

India Sociolinguistics Face Selection Analyses

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...and rarely 'opted out'

Face Preferences

Language Presented in Audio Clip

Who could be speaking?

Children across standards tended to select a single face in response to the face selection questions (95% of trials in 3rd standard, 89% of trials in 5th standard, and 90% of trials in 7th standard; 91% overall). Twenty-two children selected more than one face across 53 trials (10 for both Hindi and Urdu, 7 for U.S English, Indian English, and Marathi, 5 for Tamil, 4 for Gujarati, and 3 for Mandarin). Twenty-nine children selected "no opinion" on 39 trials (13 for Mandarin, 11 for Tamil, 6 for Marathi, 3 for Gujarati and Urdu, 2 for U.S. English, and 1 for Hindi).

Children exhibited a preference for 1-2 faces as speakers for most languages they heard in audio clips.

Language Presented by Name

Who speaks [LANGUAGE]?

Children exhibited a preference for 1-2 faces as speakers for most languages they were asked about by name.

Over Time

By Standard (Grade)

in Audio Clip

by Language Name Selective face preferences tended to get stronger with age for both auditorily presented and named languages (a greater and greater proportion of children chose the same face(s) as speakers of a given audio clip, or for a given named language).

By Age

in Audio Clip

Models: Odds of Face Selection

AUDIO

```
##
## FALSE TRUE
## 1889 51

## [1] 20

##
##          hindu                      asian
##          391                      0      308
##      asian dravidian  asian dravidian hindu  asian dravidian white
##          1                      0      1
##      asian hindu      asian hindu muslim      asian muslim
##          0                      1      1
##      asian muslim white      asian white      dravidian
##          0                      12     381
##      dravidian hindu dravidian hindu muslim  dravidian hindu white
##          14                      4      1
##      dravidian muslim      dravidian white dravidian white muslim
##          1                      1      1
##      hindu muslim      hindu white      idk
##          12                      1     39
##          muslim      muslim white      white
##          340                      0     430
```

```
## [1] 29
```

```
##
##      Gujarati      English English (India) English (U.S.)      Hindi
##          1          0          0          1          1
##      Mandarin      Marathi      Tamil      Urdu
##          1          1          1          1
```

Hindu face (from audio clip)

```
## # A tibble: 25 x 3
## # Groups:   language [9]
##   language standard mean
##   <fct>      <fct>    <dbl>
## 1 Gujarati 3      0.231
## 2 Gujarati 5      0.598
## 3 Gujarati 7      0.670
## 4 Hindi    3      0.269
## 5 Hindi    5      0.289
## 6 Hindi    7      0.319
```

```
## 7 Urdu      3      0.269
## 8 Urdu      5      0.196
## 9 Urdu      7      0.117
## 10 Marathi  3      0.212
## # i 15 more rows
```

```
## # A tibble: 25 x 3
## # Groups:   language [9]
##   language standard mean
##   <fct>      <fct>    <dbl>
## 1 Gujarati  3      0.0769
## 2 Gujarati  5      0.0515
## 3 Gujarati  7      0.0213
## 4 Hindi     3      0.0769
## 5 Hindi     5      0.0928
## 6 Hindi     7      0.0106
## 7 Urdu      3      0.0962
## 8 Urdu      5      0.0515
## 9 Urdu      7      0.0638
## 10 Marathi  3      0.115
## # i 15 more rows
```

```
## # A tibble: 8 x 2
##   language mean
##   <fct>      <dbl>
## 1 Gujarati 0.584
## 2 Hindi    0.355
## 3 Urdu     0.0741
## 4 Marathi  0.494
## 5 Tamil    0.251
## 6 English  0.0165
## 7 Mandarin 0.0206
## 8 <NA>     0
```

	V1	2.5 %	97.5 %	toss
## child_age_centered	1.46	1.24	1.73	FALSE
## languageHindi	0.35	0.24	0.51	FALSE
## languageUrdu	0.18	0.11	0.27	FALSE
## languageMarathi	0.51	0.35	0.73	FALSE
## languageTamil	0.21	0.14	0.32	FALSE
## languageEnglish (India)	0.04	0.02	0.08	FALSE
## languageEnglish (U.S.)	0.01	0.00	0.03	FALSE
## languageMandarin	0.03	0.01	0.06	FALSE
## child_age_centered:languageHindi	0.74	0.58	0.94	FALSE
## child_age_centered:languageUrdu	0.55	0.42	0.71	FALSE
## child_age_centered:languageEnglish (India)	0.67	0.45	1.00	FALSE
## child_age_centered:languageMandarin	0.33	0.20	0.50	FALSE

```
## Analysis of Deviance Table (Type II tests)
```

```
##
```

```
## Response: hindu_face
```

	LR	Chisq	Df	Pr(>Chisq)
## child_age_centered		9	1	0.0028 **

```
## language 361 7 < 0.0000000000000002 ***
## child_age_centered:language 47 7 0.000000058 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

There was a significant interaction between child age and language ($Wald\chi^2(7) = 46.91, p < .001$), such that as children got older, they increasingly selected the hindu face for Hindi ($OR = 0.74[0.58, 0.94]$), Urdu ($OR = 0.55[0.42, 0.71]$), Gujarati ($OR = 1.46[1.24, 1.73]$), Marathi ($OR = 0.88[0.70, 1.12]$), Tamil ($OR = 0.84[0.65, 1.09]$), and Indian English ($OR = 0.67[0.45, 1.00]$), and decreasingly selected it in response to clips of Mandarin ($OR = 0.33[0.20, 0.50]$).

Muslim face (from audio clip)

```
## V1 2.5 % 97.5 % toss
## (Intercept) 0.10 0.06 0.16 FALSE
## child_age_centered 0.55 0.41 0.73 FALSE
## languageHindi 9.78 5.75 17.87 FALSE
## languageUrdu 11.02 6.49 20.13 FALSE
## languageMarathi 0.37 0.13 0.92 FALSE
## languageMandarin 0.24 0.08 0.62 FALSE
## child_age_centered:languageHindi 2.19 1.60 3.06 FALSE
## child_age_centered:languageUrdu 2.04 1.50 2.85 FALSE
## child_age_centered:languageEnglish (India) 1.86 1.23 2.89 FALSE
```

Analysis of Deviance Table (Type II tests)

```
##
## Response: muslim_face
## LR Chisq Df Pr(>Chisq)
## child_age_centered 4 1 0.043 *
## language 431 7 < 0.0000000000000002 ***
## child_age_centered:language 55 7 0.0000000018 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## # A tibble: 25 x 3
## # Groups:   language [9]
## language standard mean
## <fct> <fct> <dbl>
## 1 Gujarati 3 0.346
## 2 Gujarati 5 0.0515
## 3 Gujarati 7 0.0638
## 4 Hindi 3 0.423
## 5 Hindi 5 0.423
## 6 Hindi 7 0.606
## 7 Urdu 3 0.481
## 8 Urdu 5 0.485
## 9 Urdu 7 0.585
## 10 Marathi 3 0.173
## # i 15 more rows
```

There were significant effects of language ($Wald\chi^2(7) = 430.96, p < .001$) and its interaction with child age ($Wald\chi^2(7) = 54.6, p < .001$). Children tended to select the muslim face as a speaker of Urdu (52%

of trials overall; $OR = 11.02[6.49, 20.13]$), and not to select the muslim face as a speaker of Gujarati (12% of trials; $OR = NA[NA, NA]$), Mandarin (3% of trials; $OR = 0.24[0.08, 0.62]$), and Marathi (6% of trials; $OR = 0.37[0.13, 0.92]$). As children got older, they associated the muslim face with Gujarati even less (35% of trials in 3rd grade to 6% in 7th; $OR = NA[NA, NA]$), and increased their relative selection of it as the speaker of the Hindi (42% of trials in 3rd grade to 61% in 7th; $OR = 2.19[1.60, 3.06]$), Urdu (48% of trials in 3rd grade to 59% in 7th; $OR = 2.04[1.50, 2.85]$), and Indian English ($OR = 1.86[1.23, 2.89]$) audio clips.

Dravidian face (from audio clip)

```
##                                V1 2.5 % 97.5 %  toss
## (Intercept)                   0.34  0.25   0.45 FALSE
## languageHindi                 0.51  0.32   0.80 FALSE
## languageMarathi               2.15  1.47   3.18 FALSE
## languageEnglish (India)       0.41  0.25   0.66 FALSE
## languageEnglish (U.S.)       0.53  0.33   0.84 FALSE
## languageMandarin              0.10  0.04   0.21 FALSE
## child_age_centered:languageMarathi 1.28  1.01   1.62 FALSE
## child_age_centered:languageTamil  1.42  1.10   1.84 FALSE
## child_age_centered:languageMandarin 0.59  0.36   0.93 FALSE

## Analysis of Deviance Table (Type II tests)
##
## Response: dravidian_face
##                                LR Chisq Df          Pr(>Chisq)
## child_age_centered             2.3    1             0.13
## language                      140.9   7 < 0.0000000000000002 ***
## child_age_centered:language    33.9   7             0.000018 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

There was a significant effect of language ($Wald\chi^2(7) = 140.91, p < .001$), such that children were unlikely to select the dravidian face as a speaker of Mandarin ($OR = 0.10[0.04, 0.21]$), Gujarati ($OR = 0.34[0.25, 0.45]$), Indian English ($OR = 0.41[0.25, 0.66]$), Hindi ($OR = 0.51[0.32, 0.80]$), or U.S. English ($OR = 0.53[0.33, 0.84]$), and likely to select it as a speaker of Marathi ($OR = 2.15[1.47, 3.18]$). A significant interaction between child age and language ($Wald\chi^2(7) = 33.9, p < .001$), further revealed that as children got older, they increasingly selected the dravidian face in response to clips of Tamil ($OR = 1.42[1.10, 1.84]$) and Marathi ($OR = 1.28[1.01, 1.62]$), and decreasingly in response to Gujarati ($OR = 0.95[0.79, 1.13]$) and Mandarin ($OR = 0.33[0.20, 0.50]$).

East Asian face (from audio clip)

```
##                                V1 2.5 % 97.5 %  toss
## (Intercept)                   0.04  0.02   0.08 FALSE
## languageTamil                 4.92  2.48  10.93 FALSE
## languageEnglish (India)       2.26  1.07   5.24 FALSE
## languageEnglish (U.S.)       3.49  1.70   7.89 FALSE
## languageMandarin              57.60 29.78 126.41 FALSE
## child_age_centered:languageMandarin 1.84  1.22   2.84 FALSE

## Analysis of Deviance Table (Type II tests)
##
## Response: asian_face
```

```
##                               LR Chisq Df                Pr(>Chisq)
## child_age_centered           4  1                0.059 .
## language                     466  7 < 0.0000000000000002 ***
## child_age_centered:language   35  7                0.000011 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

There was a significant effect of language ($Wald\chi^2(7) = 466.43, p < .001$), such that children were likely to select the asian face as the speaker of Mandarin ($OR = 57.60[29.78, 126.41]$), Tamil ($OR = 4.92[2.48, 10.93]$), U.S. English ($OR = 3.49[1.70, 7.89]$), and Indian English ($OR = 2.26[1.07, 5.24]$), and unlikely to select the asian face as the speaker of Gujarati ($OR = 0.04[0.02, 0.08]$). We also saw a significant interaction between language and child age ($Wald\chi^2(7) = 34.97, p < .001$), such that as children got older, they increasingly selected the east asian face for Mandarin ($OR = 1.84[1.22, 2.84]$).

White face (from audio clip)

```
##                               V1 2.5 % 97.5 %  toss
## (Intercept)                   0.03  0.01   0.07 FALSE
## languageTamil                 5.75  2.69  14.62 FALSE
## languageEnglish (India)       72.23 34.93 180.50 FALSE
## languageEnglish (U.S.)        62.06 29.94 155.30 FALSE
## languageMandarin              4.08  1.86  10.53 FALSE
## child_age_centered:languageEnglish (India) 1.80  1.15   2.94 FALSE
## child_age_centered:languageEnglish (U.S.)  2.22  1.41   3.63 FALSE
```

```
## Analysis of Deviance Table (Type II tests)
```

```
##
```

```
## Response: white_face
```

```
##                               LR Chisq Df                Pr(>Chisq)
## child_age_centered           1  1                0.36
## language                     722  7 < 0.0000000000000002 ***
## child_age_centered:language   63  7                0.000000000038 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

There was a significant effect of language ($Wald\chi^2(7) = 722.14, p < .001$), such that children rarely selected the white face as a speaker of Gujarati (4% of trials; $OR = 0.03[0.01, 0.07]$), and selected it as a speaker of either English (Indian, 70% of trials; $OR = 72.23[34.93, 180.50]$; U.S., 65% of trials; $OR = 62.06[29.94, 155.30]$), Mandarin (12% of trials; $OR = 4.08[1.86, 10.53]$) and Tamil (16% of trials; $OR = 5.75[2.69, 14.62]$). There was a significant interaction between child age and language ($Wald\chi^2(7) = 62.97, p < .001$), such that as children got older, they increasingly selected the white face for Indian English ($OR = 1.80[1.15, 2.94]$) and U.S. English ($OR = 0.99[0.64, 1.56]$).

LANGUAGE NAME

```
##
## FALSE  TRUE
## 1664    37
```

```
## [1] 13
```

```
##
##          hindu          asian
##          411          0          279
##      asian dravidian  asian dravidian hindu  asian dravidian white
##          0          1          0
##          asian hindu      asian hindu muslim      asian muslim
##          1          0          0
##      asian muslim white      asian white      dravidian
##          1          9          323
##      dravidian hindu dravidian hindu muslim  dravidian hindu white
##          6          4          0
##      dravidian muslim      dravidian white dravidian white muslim
##          0          1          0
##          hindu muslim      hindu white      idk
##          11          2          30
##          muslim      muslim white      white
##          355          1          266
```

```
## [1] 14
```

```
##
##      Gujarati      English English (India)  English (U.S.)      Hindi
##          1          0          0          0          1
##      Mandarin      Marathi      Tamil      Urdu
##          0          1          1          1
```

Hindu face (from language name)

```
## Analysis of Deviance Table (Type II tests)
##
## Response: hindu_face
##          LR Chisq Df          Pr(>Chisq)
## child_age_centered          5  1          0.028 *
## language          464  6 < 0.0000000000000002 ***
## child_age_centered:language          30  6          0.000045 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We saw significant effects of language ($Wald\chi^2(6) = 463.52, p < .001$), child age ($Wald\chi^2(1) = 4.84, p < .05$), and their interaction ($Wald\chi^2(6) = 29.68, p < .001$). Children robustly selected the hindu face as a speaker of Gujarati (58% of trials; $OR = 1.40[1.09, 1.82]$), and did so significantly less for Mandarin (2% of trials; $OR = 0.01[0.00, 0.03]$), English (2% of trials; $OR = 0.01[0.00, 0.03]$), Urdu (7% of trials; $OR = 0.05[0.02, 0.08]$), Tamil (25% of trials; $OR = 0.24[0.16, 0.35]$), Hindi (35% of trials; $OR = 0.39[0.27, 0.56]$), and Marathi (49% of trials; $OR = 0.68[0.47, 0.98]$). With age, children became less likely to select the hindu face as the speaker of Urdu (from 15% to 2%; $OR = 0.56[0.38, 0.79]$), Chinese (from 2% to 1%; $OR = 0.68[0.37, 1.20]$), and Tamil (from 31% to 22%; $OR = 0.78[0.61, 0.99]$).

Muslim face (from language name)

```
## Analysis of Deviance Table (Type II tests)
##
## Response: muslim_face
```

```
##                               LR Chisq Df           Pr(>Chisq)
## child_age_centered             4  1             0.045 *
## language                     718  6 < 0.0000000000000002 ***
## child_age_centered:language    42  6             0.00000018 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We saw significant effects of language ($Wald\chi^2(6) = 717.73, p < .001$), child age ($Wald\chi^2(1) = 4.01, p < .05$), and their interaction ($Wald\chi^2(6) = 42.04, p < .001$): with age, children became increasingly likely to select the MUSLIM face as the speaker of Urdu (from 58% of trials in 3rd grade to 93% of trials in 7th; $OR = 27.19[16.50, 46.41]$).

Dravidian face (from language name)

```
## Analysis of Deviance Table (Type II tests)
##
## Response: dravidian_face
##                               LR Chisq Df           Pr(>Chisq)
## child_age_centered             1  1             0.45
## language                     348  6 < 0.0000000000000002 ***
## child_age_centered:language    40  6             0.00000043 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We saw significant effects of language ($Wald\chi^2(6) = 348.24, p < .001$), such that children preferred the dravidian faces as speakers of Tamil (53% of trials overall; $OR = 4.39[2.94, 6.63]$) and Marathi (38% of trials; $OR = 2.36[1.58, 3.55]$), and significantly less for English (2% of trials; $OR = 0.10[0.04, 0.21]$), Mandarin (4% of trials; $OR = 0.15[0.06, 0.30]$), Urdu (7% of trials; $OR = 0.25[0.13, 0.46]$), Gujarati (21% of trials; $OR = 0.27[0.19, 0.36]$), and Hindi (10% of trials; $OR = 0.10[0.04, 0.21]$).

A significant interaction between language and child age ($Wald\chi^2(6) = 40.15, p < .001$) additionally suggested that, with age, children became more likely to identify the dravidian face as specifically a potential speaker of Tamil (from 33% of trials in 3rd grade, to 68% of trials in 7th grade; $OR = 1.52[1.18, 1.96]$).

- This reflects accurate model of language–phenotype association

East Asian face (from language name)

```
## Analysis of Deviance Table (Type II tests)
##
## Response: asian_face
##                               LR Chisq Df           Pr(>Chisq)
## child_age_centered             2  1             0.2
## language                     737  6 < 0.0000000000000002 ***
## child_age_centered:language    38  6             0.00000014 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We saw a significant effect of language ($Wald\chi^2(6) = 736.65, p < .001$) and its interaction with child age ($Wald\chi^2(6) = 37.51, p < .001$) such that children were most likely to select the asian face in response to Chinese (85% across trials; $OR = 233.88[101.61, 681.44]$) or English (9%; $OR = 3.18[1.33, 9.34]$), and avoided it in response to Gujarati (4% across trials; $OR = 0.03[0.01, 0.06]$) — tendencies that persisted or strengthened over time. That is, with age, children became even less likely to identify the asian face as a

speaker of Gujarati (10% to 1%; $OR = 0.62[0.37, 0.95]$), and all the more likely to identify the asian face as a speaker of Chinese (from 73% in 3rd grade to 96% in 7th; $OR = 2.48[1.52, 4.31]$) or English (14% to 12%; $OR = 1.68[1.01, 2.96]$).

White face (from language name)

```
## Analysis of Deviance Table (Type II tests)
##
## Response: white_face
##
##          LR Chisq Df          Pr(>Chisq)
## child_age_centered      5  1          0.028 *
## language              746  6 < 0.0000000000000002 ***
## child_age_centered:language    33  6          0.000011 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We saw significant effects of language ($Wald\chi^2(6) = 746.48, p < .001$), child age ($Wald\chi^2(1) = 4.85, p < .05$), and their interaction ($Wald\chi^2(6) = 32.89, p < .001$), such that children showed a preference for the white face when asked about English (83% of all trials; $OR = 256.65[105.03, 869.15]$), Chinese (8% of all trials; $OR = 3.71[1.42, 12.89]$), and Tamil (9% of all trials; $OR = 3.82[1.45, 13.32]$), and a dispreference when asked about Gujarati (3% of all trials; $OR = 0.02[0.01, 0.05]$). With age, children became even more likely to select the white face in response to English (from 73% in 3rd grade to 92% in 7th grade; $OR = 2.20[1.30, 4.08]$) and less likely to select the white face in response to Gujarati (6% down to 1%; $OR = 0.62[0.35, 1.00]$).

Mixed Effects Multinomial Regression

AUDIO

```
##
## Iteration 1 - deviance = 4323 - criterion = 0.86
## Iteration 2 - deviance = 4242 - criterion = 0.07
## Iteration 3 - deviance = 4217 - criterion = 0.0079
## Iteration 4 - deviance = 4210 - criterion = 0.00029
## Iteration 5 - deviance = 4210 - criterion = 0.00000015
## Iteration 6 - deviance = 4210 - criterion = 0.000000000000018
## converged

##
## Call:
## mblogit(formula = face ~ language * age, data = fa_for_plots,
##         random = ~1 | id)
##
## Equation for asian vs hindu:
##
##          Estimate Std. Error z value          Pr(>|z|)
## (Intercept)    -2.5032     0.3400   -7.36    0.000000000000018
## languageHindi     0.8095     0.4854    1.67         0.095
## languageUrdu      1.5739     0.4801    3.28         0.001
## languageMarathi    0.5033     0.4799    1.05         0.294
## languageTamil      2.3639     0.4051    5.83    0.00000000538688
## languageEnglish (India) 2.9707     0.5360    5.54    0.00000002984738
## languageEnglish (U.S.) 4.4028     0.6713    6.56    0.00000000005421
```

```

## languageMandarin      5.5534      0.5525      10.05 < 0.0000000000000002
## age                   -0.4594      0.2081      -2.21      0.027
## languageHindi:age      0.0846      0.2877      0.29      0.769
## languageUrdu:age       0.5227      0.2882      1.81      0.070
## languageMarathi:age    -0.1027      0.2895     -0.35      0.723
## languageTamil:age      0.0890      0.2502      0.36      0.722
## languageEnglish (India):age 0.3245      0.3236      1.00      0.316
## languageEnglish (U.S.):age 0.3107      0.4044      0.77      0.442
## languageMandarin:age    1.3060      0.3094      4.22      0.00002428297271
##
## (Intercept)           ***
## languageHindi          .
## languageUrdu           **
## languageMarathi
## languageTamil          ***
## languageEnglish (India) ***
## languageEnglish (U.S.) ***
## languageMandarin       ***
## age                    *
## languageHindi:age
## languageUrdu:age       .
## languageMarathi:age
## languageTamil:age
## languageEnglish (India):age
## languageEnglish (U.S.):age
## languageMandarin:age   ***
##
## Equation for dravidian vs hindu:
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -0.7040    0.1578   -4.46 0.00000810 ***
## languageHindi     0.0653    0.2682    0.24  0.80761
## languageUrdu      1.0945    0.2813    3.89  0.00010 ***
## languageMarathi    0.8278    0.2182    3.79  0.00015 ***
## languageTamil      0.9757    0.2547    3.83  0.00013 ***
## languageEnglish (India) 1.7513    0.4075    4.30 0.00001729 ***
## languageEnglish (U.S.)  2.8817    0.5876    4.90 0.00000094 ***
## languageMandarin    0.6713    0.6169    1.09  0.27656
## age              -0.2096    0.1014   -2.07  0.03863 *
## languageHindi:age    0.3261    0.1698    1.92  0.05477 .
## languageUrdu:age     0.6346    0.1740    3.65  0.00026 ***
## languageMarathi:age  0.1596    0.1405    1.14  0.25604
## languageTamil:age    0.2434    0.1617    1.51  0.13220
## languageEnglish (India):age 0.0938    0.2478    0.38  0.70509
## languageEnglish (U.S.):age 0.2244    0.3564    0.63  0.52889
## languageMandarin:age  0.3561    0.3257    1.09  0.27434
##
## Equation for muslim vs hindu:
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -2.180     0.334   -6.53 0.000000000067729
## languageHindi     2.758     0.370    7.45 0.000000000000091
## languageUrdu      3.481     0.392    8.89 < 0.000000000000002
## languageMarathi   -0.175     0.548   -0.32  0.75022
## languageTamil      1.784     0.411    4.34 0.000014431878304
## languageEnglish (India) 2.599     0.531    4.90 0.000000982956188

```

```

## languageEnglish (U.S.)      2.932      0.743      3.95      0.000079604803162
## languageMandarin           1.851      0.699      2.65              0.00810
## age                        -0.931      0.182     -5.10      0.000000331548142
## languageHindi:age          1.030      0.208      4.95      0.000000726384764
## languageUrdu:age           1.279      0.220      5.83      0.000000005658876
## languageMarathi:age        0.036      0.295      0.12              0.90292
## languageTamil:age          0.480      0.236      2.04              0.04158
## languageEnglish (India):age 1.089      0.311      3.50              0.00047
## languageEnglish (U.S.):age  0.733      0.431      1.70              0.08922
## languageMandarin:age       1.396      0.389      3.59              0.00033
##
## (Intercept)                ***
## languageHindi               ***
## languageUrdu                ***
## languageMarathi
## languageTamil               ***
## languageEnglish (India)     ***
## languageEnglish (U.S.)      ***
## languageMandarin            **
## age                         ***
## languageHindi:age           ***
## languageUrdu:age            ***
## languageMarathi:age
## languageTamil:age           *
## languageEnglish (India):age ***
## languageEnglish (U.S.):age  .
## languageMandarin:age        ***
##
## Equation for white vs hindu:
##                               Estimate Std. Error z value      Pr(>|z|)
## (Intercept)                 -2.766      0.393     -7.03      0.0000000000002
## languageHindi                0.853      0.553      1.54              0.12274
## languageUrdu                 1.450      0.550      2.64              0.00831
## languageMarathi              0.610      0.556      1.10              0.27228
## languageTamil                2.569      0.452      5.68      0.000000013101
## languageEnglish (India)      5.574      0.514     10.85 < 0.000000000000002
## languageEnglish (U.S.)       6.459      0.670      9.63 < 0.000000000000002
## languageMandarin             3.974      0.614      6.47      0.0000000000097
## age                         -0.543      0.234     -2.32              0.02034
## languageHindi:age            0.107      0.320      0.33              0.73832
## languageUrdu:age             0.736      0.330      2.23              0.02564
## languageMarathi:age          -0.304      0.317     -0.96              0.33829
## languageTamil:age            0.212      0.273      0.78              0.43811
## languageEnglish (India):age  0.719      0.308      2.33              0.01973
## languageEnglish (U.S.):age    0.949      0.404      2.35              0.01876
## languageMandarin:age         1.180      0.345      3.43              0.00061
##
## (Intercept)                ***
## languageHindi               ***
## languageUrdu                **
## languageMarathi
## languageTamil               ***
## languageEnglish (India)     ***
## languageEnglish (U.S.)      ***

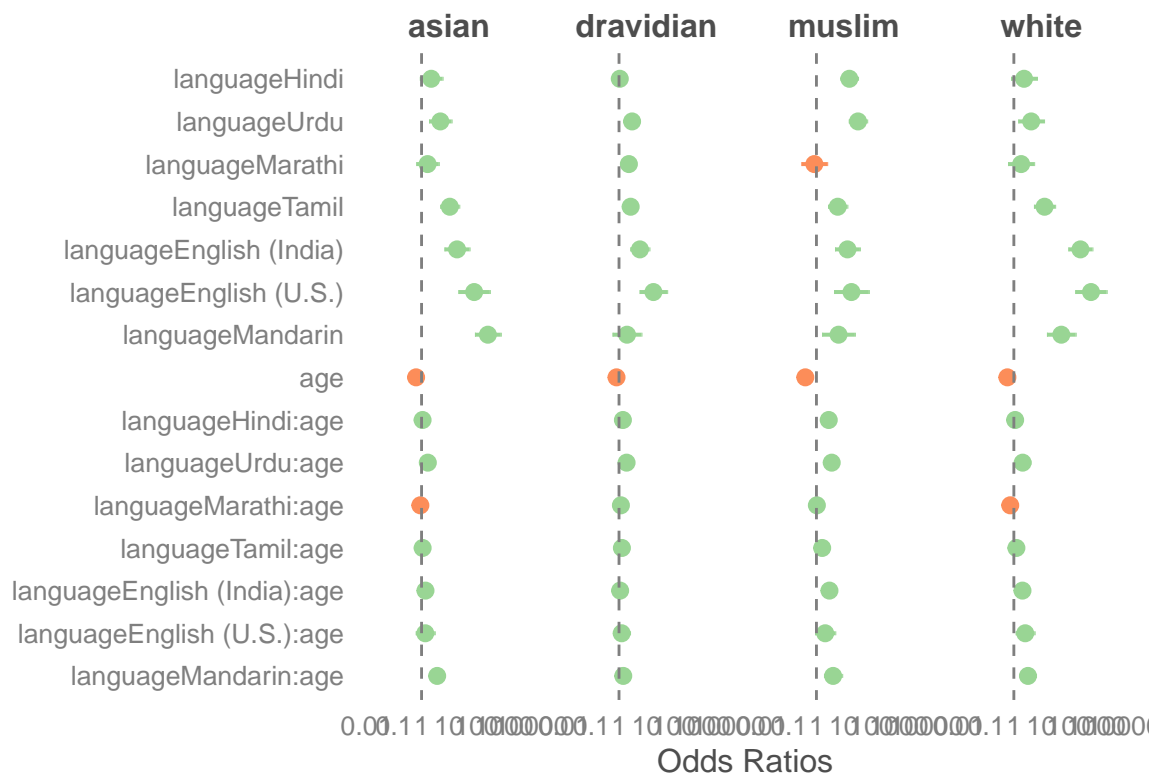
```

```

## languageMandarin      ***
## age                   *
## languageHindi:age
## languageUrdu:age      *
## languageMarathi:age
## languageTamil:age
## languageEnglish (India):age *
## languageEnglish (U.S.):age *
## languageMandarin:age  ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Co-)Variances:
## Grouping level: id
##
##           Estimate
## asian~1    0.000002035053
## dravidian~1 0.000000003138 0.000002037584
## muslim~1   -0.000000000758 0.000000003638 0.000002038253
## white~1    -0.000000000249 -0.000000001487 0.000000004534 0.000002040035
##
## Approximate residual deviance: 4210
## Number of Fisher scoring iterations: 6
## Number of observations
## Groups by id: 126
## Individual observations: 1849 (1 observation deleted due to missingness)

```

Face Selection: Who could be speaking?



face: asian
 face: dravidian
 face: muslim
 face: white
 Predictors
 Odds Ratios
 CI
 p
 Odds Ratios
 CI
 p
 Odds Ratios
 CI
 p
 Odds Ratios
 CI
 p
 (Intercept)
 0.08
 0.04 – 0.16
 <0.001
 0.49
 0.36 – 0.67
 <0.001
 0.11
 0.06 – 0.22
 <0.001
 0.06
 0.03 – 0.14
 <0.001
 languageHindi
 2.25
 0.87 – 5.82
 0.095
 1.07

0.63 – 1.81
 0.808
 15.77
 7.64 – 32.58
 <0.001
 2.35
 0.79 – 6.93
 0.123
 languageUrdu
 4.83
 1.88 – 12.37
 0.001
 2.99
 1.72 – 5.19
 <0.001
 32.50
 15.09 – 70.03
 <0.001
 4.27
 1.45 – 12.53
 0.008
 languageMarathi
 1.65
 0.65 – 4.24
 0.294
 2.29
 1.49 – 3.51
 <0.001
 0.84
 0.29 – 2.46
 0.750
 1.84
 0.62 – 5.47
 0.272
 languageTamil
 10.63

4.81 – 23.53
 <0.001
 2.65
 1.61 – 4.37
 <0.001
 5.95
 2.66 – 13.33
 <0.001
 13.05
 5.38 – 31.66
 <0.001
 languageEnglish (India)
 19.51
 6.82 – 55.78
 <0.001
 5.76
 2.59 – 12.81
 <0.001
 13.45
 4.75 – 38.09
 <0.001
 263.36
 96.19 – 721.07
 <0.001
 languageEnglish (U.S.)
 81.68
 21.91 – 304.52
 <0.001
 17.85
 5.64 – 56.47
 <0.001
 18.77
 4.37 – 80.57
 <0.001
 638.61
 171.57 – 2377.01

<0.001
 languageMandarin
 258.11
 87.39 – 762.34
 <0.001
 1.96
 0.58 – 6.56
 0.277
 6.36
 1.62 – 25.05
 0.008
 53.19
 15.96 – 177.26
 <0.001
 age
 0.63
 0.42 – 0.95
 0.027
 0.81
 0.66 – 0.99
 0.039
 0.39
 0.28 – 0.56
 <0.001
 0.58
 0.37 – 0.92
 0.020
 languageHindi:age
 1.09
 0.62 – 1.91
 0.769
 1.39
 0.99 – 1.93
 0.055
 2.80
 1.86 – 4.21

<0.001
 1.11
 0.59 – 2.08
 0.738
 languageUrdu:age
 1.69
 0.96 – 2.97
 0.070
 1.89
 1.34 – 2.65
 <0.001
 3.59
 2.34 – 5.53
 <0.001
 2.09
 1.09 – 3.99
 0.026
 languageMarathi:age
 0.90
 0.51 – 1.59
 0.723
 1.17
 0.89 – 1.54
 0.256
 1.04
 0.58 – 1.85
 0.903
 0.74
 0.40 – 1.37
 0.338
 languageTamil:age
 1.09
 0.67 – 1.79
 0.722
 1.28
 0.93 – 1.75

0.132
 1.62
 1.02 – 2.57
 0.042
 1.24
 0.72 – 2.11
 0.438
 languageEnglish (India):age
 1.38
 0.73 – 2.61
 0.316
 1.10
 0.68 – 1.79
 0.705
 2.97
 1.61 – 5.47
 <0.001
 2.05
 1.12 – 3.76
 0.020
 languageEnglish (U.S.):age
 1.36
 0.62 – 3.01
 0.442
 1.25
 0.62 – 2.52
 0.529
 2.08
 0.89 – 4.85
 0.089
 2.58
 1.17 – 5.70
 0.019
 languageMandarin:age
 3.69
 2.01 – 6.77

<0.001

1.43

0.75 – 2.70

0.274

4.04

1.88 – 8.66

<0.001

3.26

1.66 – 6.40

0.001

N id

126

Observations

1849

##

```
## Iteration 1 - deviance = 4084 - criterion = 0.28
## Iteration 2 - deviance = 4036 - criterion = 0.012
## Iteration 3 - deviance = 4034 - criterion = 0.00061
## Iteration 4 - deviance = 4033 - criterion = 0.000081
## Iteration 5 - deviance = 4033 - criterion = 0.000026
## Iteration 6 - deviance = 4033 - criterion = 0.0000097
## Iteration 7 - deviance = 4033 - criterion = 0.0000036
## Iteration 8 - deviance = 4033 - criterion = 0.0000013
## Iteration 9 - deviance = 4033 - criterion = 0.00000048
## Iteration 10 - deviance = 4033 - criterion = 0.00000018
## Iteration 11 - deviance = 4033 - criterion = 0.000000065
## Iteration 12 - deviance = 4033 - criterion = 0.000000024
## Iteration 13 - deviance = 4033 - criterion = 0.0000000088
## converged
```

##

Call:

```
## mblogit(formula = face ~ language * id_correct + age, data = fai)
```

##

Equation for asian vs hindu:

##	Estimate	Std. Error	z value	Pr(> z)	
## (Intercept)	-1.2687	0.5833	-2.18	0.02962	*
## languageHindi	-0.3308	0.9744	-0.34	0.73421	
## languageUrdu	0.5193	0.6674	0.78	0.43648	
## languageMarathi	-0.1583	0.7400	-0.21	0.83061	
## languageTamil	1.1704	0.6391	1.83	0.06706	.
## languageEnglish (India)	1.4413	0.8878	1.62	0.10448	
## languageEnglish (U.S.)	15.3760	599.8816	0.03	0.97955	
## languageMandarin	2.8556	0.6979	4.09	0.000043	***
## id_correct	-1.5993	0.7188	-2.23	0.02608	*
## age	-0.1475	0.0609	-2.42	0.01548	*

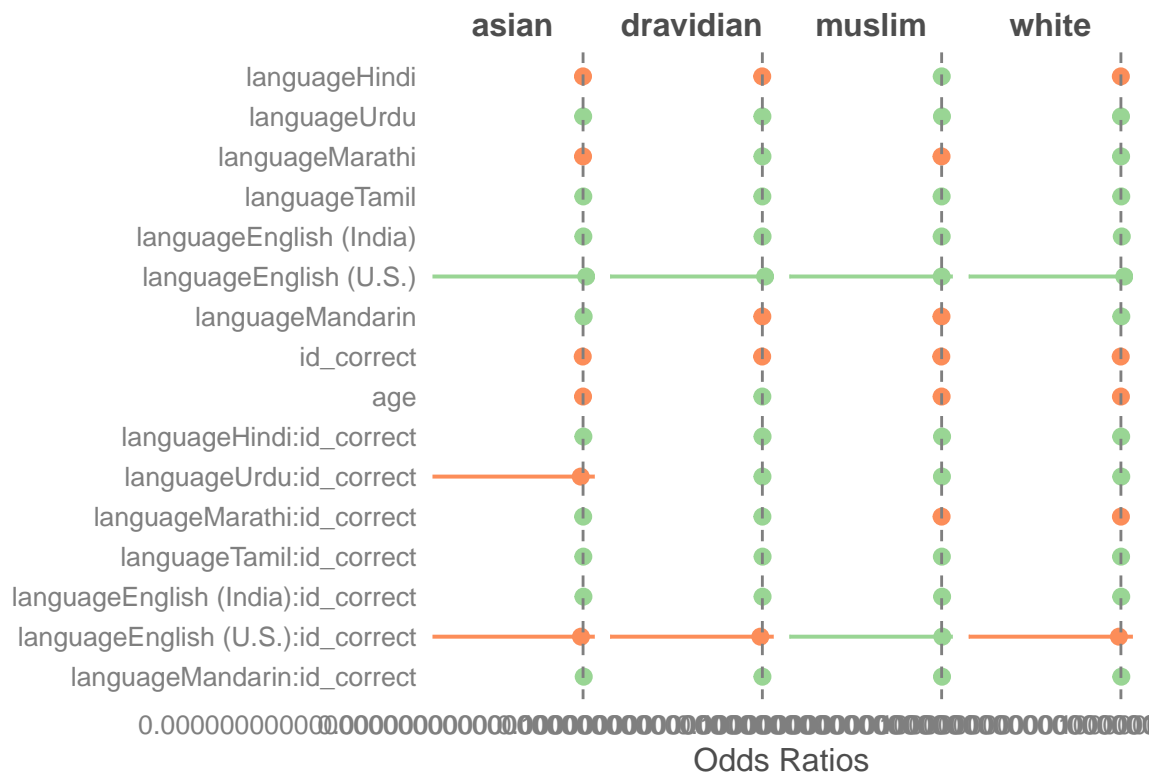
```

## languageHindi:id_correct      1.5803      1.1161      1.42  0.15679
## languageUrdu:id_correct      -11.3713     456.2557     -0.02  0.98012
## languageMarathi:id_correct     0.5934      0.9699      0.61  0.54068
## languageTamil:id_correct       1.3299      0.8540      1.56  0.11940
## languageEnglish (India):id_correct  1.8343      1.1148      1.65  0.09989 .
## languageEnglish (U.S.):id_correct -10.1641     599.8822     -0.02  0.98648
## languageMandarin:id_correct     3.2206      0.9327      3.45  0.00055 ***
##
## Equation for dravidian vs hindu:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)      0.080175   0.402980    0.20   0.842
## languageHindi    -0.667914   0.687192   -0.97   0.331
## languageUrdu      0.302779   0.468914    0.65   0.518
## languageMarathi   0.492439   0.481165    1.02   0.306
## languageTamil     0.069322   0.472974    0.15   0.883
## languageEnglish (India)  0.931449   0.708958    1.31   0.189
## languageEnglish (U.S.) 13.406459  599.881641    0.02   0.982
## languageMandarin  -0.080142   0.641451   -0.12   0.901
## id_correct       -0.955690   0.442288   -2.16   0.031 *
## age              0.000137   0.047980    0.00   0.998
## languageHindi:id_correct  0.869665   0.749689    1.16   0.246
## languageUrdu:id_correct  0.572781   0.869577    0.66   0.510
## languageMarathi:id_correct 0.258950   0.546243    0.47   0.635
## languageTamil:id_correct  1.064021   0.601304    1.77   0.077 .
## languageEnglish (India):id_correct 0.985488   0.871781    1.13   0.258
## languageEnglish (U.S.):id_correct -9.822913  599.882113   -0.02   0.987
## languageMandarin:id_correct 0.444743   0.987656    0.45   0.652
##
## Equation for muslim vs hindu:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)     -0.3021     0.4330   -0.70   0.4854
## languageHindi     0.5279     0.6172    0.86   0.3924
## languageUrdu      1.5507     0.4815    3.22   0.0013 **
## languageMarathi   -0.4801     0.5665   -0.85   0.3968
## languageTamil     0.0554     0.5119    0.11   0.9138
## languageEnglish (India) 0.2700     0.8284    0.33   0.7445
## languageEnglish (U.S.) 0.2552    848.9163    0.00   0.9998
## languageMandarin  -0.7243     0.8027   -0.90   0.3669
## id_correct       -1.6502     0.5141   -3.21   0.0013 **
## age             -0.1084     0.0518   -2.09   0.0366 *
## languageHindi:id_correct  2.0489     0.6981    2.93   0.0033 **
## languageUrdu:id_correct  1.4434     0.8052    1.79   0.0730 .
## languageMarathi:id_correct -0.2323     0.8147   -0.29   0.7756
## languageTamil:id_correct  1.1327     0.7239    1.56   0.1176
## languageEnglish (India):id_correct 2.2010     1.0147    2.17   0.0301 *
## languageEnglish (U.S.):id_correct 3.3065    848.9167    0.00   0.9969
## languageMandarin:id_correct 1.8182     1.1914    1.53   0.1270
##
## Equation for white vs hindu:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)     -1.8076     0.7659   -2.36   0.018 *
## languageHindi    -0.3958     1.3022   -0.30   0.761
## languageUrdu      0.3565     0.8744    0.41   0.683
## languageMarathi   0.7845     0.8684    0.90   0.366

```

```
## languageTamil 1.6354 0.8118 2.01 0.044 *
## languageEnglish (India) 4.2250 0.9262 4.56 0.0000051 ***
## languageEnglish (U.S.) 16.5436 599.8817 0.03 0.978
## languageMandarin 1.9211 0.9062 2.12 0.034 *
## id_correct -0.9235 0.8608 -1.07 0.283
## age -0.0161 0.0572 -0.28 0.778
## languageHindi:id_correct 1.2783 1.4116 0.91 0.365
## languageUrdu:id_correct 1.6757 1.2937 1.30 0.195
## languageMarathi:id_correct -0.0601 1.0235 -0.06 0.953
## languageTamil:id_correct 0.6602 0.9817 0.67 0.501
## languageEnglish (India):id_correct 1.4273 1.0890 1.31 0.190
## languageEnglish (U.S.):id_correct -9.5408 599.8822 -0.02 0.987
## languageMandarin:id_correct 1.8498 1.1151 1.66 0.097 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate residual Deviance: 4030
## Number of Fisher scoring iterations: 13
## Number of observations: 1741
## (128 observations deleted due to missingness)
```

Face Selection: Who could be speaking?



face: asian

face: dravidian

face: muslim

face: white
Predictors
Odds Ratios
CI
p
Odds Ratios
CI
p
Odds Ratios
CI
p
Odds Ratios
CI
p
(Intercept)
0.28
0.09 – 0.88
0.030
1.08
0.49 – 2.39
0.842
0.74
0.32 – 1.73
0.485
0.16
0.04 – 0.74
0.018
languageHindi
0.72
0.11 – 4.85
0.734
0.51
0.13 – 1.97
0.331
1.70
0.51 – 5.68

0.392
0.67
0.05 – 8.64
0.761
languageUrdu
1.68
0.45 – 6.22
0.436
1.35
0.54 – 3.39
0.518
4.71
1.83 – 12.11
0.001
1.43
0.26 – 7.93
0.683
languageMarathi
0.85
0.20 – 3.64
0.831
1.64
0.64 – 4.20
0.306
0.62
0.20 – 1.88
0.397
2.19
0.40 – 12.02
0.366
languageTamil
3.22
0.92 – 11.28
0.067
1.07
0.42 – 2.71

0.883
 1.06
 0.39 – 2.88
 0.914
 5.13
 1.05 – 25.19
 0.044
 languageEnglish (India)
 4.23
 0.74 – 24.08
 0.104
 2.54
 0.63 – 10.19
 0.189
 1.31
 0.26 – 6.64
 0.744
 68.37
 11.13 – 419.98
 <0.001
 languageEnglish (U.S.)
 4761207.24
 0.00 – Inf
 0.980
 664279.79
 0.00 – Inf
 0.982
 1.29
 0.00 – Inf
 1.000
 15303889.60
 0.00 – Inf
 0.978
 languageMandarin
 17.39
 4.43 – 68.27

<0.001
0.92
0.26 – 3.24
0.901
0.48
0.10 – 2.34
0.367
6.83
1.16 – 40.34
0.034
id_correct
0.20
0.05 – 0.83
0.026
0.38
0.16 – 0.92
0.031
0.19
0.07 – 0.53
0.001
0.40
0.07 – 2.15
0.283
age
0.86
0.77 – 0.97
0.015
1.00
0.91 – 1.10
0.998
0.90
0.81 – 0.99
0.037
0.98
0.88 – 1.10
0.778

languageHindi:id_correct

4.86

0.54 – 43.28

0.157

2.39

0.55 – 10.37

0.246

7.76

1.98 – 30.49

0.003

3.59

0.23 – 57.11

0.365

languageUrdu:id_correct

0.00

0.00 – Inf

0.980

1.77

0.32 – 9.75

0.510

4.24

0.87 – 20.52

0.073

5.34

0.42 – 67.45

0.195

languageMarathi:id_correct

1.81

0.27 – 12.11

0.541

1.30

0.44 – 3.78

0.635

0.79

0.16 – 3.91

0.776

0.94
 0.13 – 7.00
 0.953
 languageTamil:id_correct
 3.78
 0.71 – 20.16
 0.119
 2.90
 0.89 – 9.42
 0.077
 3.10
 0.75 – 12.83
 0.118
 1.94
 0.28 – 13.25
 0.501
 languageEnglish (India):id_correct
 6.26
 0.70 – 55.66
 0.100
 2.68
 0.49 – 14.79
 0.258
 9.03
 1.24 – 66.00
 0.030
 4.17
 0.49 – 35.22
 0.190
 languageEnglish (U.S.):id_correct
 0.00
 0.00 – Inf
 0.986
 0.00
 0.00 – Inf
 0.987

27.29
 0.00 – Inf
 0.997
 0.00
 0.00 – Inf
 0.987
 languageMandarin:id_correct
 25.04
 4.03 – 155.81
 0.001
 1.56
 0.23 – 10.81
 0.652
 6.16
 0.60 – 63.64
 0.127
 6.36
 0.71 – 56.57
 0.097
 Observations
 1741
 Nagelkerke's R2
 0.619

```

##
## Iteration 1 - deviance = 3910 - criterion = 0.25
## Iteration 2 - deviance = 3841 - criterion = 0.018
## Iteration 3 - deviance = 3834 - criterion = 0.0017
## Iteration 4 - deviance = 3834 - criterion = 0.00016
## Iteration 5 - deviance = 3834 - criterion = 0.000027
## Iteration 6 - deviance = 3834 - criterion = 0.0000095
## Iteration 7 - deviance = 3834 - criterion = 0.0000035
## Iteration 8 - deviance = 3833 - criterion = 0.0000013
## Iteration 9 - deviance = 3833 - criterion = 0.00000047
## Iteration 10 - deviance = 3833 - criterion = 0.00000017
## Iteration 11 - deviance = 3833 - criterion = 0.000000064
## Iteration 12 - deviance = 3833 - criterion = 0.000000024
## Iteration 13 - deviance = 3833 - criterion = 0.0000000087
## converged

##
## Call:
## mblogit(formula = face ~ language * id_correct * child_age_centered,

```

```
## data = fai[fai$face != "idk" & fai$num_faces == 1, ]
##
## Equation for asian vs hindu:
##
## Estimate Std. Error
## (Intercept) -2.0684 1.0514
## languageHindi 0.0617 1.5815
## languageUrdu 1.3046 1.1068
## languageMarathi 0.7552 1.1783
## languageTamil 2.0759 1.0905
## languageEnglish (India) 2.2473 1.2628
## languageEnglish (U.S.) 14.9170 653.5689
## languageMandarin 4.4425 1.2398
## id_correct -0.7466 1.1328
## child_age_centered -0.9940 0.5525
## languageHindi:id_correct 0.9368 1.6849
## languageUrdu:id_correct -9.9189 493.6155
## languageMarathi:id_correct -0.3110 1.3455
## languageTamil:id_correct 0.3959 1.2287
## languageEnglish (India):id_correct 0.8975 1.4405
## languageEnglish (U.S.):id_correct -9.8363 653.5695
## languageMandarin:id_correct 1.9350 1.4723
## languageHindi:child_age_centered 0.5563 0.7668
## languageUrdu:child_age_centered 0.9912 0.5892
## languageMarathi:child_age_centered 0.9771 0.6377
## languageTamil:child_age_centered 0.4743 0.5771
## languageEnglish (India):child_age_centered 0.8937 0.7103
## languageEnglish (U.S.):child_age_centered 0.1489 319.4281
## languageMandarin:child_age_centered 1.6658 0.6372
## id_correct:child_age_centered 0.7132 0.6148
## languageHindi:id_correct:child_age_centered -0.6634 0.8469
## languageUrdu:id_correct:child_age_centered 0.5324 261.4263
## languageMarathi:id_correct:child_age_centered -1.2935 0.7596
## languageTamil:id_correct:child_age_centered -0.1205 0.7010
## languageEnglish (India):id_correct:child_age_centered -0.7679 0.8226
## languageEnglish (U.S.):id_correct:child_age_centered -0.3440 319.4286
## languageMandarin:id_correct:child_age_centered -0.4174 0.7894
## z value Pr(>|z|)
## (Intercept) -1.97 0.04916 *
## languageHindi 0.04 0.96889
## languageUrdu 1.18 0.23850
## languageMarathi 0.64 0.52157
## languageTamil 1.90 0.05696 .
## languageEnglish (India) 1.78 0.07514 .
## languageEnglish (U.S.) 0.02 0.98179
## languageMandarin 3.58 0.00034 ***
## id_correct -0.66 0.50987
## child_age_centered -1.80 0.07201 .
## languageHindi:id_correct 0.56 0.57820
## languageUrdu:id_correct -0.02 0.98397
## languageMarathi:id_correct -0.23 0.81721
## languageTamil:id_correct 0.32 0.74727
## languageEnglish (India):id_correct 0.62 0.53325
## languageEnglish (U.S.):id_correct -0.02 0.98799
## languageMandarin:id_correct 1.31 0.18874
```

```

## languageHindi:child_age_centered      0.73  0.46817
## languageUrdu:child_age_centered       1.68  0.09249 .
## languageMarathi:child_age_centered    1.53  0.12546
## languageTamil:child_age_centered      0.82  0.41122
## languageEnglish (India):child_age_centered 1.26  0.20829
## languageEnglish (U.S.):child_age_centered 0.00  0.99963
## languageMandarin:child_age_centered    2.61  0.00894 **
## id_correct:child_age_centered         1.16  0.24598
## languageHindi:id_correct:child_age_centered -0.78  0.43348
## languageUrdu:id_correct:child_age_centered 0.00  0.99838
## languageMarathi:id_correct:child_age_centered -1.70  0.08862 .
## languageTamil:id_correct:child_age_centered -0.17  0.86349
## languageEnglish (India):id_correct:child_age_centered -0.93  0.35055
## languageEnglish (U.S.):id_correct:child_age_centered 0.00  0.99914
## languageMandarin:id_correct:child_age_centered -0.53  0.59703
##
## Equation for dravidian vs hindu:
##
##                                     Estimate Std. Error
## (Intercept)                       -0.0250    0.4225
## languageHindi                     -0.5460    0.7026
## languageUrdu                      0.4315    0.4912
## languageMarathi                   0.7328    0.5142
## languageTamil                    0.2584    0.5050
## languageEnglish (India)           1.0307    0.7325
## languageEnglish (U.S.)           13.5827   653.5666
## languageMandarin                  0.3895    0.9033
## id_correct                       -0.7800    0.4602
## child_age_centered                -0.3304    0.2701
## languageHindi:id_correct           0.6513    0.7662
## languageUrdu:id_correct            2.6067    2.3716
## languageMarathi:id_correct         0.0223    0.5858
## languageTamil:id_correct           0.7226    0.6335
## languageEnglish (India):id_correct 0.7131    0.9021
## languageEnglish (U.S.):id_correct -10.1152   653.5671
## languageMandarin:id_correct        0.0982    1.3608
## languageHindi:child_age_centered  0.4350    0.3849
## languageUrdu:child_age_centered    0.7427    0.3106
## languageMarathi:child_age_centered 0.5932    0.3260
## languageTamil:child_age_centered   0.2231    0.3135
## languageEnglish (India):child_age_centered 0.3134    0.4718
## languageEnglish (U.S.):child_age_centered 0.2796   319.4273
## languageMandarin:child_age_centered 0.5604    0.4690
## id_correct:child_age_centered      0.1468    0.2943
## languageHindi:id_correct:child_age_centered -0.0922    0.4326
## languageUrdu:id_correct:child_age_centered 0.6843    1.0551
## languageMarathi:id_correct:child_age_centered -0.5107    0.3720
## languageTamil:id_correct:child_age_centered 0.3587    0.4210
## languageEnglish (India):id_correct:child_age_centered -0.3208    0.5631
## languageEnglish (U.S.):id_correct:child_age_centered -0.5135   319.4276
## languageMandarin:id_correct:child_age_centered -0.2201    0.7428
##
##                                     z value Pr(>|z|)
## (Intercept)                       -0.06    0.953
## languageHindi                     -0.78    0.437
## languageUrdu                      0.88    0.380

```

## languageMarathi	1.43	0.154
## languageTamil	0.51	0.609
## languageEnglish (India)	1.41	0.159
## languageEnglish (U.S.)	0.02	0.983
## languageMandarin	0.43	0.666
## id_correct	-1.70	0.090 .
## child_age_centered	-1.22	0.221
## languageHindi:id_correct	0.85	0.395
## languageUrdu:id_correct	1.10	0.272
## languageMarathi:id_correct	0.04	0.970
## languageTamil:id_correct	1.14	0.254
## languageEnglish (India):id_correct	0.79	0.429
## languageEnglish (U.S.):id_correct	-0.02	0.988
## languageMandarin:id_correct	0.07	0.942
## languageHindi:child_age_centered	1.13	0.258
## languageUrdu:child_age_centered	2.39	0.017 *
## languageMarathi:child_age_centered	1.82	0.069 .
## languageTamil:child_age_centered	0.71	0.477
## languageEnglish (India):child_age_centered	0.66	0.506
## languageEnglish (U.S.):child_age_centered	0.00	0.999
## languageMandarin:child_age_centered	1.19	0.232
## id_correct:child_age_centered	0.50	0.618
## languageHindi:id_correct:child_age_centered	-0.21	0.831
## languageUrdu:id_correct:child_age_centered	0.65	0.517
## languageMarathi:id_correct:child_age_centered	-1.37	0.170
## languageTamil:id_correct:child_age_centered	0.85	0.394
## languageEnglish (India):id_correct:child_age_centered	-0.57	0.569
## languageEnglish (U.S.):id_correct:child_age_centered	0.00	0.999
## languageMandarin:id_correct:child_age_centered	-0.30	0.767
##		
## Equation for muslim vs hindu:		
##	Estimate	Std. Error
## (Intercept)	-3.851	1.936
## languageHindi	4.079	1.990
## languageUrdu	5.136	1.949
## languageMarathi	2.673	2.013
## languageTamil	3.664	1.960
## languageEnglish (India)	3.155	2.177
## languageEnglish (U.S.)	3.851	924.284
## languageMandarin	3.017	2.241
## id_correct	1.767	1.963
## child_age_centered	-2.232	0.852
## languageHindi:id_correct	-1.407	2.024
## languageUrdu:id_correct	0.336	3.010
## languageMarathi:id_correct	-3.832	2.214
## languageTamil:id_correct	-2.447	2.041
## languageEnglish (India):id_correct	-0.671	2.268
## languageEnglish (U.S.):id_correct	-0.365	924.284
## languageMandarin:id_correct	-1.561	2.512
## languageHindi:child_age_centered	2.130	0.880
## languageUrdu:child_age_centered	2.569	0.862
## languageMarathi:child_age_centered	1.825	0.902
## languageTamil:child_age_centered	1.650	0.870
## languageEnglish (India):child_age_centered	1.557	1.010

```

## languageEnglish (U.S.):child_age_centered      2.232    451.739
## languageMandarin:child_age_centered            2.318      1.007
## id_correct:child_age_centered                  1.586      0.874
## languageHindi:id_correct:child_age_centered    -1.336      0.909
## languageUrdu:id_correct:child_age_centered     -0.553      1.319
## languageMarathi:id_correct:child_age_centered  -2.358      1.025
## languageTamil:id_correct:child_age_centered    -1.308      0.959
## languageEnglish (India):id_correct:child_age_centered -0.518      1.077
## languageEnglish (U.S.):id_correct:child_age_centered -2.196    451.739
## languageMandarin:id_correct:child_age_centered -0.514      1.222
##
## z value Pr(>|z|)
## (Intercept) -1.99  0.0467 *
## languageHindi 2.05  0.0404 *
## languageUrdu 2.64  0.0084 **
## languageMarathi 1.33  0.1844
## languageTamil 1.87  0.0616 .
## languageEnglish (India) 1.45  0.1474
## languageEnglish (U.S.) 0.00  0.9967
## languageMandarin 1.35  0.1783
## id_correct 0.90  0.3681
## child_age_centered -2.62  0.0088 **
## languageHindi:id_correct -0.69  0.4871
## languageUrdu:id_correct 0.11  0.9110
## languageMarathi:id_correct -1.73  0.0835 .
## languageTamil:id_correct -1.20  0.2305
## languageEnglish (India):id_correct -0.30  0.7672
## languageEnglish (U.S.):id_correct 0.00  0.9997
## languageMandarin:id_correct -0.62  0.5343
## languageHindi:child_age_centered 2.42  0.0155 *
## languageUrdu:child_age_centered 2.98  0.0029 **
## languageMarathi:child_age_centered 2.02  0.0432 *
## languageTamil:child_age_centered 1.90  0.0578 .
## languageEnglish (India):child_age_centered 1.54  0.1232
## languageEnglish (U.S.):child_age_centered 0.00  0.9961
## languageMandarin:child_age_centered 2.30  0.0213 *
## id_correct:child_age_centered 1.81  0.0696 .
## languageHindi:id_correct:child_age_centered -1.47  0.1417
## languageUrdu:id_correct:child_age_centered -0.42  0.6753
## languageMarathi:id_correct:child_age_centered -2.30  0.0214 *
## languageTamil:id_correct:child_age_centered -1.36  0.1725
## languageEnglish (India):id_correct:child_age_centered -0.48  0.6306
## languageEnglish (U.S.):id_correct:child_age_centered 0.00  0.9961
## languageMandarin:id_correct:child_age_centered -0.42  0.6740
##
## Equation for white vs hindu:
##
## Estimate Std. Error
## (Intercept) -4.028    2.487
## languageHindi 1.804    2.719
## languageUrdu 2.601    2.525
## languageMarathi 1.399    2.704
## languageTamil 4.009    2.503
## languageEnglish (India) 6.472    2.543
## languageEnglish (U.S.) 18.808   653.571
## languageMandarin 4.852    2.590

```


## id_correct	1.329	2.520
## child_age_centered	-1.618	1.103
## languageHindi:id_correct	-1.335	2.795
## languageUrdu:id_correct	1.313	3.551
## languageMarathi:id_correct	-0.810	2.775
## languageTamil:id_correct	-2.008	2.576
## languageEnglish (India):id_correct	-0.861	2.610
## languageEnglish (U.S.):id_correct	-11.838	653.571
## languageMandarin:id_correct	-0.624	2.718
## languageHindi:child_age_centered	1.562	1.223
## languageUrdu:child_age_centered	1.672	1.133
## languageMarathi:child_age_centered	0.602	1.206
## languageTamil:child_age_centered	1.233	1.115
## languageEnglish (India):child_age_centered	1.747	1.156
## languageEnglish (U.S.):child_age_centered	1.985	319.429
## languageMandarin:child_age_centered	2.243	1.159
## id_correct:child_age_centered	1.185	1.131
## languageHindi:id_correct:child_age_centered	-1.692	1.281
## languageUrdu:id_correct:child_age_centered	0.712	1.614
## languageMarathi:id_correct:child_age_centered	-1.029	1.264
## languageTamil:id_correct:child_age_centered	-1.305	1.192
## languageEnglish (India):id_correct:child_age_centered	-1.104	1.209
## languageEnglish (U.S.):id_correct:child_age_centered	-1.554	319.429
## languageMandarin:id_correct:child_age_centered	-1.171	1.255
##	z value	Pr(> z)
## (Intercept)	-1.62	0.105
## languageHindi	0.66	0.507
## languageUrdu	1.03	0.303
## languageMarathi	0.52	0.605
## languageTamil	1.60	0.109
## languageEnglish (India)	2.54	0.011 *
## languageEnglish (U.S.)	0.03	0.977
## languageMandarin	1.87	0.061 .
## id_correct	0.53	0.598
## child_age_centered	-1.47	0.142
## languageHindi:id_correct	-0.48	0.633
## languageUrdu:id_correct	0.37	0.711
## languageMarathi:id_correct	-0.29	0.770
## languageTamil:id_correct	-0.78	0.436
## languageEnglish (India):id_correct	-0.33	0.741
## languageEnglish (U.S.):id_correct	-0.02	0.986
## languageMandarin:id_correct	-0.23	0.818
## languageHindi:child_age_centered	1.28	0.201
## languageUrdu:child_age_centered	1.48	0.140
## languageMarathi:child_age_centered	0.50	0.618
## languageTamil:child_age_centered	1.11	0.269
## languageEnglish (India):child_age_centered	1.51	0.130
## languageEnglish (U.S.):child_age_centered	0.01	0.995
## languageMandarin:child_age_centered	1.94	0.053 .
## id_correct:child_age_centered	1.05	0.295
## languageHindi:id_correct:child_age_centered	-1.32	0.186
## languageUrdu:id_correct:child_age_centered	0.44	0.659
## languageMarathi:id_correct:child_age_centered	-0.81	0.416
## languageTamil:id_correct:child_age_centered	-1.10	0.273

```
## languageEnglish (India):id_correct:child_age_centered -0.91 0.361
## languageEnglish (U.S.):id_correct:child_age_centered 0.00 0.996
## languageMandarin:id_correct:child_age_centered -0.93 0.351
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate residual Deviance: 3830
## Number of Fisher scoring iterations: 13
## Number of observations: 1741
## (128 observations deleted due to missingness)
```

LABEL

```
##
## Iteration 1 - deviance = 3072 - criterion = 0.81
## Iteration 2 - deviance = 2982 - criterion = 0.071
## Iteration 3 - deviance = 2961 - criterion = 0.019
## Iteration 4 - deviance = 2960 - criterion = 0.0058
## Iteration 5 - deviance = 2960 - criterion = 0.0014
## Iteration 6 - deviance = 2960 - criterion = 0.000068
## Iteration 7 - deviance = 2960 - criterion = 0.0000001
## Iteration 8 - deviance = 2960 - criterion = 0.000000000000021
## converged

##
## Call:
## mblogit(formula = face ~ language * age, data = fl_for_plots,
## random = ~1 | id)
##
## Equation for asian vs hindu:
##
```

	Estimate	Std. Error	z value	Pr(> z)	
## (Intercept)	-2.989	0.432	-6.92	0.00000000000044	***
## languageHindi	0.701	0.584	1.20	0.2303	
## languageUrdu	2.892	0.604	4.79	0.0000016769136	***
## languageMarathi	0.355	0.566	0.63	0.5311	
## languageTamil	1.585	0.536	2.96	0.0031	**
## languageEnglish	4.647	0.771	6.02	0.0000000016991	***
## languageMandarin	7.191	0.775	9.28	< 0.0000000000000002	***
## age	-0.509	0.239	-2.13	0.0331	*
## languageHindi:age	0.256	0.335	0.76	0.4453	
## languageUrdu:age	0.472	0.335	1.41	0.1589	
## languageMarathi:age	0.349	0.331	1.06	0.2907	
## languageTamil:age	0.166	0.300	0.55	0.5802	
## languageEnglish:age	0.461	0.456	1.01	0.3119	
## languageMandarin:age	1.041	0.424	2.45	0.0142	*

```
##
## Equation for dravidian vs hindu:
##
```

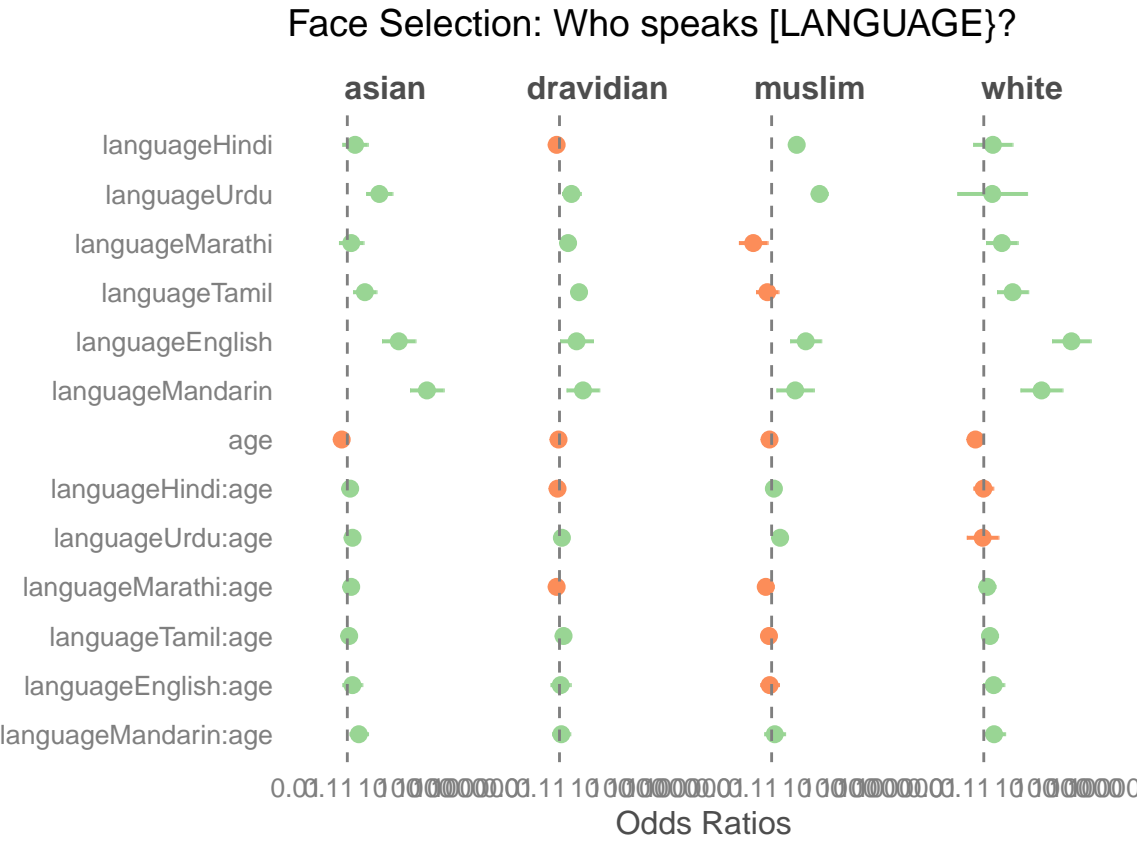
	Estimate	Std. Error	z value	Pr(> z)	
## (Intercept)	-1.0273	0.1668	-6.16	0.0000000000741112	***
## languageHindi	-0.2566	0.3059	-0.84	0.40157	
## languageUrdu	1.0856	0.4298	2.53	0.01154	*
## languageMarathi	0.7772	0.2216	3.51	0.00045	***
## languageTamil	1.7681	0.2316	7.63	0.0000000000000023	***

```

## languageEnglish      1.5434      0.7574      2.04      0.04159 *
## languageMandarin     2.1229      0.7527      2.82      0.00480 **
## age                  -0.0882      0.1034     -0.85      0.39334
## languageHindi:age    -0.1771      0.1857     -0.95      0.34027
## languageUrdu:age      0.2173      0.2497      0.87      0.38433
## languageMarathi:age  -0.2569      0.1383     -1.86      0.06312 .
## languageTamil:age     0.3678      0.1446      2.54      0.01097 *
## languageEnglish:age   0.1102      0.4623      0.24      0.81159
## languageMandarin:age  0.1669      0.4133      0.40      0.68633
##
## Equation for muslim vs hindu:
##               Estimate Std. Error z value      Pr(>|z|)
## (Intercept)      -1.808      0.231    -7.84  0.0000000000000044 ***
## languageHindi       2.265      0.274     8.25 < 0.0000000000000002 ***
## languageUrdu        4.329      0.378    11.45 < 0.0000000000000002 ***
## languageMarathi     -1.661      0.660     -2.52      0.0118 *
## languageTamil       -0.390      0.515     -0.76      0.4495
## languageEnglish      3.083      0.716     4.31  0.0000166161814767 ***
## languageMandarin     2.128      0.861     2.47      0.0135 *
## age                -0.191      0.141     -1.36      0.1754
## languageHindi:age    0.204      0.168     1.21      0.2256
## languageUrdu:age     0.767      0.223     3.43      0.0006 ***
## languageMarathi:age  -0.529      0.361     -1.46      0.1432
## languageTamil:age    -0.241      0.289     -0.83      0.4042
## languageEnglish:age  -0.175      0.426     -0.41      0.6821
## languageMandarin:age  0.283      0.477     0.59      0.5532
##
## Equation for white vs hindu:
##               Estimate Std. Error z value      Pr(>|z|)
## (Intercept)      -3.729      0.665     -5.60  0.0000000021 ***
## languageHindi       0.821      0.905      0.91      0.36426
## languageUrdu        0.764      1.606      0.48      0.63399
## languageMarathi     1.636      0.729      2.25      0.02475 *
## languageTamil       2.608      0.719      3.63      0.00029 ***
## languageEnglish      7.920      0.889     8.91 < 0.0000000000000002 ***
## languageMandarin     5.219      0.967     5.40  0.0000000067 ***
## age                -0.754      0.336     -2.24      0.02486 *
## languageHindi:age    -0.033      0.456     -0.07      0.94239
## languageUrdu:age     -0.104      0.728     -0.14      0.88660
## languageMarathi:age  0.316      0.380      0.83      0.40627
## languageTamil:age    0.560      0.373      1.50      0.13381
## languageEnglish:age  0.893      0.492      1.82      0.06936 .
## languageMandarin:age  0.929      0.510      1.82      0.06860 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Co-)Variances:
## Grouping level: id
##               Estimate                               Std.Err.
## asian~1         0.00001026717                        0.000000000000000964
## dravidian~1    -0.00000002889  0.00001027054          0.000000000000000682  0.000
## muslim~1       -0.00000000150 -0.00000001153  0.00001032284      0.000000000000000687  0.000
## white~1        -0.00000000747  0.00000000559 -0.00000002244  0.00001033150      0.000000000000000688  0.000
##

```

Approximate residual deviance: 2960
Number of Fisher scoring iterations: 8
Number of observations
Groups by id: 126
Individual observations: 1633 (1 observation deleted due to missingness)



face: asian
face: dravidian
face: muslim
face: white
Predictors
Odds Ratios
CI
p
Odds Ratios
CI
p
Odds Ratios
CI

p	
Odds Ratios	
CI	
p	
(Intercept)	
0.05	
0.02 – 0.12	
<0.001	
0.36	
0.26 – 0.50	
<0.001	
0.16	
0.10 – 0.26	
<0.001	
0.02	
0.01 – 0.09	
<0.001	
languageHindi	
2.02	
0.64 – 6.34	
0.230	
0.77	
0.42 – 1.41	
0.402	
9.63	
5.62 – 16.49	
<0.001	
2.27	
0.39 – 13.40	
0.364	
languageUrdu	
18.03	
5.52 – 58.92	
<0.001	
2.96	
1.28 – 6.88	

0.012
 75.84
 36.14 – 159.12
 <0.001
 2.15
 0.09 – 50.01
 0.634
 languageMarathi
 1.43
 0.47 – 4.33
 0.531
 2.18
 1.41 – 3.36
 <0.001
 0.19
 0.05 – 0.69
 0.012
 5.13
 1.23 – 21.42
 0.025
 languageTamil
 4.88
 1.71 – 13.94
 0.003
 5.86
 3.72 – 9.23
 <0.001
 0.68
 0.25 – 1.86
 0.450
 13.57
 3.31 – 55.57
 <0.001
 languageEnglish
 104.32
 22.99 – 473.33

<0.001
4.68
1.06 – 20.66
0.042
21.83
5.36 – 88.83
<0.001
2752.85
481.83 – 15727.75
<0.001
languageMandarin
1328.01
290.63 – 6068.19
<0.001
8.36
1.91 – 36.54
0.005
8.40
1.55 – 45.43
0.013
184.67
27.77 – 1228.21
<0.001
age
0.60
0.38 – 0.96
0.033
0.92
0.75 – 1.12
0.393
0.83
0.63 – 1.09
0.175
0.47
0.24 – 0.91
0.025

languageHindi:age

1.29

0.67 – 2.49

0.445

0.84

0.58 – 1.21

0.340

1.23

0.88 – 1.71

0.226

0.97

0.40 – 2.37

0.942

languageUrdu:age

1.60

0.83 – 3.09

0.159

1.24

0.76 – 2.03

0.384

2.15

1.39 – 3.34

0.001

0.90

0.22 – 3.75

0.887

languageMarathi:age

1.42

0.74 – 2.71

0.291

0.77

0.59 – 1.01

0.063

0.59

0.29 – 1.20

0.143

1.37
 0.65 – 2.89
 0.406
 languageTamil:age
 1.18
 0.66 – 2.12
 0.580
 1.44
 1.09 – 1.92
 0.011
 0.79
 0.45 – 1.38
 0.404
 1.75
 0.84 – 3.64
 0.134
 languageEnglish:age
 1.59
 0.65 – 3.88
 0.312
 1.12
 0.45 – 2.76
 0.812
 0.84
 0.36 – 1.94
 0.682
 2.44
 0.93 – 6.41
 0.069
 languageMandarin:age
 2.83
 1.23 – 6.50
 0.014
 1.18
 0.53 – 2.66
 0.686

1.33

0.52 – 3.38

0.553

2.53

0.93 – 6.89

0.069

N id

126

Observations

1633

##

```
## Iteration 1 - deviance = 2561 - criterion = 0.13
## Iteration 2 - deviance = 2488 - criterion = 0.029
## Iteration 3 - deviance = 2481 - criterion = 0.0029
## Iteration 4 - deviance = 2479 - criterion = 0.0005
## Iteration 5 - deviance = 2479 - criterion = 0.00017
## Iteration 6 - deviance = 2479 - criterion = 0.000061
## Iteration 7 - deviance = 2479 - criterion = 0.000022
## Iteration 8 - deviance = 2479 - criterion = 0.0000082
## Iteration 9 - deviance = 2479 - criterion = 0.000003
## Iteration 10 - deviance = 2479 - criterion = 0.0000011
## Iteration 11 - deviance = 2479 - criterion = 0.00000041
## Iteration 12 - deviance = 2479 - criterion = 0.00000015
## Iteration 13 - deviance = 2479 - criterion = 0.000000056
## Iteration 14 - deviance = 2479 - criterion = 0.00000002
## Iteration 15 - deviance = 2479 - criterion = 0.0000000075
## converged
```

##

Call:

```
## mblogit(formula = face ~ language * id_correct + age, data = fli)
```

##

Equation for asian vs hindu:

##	Estimate	Std. Error	z value	Pr(> z)	
## (Intercept)	-1.7273	0.5148	-3.36	0.00079	***
## languageHindi	-14.9525	1051.5966	-0.01	0.98866	
## languageUrdu	1.6226	0.6313	2.57	0.01017	*
## languageMarathi	-0.0556	0.6728	-0.08	0.93410	
## languageTamil	0.2818	0.6473	0.44	0.66338	
## languageMandarin	4.9898	0.8856	5.63	0.000000018	***
## id_correct	-1.5943	0.7221	-2.21	0.02726	*
## age	-0.2056	0.0815	-2.52	0.01164	*
## languageHindi:id_correct	16.1904	1051.5968	0.02	0.98772	
## languageUrdu:id_correct	-14.1654	1416.0601	-0.01	0.99202	
## languageMarathi:id_correct	-0.2434	1.1062	-0.22	0.82585	
## languageTamil:id_correct	2.2003	0.9283	2.37	0.01778	*
## languageMandarin:id_correct	3.3877	1.4279	2.37	0.01767	*

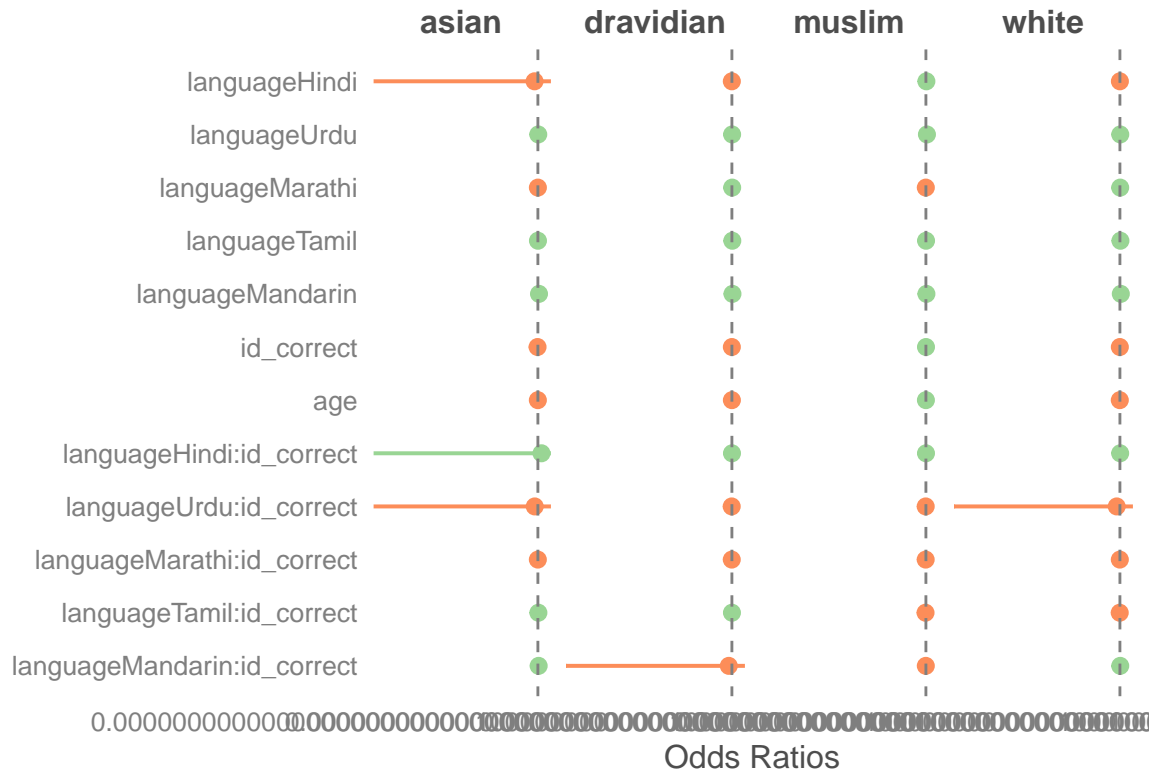
##

```

## Equation for dravidian vs hindu:
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -0.9150    0.4043   -2.26  0.0236 *
## languageHindi  -0.3000    0.6979   -0.43  0.6673
## languageUrdu    0.9165    0.5449    1.68  0.0926 .
## languageMarathi  1.1675    0.4673    2.50  0.0125 *
## languageTamil   1.7988    0.4555    3.95 0.000078 ***
## languageMandarin 2.5247    0.8740    2.89  0.0039 **
## id_correct     -0.2642    0.4510   -0.59  0.5580
## age            -0.0528    0.0519   -1.02  0.3097
## languageHindi:id_correct  0.3803    0.7749    0.49  0.6236
## languageUrdu:id_correct -0.8909    1.2971   -0.69  0.4922
## languageMarathi:id_correct -0.6147    0.5405   -1.14  0.2554
## languageTamil:id_correct  0.2516    0.5715    0.44  0.6597
## languageMandarin:id_correct -13.8767   536.6302   -0.03  0.9794
##
## Equation for muslim vs hindu:
##               Estimate Std. Error z value      Pr(>|z|)
## (Intercept)    -2.2846    0.7433   -3.07      0.0021 **
## languageHindi    2.1444    0.8472    2.53      0.0114 *
## languageUrdu     4.6166    0.7916    5.83 0.0000000055 ***
## languageMarathi  -0.3932    1.0406   -0.38      0.7056
## languageTamil    0.6441    0.8544    0.75      0.4509
## languageMandarin 2.2739    1.2469    1.82      0.0682 .
## id_correct       0.3777    0.7902    0.48      0.6327
## age              0.0569    0.0604    0.94      0.3457
## languageHindi:id_correct  0.3812    0.9033    0.42      0.6730
## languageUrdu:id_correct -0.9854    1.0536   -0.94      0.3496
## languageMarathi:id_correct -1.0356    1.2228   -0.85      0.3970
## languageTamil:id_correct -1.6342    1.3628   -1.20      0.2305
## languageMandarin:id_correct -0.4153    1.9023   -0.22      0.8272
##
## Equation for white vs hindu:
##               Estimate Std. Error z value      Pr(>|z|)
## (Intercept)    -3.1303    0.7648   -4.09 0.00004255 ***
## languageHindi  -0.0853    1.2844   -0.07      0.94705
## languageUrdu    1.5564    0.9407    1.65      0.09801 .
## languageMarathi  1.2713    0.8486    1.50      0.13408
## languageTamil    2.3274    0.8108    2.87      0.00410 **
## languageMandarin 4.0607    1.1045    3.68      0.00024 ***
## id_correct     -0.3431    0.9097   -0.38      0.70607
## age            -0.4795    0.0929   -5.16 0.00000025 ***
## languageHindi:id_correct  1.1085    1.4492    0.76      0.44436
## languageUrdu:id_correct -14.3241  1348.8109   -0.01      0.99153
## languageMarathi:id_correct -0.3805    1.0794   -0.35      0.72449
## languageTamil:id_correct -0.8336    1.1453   -0.73      0.46673
## languageMandarin:id_correct  1.4959    1.6173    0.92      0.35499
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate residual Deviance: 2480
## Number of Fisher scoring iterations: 15
## Number of observations: 1317
## (96 observations deleted due to missingness)

```

Face Selection: Who speaks [LANGUAGE]?



face: asian
face: dravidian
face: muslim
face: white
Predictors
Odds Ratios
CI
p
Odds Ratios
CI
p
Odds Ratios
CI
p
Odds Ratios
CI
p

(Intercept)
0.18
0.06 – 0.49
0.001
0.40
0.18 – 0.88
0.024
0.10
0.02 – 0.44
0.002
0.04
0.01 – 0.20
<0.001
languageHindi
0.00
0.00 – Inf
0.989
0.74
0.19 – 2.91
0.667
8.54
1.62 – 44.92
0.011
0.92
0.07 – 11.38
0.947
languageUrdu
5.07
1.47 – 17.46
0.010
2.50
0.86 – 7.28
0.093
101.15
21.43 – 477.33
<0.001

4.74
 0.75 – 29.97
 0.098
 languageMarathi
 0.95
 0.25 – 3.54
 0.934
 3.21
 1.29 – 8.03
 0.012
 0.67
 0.09 – 5.19
 0.706
 3.57
 0.68 – 18.81
 0.134
 languageTamil
 1.33
 0.37 – 4.71
 0.663
 6.04
 2.47 – 14.75
 <0.001
 1.90
 0.36 – 10.16
 0.451
 10.25
 2.09 – 50.22
 0.004
 languageMandarin
 146.91
 25.90 – 833.34
 <0.001
 12.49
 2.25 – 69.24
 0.004

9.72
 0.84 – 111.91
 0.068
 58.02
 6.66 – 505.46
 <0.001
 id_correct
 0.20
 0.05 – 0.84
 0.027
 0.77
 0.32 – 1.86
 0.558
 1.46
 0.31 – 6.87
 0.633
 0.71
 0.12 – 4.22
 0.706
 age
 0.81
 0.69 – 0.96
 0.012
 0.95
 0.86 – 1.05
 0.310
 1.06
 0.94 – 1.19
 0.346
 0.62
 0.52 – 0.74
 <0.001
 languageHindi:id_correct
 10749750.87
 0.00 – Inf
 0.988

1.46
0.32 – 6.68
0.624
1.46
0.25 – 8.60
0.673
3.03
0.18 – 51.88
0.444
languageUrdu:id_correct
0.00
0.00 – Inf
0.992
0.41
0.03 – 5.21
0.492
0.37
0.05 – 2.94
0.350
0.00
0.00 – Inf
0.992
languageMarathi:id_correct
0.78
0.09 – 6.85
0.826
0.54
0.19 – 1.56
0.255
0.36
0.03 – 3.90
0.397
0.68
0.08 – 5.67
0.724
languageTamil:id_correct

9.03
 1.46 – 55.68
 0.018
 1.29
 0.42 – 3.94
 0.660
 0.20
 0.01 – 2.82
 0.230
 0.43
 0.05 – 4.10
 0.467
 languageMandarin:id_correct
 29.60
 1.80 – 486.08
 0.018
 0.00
 0.00 – Inf
 0.979
 0.66
 0.02 – 27.47
 0.827
 4.46
 0.19 – 106.26
 0.355
 Observations
 1317
 Nagelkerke's R2
 0.768

```

##
## Iteration 1 - deviance = 2484 - criterion = 0.1
## Iteration 2 - deviance = 2399 - criterion = 0.035
## Iteration 3 - deviance = 2384 - criterion = 0.0064
## Iteration 4 - deviance = 2380 - criterion = 0.0015
## Iteration 5 - deviance = 2379 - criterion = 0.00035
## Iteration 6 - deviance = 2379 - criterion = 0.000078
## Iteration 7 - deviance = 2379 - criterion = 0.000023
## Iteration 8 - deviance = 2379 - criterion = 0.0000083
## Iteration 9 - deviance = 2379 - criterion = 0.0000031
  
```

```

## Iteration 10 - deviance = 2379 - criterion = 0.0000011
## Iteration 11 - deviance = 2379 - criterion = 0.00000042
## Iteration 12 - deviance = 2379 - criterion = 0.00000015
## Iteration 13 - deviance = 2379 - criterion = 0.000000056
## Iteration 14 - deviance = 2379 - criterion = 0.000000021
## Iteration 15 - deviance = 2379 - criterion = 0.0000000076
## converged

##
## Call:
## mblogit(formula = face ~ language * id_correct * age, data = fli)
##
## Equation for asian vs hindu:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)      -1.6746    0.7600   -2.20   0.028 *
## languageHindi    -14.8907  1135.9133   -0.01   0.990
## languageUrdu       1.3668    0.9087    1.50   0.133
## languageMarathi    0.0773    0.8825    0.09   0.930
## languageTamil     -0.2265    0.9320   -0.24   0.808
## languageMandarin    5.5890    1.4226    3.93 0.000085 ***
## id_correct       -1.7120    0.9388   -1.82   0.068 .
## age              -0.1757    0.3919   -0.45   0.654
## languageHindi:id_correct  16.1841  1135.9136    0.01   0.989
## languageUrdu:id_correct -13.4353  1596.0652   -0.01   0.993
## languageMarathi:id_correct -0.3041    1.2771   -0.24   0.812
## languageTamil:id_correct  2.6606    1.1801    2.25   0.024 *
## languageMandarin:id_correct  2.7673    1.8708    1.48   0.139
## languageHindi:age    0.0764   547.4879    0.00   1.000
## languageUrdu:age    -0.0265    0.4776   -0.06   0.956
## languageMarathi:age   0.2496    0.4824    0.52   0.605
## languageTamil:age   -0.3276    0.4746   -0.69   0.490
## languageMandarin:age  0.7132    0.6935    1.03   0.304
## id_correct:age      -0.2423    0.5127   -0.47   0.636
## languageHindi:id_correct:age -0.0163   547.4881    0.00   1.000
## languageUrdu:id_correct:age  0.6098   829.1299    0.00   0.999
## languageMarathi:id_correct:age  0.0157    0.7449    0.02   0.983
## languageTamil:id_correct:age  0.4014    0.6713    0.60   0.550
## languageMandarin:id_correct:age  0.1708    1.0245    0.17   0.868
##
## Equation for dravidian vs hindu:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)      -0.7684    0.5033   -1.53   0.1268
## languageHindi    -0.6568    0.8601   -0.76   0.4451
## languageUrdu       0.8561    0.6599    1.30   0.1945
## languageMarathi    0.7827    0.5744    1.36   0.1730
## languageTamil     1.5399    0.5445    2.83   0.0047 **
## languageMandarin    2.8265    1.3482    2.10   0.0360 *
## id_correct       -0.4139    0.5417   -0.76   0.4448
## age              0.0696    0.2775    0.25   0.8019
## languageHindi:id_correct  0.7179    0.9270    0.77   0.4387
## languageUrdu:id_correct -0.5360    1.4683   -0.37   0.7151
## languageMarathi:id_correct -0.1596    0.6408   -0.25   0.8034
## languageTamil:id_correct  0.5071    0.6453    0.79   0.4320
## languageMandarin:id_correct -14.1735   553.3035   -0.03   0.9796

```

```

## languageHindi:age          -0.3593      0.4298    -0.84    0.4032
## languageUrdu:age           0.0303      0.3730     0.08    0.9353
## languageMarathi:age        -0.4535      0.3243    -1.40    0.1619
## languageTamil:age          0.2119      0.3019     0.70    0.4827
## languageMandarin:age       0.2528      0.6588     0.38    0.7011
## id_correct:age             -0.0970      0.3047    -0.32    0.7503
## languageHindi:id_correct:age 0.0826      0.4818     0.17    0.8639
## languageUrdu:id_correct:age 0.2420      0.7804     0.31    0.7565
## languageMarathi:id_correct:age 0.3018      0.3698     0.82    0.4144
## languageTamil:id_correct:age -0.0124      0.3893    -0.03    0.9745
## languageMandarin:id_correct:age 0.1804    366.5805     0.00    0.9996
##
## Equation for muslim vs hindu:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)      -5.655      3.928   -1.44    0.150
## languageHindi       5.477      3.950    1.39    0.166
## languageUrdu       8.149      3.941    2.07    0.039 *
## languageMarathi     1.109      4.491    0.25    0.805
## languageTamil       3.816      3.959    0.96    0.335
## languageMandarin    2.495      6.198    0.40    0.687
## id_correct         3.794      3.937    0.96    0.335
## age               -1.611      1.587   -1.01    0.310
## languageHindi:id_correct -2.979      3.962   -0.75    0.452
## languageUrdu:id_correct -4.414      4.030   -1.10    0.273
## languageMarathi:id_correct -2.520      4.545   -0.55    0.579
## languageTamil:id_correct -7.869      5.648   -1.39    0.164
## languageMandarin:id_correct -0.634      6.389   -0.10    0.921
## languageHindi:age     1.580      1.600    0.99    0.323
## languageUrdu:age      2.265      1.599    1.42    0.157
## languageMarathi:age    0.330      1.858    0.18    0.859
## languageTamil:age      1.255      1.608    0.78    0.435
## languageMandarin:age   0.197      2.509    0.08    0.937
## id_correct:age        1.378      1.596    0.86    0.388
## languageHindi:id_correct:age -1.388      1.612   -0.86    0.389
## languageUrdu:id_correct:age -1.841      1.656   -1.11    0.266
## languageMarathi:id_correct:age -0.680      1.903   -0.36    0.721
## languageTamil:id_correct:age -3.090      2.354   -1.31    0.189
## languageMandarin:id_correct:age 0.036      2.689    0.01    0.989
##
## Equation for white vs hindu:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)      -4.556      2.828   -1.61    0.107
## languageHindi     -2.389      7.798   -0.31    0.759
## languageUrdu       1.677      3.201    0.52    0.600
## languageMarathi    2.927      2.873    1.02    0.308
## languageTamil      3.838      2.844    1.35    0.177
## languageMandarin   6.401      3.095    2.07    0.039 *
## id_correct         0.933      2.906    0.32    0.748
## age               -1.152      1.188   -0.97    0.332
## languageHindi:id_correct  2.830      7.873    0.36    0.719
## languageUrdu:id_correct -13.509    1596.068  -0.01    0.993
## languageMarathi:id_correct -1.791      2.981   -0.60    0.548
## languageTamil:id_correct -2.665      3.075   -0.87    0.386
## languageMandarin:id_correct -1.133      3.385   -0.33    0.738

```

```
## languageHindi:age          -0.945      3.027    -0.31    0.755
## languageUrdu:age           0.227      1.362     0.17    0.867
## languageMarathi:age        0.739      1.222     0.60    0.545
## languageTamil:age          0.997      1.199     0.83    0.406
## languageMandarin:age       1.671      1.333     1.25    0.210
## id_correct:age             0.481      1.244     0.39    0.699
## languageHindi:id_correct:age 0.529      3.077     0.17    0.863
## languageUrdu:id_correct:age 0.609     829.131     0.00    0.999
## languageMarathi:id_correct:age -0.437      1.304    -0.34    0.737
## languageTamil:id_correct:age -1.166      1.379    -0.85    0.398
## languageMandarin:id_correct:age -1.322      1.565    -0.84    0.398
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate residual Deviance: 2380
## Number of Fisher scoring iterations: 15
## Number of observations: 1317
## (96 observations deleted due to missingness)
```

BOTH

```
##
## Iteration 1 - deviance = 6338 - criterion = 0.25
## Iteration 2 - deviance = 6261 - criterion = 0.012
## Iteration 3 - deviance = 6259 - criterion = 0.00035
## Iteration 4 - deviance = 6259 - criterion = 0.0000018
## Iteration 5 - deviance = 6259 - criterion = 0.00000000029
## converged

##
## Call:
## mblogit(formula = face ~ language * presentation + age, data = finoeng_df)
##
## Equation for asian vs hindu:
##
##              Estimate Std. Error z value
## (Intercept)    -2.3918    0.3026   -7.90
## languageHindi     0.8934    0.4234    2.11
## languageMandarin   4.9181    0.4123   11.93
## languageMarathi    0.6069    0.4120    1.47
## languageTamil     2.2556    0.3676    6.14
## languageUrdu       1.4145    0.4361    3.24
## presentationlabel -0.3641    0.4584   -0.79
## age              -0.1628    0.0479   -3.40
## languageHindi:presentationlabel -0.4082    0.6606   -0.62
## languageMandarin:presentationlabel 1.8116    0.7369    2.46
## languageMarathi:presentationlabel -0.5521    0.6498   -0.85
## languageTamil:presentationlabel -0.6853    0.5714   -1.20
## languageUrdu:presentationlabel  1.2826    0.6508    1.97
##
##              Pr(>|z|)
## (Intercept)    0.0000000000000027 ***
## languageHindi      0.03486 *
## languageMandarin   < 0.0000000000000002 ***
## languageMarathi    0.14071
```

```

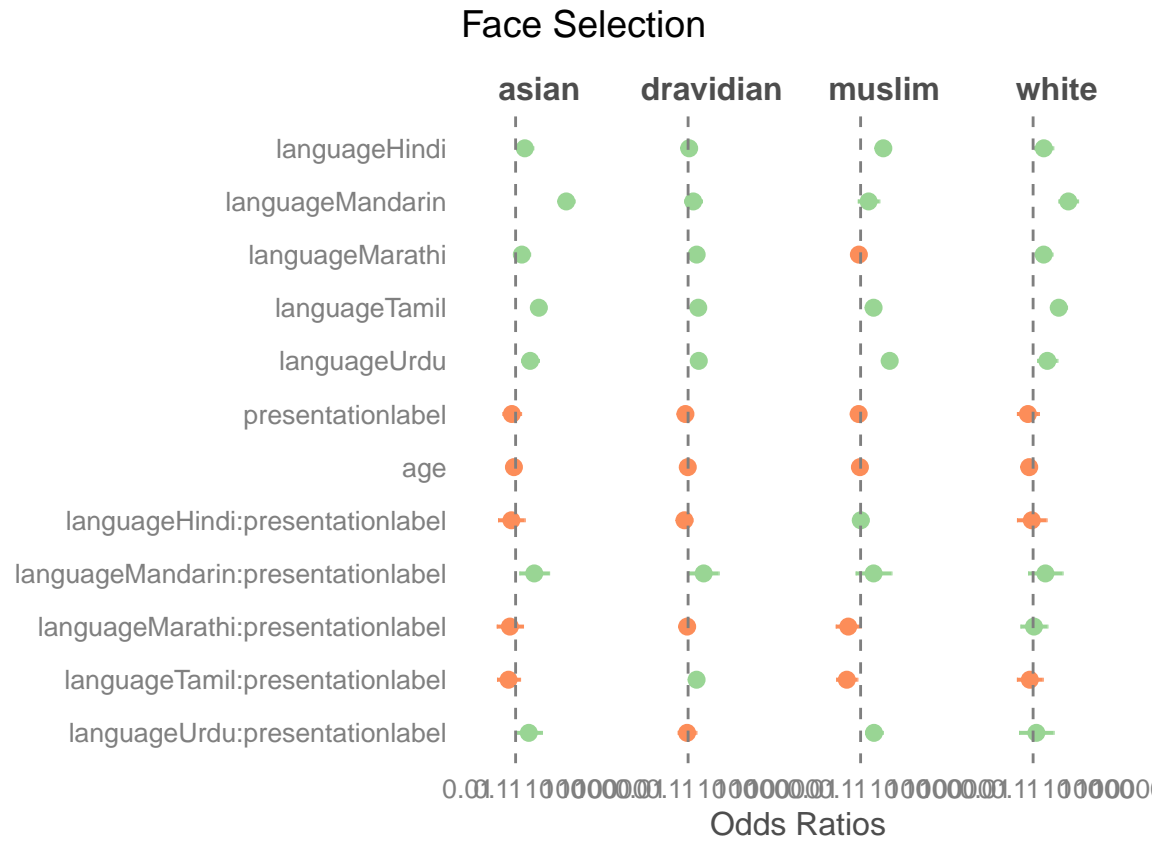
## languageTamil          0.0000000008454506 ***
## languageUrdu           0.00118 **
## presentationlabel      0.42705
## age                    0.00068 ***
## languageHindi:presentationlabel 0.53668
## languageMandarin:presentationlabel 0.01395 *
## languageMarathi:presentationlabel 0.39554
## languageTamil:presentationlabel 0.23039
## languageUrdu:presentationlabel 0.04876 *
##
## Equation for dravidian vs hindu:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -0.7305   0.1546   -4.73 0.0000023 ***
## languageHindi     0.1032   0.2652    0.39  0.6972
## languageMandarin  0.5025   0.4317    1.16  0.2444
## languageMarathi   0.8302   0.2135    3.89  0.0001 ***
## languageTamil     0.9855   0.2441    4.04 0.0000540 ***
## languageUrdu      1.0360   0.2663    3.89  0.0001 ***
## presentationlabel -0.2586   0.2254   -1.15  0.2513
## age              -0.0317   0.0341   -0.93  0.3515
## languageHindi:presentationlabel -0.3520   0.3948   -0.89  0.3726
## languageMandarin:presentationlabel 1.5107   0.7444    2.03  0.0424 *
## languageMarathi:presentationlabel -0.0905   0.3034   -0.30  0.7656
## languageTamil:presentationlabel  0.8223   0.3331    2.47  0.0135 *
## languageUrdu:presentationlabel -0.0990   0.4607   -0.21  0.8299
##
## Equation for muslim vs hindu:
##
##               Estimate Std. Error z value
## (Intercept)    -1.6002   0.2151   -7.44
## languageHindi     2.2044   0.2670    8.26
## languageMandarin  0.7778   0.5335    1.46
## languageMarathi   -0.1672   0.3526   -0.47
## languageTamil     1.2576   0.3081    4.08
## languageUrdu      2.8238   0.2853    9.90
## presentationlabel -0.1894   0.3116   -0.61
## age              -0.0666   0.0382   -1.74
## languageHindi:presentationlabel  0.0171   0.3793    0.05
## languageMandarin:presentationlabel 1.2583   0.8862    1.42
## languageMarathi:presentationlabel -1.1950   0.6195   -1.93
## languageTamil:presentationlabel -1.3391   0.5233   -2.56
## languageUrdu:presentationlabel  1.2980   0.4396    2.95
##
##                               Pr(>|z|)
## (Intercept)    0.00000000000001 ***
## languageHindi < 0.000000000000002 ***
## languageMandarin  0.1449
## languageMarathi   0.6354
## languageTamil     0.0000447976645 ***
## languageUrdu      < 0.000000000000002 ***
## presentationlabel  0.5433
## age              0.0817 .
## languageHindi:presentationlabel  0.9640
## languageMandarin:presentationlabel 0.1556
## languageMarathi:presentationlabel 0.0537 .
## languageTamil:presentationlabel  0.0105 *

```

```

## languageUrdu:presentationlabel          0.0031 **
##
## Equation for white vs hindu:
##
##               Estimate Std. Error z value
## (Intercept)      -2.8096    0.3497   -8.03
## languageHindi       1.0376    0.4709    2.20
## languageMandarin     3.4199    0.4836    7.07
## languageMarathi      1.0232    0.4386    2.33
## languageTamil        2.4898    0.4102    6.07
## languageUrdu         1.3799    0.4994    2.76
## presentationlabel   -0.5020    0.5442   -0.92
## age                 -0.3800    0.0551   -6.89
## languageHindi:presentationlabel -0.1296    0.7328   -0.18
## languageMandarin:presentationlabel  1.1918    0.8520    1.40
## languageMarathi:presentationlabel  0.0839    0.6669    0.13
## languageTamil:presentationlabel -0.3175    0.6401   -0.50
## languageUrdu:presentationlabel  0.3154    0.8556    0.37
##
##               Pr(>|z|)
## (Intercept)      0.00000000000000095 ***
## languageHindi           0.0276 *
## languageMandarin      0.00000000000153180 ***
## languageMarathi        0.0197 *
## languageTamil          0.00000000127766710 ***
## languageUrdu           0.0057 **
## presentationlabel      0.3563
## age                  0.00000000000547130 ***
## languageHindi:presentationlabel  0.8596
## languageMandarin:presentationlabel  0.1619
## languageMarathi:presentationlabel  0.8999
## languageTamil:presentationlabel  0.6199
## languageUrdu:presentationlabel  0.7124
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate residual Deviance: 6260
## Number of Fisher scoring iterations: 5
## Number of observations: 2809

```



face: asian

face: dravidian

face: muslim

face: white

Predictors

Odds Ratios

CI

P

Odds Ratios

CI

P

Odds Ratios

CI

P

(Intercept)
0.09
0.05 – 0.17
<0.001
0.48
0.36 – 0.65
<0.001
0.20
0.13 – 0.31
<0.001
0.06
0.03 – 0.12
<0.001
languageHindi
2.44
1.07 – 5.60
0.035
1.11
0.66 – 1.86
0.697
9.07
5.37 – 15.30
<0.001
2.82
1.12 – 7.10
0.028
languageMandarin
136.74
60.95 – 306.80
<0.001
1.65
0.71 – 3.85
0.244
2.18
0.76 – 6.19
0.145

30.57
 11.85 – 78.86
 <0.001
 languageMarathi
 1.83
 0.82 – 4.11
 0.141
 2.29
 1.51 – 3.49
 <0.001
 0.85
 0.42 – 1.69
 0.635
 2.78
 1.18 – 6.57
 0.020
 languageTamil
 9.54
 4.64 – 19.61
 <0.001
 2.68
 1.66 – 4.32
 <0.001
 3.52
 1.92 – 6.43
 <0.001
 12.06
 5.40 – 26.94
 <0.001
 languageUrdu
 4.11
 1.75 – 9.67
 0.001
 2.82
 1.67 – 4.75
 <0.001

16.84
 9.63 – 29.46
 <0.001
 3.97
 1.49 – 10.58
 0.006
 presentationlabel
 0.69
 0.28 – 1.71
 0.427
 0.77
 0.50 – 1.20
 0.251
 0.83
 0.45 – 1.52
 0.543
 0.61
 0.21 – 1.76
 0.356
 age
 0.85
 0.77 – 0.93
 0.001
 0.97
 0.91 – 1.04
 0.352
 0.94
 0.87 – 1.01
 0.082
 0.68
 0.61 – 0.76
 <0.001
 languageHindi:presentationlabel
 0.66
 0.18 – 2.43
 0.537

0.70
0.32 – 1.52
0.373
1.02
0.48 – 2.14
0.964
0.88
0.21 – 3.69
0.860
languageMandarin:presentationlabel
6.12
1.44 – 25.94
0.014
4.53
1.05 – 19.49
0.042
3.52
0.62 – 19.99
0.156
3.29
0.62 – 17.49
0.162
languageMarathi:presentationlabel
0.58
0.16 – 2.06
0.396
0.91
0.50 – 1.66
0.766
0.30
0.09 – 1.02
0.054
1.09
0.29 – 4.02
0.900
languageTamil:presentationlabel

0.50
 0.16 – 1.54
 0.230
 2.28
 1.18 – 4.37
 0.014
 0.26
 0.09 – 0.73
 0.010
 0.73
 0.21 – 2.55
 0.620
 languageUrdu:presentationlabel
 3.61
 1.01 – 12.91
 0.049
 0.91
 0.37 – 2.23
 0.830
 3.66
 1.55 – 8.67
 0.003
 1.37
 0.26 – 7.33
 0.712
 Observations
 2809
 Nagelkerke's R2
 0.655

```

##
## Iteration 1 - deviance = 6137 - criterion = 0.22
## Iteration 2 - deviance = 6033 - criterion = 0.017
## Iteration 3 - deviance = 6024 - criterion = 0.0015
## Iteration 4 - deviance = 6023 - criterion = 0.00017
## Iteration 5 - deviance = 6023 - criterion = 0.000019
## Iteration 6 - deviance = 6023 - criterion = 0.00000061
## Iteration 7 - deviance = 6023 - criterion = 0.00000000085
## converged

```

```
##
## Call:
## mblogit(formula = face ~ language * presentation * age, data = finoeng_df)
##
## Equation for asian vs hindu:
##
```

	Estimate	Std. Error	z	value
## (Intercept)	-2.3940	0.3207	-7.47	
## languageHindi	0.6991	0.4722	1.48	
## languageMandarin	5.4582	0.5408	10.09	
## languageMarathi	0.4895	0.4523	1.08	
## languageTamil	2.2569	0.3868	5.84	
## languageUrdu	1.4645	0.4665	3.14	
## presentationlabel	-0.5968	0.5381	-1.11	
## age	-0.4257	0.1988	-2.14	
## languageHindi:presentationlabel	-0.0234	0.7514	-0.03	
## languageMandarin:presentationlabel	1.7458	0.9455	1.85	
## languageMarathi:presentationlabel	-0.1416	0.7250	-0.20	
## languageTamil:presentationlabel	-0.6706	0.6610	-1.01	
## languageUrdu:presentationlabel	1.4290	0.7635	1.87	
## languageHindi:age	0.0485	0.2815	0.17	
## languageMandarin:age	1.2777	0.3034	4.21	
## languageMarathi:age	-0.0977	0.2770	-0.35	
## languageTamil:age	0.0679	0.2411	0.28	
## languageUrdu:age	0.4888	0.2814	1.74	
## presentationlabel:age	-0.0866	0.3112	-0.28	
## languageHindi:presentationlabel:age	0.2056	0.4384	0.47	
## languageMandarin:presentationlabel:age	-0.2296	0.5221	-0.44	
## languageMarathi:presentationlabel:age	0.4491	0.4321	1.04	
## languageTamil:presentationlabel:age	0.1012	0.3850	0.26	
## languageUrdu:presentationlabel:age	-0.0138	0.4379	-0.03	

```
##
## Pr(>|z|)
## (Intercept) 0.0000000000000083 ***
## languageHindi 0.1388
## languageMandarin < 0.0000000000000002 ***
## languageMarathi 0.2792
## languageTamil 0.000000005365558 ***
## languageUrdu 0.0017 **
## presentationlabel 0.2674
## age 0.0323 *
## languageHindi:presentationlabel 0.9752
## languageMandarin:presentationlabel 0.0648 .
## languageMarathi:presentationlabel 0.8452
## languageTamil:presentationlabel 0.3103
## languageUrdu:presentationlabel 0.0613 .
## languageHindi:age 0.8632
## languageMandarin:age 0.000025331516146 ***
## languageMarathi:age 0.7243
## languageTamil:age 0.7782
## languageUrdu:age 0.0823 .
## presentationlabel:age 0.7809
## languageHindi:presentationlabel:age 0.6391
## languageMandarin:presentationlabel:age 0.6601
## languageMarathi:presentationlabel:age 0.2986
## languageTamil:presentationlabel:age 0.7926
```

```

## languageUrdu:presentationlabel:age                                0.9748
##
## Equation for dravidian vs hindu:
##
## (Intercept)                                Estimate Std. Error z value Pr(>|z|)
## languageHindi                                0.0485    0.2677    0.18  0.85629
## languageMandarin                             0.6549    0.6170    1.06  0.28850
## languageMarathi                             0.7998    0.2173    3.68  0.00023 ***
## languageTamil                              0.9257    0.2530    3.66  0.00025 ***
## languageUrdu                               1.0775    0.2808    3.84  0.00012 ***
## presentationlabel                          -0.2993    0.2272   -1.32  0.18783
## age                                         -0.2085    0.1012   -2.06  0.03944 *
## languageHindi:presentationlabel            -0.3728    0.4051   -0.92  0.35754
## languageMandarin:presentationlabel         1.4276    0.9733    1.47  0.14242
## languageMarathi:presentationlabel          -0.0593    0.3086   -0.19  0.84752
## languageTamil:presentationlabel            0.8263    0.3415    2.42  0.01554 *
## languageUrdu:presentationlabel             -0.0321    0.5128   -0.06  0.95011
## languageHindi:age                          0.3260    0.1702    1.92  0.05544 .
## languageMandarin:age                      0.3552    0.3260    1.09  0.27584
## languageMarathi:age                       0.1578    0.1405    1.12  0.26127
## languageTamil:age                         0.2255    0.1604    1.41  0.15986
## languageUrdu:age                          0.6320    0.1737    3.64  0.00027 ***
## presentationlabel:age                     0.1271    0.1439    0.88  0.37704
## languageHindi:presentationlabel:age        -0.5152    0.2515   -2.05  0.04052 *
## languageMandarin:presentationlabel:age     -0.1948    0.5268   -0.37  0.71148
## languageMarathi:presentationlabel:age      -0.4206    0.1965   -2.14  0.03229 *
## languageTamil:presentationlabel:age        0.1470    0.2153    0.68  0.49470
## languageUrdu:presentationlabel:age         -0.4210    0.3042   -1.38  0.16642
##
## Equation for muslim vs hindu:
##
## (Intercept)                                Estimate Std. Error z value
## languageHindi                                2.7771    0.3698    7.51
## languageMandarin                             1.8538    0.6992    2.65
## languageMarathi                             -0.1857    0.5482   -0.34
## languageTamil                              1.7895    0.4087    4.38
## languageUrdu                               3.5053    0.3913    8.96
## presentationlabel                          0.3736    0.4060    0.92
## age                                         -0.9360    0.1826   -5.13
## languageHindi:presentationlabel            -0.5384    0.4601   -1.17
## languageMandarin:presentationlabel         0.2749    1.1097    0.25
## languageMarathi:presentationlabel          -1.4852    0.8581   -1.73
## languageTamil:presentationlabel            -2.1791    0.6578   -3.31
## languageUrdu:presentationlabel            0.8354    0.5441    1.54
## languageHindi:age                          1.0372    0.2081    4.98
## languageMandarin:age                      1.4019    0.3897    3.60
## languageMarathi:age                       0.0367    0.2952    0.12
## languageTamil:age                         0.4838    0.2341    2.07
## languageUrdu:age                          1.2911    0.2194    5.89
## presentationlabel:age                     0.7437    0.2309    3.22
## languageHindi:presentationlabel:age        -0.8348    0.2678   -3.12
## languageMandarin:presentationlabel:age     -1.1172    0.6166   -1.81
## languageMarathi:presentationlabel:age      -0.5681    0.4668   -1.22
## languageTamil:presentationlabel:age       -0.7234    0.3721   -1.94

```

```

## languageUrdu:presentationlabel:age      -0.5181      0.3136      -1.65
##                                           Pr(>|z|)
## (Intercept)                            0.000000000065835 ***
## languageHindi                          0.000000000000059 ***
## languageMandarin                       0.00802 **
## languageMarathi                        0.73482
## languageTamil                         0.000011941391561 ***
## languageUrdu                          < 0.0000000000000002 ***
## presentationlabel                      0.35747
## age                                    0.000000294993231 ***
## languageHindi:presentationlabel        0.24195
## languageMandarin:presentationlabel     0.80432
## languageMarathi:presentationlabel      0.08350 .
## languageTamil:presentationlabel        0.00092 ***
## languageUrdu:presentationlabel         0.12472
## languageHindi:age                      0.000000621635713 ***
## languageMandarin:age                   0.00032 ***
## languageMarathi:age                    0.90115
## languageTamil:age                      0.03877 *
## languageUrdu:age                       0.000000003975005 ***
## presentationlabel:age                  0.00128 **
## languageHindi:presentationlabel:age    0.00183 **
## languageMandarin:presentationlabel:age 0.07002 .
## languageMarathi:presentationlabel:age  0.22359
## languageTamil:presentationlabel:age    0.05190 .
## languageUrdu:presentationlabel:age     0.09849 .
##
## Equation for white vs hindu:
##                                     Estimate Std. Error z value
## (Intercept)                      -2.7662      0.3934    -7.03
## languageHindi                     0.8519      0.5530     1.54
## languageMandarin                  3.9766      0.6143     6.47
## languageMarathi                   0.5979      0.5556     1.08
## languageTamil                     2.5362      0.4514     5.62
## languageUrdu                     1.5691      0.5368     2.92
## presentationlabel                 -0.9650      0.7732    -1.25
## age                              -0.5467      0.2346    -2.33
## languageHindi:presentationlabel   -0.0574      1.0606    -0.05
## languageMandarin:presentationlabel 1.2450      1.1456     1.09
## languageMarathi:presentationlabel  1.0313      0.9164     1.13
## languageTamil:presentationlabel    0.0739      0.8493     0.09
## languageUrdu:presentationlabel     -0.8023      1.6919    -0.47
## languageHindi:age                 0.1079      0.3203     0.34
## languageMandarin:age               1.1872      0.3452     3.44
## languageMarathi:age                -0.3039      0.3176    -0.96
## languageTamil:age                 0.2009      0.2729     0.74
## languageUrdu:age                  0.8411      0.3239     2.60
## presentationlabel:age              -0.2113      0.4101    -0.52
## languageHindi:presentationlabel:age -0.1441      0.5574    -0.26
## languageMandarin:presentationlabel:age -0.2533      0.6167    -0.41
## languageMarathi:presentationlabel:age 0.6204      0.4958     1.25
## languageTamil:presentationlabel:age  0.3629      0.4627     0.78
## languageUrdu:presentationlabel:age  -0.9413      0.7962    -1.18
##                                     Pr(>|z|)

```

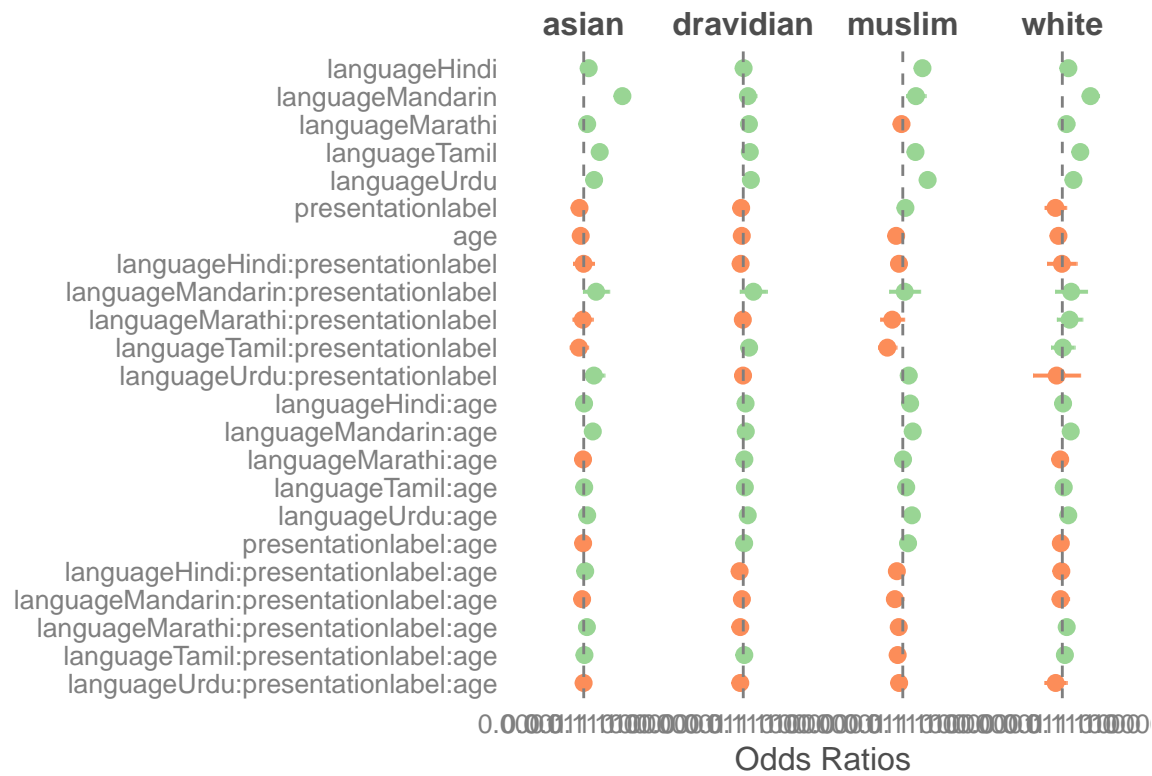
```

## (Intercept) 0.000000000002 ***
## languageHindi 0.12341
## languageMandarin 0.000000000096 ***
## languageMarathi 0.28182
## languageTamil 0.000000019325 ***
## languageUrdu 0.00346 **
## presentationlabel 0.21200
## age 0.01977 *
## languageHindi:presentationlabel 0.95687
## languageMandarin:presentationlabel 0.27716
## languageMarathi:presentationlabel 0.26043
## languageTamil:presentationlabel 0.93064
## languageUrdu:presentationlabel 0.63534
## languageHindi:age 0.73622
## languageMandarin:age 0.00058 ***
## languageMarathi:age 0.33859
## languageTamil:age 0.46173
## languageUrdu:age 0.00942 **
## presentationlabel:age 0.60630
## languageHindi:presentationlabel:age 0.79599
## languageMandarin:presentationlabel:age 0.68128
## languageMarathi:presentationlabel:age 0.21081
## languageTamil:presentationlabel:age 0.43291
## languageUrdu:presentationlabel:age 0.23712
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate residual Deviance: 6020
## Number of Fisher scoring iterations: 7
## Number of observations: 2809

## Analysis of Deviance Table
##
## Model 1: face ~ language * presentation + age
## Model 2: face ~ language * presentation * age
##   Resid. Df Resid. Dev Df Deviance
## 1      11184      6259
## 2      11140      6023  44      236

```


Face Selection



face: asian

face: dravidian

face: muslim

face: white

Predictors

Odds Ratios

CI

p

Odds Ratios

CI

p

Odds Ratios

CI

p

Odds Ratios

CI

p

(Intercept)
0.09
0.05 – 0.17
<0.001
0.50
0.37 – 0.68
<0.001
0.11
0.06 – 0.22
<0.001
0.06
0.03 – 0.14
<0.001
languageHindi
2.01
0.80 – 5.08
0.139
1.05
0.62 – 1.77
0.856
16.07
7.79 – 33.18
<0.001
2.34
0.79 – 6.93
0.123
languageMandarin
234.67
81.31 – 677.31
<0.001
1.92
0.57 – 6.45
0.288
6.38
1.62 – 25.13
0.008

53.33
 16.00 – 177.78
 <0.001
 languageMarathi
 1.63
 0.67 – 3.96
 0.279
 2.23
 1.45 – 3.41
 <0.001
 0.83
 0.28 – 2.43
 0.735
 1.82
 0.61 – 5.40
 0.282
 languageTamil
 9.55
 4.48 – 20.39
 <0.001
 2.52
 1.54 – 4.14
 <0.001
 5.99
 2.69 – 13.34
 <0.001
 12.63
 5.21 – 30.60
 <0.001
 languageUrdu
 4.33
 1.73 – 10.79
 0.002
 2.94
 1.69 – 5.09
 <0.001

33.29
15.46 – 71.68
<0.001
4.80
1.68 – 13.75
0.003
presentationlabel
0.55
0.19 – 1.58
0.267
0.74
0.47 – 1.16
0.188
1.45
0.66 – 3.22
0.357
0.38
0.08 – 1.73
0.212
age
0.65
0.44 – 0.96
0.032
0.81
0.67 – 0.99
0.039
0.39
0.27 – 0.56
<0.001
0.58
0.37 – 0.92
0.020
languageHindi:presentationlabel
0.98
0.22 – 4.26
0.975

0.69
 0.31 – 1.52
 0.358
 0.58
 0.24 – 1.44
 0.242
 0.94
 0.12 – 7.55
 0.957
 languageMandarin:presentationlabel
 5.73
 0.90 – 36.56
 0.065
 4.17
 0.62 – 28.08
 0.142
 1.32
 0.15 – 11.59
 0.804
 3.47
 0.37 – 32.80
 0.277
 languageMarathi:presentationlabel
 0.87
 0.21 – 3.59
 0.845
 0.94
 0.51 – 1.73
 0.848
 0.23
 0.04 – 1.22
 0.083
 2.80
 0.47 – 16.90
 0.260
 languageTamil:presentationlabel

0.51
 0.14 – 1.87
 0.310
 2.28
 1.17 – 4.46
 0.016
 0.11
 0.03 – 0.41
 0.001
 1.08
 0.20 – 5.69
 0.931
 languageUrdu:presentationlabel
 4.17
 0.93 – 18.64
 0.061
 0.97
 0.35 – 2.65
 0.950
 2.31
 0.79 – 6.70
 0.125
 0.45
 0.02 – 12.35
 0.635
 languageHindi:age
 1.05
 0.60 – 1.82
 0.863
 1.39
 0.99 – 1.93
 0.055
 2.82
 1.88 – 4.24
 <0.001
 1.11

0.59 – 2.09
 0.736
 languageMandarin:age
 3.59
 1.98 – 6.50
 <0.001
 1.43
 0.75 – 2.70
 0.276
 4.06
 1.89 – 8.72
 <0.001
 3.28
 1.67 – 6.45
 0.001
 languageMarathi:age
 0.91
 0.53 – 1.56
 0.724
 1.17
 0.89 – 1.54
 0.261
 1.04
 0.58 – 1.85
 0.901
 0.74
 0.40 – 1.38
 0.339
 languageTamil:age
 1.07
 0.67 – 1.72
 0.778
 1.25
 0.91 – 1.72
 0.160
 1.62

1.03 – 2.57
 0.039
 1.22
 0.72 – 2.09
 0.462
 languageUrdu:age
 1.63
 0.94 – 2.83
 0.082
 1.88
 1.34 – 2.64
 <0.001
 3.64
 2.37 – 5.59
 <0.001
 2.32
 1.23 – 4.38
 0.009
 presentationlabel:age
 0.92
 0.50 – 1.69
 0.781
 1.14
 0.86 – 1.51
 0.377
 2.10
 1.34 – 3.31
 0.001
 0.81
 0.36 – 1.81
 0.606
 languageHindi:presentationlabel:age
 1.23
 0.52 – 2.90
 0.639
 0.60

0.36 – 0.98
0.041
0.43
0.26 – 0.73
0.002
0.87
0.29 – 2.58
0.796
languageMandarin:presentationlabel:age
0.79
0.29 – 2.21
0.660
0.82
0.29 – 2.31
0.711
0.33
0.10 – 1.10
0.070
0.78
0.23 – 2.60
0.681
languageMarathi:presentationlabel:age
1.57
0.67 – 3.65
0.299
0.66
0.45 – 0.97
0.032
0.57
0.23 – 1.41
0.224
1.86
0.70 – 4.91
0.211
languageTamil:presentationlabel:age
1.11

0.52 – 2.35
 0.793
 1.16
 0.76 – 1.77
 0.495
 0.49
 0.23 – 1.01
 0.052
 1.44
 0.58 – 3.56
 0.433
 languageUrdu:presentationlabel:age
 0.99
 0.42 – 2.33
 0.975
 0.66
 0.36 – 1.19
 0.166
 0.60
 0.32 – 1.10
 0.098
 0.39
 0.08 – 1.86
 0.237
 Observations
 2809
 Nagelkerke's R²
 0.686