Gendered sound symbolism interacts with gendered morphology in Urdu names

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Acknowledgements

University of Toronto Work Study Program ($)

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Professor Yoonjung Kang (☺)

Gender morphology

Italian: Giorgi**o**♂ / Giorgi**a**♀

Russian: Alexander (Александр) / Alexandr**a**♀ (Александр**а**♀)

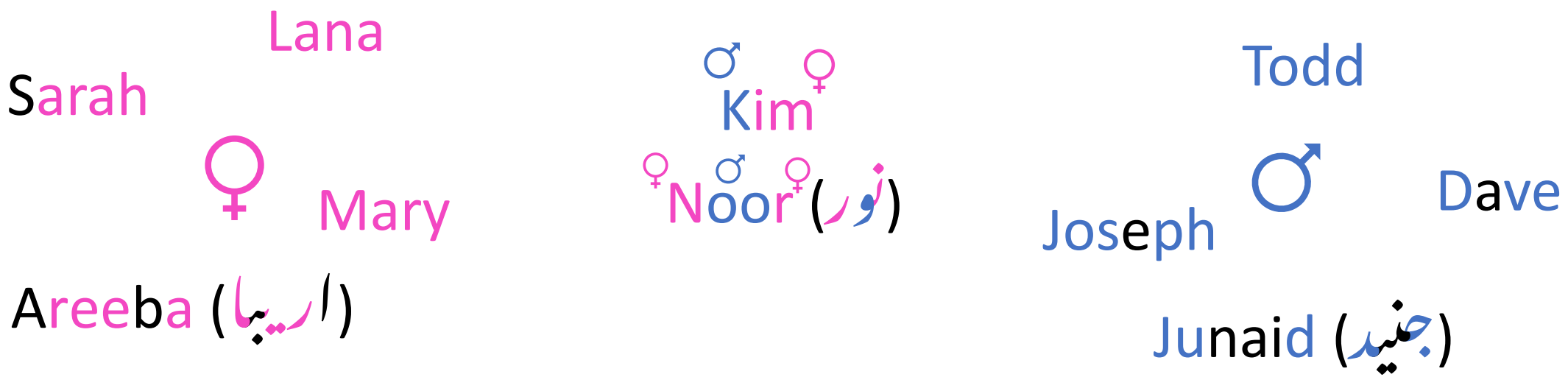
Korean: Tae-shik (태식) / Yoon-jung (윤정)

Urdu:

Muneeb (منیب) / Muneeb**a**♀ (منیبہ♀)

Arslan (ارسلان) / Iman (ایمان)

Gendered sound symbolism



Outline

- Background and motivation
  - Conventional vs synesthetic gendered sound symbolism
  - Previous work
- Our contribution
  - Introducing morphology as an interaction effect
  - Implications and future directions

Outline

- Background and motivation
  - **Conventional vs synesthetic gendered sound symbolism**
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(Saussure 1916)

Arbitrariness of the sign?

Usien via Wikimedia, 2016.
Background removed. CC-BY-SA

(Saussure 1916)

Arbitrariness of the sign?

✅ dog

Usien via Wikimedia, 2016.
Background removed. CC-BY-SA

(Saussure 1916)

Arbitrariness of the sign?

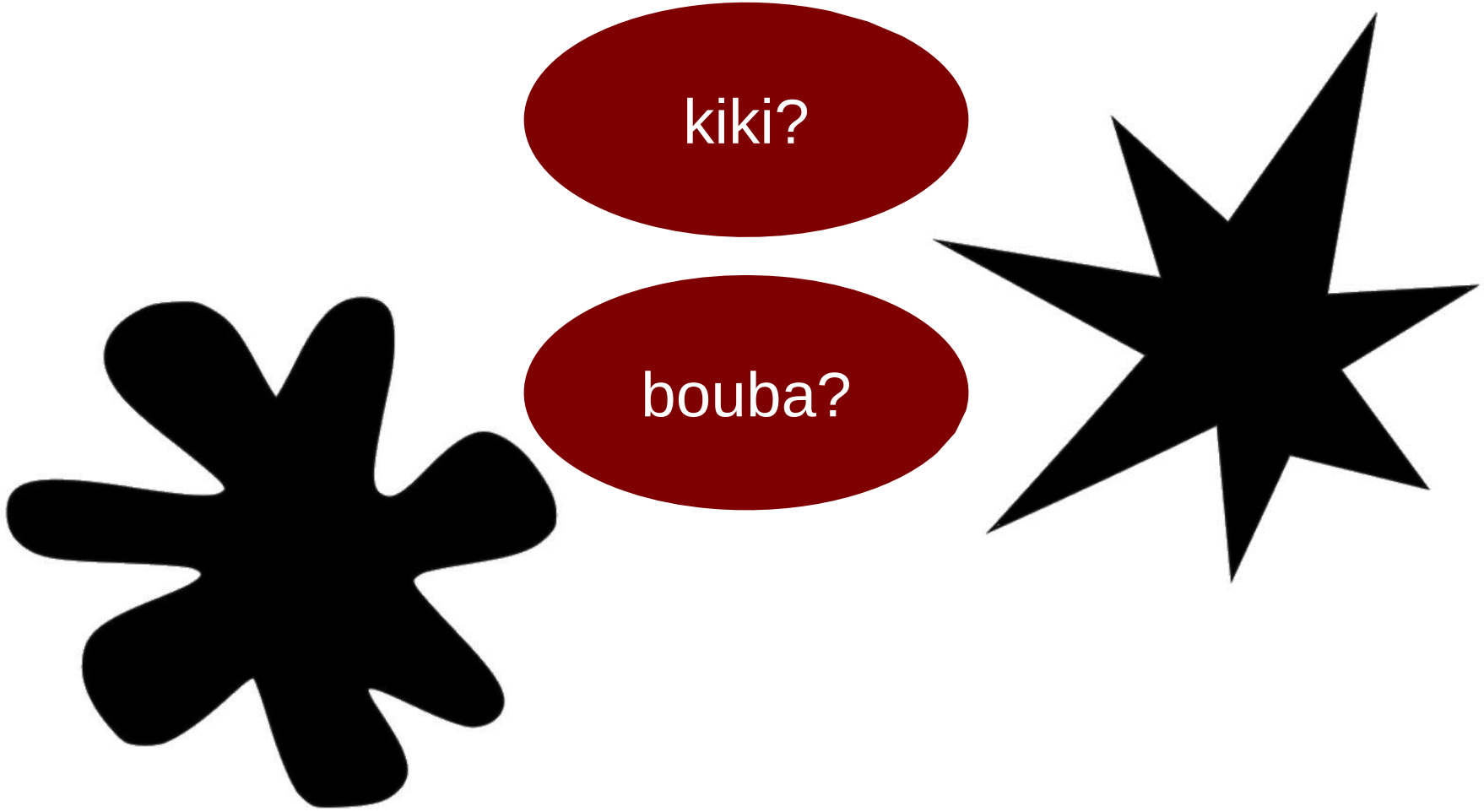
✅ dog

✅ cat

Usien via Wikimedia, 2016.
Background removed. CC-BY-SA

(Köhler 1929; Ramachandran & Hubbard 2001; Ćwiek et al. 2021)

Non-arbitrariness of the sign?

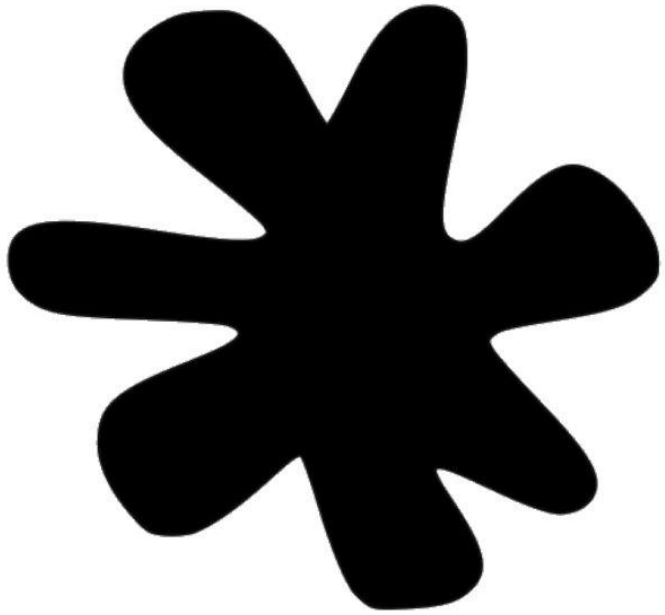


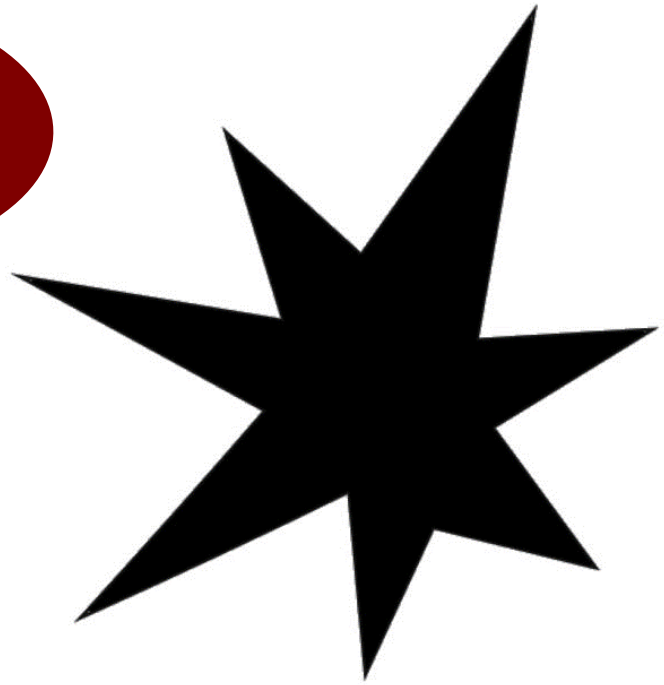
(Köhler 1929; Ramachandran & Hubbard 2001; Ćwiek et al. 2021)

Non-arbitrariness of the sign?

✅ bouba

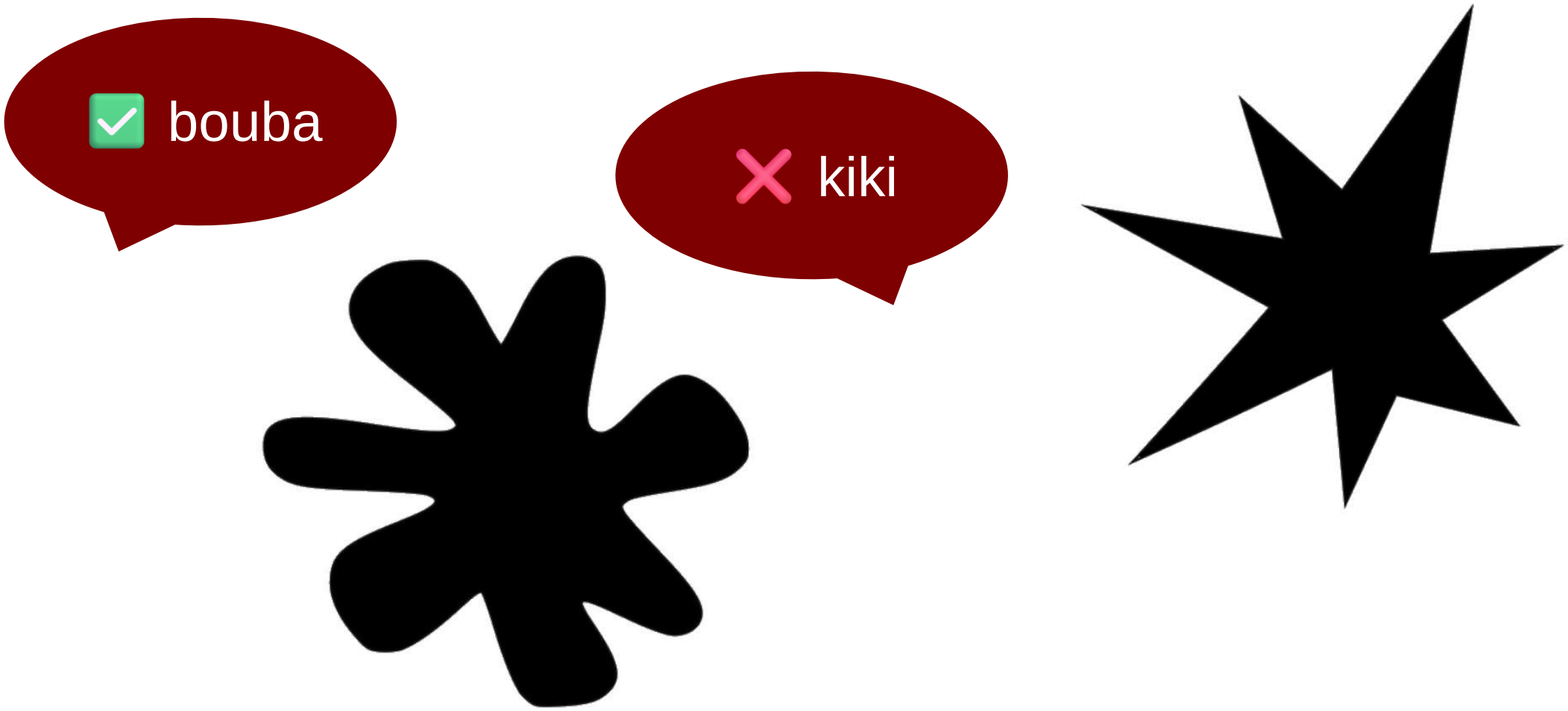
kiki?





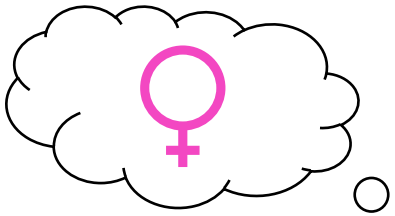
(Köhler 1929; Ramachandran & Hubbard 2001; Ćwiek et al. 2021)

Non-arbitrariness of the sign?



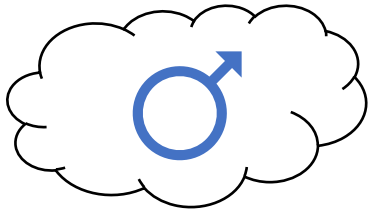
(Kang 2021; Ackermann & Zimmer 2021)

Sound-gender associations



Areeba
/əˈri.bɑː/
اریبا

- sonorants
- longer
- open syllables
- front vowels
- nonfinal stress



Junaid
/d͡ʒʊˈneɖ/
جنید

- obstruents
- shorter
- closed syllables
- back vowels
- final stress

(Ohala 1994; Oelkers 2003)

Synesthetic sound symbolism

♀ r

♀ n

♂ k

♂ d

♀ i

♂ a

Flute: Thea Paraskevaides via Wikimedia, 2010. CC-BY-SA

Rock: Harouy Jean-Michel via Wikimedia, 2019. Background removed. CC-BY-SA

(see Nübling 2009, Ackermann & Zimmer 2021)

Conventional sound symbolism

♂ **Muneeb** /mʊˈniːb/ منیب

\+

♀ **-a** /-ɑː/ ـہ

⟹

♀ **Muneeba** /mʊˈniː.bɑː/ منیبہ

Outline

- Background and motivation
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  - **Previous work**
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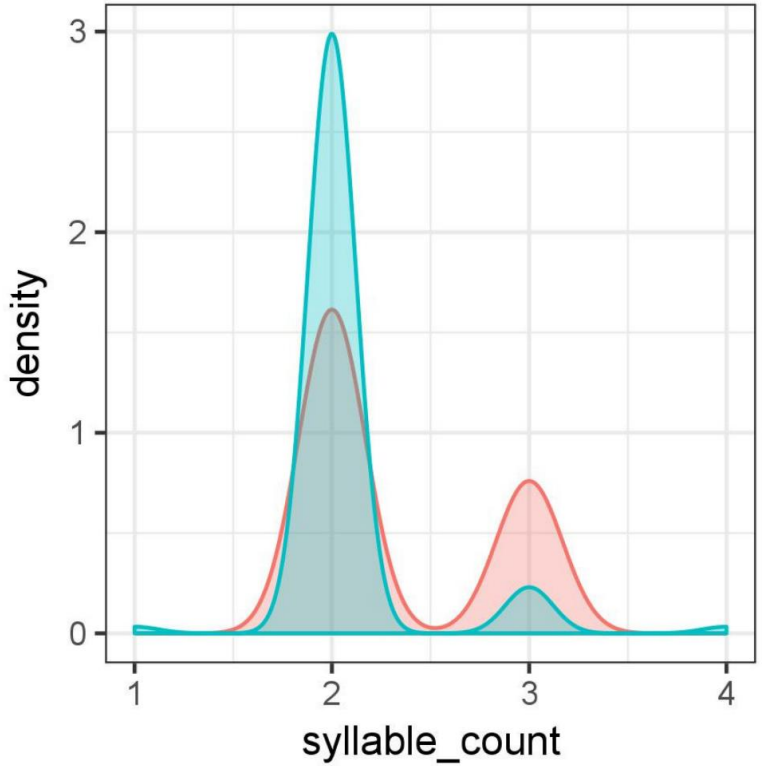
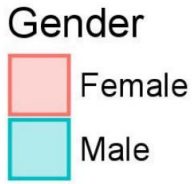
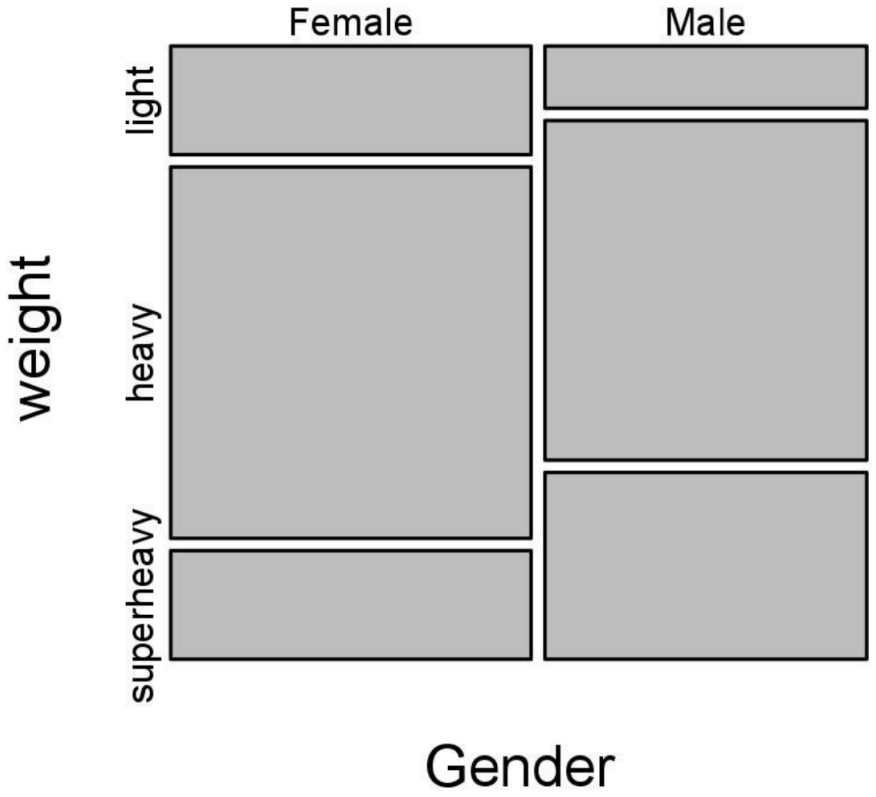
  - Implications and future directions

(Mohsin & Kang 2018)

Previous research on Urdu names







$p < 0.001$ (highly significant)

Avoiding confounds from morphology

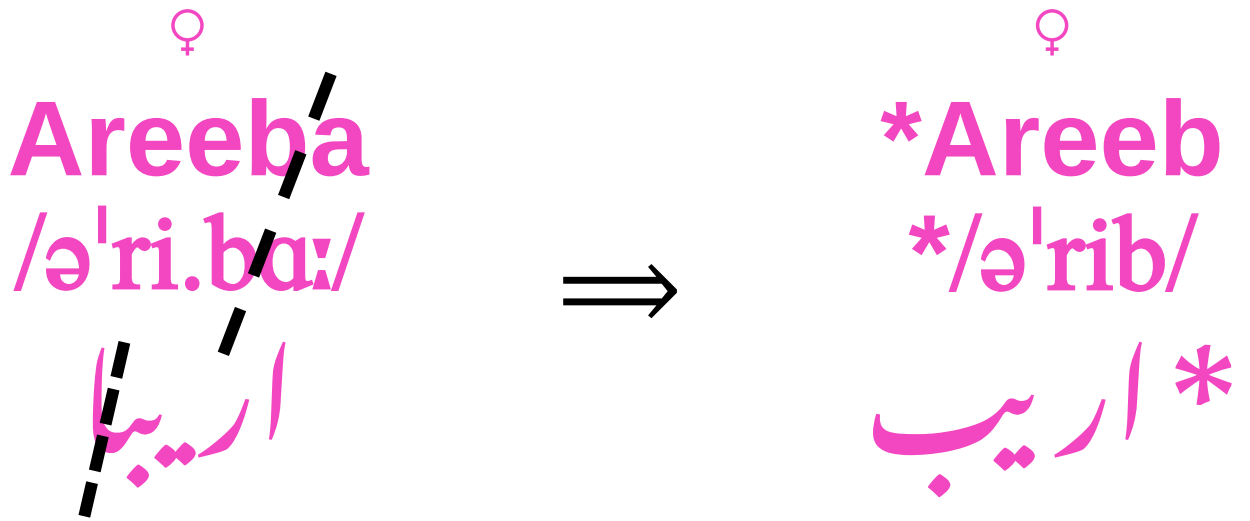
“Average sonority (till final sound)” and “Sonority of final sound”
(Ackermann & Zimmer 2021)

“Final phoneme”
(Cassidy, Kelly, & Sharoni 1999)

“The second scale, which applies to the last phoneme…”
(Barry & Harper 1995)

(Kang 2021)

Controlling for morphology



Low vowels → masculine

Longer → masculine

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Communicative functions of gendered sound symbolism and morphology

(Oelkers 2003)

Areeba
/əˈri.bɑː/
اریبا

Amalia Kadji, Vecteezy.com

Noor
/nur/
نور

Communicative functions of gendered sound symbolism and morphology

(Oelkers 2003)

Areeba
/əˈri.bɑː/
اریبا

Noor
/nur/
نور

Amalia Kadji, Vecteezy.com

Communicative functions of gendered sound symbolism and morphology

(Oelkers 2003)

Areeba
/əˈri.bɑː/
اریبا

Noor
/nur/
نور

Amalia Kadji, Vecteezy.com

Name data

~100 boys' names and ~100 girls' names

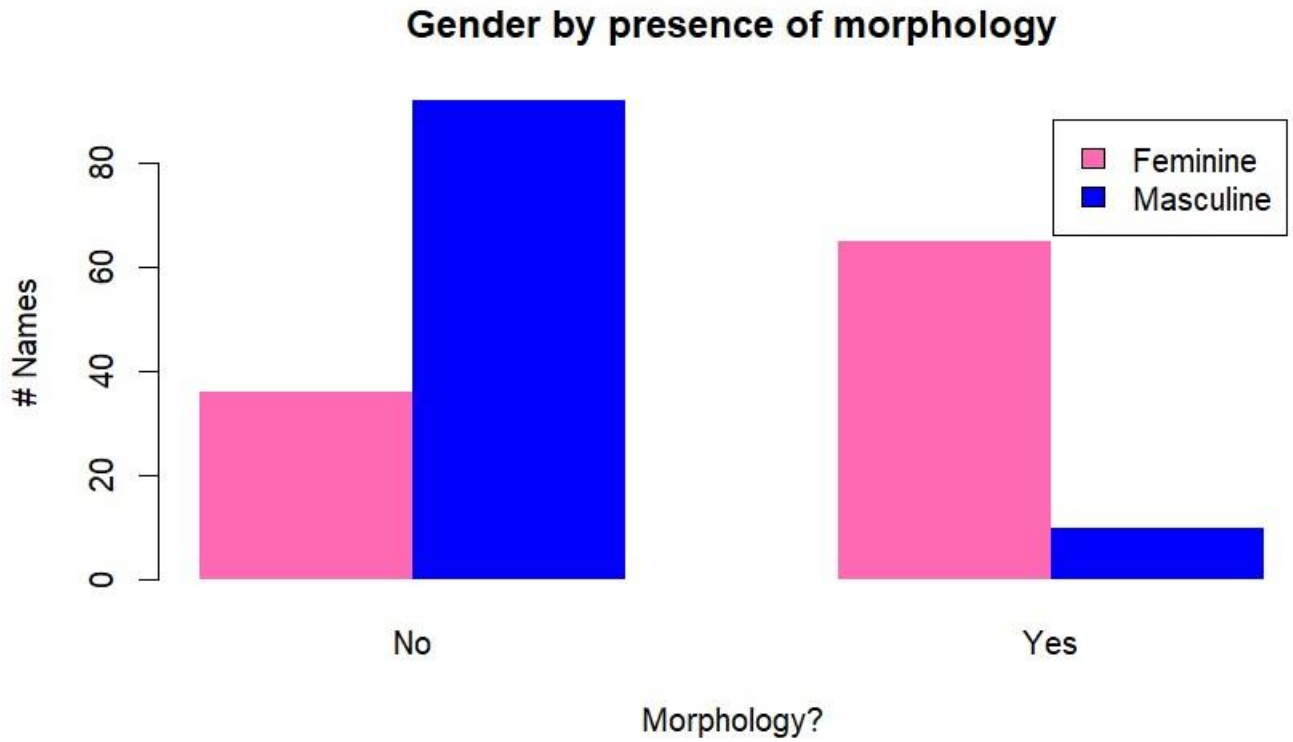
2022 matriculation results

Board of Intermediate and Secondary Education, Gujranwala

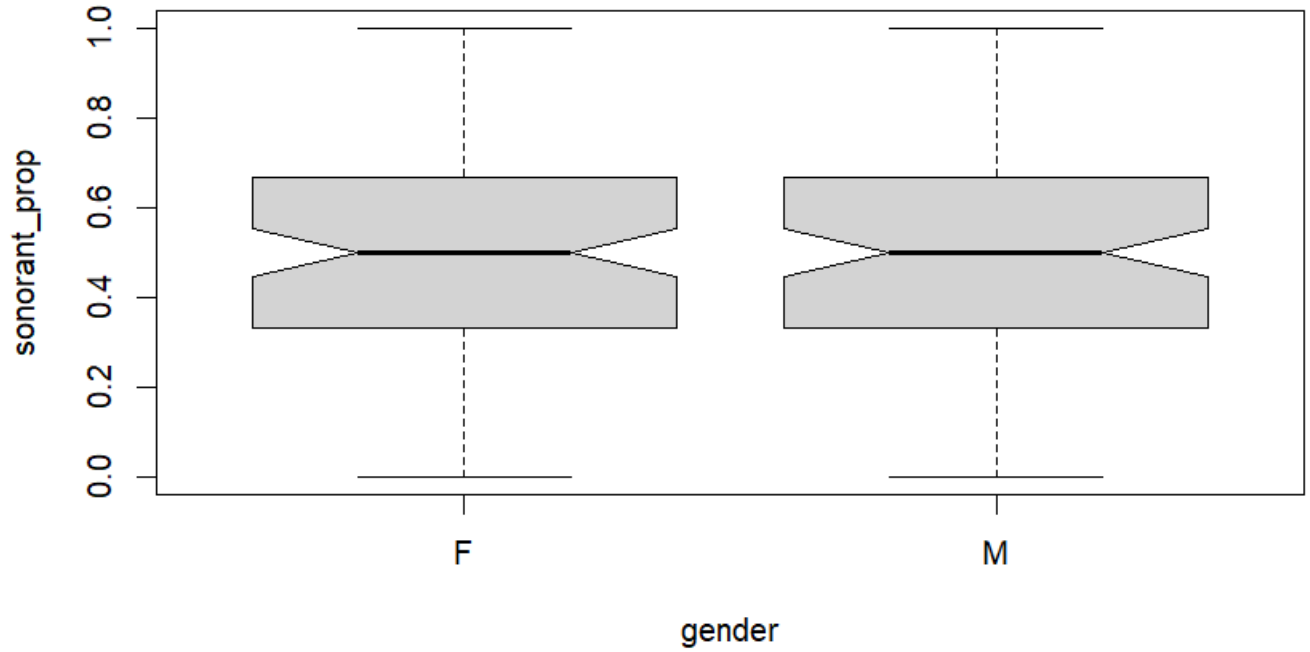
14- and 15-year-olds

16 900 boys, 11 485 girls

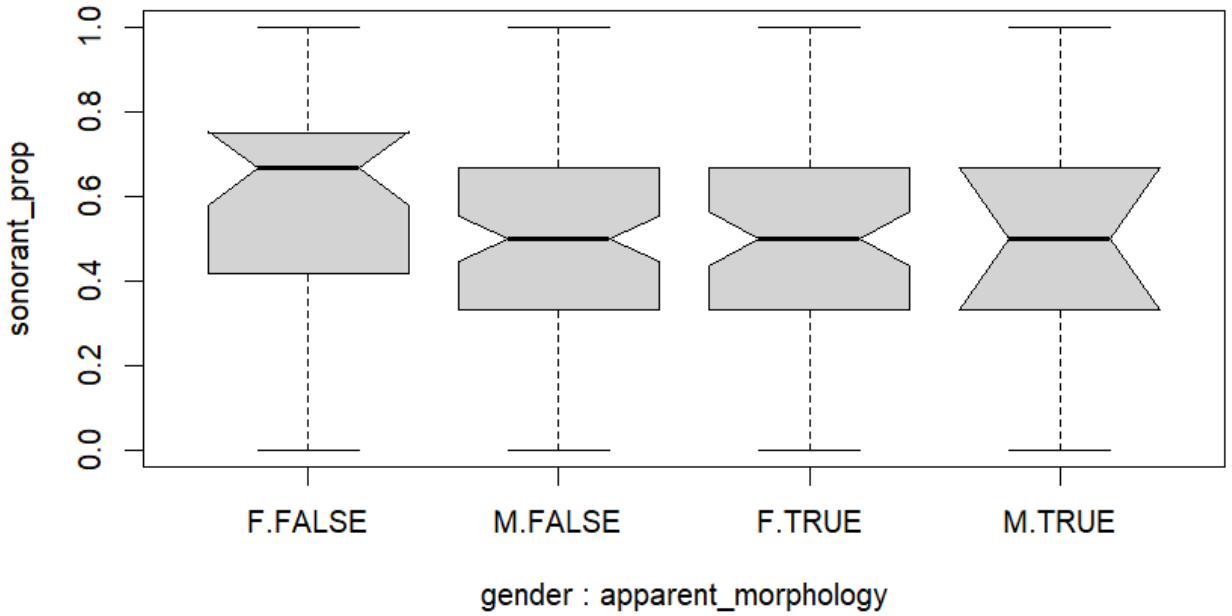
Feminine morphology as a feminine cue

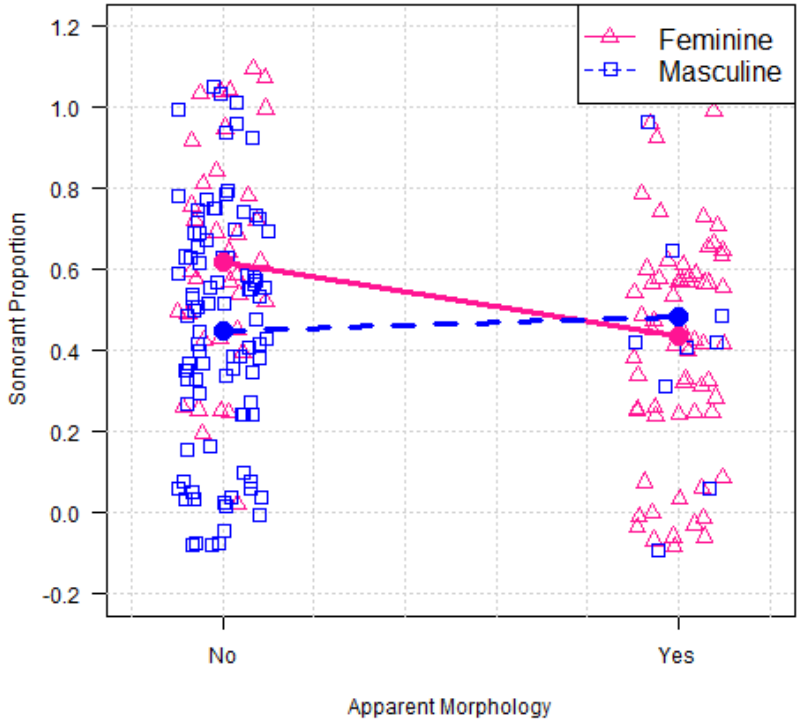


Sonorants as a feminine cue…?

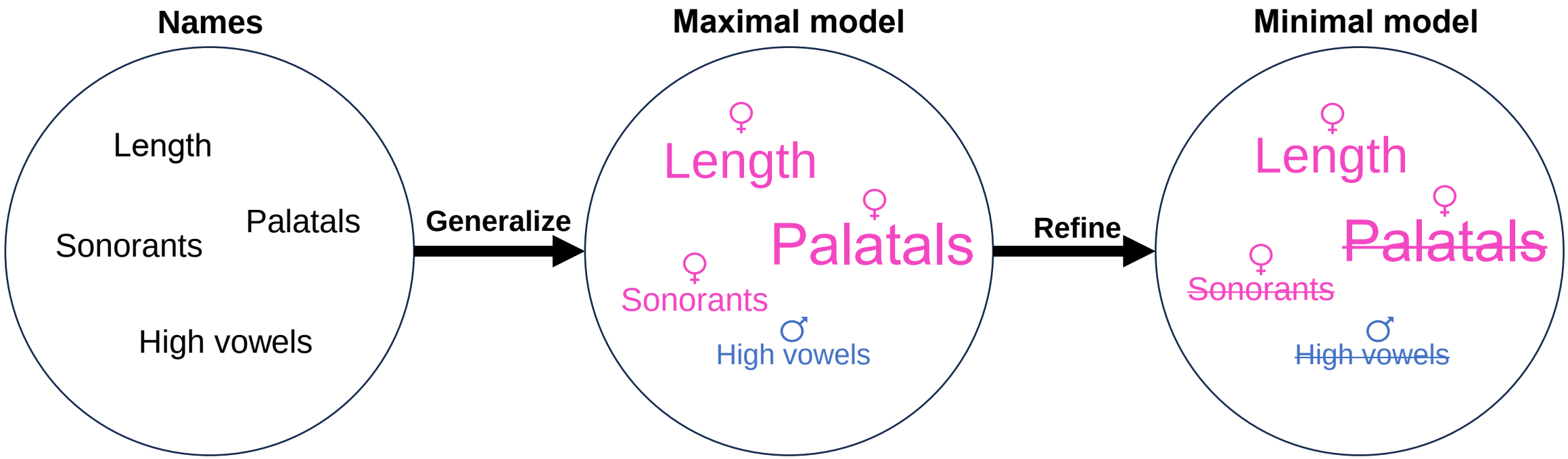


Sonorants as a feminine cue!

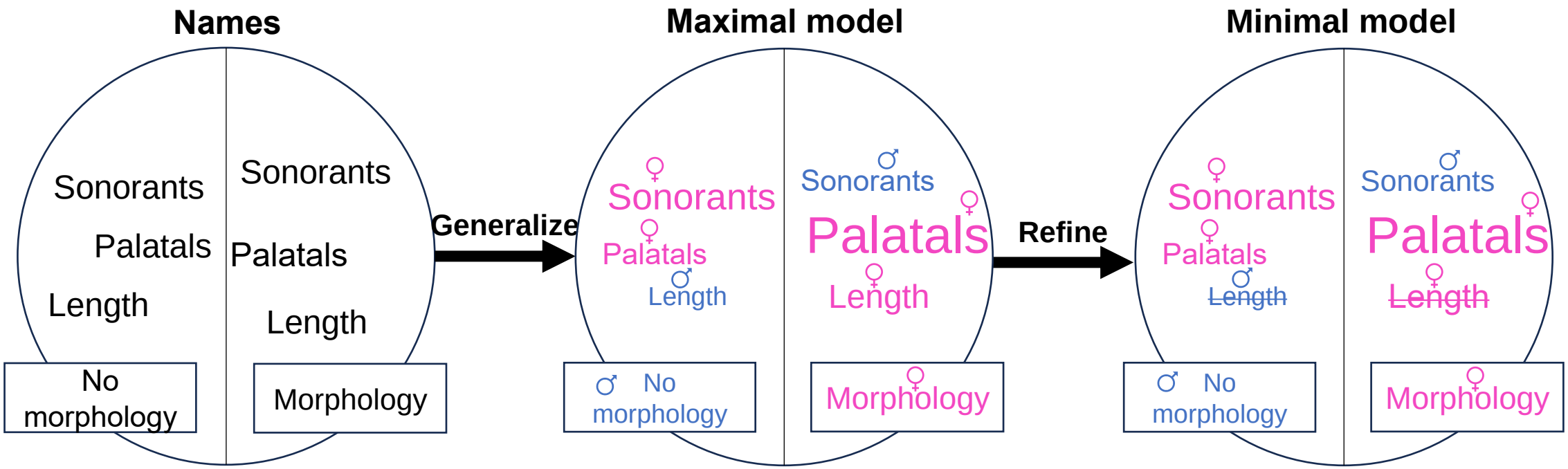




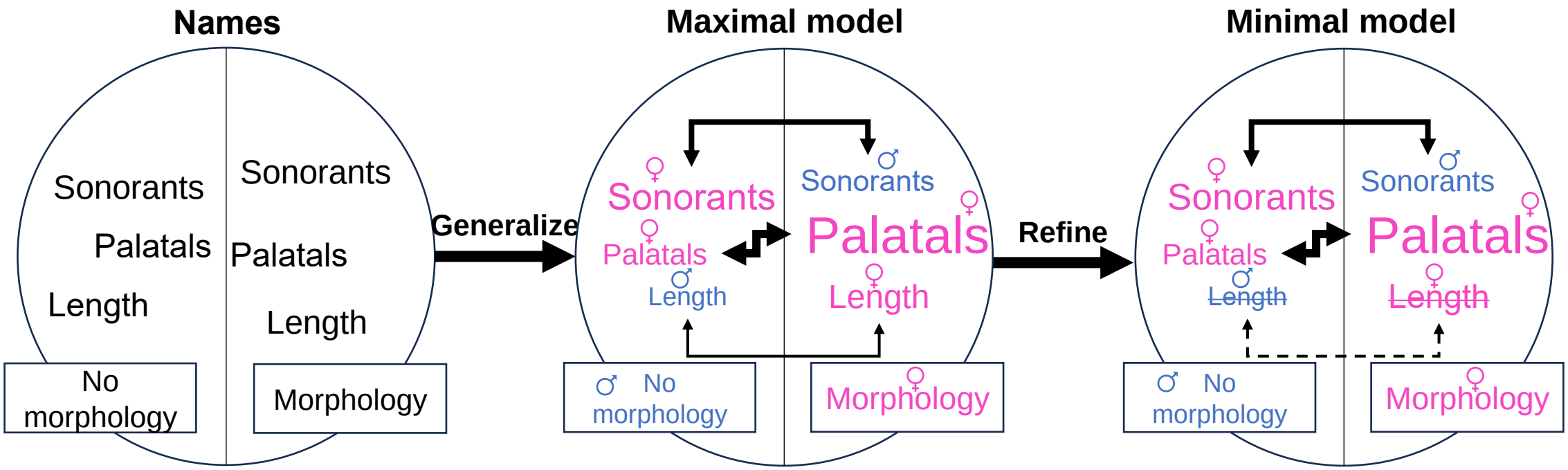
Logistic regression models



Interaction effects



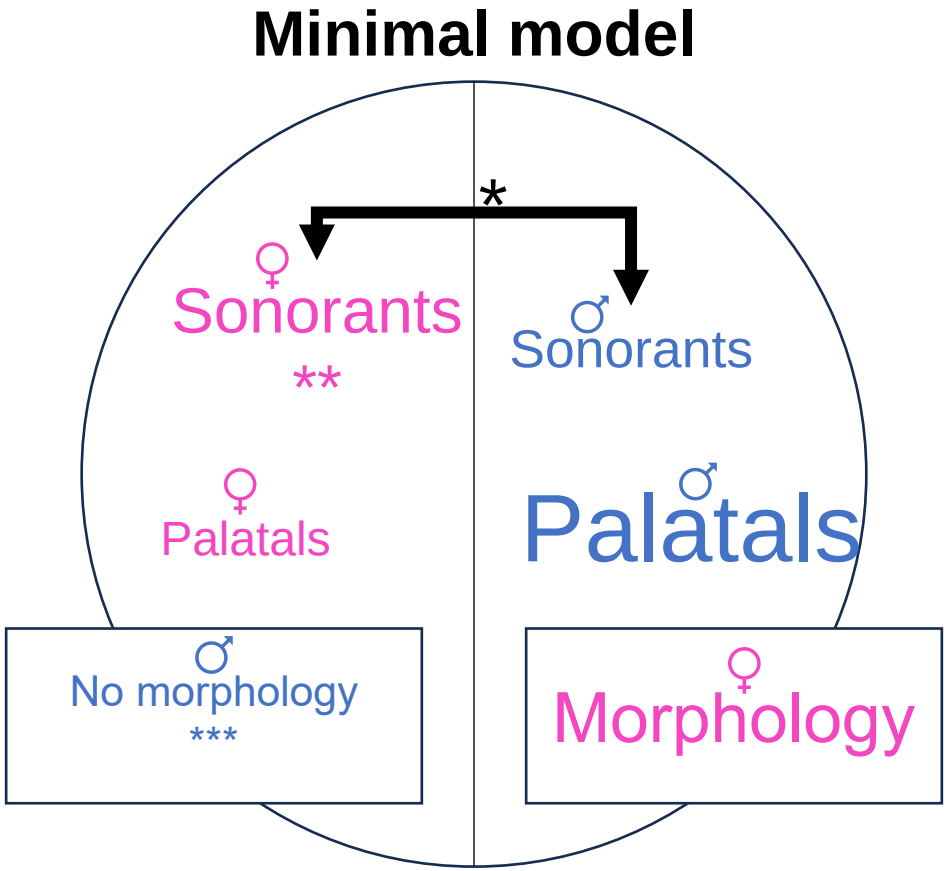
Interaction effects



Our findings

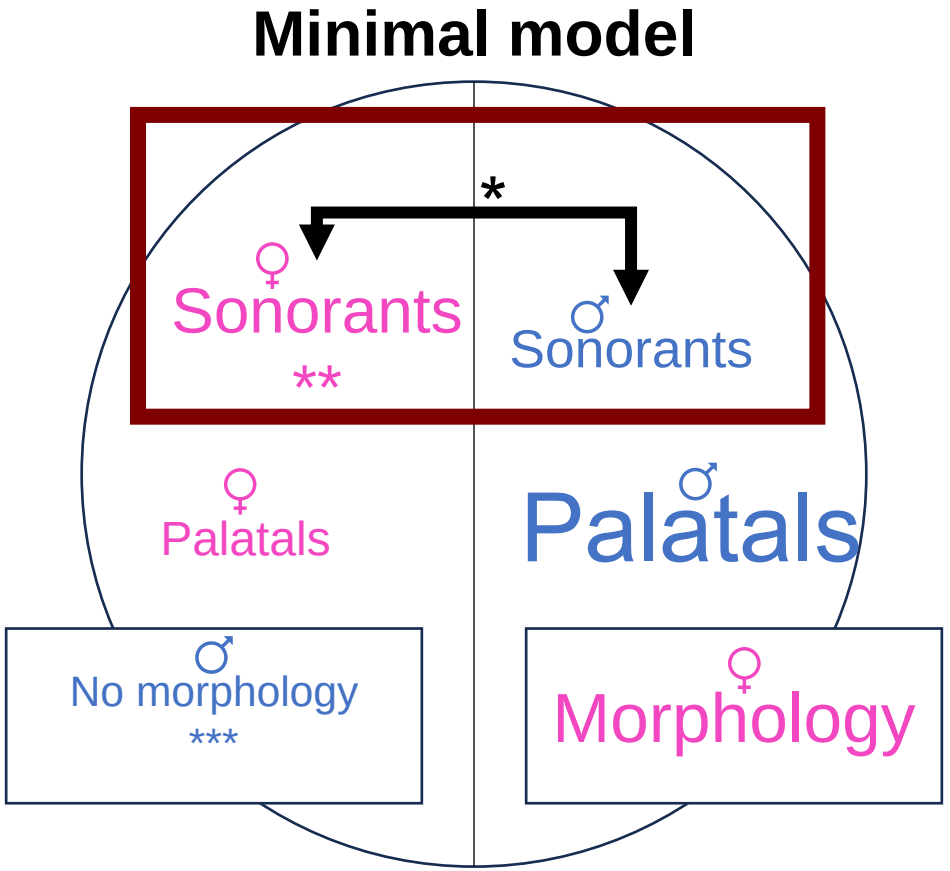
	Coefficient	Std. Error	*Z* value	Pr(> |*Z*|)
(Intercept)	1.0443	0.2163	4.827	1.38e-6***
Apparent Morphology	-6.7789	286.5978	-0.024	0.98113
Sonorants	-2.2891	0.7779	-2.943	0.00325**
Palatals	-1.2661	1.4150	-0.895	0.37091
App Morph:Sonorants	2.8054	1.4189	1.977	0.04802*
App Morph:Palatals	-47.4993	3262.3920	-0.015	0.98838
Log Likelihood			-96.73	
Akaike Information Criterion			205.46	

Our findings



* p < 0.05
** p < 0.01
*** p < 0.001

Our findings



* p < 0.05
** p < 0.01
*** p < 0.001

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Implications in the search for sound-meaning associations

A methodological problem

A cross-linguistic account

An increasingly intricate human communication system

Conclusions

Feminine Urdu names have more sonorants **when morphology is not present**

Experimental and corpus evidence is needed to understand the **synchronicity and robustness** of these results

Future sound symbolism research needs to **account for these confounding effects**

hassankhan.net/research

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Appendix A: Data collection and annotation

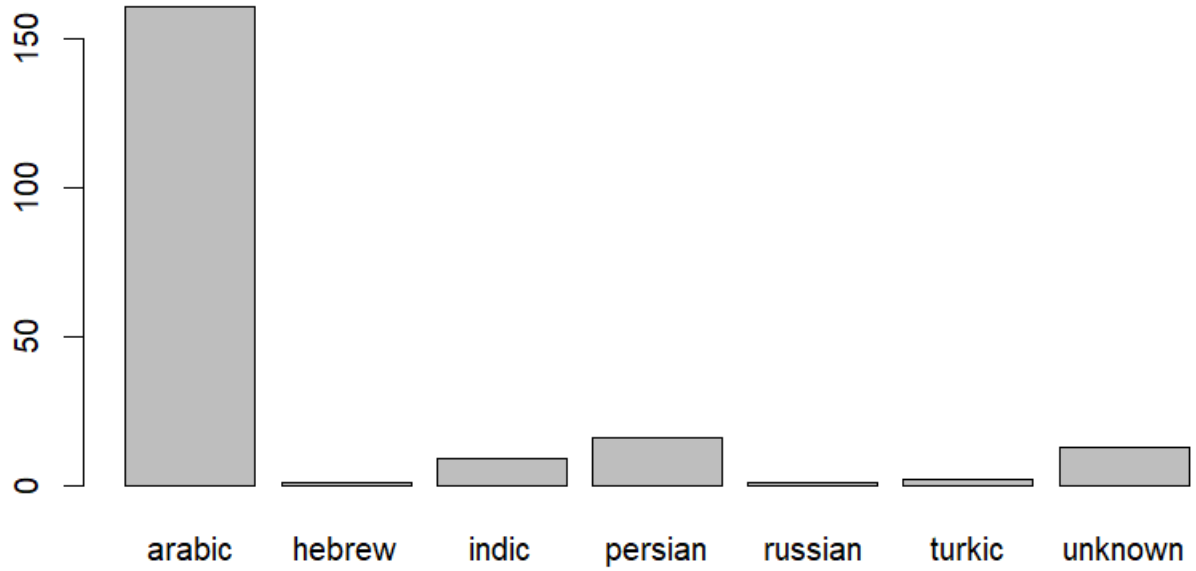
Name sources

- 102 boys' names, 101 girls' names; unisex names were not removed
- Board of Intermediate and Secondary Education 2022 matriculation results
- Pronunciations from Urdu-language baby name YouTube channels
  - *ZAHID INFO HUB*, *Ali Bhai*, *Urdusy*, *Smart Life Tube*…
  - Coded using Saleem's (2002) phonemic inventory of Urdu

Variables

- Independent variable gender (M or F)
- Dependent variables coded automatically in *R* (R Core Team 2023)
- Continuous phonological dependent variables (centred)
  - Length in syllables
  - Proportions of high vowels, front vowels, sonorant consonants, palatal consonants, light syllables
- Novel categorical dependent variable “apparent morphology”
  - True for names ending in feminine suffixes /-ɑ/, /-i/, /-ət̪/

Urdu name origins



-a

/-ɑː/

ـا

Appendix B: Models

Negative coefficients lean feminine.

Minimal model, only phonological variables

	Coefficient	Std. Error	*Z* value	Pr(> |*Z*|)
(Intercept)	-0.0125	0.1485	-0.084	0.933
Syllables	-1.3892	0.3368	-4.124	3.72e-05
Log Likelihood			-130.30	
Akaike Information Criterion			264.61	

Maximal model, only phonological variables

	Coefficient	Std. Error	*Z* value	Pr(> |*Z*|)
(Intercept)	-0.0212	0.1510	-0.141	0.88812
High Vowels	0.4336	0.6880	0.630	0.52855
Front Vowels	-0.2242	0.6402	-0.350	0.72615
Sonorants	-0.7072	0.5375	-1.316	0.18829
Palatals	-1.9820	0.9268	-2.139	0.03247*
Light Syllables	-0.2344	0.6687	-0.351	0.72594
Syllables	-1.2695	0.3569	-3.557	0.00038***
Log Likelihood			-127.40	
Akaike Information Criterion			268.79	

Minimal model, with morphology as an interaction effect

	Coefficient	Std. Error	*Z* value	Pr(> |*Z*|)
(Intercept)	1.0443	0.2163	4.827	1.38e-6***
Apparent Morphology	-6.7789	286.5978	-0.024	0.98113
Sonorants	-2.2891	0.7779	-2.943	0.00325**
Palatals	-1.2661	1.4150	-0.895	0.37091
App Morph:Sonorants	2.8054	1.4189	1.977	0.04802*
App Morph:Palatals	-47.4993	3262.3920	-0.015	0.98838
Log Likelihood			-96.73	
Akaike Information Criterion			205.46	

Maximal model, with morphology as an interaction effect

	Coefficient	Std. Error	*Z* value	Pr(> |*Z*|)
(Intercept)	1.0719	0.2410	4.446	8.74e-06***
Apparent Morphology	-7.4064	232.3169	-0.032	0.97457
High Vowels	0.2298	0.8147	0.282	0.77786
Front Vowels	-0.0934	0.7612	-0.123	0.90230
Sonorants	-2.3470	0.8092	-2.901	0.00373**
Palatals	-1.3221	1.4382	-0.919	0.35792
Light Syllables	-0.7021	0.8742	-0.803	0.42191
Syllables	0.1963	0.5704	0.344	0.73075
App Morph:High Vowels	9.7718	4.9479	1.975	0.04828*
App Morph:Front Vowels	-11.506	5.1371	-2.240	0.02510*
App Morph:Sonorants	3.4167	1.6176	2.112	0.03468*
App Morph:Palatals	-54.8929	2644.4998	-0.021	0.98344
App Morph:Light Syllables	0.4160	2.1430	0.194	0.84609
App Morph:Syllables	-1.9817	1.3500	-1.468	0.14214

Log Likelihood	-92.28
Akaike Information Criterion	212.55

Appendix C: Post-hoc interaction effects testing

Done using the *phia* package (Posit team 2023)

Minimal model, sonorants

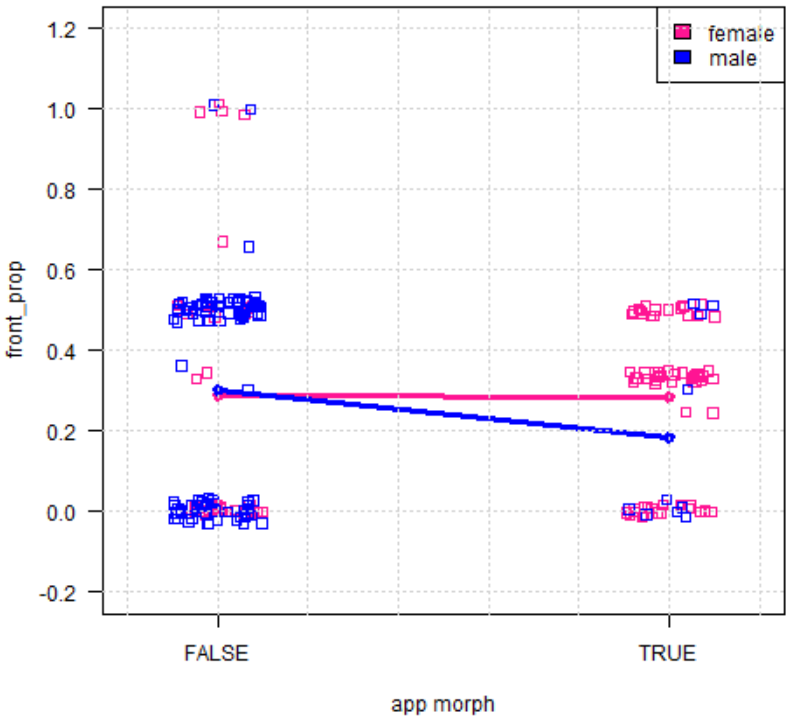
	Value	χ^2	Pr(> χ^2)
No apparent morphology	-2.28914	8.6591	0.006509**
Apparent Morphology	0.51624	0.1893	0.663518

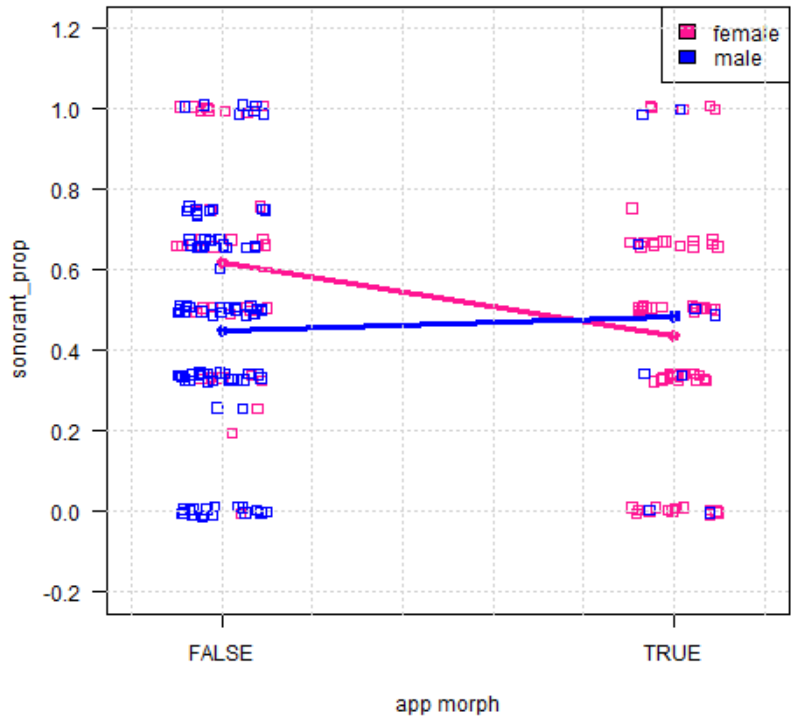
Minimal model, palatals

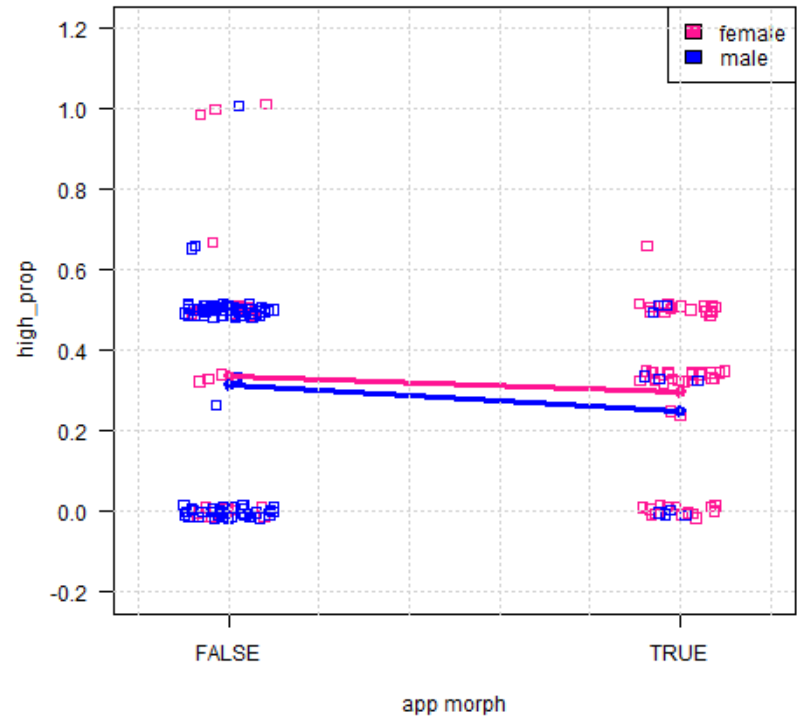
	Value	χ^2	Pr(> χ^2)
No apparent morphology	-1.266	0.8006	0.7418
Apparent Morphology	-48.765	0.0002	0.9881

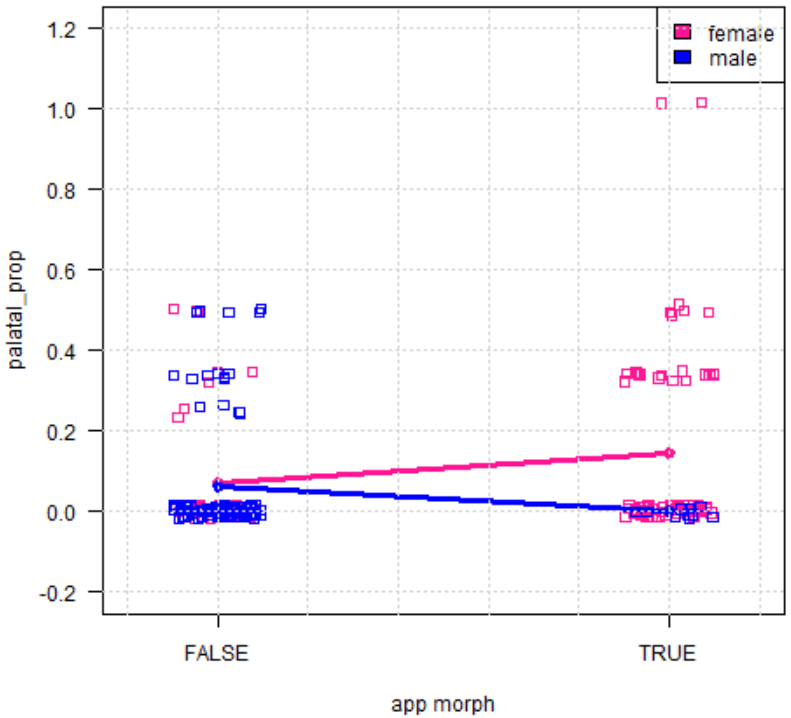
Appendix D: Stripcharts of phonological variables across apparent morphology

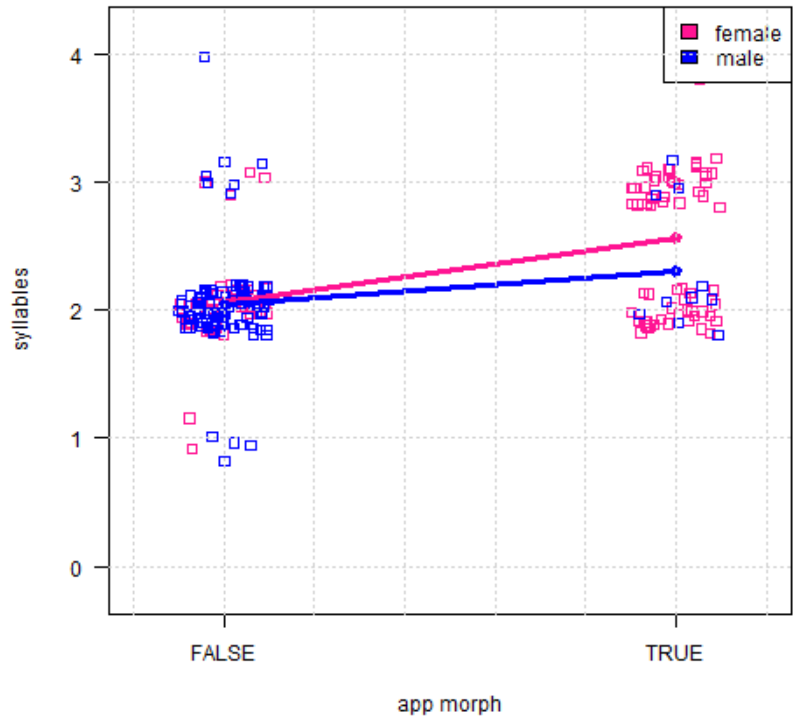
x-axis is morphology, colour/shape indicates gender, y-axis is phonological variable

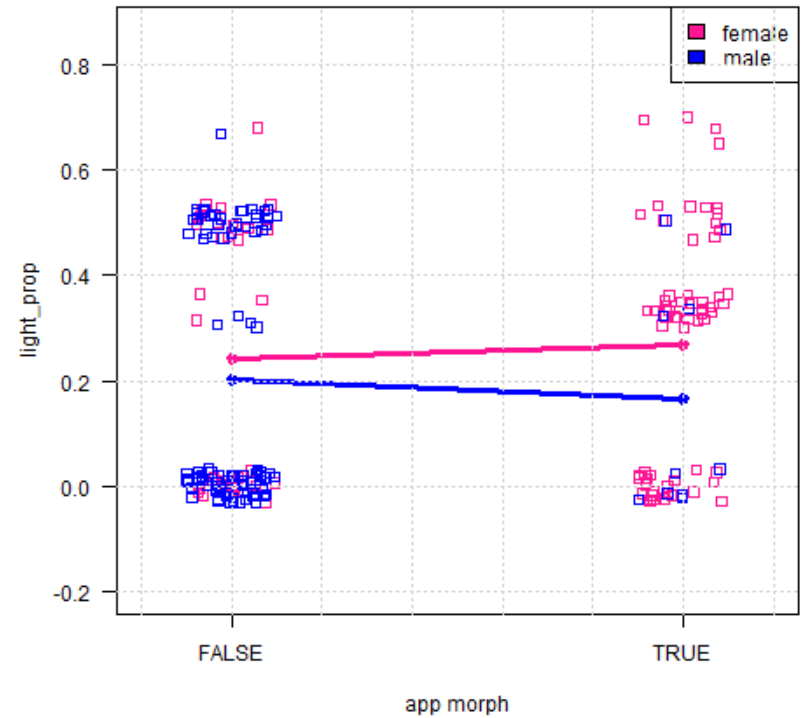

female
male
front_prop
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
FALSE
TRUE
app morph


female
male
sonorant_prop
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
FALSE
TRUE
app morph


female
male
high_prop
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
FALSE
TRUE
app morph


female
male
palatal_prop
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
FALSE
TRUE
app morph


female
male
syllables
4
3
2
1
0
FALSE
TRUE
app morph


female
male
light_prop
0.8
0.6
0.4
0.2
0.0
-0.2
FALSE
TRUE
app morph

Appendix E: Drawing generalizations in logistic regression models

Names are marked for variables

Muneeb

[-Length
+Sonorants
-Palatals
+High vowels]

Maryam

[+Length
++Sonorants
+Palatals
High vowels]

Ayesha

[+Length
Sonorants
++Palatals
High vowels]

Sohaib

[-Length
+Sonorants
Palatals
High vowels]

Patterns are found

Muneeb

-Length
+Sonorants
-Palatals
+High vowels

Maryam

+Length
++Sonorants
+Palatals
High vowels

Ayesha

+Length
Sonorants
++Palatals
High vowels

Sohaib

-Length
+Sonorants
Palatals
High vowels

Generalizations are drawn

++Sonorants

+High vowels

+Length

++Palatals