Data Visdualization on Madarin Vowels

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Author Note

Steffi and Jun are the owner of the dataset. They have the correct permissions to make the dataset public.

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Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

Keywords: Madarin, Vowels, Native speaker, Non-native speaker

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Contents

Methods

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Participants

Material

Procedure

Data analysis

We used R (Version 3.4.2; R Core Team, 2017) and the R-packages *bindrcpp* (Version 0.2.2; Müller, 2018), *dplyr* (Version 0.7.6; Wickham, François, Henry, & Müller, 2018), *forcats* (Version 0.3.0; Wickham, 2018a), *ggplot2* (Version 3.0.0; Wickham, 2016), *here* (Version 0.1; Müller, 2017), *janitor* (Version 1.1.1; Firke, 2018), *kableExtra* (Version 0.9.0; Zhu, 2018), *knitr* (Version 1.20; Xie, 2015), *papaja* (Version 0.1.0.9842; Aust & Barth, 2018), *purrr* (Version 0.2.5; Henry & Wickham, 2018), *readr* (Version 1.1.1; Wickham, Hester, & Francois, 2017), *rio* (Version 0.5.10; C.-h. Chan, Chan, Leeper, & Becker, 2018), *stringr* (Version 1.3.1; Wickham, 2018b), *tibble* (Version 1.4.2; Müller & Wickham, 2018), *tidyr* (Version 0.8.1; Wickham & Henry, 2018), *tidyverse* (Version 1.2.1; Wickham, 2017), and *tinytex* (Version 0.8; Xie, 2018) for all our analyses.

Results

Discussion

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Table 1

Formant by volwels among non-native and native groups

group	vowel	F1_mean	F2_mean	F1_sd	F2_sd
NNS	ai	913.33	1513.83	47.14	161.28
NNS	ao	901.50	1377.00	63.86	107.69
NNS	e	640.33	1702.33	70.43	238.62
NNS	en	651.33	1980.00	88.59	166.70
NNS	wo	551.50	1043.67	49.79	61.90
NNS	wu	416.00	1122.83	69.62	196.96
NNS	ye	520.67	2320.00	65.50	95.07
NNS	yi	335.67	2646.50	46.03	100.61
NNS	yu	321.50	1806.83	31.25	186.00
NS	ai	910.33	1655.50	115.38	142.20
NS	ao	848.00	1305.17	59.50	147.96
NS	e	596.83	1289.67	105.92	152.62
NS	en	717.67	1850.50	40.10	101.96
NS	wo	554.50	908.67	48.53	76.63
NS	wu	335.00	840.00	15.63	56.02
NS	ye	556.83	2486.50	38.02	128.39
NS	yi	308.33	2916.17	30.23	73.78
NS	yu	309.17	2420.83	15.17	237.25

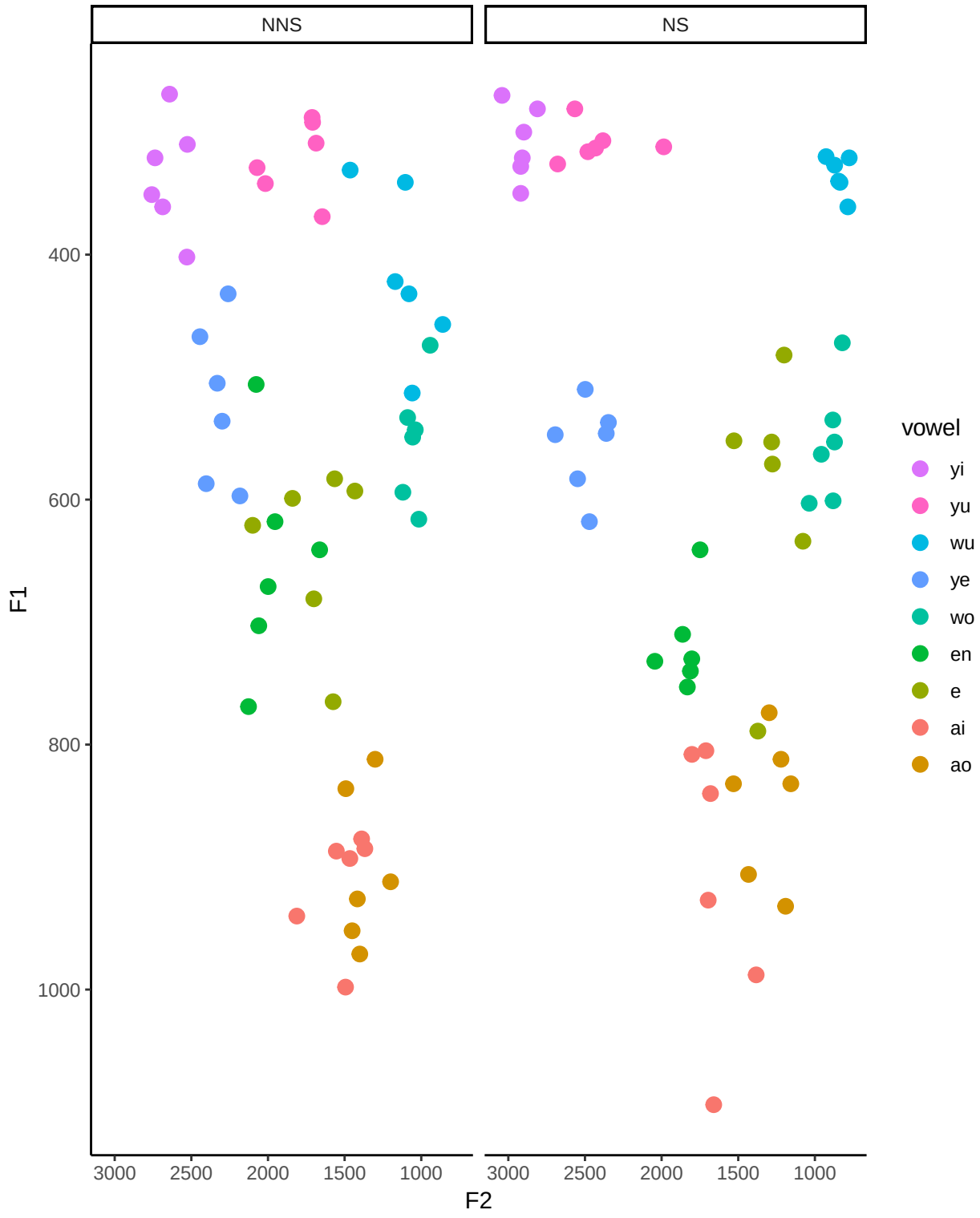
NNS
NS
400
600
800
1000
F1
3000
2500
2000
1500
1000
F2
vowel
yi
yu
wu
ye
wo
en
e
ai
ao

Figure 1

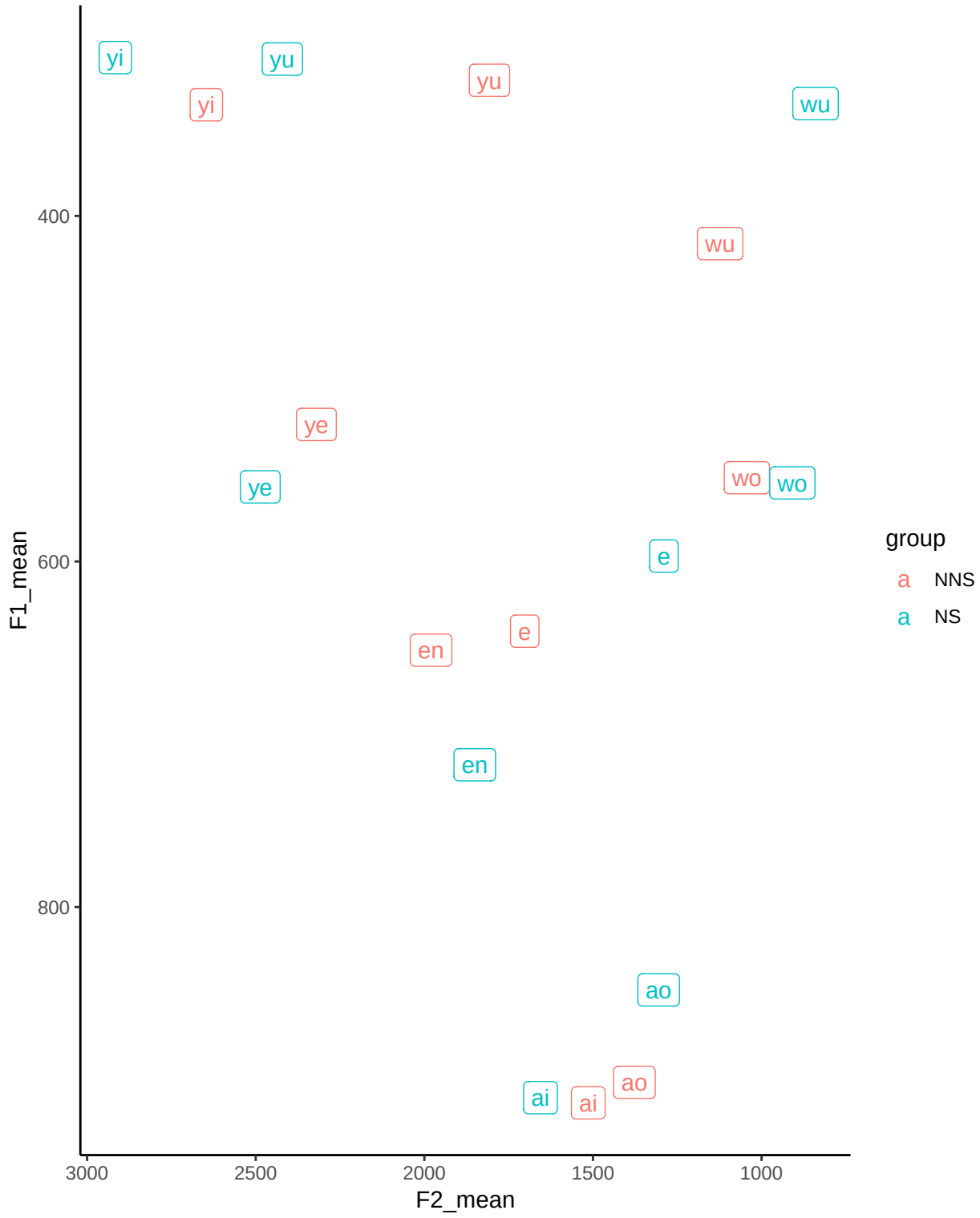
yi
yu
yu
yi
wu
400
wu
ye
ye
wo
wo
e
600
F1_mean
e
en
en
800
ao
ao
ai
ai
3000
2500
2000
1500
1000
F2_mean
group
a NNS
a NS

Figure 2

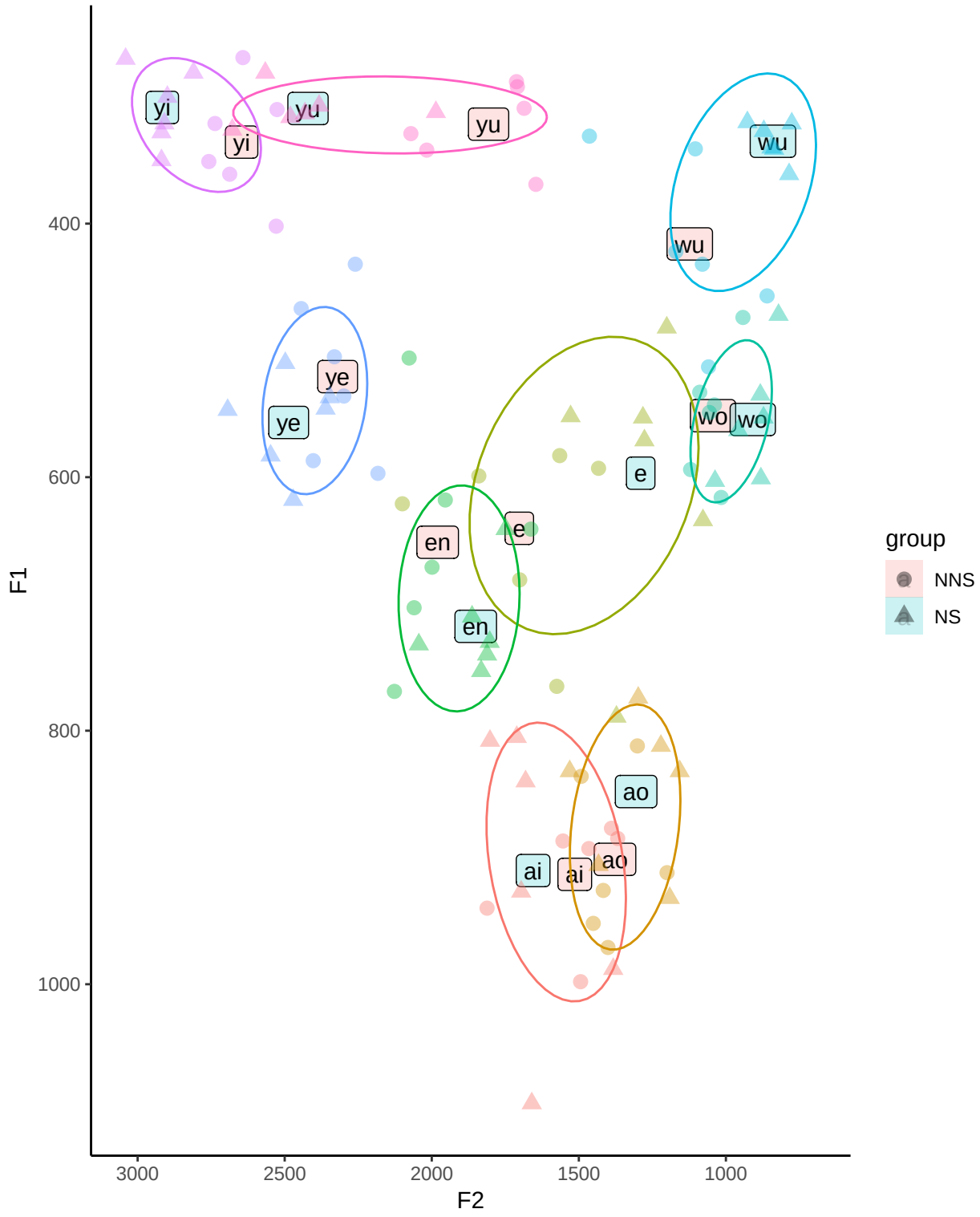
yi
yi
yu
yu
wu
wu
ye
ye
wo
wo
e
e
en
en
ao
ao
ai
ai
400
600
800
1000
F1
3000
2500
2000
1500
1000
F2
group
NNS
NS

Figure 3