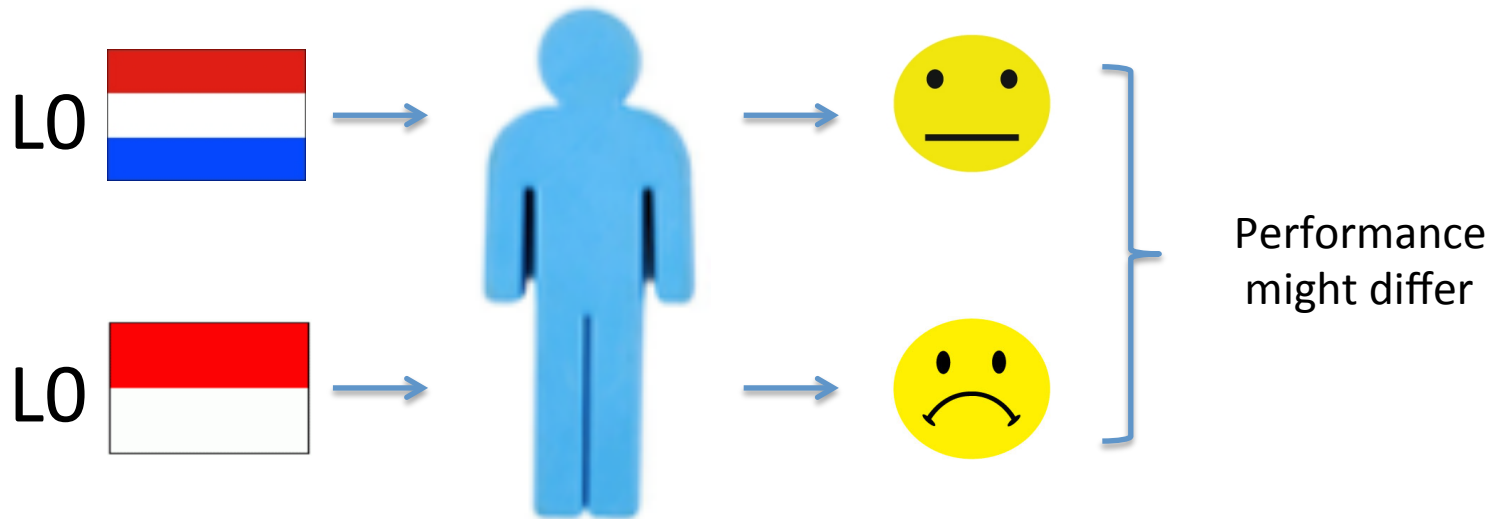
Unfamiliar languages

- General expectation: there is no variation across unfamiliar languages



Unfamiliar languages

- Hypothesis: performance might differ across unfamiliar languages

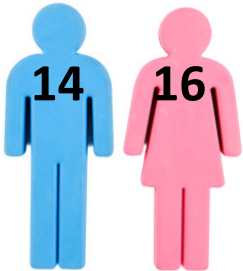


Research questions

- Do people process the phonotactics of one unfamiliar language better than another?
- Does this bias facilitate the vocabulary acquisition in this language?

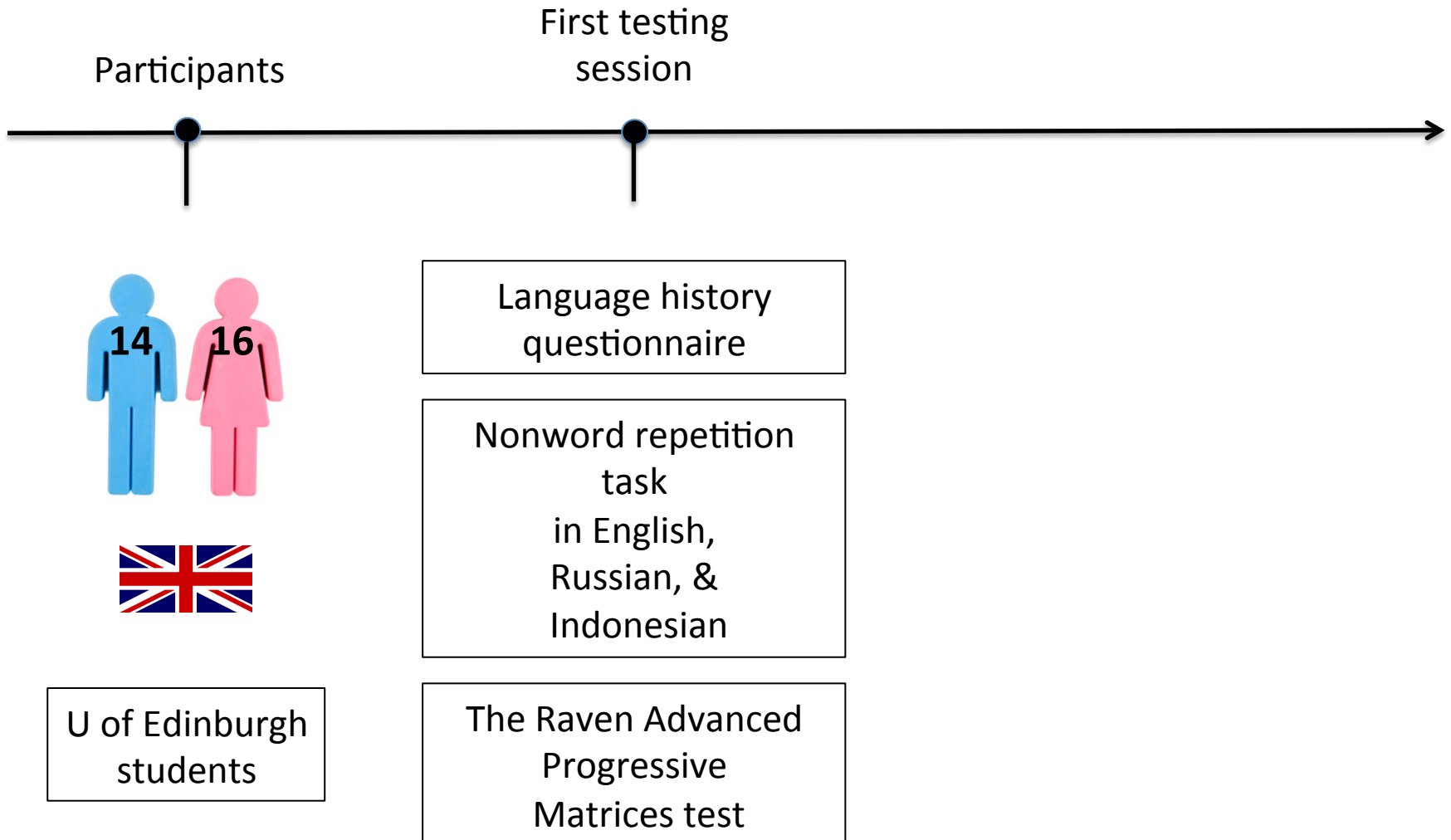
The study

Participants

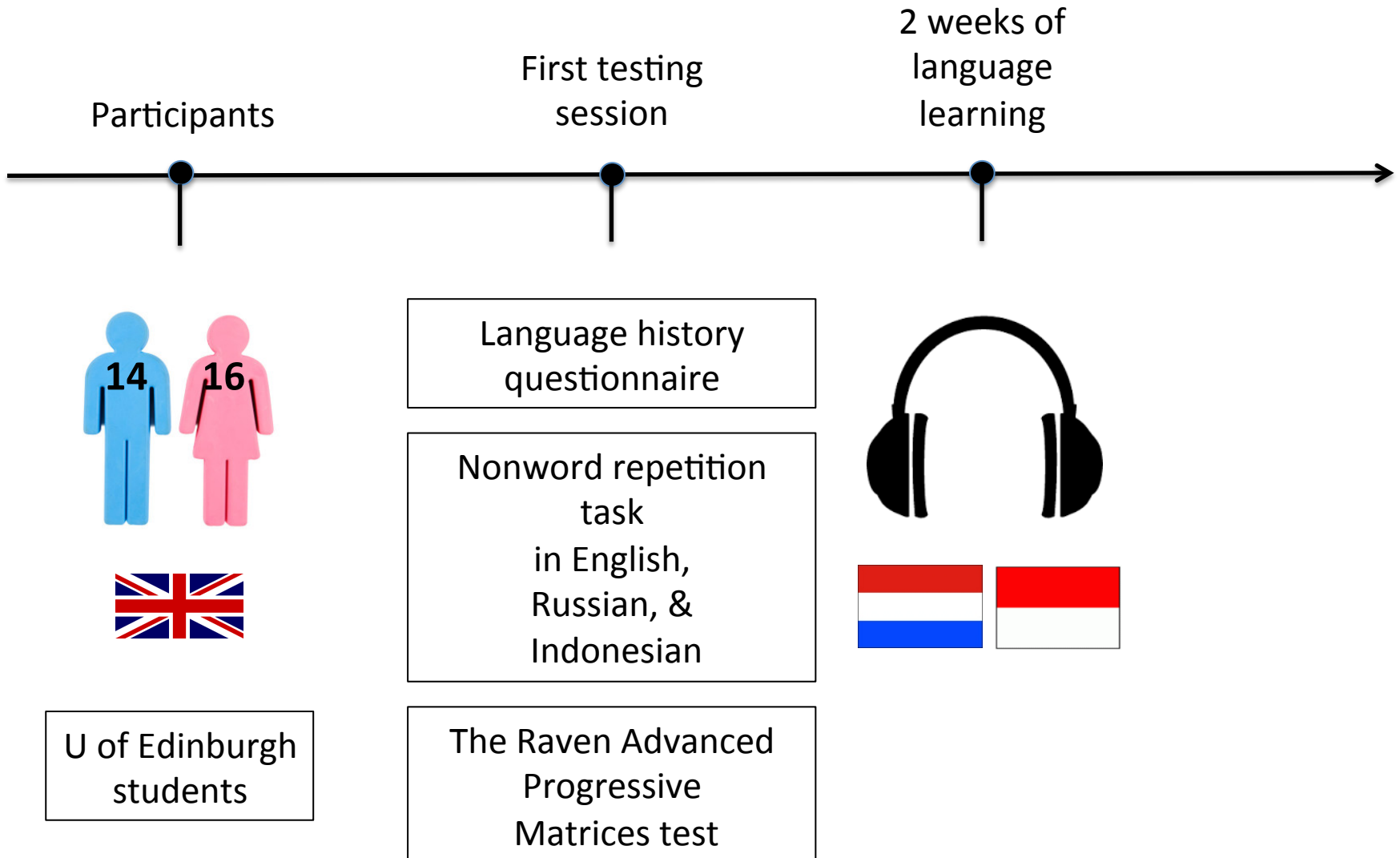


U of Edinburgh
students

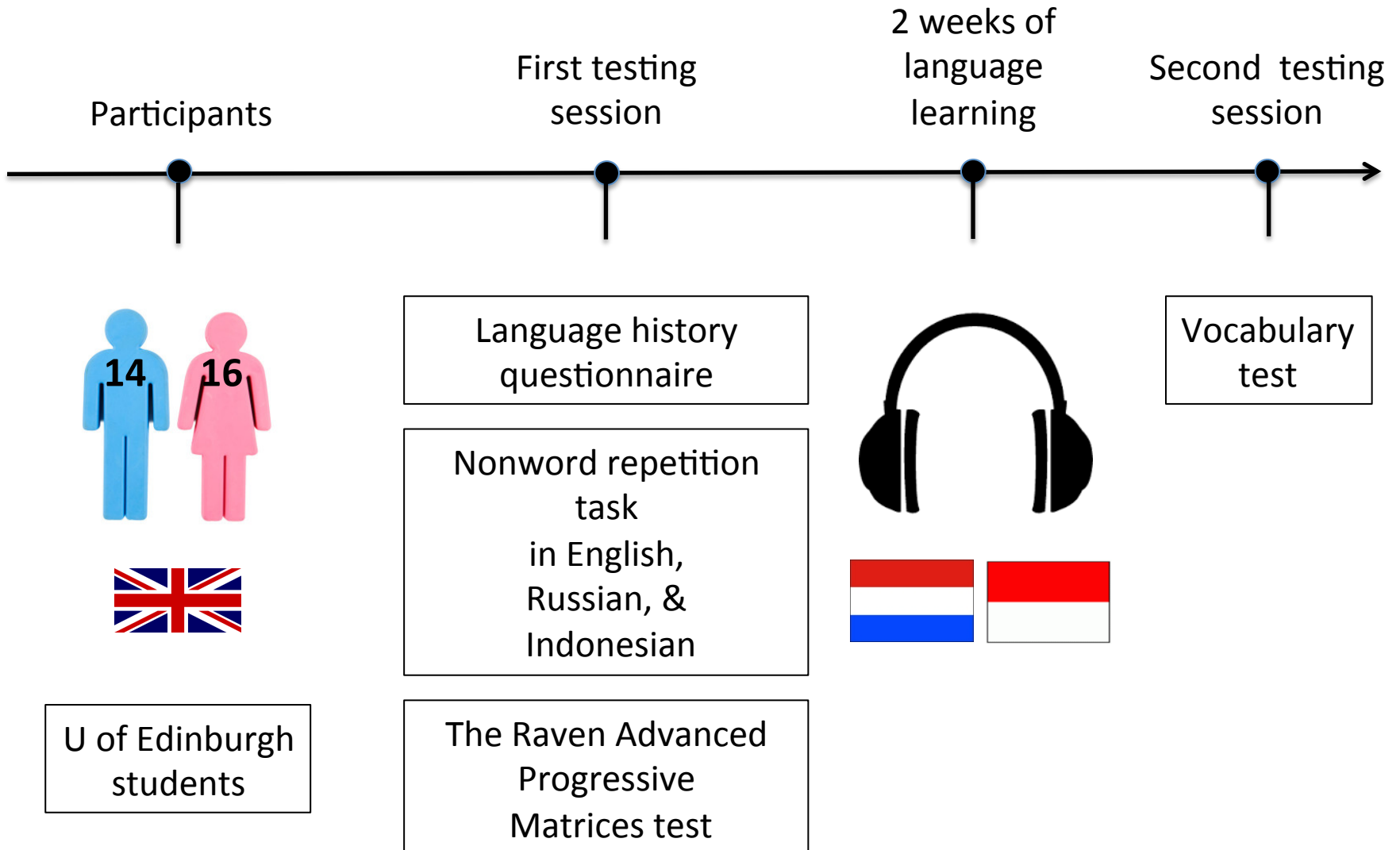
The study



The study



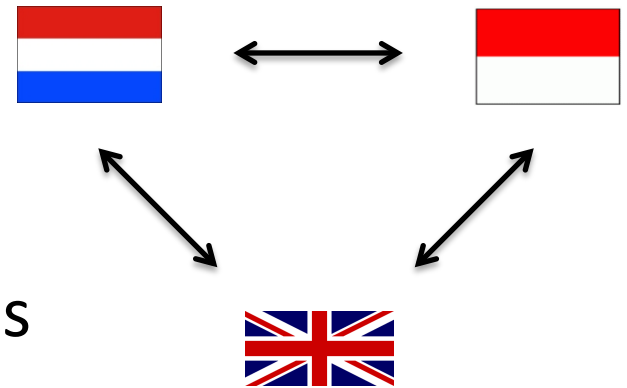
The study



Language choices

1. U.S. Foreign Service Institute's Ranking

- Russian & Indonesian from Level III (learning difficulty)



2. Phonological distance

- Do not share many phonemes
 - Stanford Phonology Archive
 - UCLA Phonological Segment Inventory Database

Results

Do people process the phonotactics of one unfamiliar language better than another?

Descriptive statistics

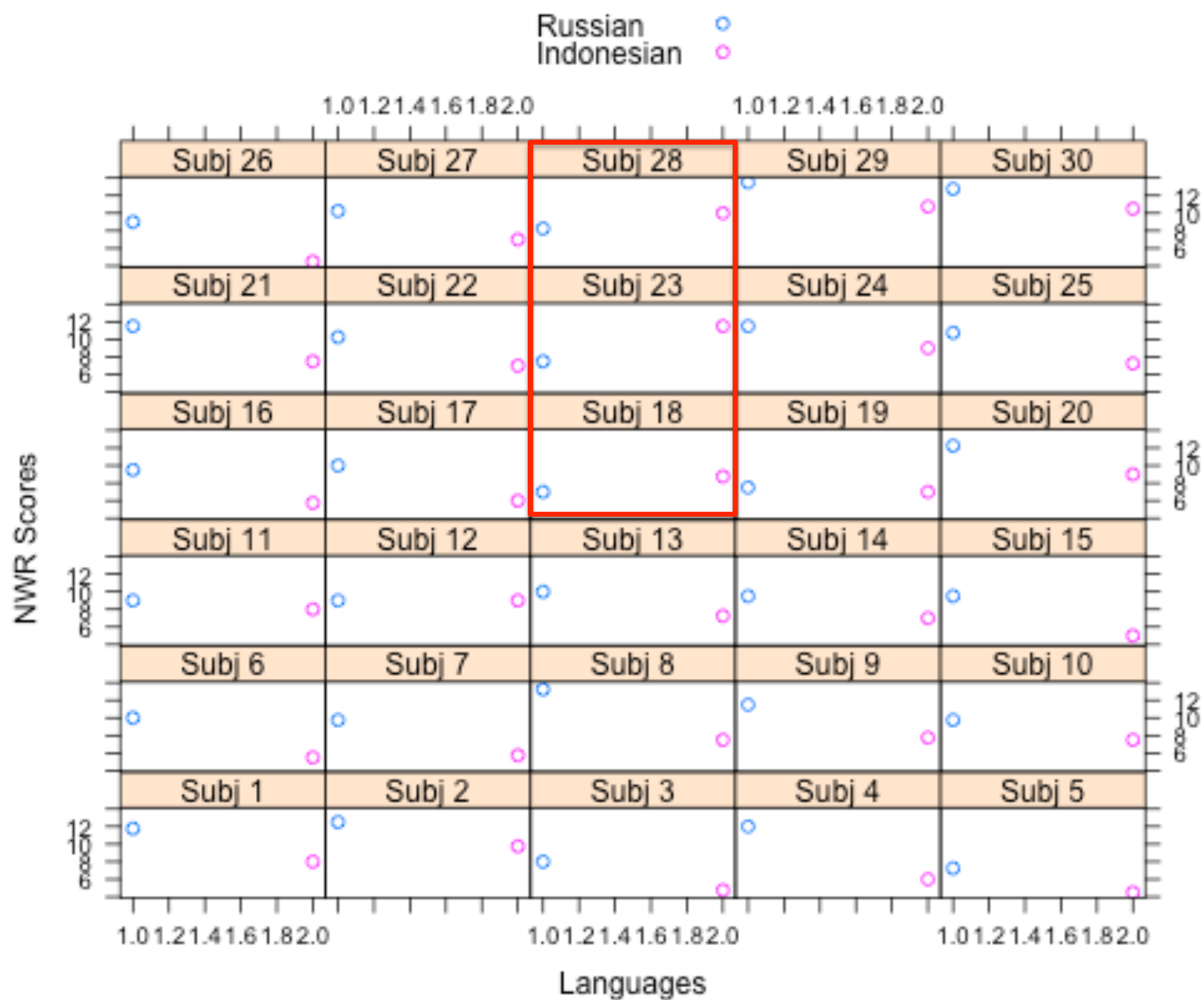
Task	Scoring	N	Min	Max	Mean	Median	SD
Nonword repetition test:	Max = 14	30					
English			8.25	14.00	11.92	12.00	1.33
Russian			7.00	13.50	10.14	10.00	1.82
Indonesian			4.50	11.50	7.49	7.00	1.89
Nonverbal ability	Max = 12	30	7	12	10.60	11.00	1.45
Vocabulary test, all scores	Max = 30	25	17.00	30.00	24.36	25.00	3.71

Paired Student's t-test

- Participants performed better repeating the Russian-sounding nonwords
 - $t(29) = 6.60, p < 0.01$
 - Russian prosodic structure is easier?

Paired Student's t-test

- Participants performed better repeating the Russian-sounding nonwords
 - $t(29) = 6.60, p < 0.01$
 - Russian prosodic structure is easier?
- A few individuals demonstrated a reverse pattern



Results

Does this bias facilitate the vocabulary acquisition in this language?

Correlational analysis

Task	Vocabulary test, all (n = 25)	Vocabulary test, Russian (n = 22)	Vocabulary test, Indonesian (n = 3)
<hr/>			
Nonword repetition task:			
English	0.29	0.19	0.50
Russian	0.45*	0.53**	-1.00**
Indonesian	0.34	0.41	1.00*
<hr/>			
Nonverbal ability (Raven's)	0.34	0.28	1.00**

*p < 0.05, **p < 0.01

Regression analysis

- Russian nonword repetition accounted for 25.7% of the variance in vocabulary learning ($R^2 = 0.257$, $F(2, 19) = 6.929$, $p < .01$).
- Nonverbal ability showed no effect.

Conclusion

- Do people process the phonotactics of one unfamiliar language better than another?
 - Some individuals have preferences for specific phonotactics.

Conclusion

- Does this bias facilitate the vocabulary acquisition in this language?
 - Ability to repeat nonwords that sound like a specific (unfamiliar) foreign language predicts learning outcomes in this language.

Thank you!

VitaVKogan@gmail.com

SampleALanguage@gmail.com