India Sociolinguistics Wealth Associations Analyses

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no_opinion_trials	n_children
1	15
2	10
3	6
4	9
5	3
6	1
7	8
8	3
9	1
10	1
11	1
13	1
16	2

language	n
Mandarin	49
Marathi	45
Tamil	39
English (U.S.)	30
English (India)	28
Hindi	27
Gujarati	25
Urdu	22

"No opinion" selected on 265 trials by 61 children; all children selected single response.

```
##
##           idk poorer richer   same
##      0    265    276    589    723
```

```
## # A tibble: 12 x 5
##    standard wealth     n n_std   prop
##    <fct>    <fct>  <int> <int>  <dbl>
##  1 3        idk       26   300 0.0867
##  2 3        poorer    50   300 0.167
##  3 3        richer   118   300 0.393
##  4 3        same     106   300 0.353
```

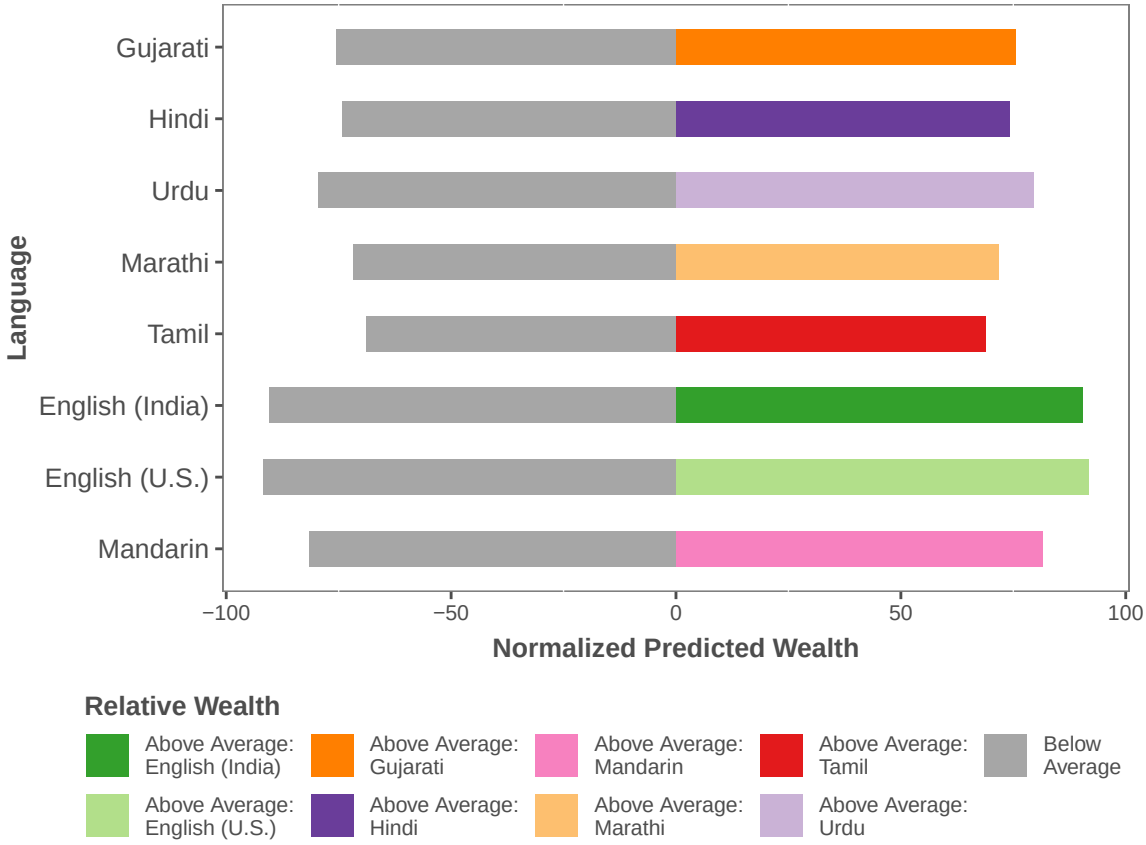
```
##  5 5        idk       43   803 0.0535
##  6 5        poorer   140   803 0.174
##  7 5        richer   331   803 0.412
##  8 5        same     289   803 0.360
##  9 7        idk      196   750 0.261
## 10 7        poorer    86   750 0.115
## 11 7        richer   140   750 0.187
## 12 7        same     328   750 0.437
```

```
## # A tibble: 8 x 5
##   language           idk poorer richer  same
##   <fct>            <dbl>  <dbl>  <dbl> <dbl>
## 1 Gujarati        0.108  0.177   0.237 0.478
## 2 Hindi           0.117  0.186   0.234 0.463
## 3 Urdu            0.0940 0.132   0.248 0.526
## 4 Marathi         0.195  0.160   0.242 0.403
## 5 Tamil           0.170  0.213   0.217 0.4
## 6 English (India) 0.122  0.135   0.461 0.283
## 7 English (U.S.)  0.129  0.0858  0.438 0.348
## 8 Mandarin        0.211  0.103   0.466 0.220
```

```
## # A tibble: 8 x 6
##   wealth language          `3`   `5`    `7` less_7th
##   <fct>  <fct>           <dbl> <dbl>  <dbl> <lgl>
## 1 richer Gujarati        0.395 0.287 0.118  TRUE
## 2 richer Hindi           0.324 0.31  0.117  TRUE
## 3 richer Urdu            0.308 0.337 0.128  TRUE
## 4 richer Marathi         0.333 0.327 0.117  TRUE
## 5 richer Tamil           0.368 0.303 0.0645 TRUE
## 6 richer English (India) 0.351 0.616 0.340  TRUE
## 7 richer English (U.S.)  0.553 0.554 0.266  TRUE
## 8 richer Mandarin        0.514 0.564 0.340  TRUE
```

```
## # A tibble: 32 x 6
##    wealth language           `3`    `5`   `7` less_7th
##    <fct>  <fct>            <dbl>  <dbl> <dbl> <lgl>
##  1 idk    Gujarati        0.132  0.0495 0.161 FALSE
##  2 idk    Hindi           0.0811 0.07   0.181 FALSE
##  3 idk    Urdu            0.0256 0.0198 0.202 FALSE
##  4 idk    Marathi         0.111  0.0693 0.362 FALSE
##  5 idk    Tamil           0.0789 0.0404 0.344 FALSE
##  6 idk    English (India) 0.0541 0.0303 0.245 FALSE
##  7 idk    English (U.S.)  0.0263 0.0396 0.266 FALSE
##  8 idk    Mandarin        0.189  0.109  0.330 FALSE
##  9 poorer Gujarati        0.132  0.238  0.129 TRUE
## 10 poorer Hindi           0.243  0.22   0.128 TRUE
## # i 22 more rows
```

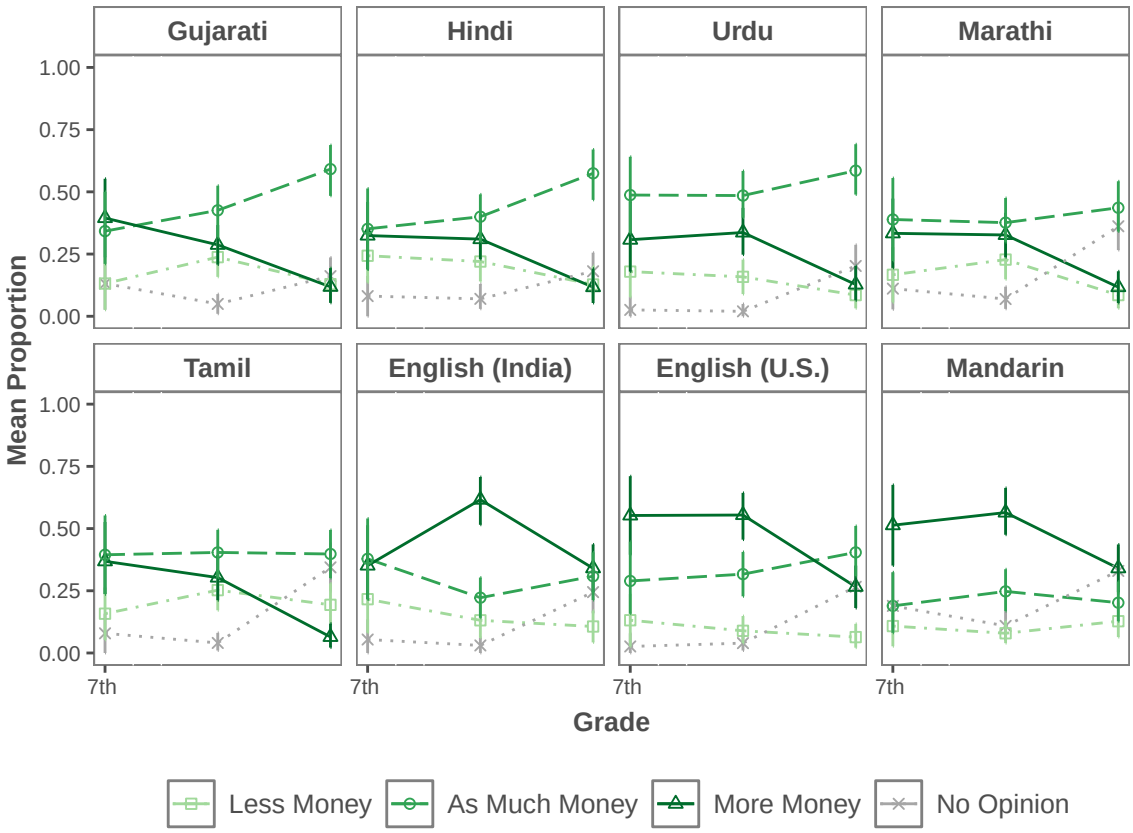
Diverging Barchart



Categorically: "Less $"/"As Much $"/"More $"

Over Time

By Standard



Plots

With Age

Plots

Ordinal Logistic Regression

```
## # A tibble: 4 x 2
##   wealth     n
##   <fct>  <int>
## 1 idk      265
## 2 poorer   276
## 3 richer   589
## 4 same     723
```

```
## Cumulative Link Mixed Model fitted with the Laplace approximation
##
## formula: wealth ~ language + child_age_centered + (1 | id)
## data:    w_for_plots
##
##  link  threshold nobs logLik   AIC     niter     max.grad cond.H
##  logit flexible  1588 -1543.37 3108.74 880(3523) 7.88e-04 6.3e+01
##
## Random effects:
```

```
##  Groups Name        Variance Std.Dev.
##  id     (Intercept) 0.627    0.792
## Number of groups:  id 127
##
## Coefficients:
##                          Estimate Std. Error z value Pr(>|z|)
## languageHindi            -0.0509     0.1898   -0.27    0.789
## languageUrdu              0.1486     0.1860    0.80    0.424
## languageMarathi           0.0707     0.1953    0.36    0.717
## languageTamil            -0.2298     0.1942   -1.18    0.237
## languageEnglish (India)   0.9672     0.1989    4.86  1.2e-06 ***
## languageEnglish (U.S.)    0.9841     0.1956    5.03  4.9e-07 ***
## languageMandarin          1.2416     0.2076    5.98  2.2e-09 ***
## child_age_centered       -0.1313     0.0556   -2.36    0.018 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Threshold coefficients:
##             Estimate Std. Error z value
## poorer|same   -1.458      0.160   -9.13
## same|richer    0.964      0.156    6.16
```

```
## Likelihood ratio tests of cumulative link models:
##
##                   formula:                                              link:
## w_ord_mod         wealth ~ language + child_age_centered + (1 | id) logit
## w_ord_ageint_mod wealth ~ language * child_age_centered + (1 | id) logit
##                   threshold:
## w_ord_mod         flexible
## w_ord_ageint_mod flexible
##
##                   no.par  AIC logLik LR.stat df Pr(>Chisq)
## w_ord_mod             11 3109  -1543
## w_ord_ageint_mod      18 3115  -1539    8.04  7       0.33
```

```
## Likelihood ratio tests of cumulative link models:
##
##                  formula:                                              link:
## w_ord_noage_mod wealth ~ language + (1 | id)                          logit
## w_ord_mod       wealth ~ language + child_age_centered + (1 | id) logit
##                  threshold:
## w_ord_noage_mod flexible
## w_ord_mod       flexible
##
##                  no.par  AIC logLik LR.stat df Pr(>Chisq)
## w_ord_noage_mod     10 3112  -1546
## w_ord_mod           11 3109  -1543     5.5  1      0.019 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Table

wealth

Predictors

Odds Ratios

CI

p

poorer|same

0.23 ***

0.17 – 0.32

<0.001

same|richer

2.62 ***

1.93 – 3.56

<0.001

language [Hindi]

0.95

0.66 – 1.38

0.789

language [Urdu]

1.16

0.81 – 1.67

0.424

language [Marathi]

1.07

0.73 – 1.57

0.717

language [Tamil]

0.79

0.54 – 1.16

0.237

language [English(India)]

2.63 ***

1.78 – 3.88

<0.001

language [English (U.S.)]

2.68 ***

1.82 – 3.93

<0.001

language [Mandarin]

3.46 ***

2.30 – 5.20

<0.001

child age centered

0.88 *

0.79 – 0.98

0.018

N id

127

Observations

1588

Marginal R2 / Conditional R2

0.076 / 0.224

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

Forest Plot

Familiarity

Table

wealth

Predictors

Odds Ratios

CI

p

child_age_centered

0.89 *

0.80 – 0.99

0.039

familiar1

0.39

0.05 – 3.45

0.400

Gujarati

Reference

languageEnglish (India):familiar1

0.00

0.00 – 188134468825407528960.00

0.529

Hindi

0.98

0.67 – 1.42

0.897

languageEnglish (U.S.):familiar1

2.02

0.15 – 27.24

0.597

Urdu

0.44

0.05 – 3.88

0.462

Marathi

0.57

0.06 – 5.23

0.622

Tamil

0.35

0.04 – 3.07

0.342

languageMandarin:familiar1

2.18

0.23 – 20.94

0.500

English (India)

3325148319.15

0.00 – 84125323484552812458245388721008410624.00

0.511

languageMarathi:familiar1

1.75

0.18 – 16.64

0.627

English (U.S.)

1.35

0.10 – 17.54

0.820

languageTamil:familiar1

2.06

0.22 – 19.56

0.529

Mandarin

1.60

0.18 – 14.59

0.675

languageUrdu:familiar1

3.93

0.41 – 37.82

0.237

poorer|same

0.09 *

0.01 – 0.82

0.032

same|richer

1.08

0.13 – 9.27

0.945

N id

127

Observations

1576

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

Gender

Table

wealth

Predictors

Odds Ratios

CI

p

poorer|same

0.19 ***

0.13 – 0.30

<0.001

same|richer

2.19 ***

1.44 – 3.35

<0.001

language [Hindi]

1.01

0.58 – 1.75

0.970

language [Urdu]

1.05

0.61 – 1.80

0.868

language [Marathi]

1.09

0.62 – 1.91

0.759

language [Tamil]

0.58

0.33 – 1.03

0.061

language [English(India)]

2.20 **

1.23 – 3.96

0.008

language [English (U.S.)]

1.80 *

1.04 – 3.12

0.037

language [Mandarin]

4.46 ***

2.44 – 8.13

<0.001

speaker FEMALE [1]

0.67

0.39 – 1.15

0.150

child age centered

0.87 *

0.77 – 0.98

0.021

language [Hindi] ×speaker FEMALE [1]

1.03

0.48 – 2.21

0.933

language [Urdu] × speakerFEMALE [1]

1.31

0.62 – 2.77

0.474

language [Marathi] ×speaker FEMALE [1]

1.02

0.46 – 2.22

0.969

language [Tamil] ×speaker FEMALE [1]

1.81

0.83 – 3.94

0.136

language [English(India)] × speaker FEMALE[1]

1.54

0.69 – 3.42

0.288

language [English (U.S.)]× speaker FEMALE [1]

2.67 *

1.21 – 5.86

0.014

language [Mandarin] ×speaker FEMALE [1]

0.63

0.28 – 1.45

0.277

N id

118

Observations

1516

Marginal R2 / Conditional R2

0.090 / 0.242

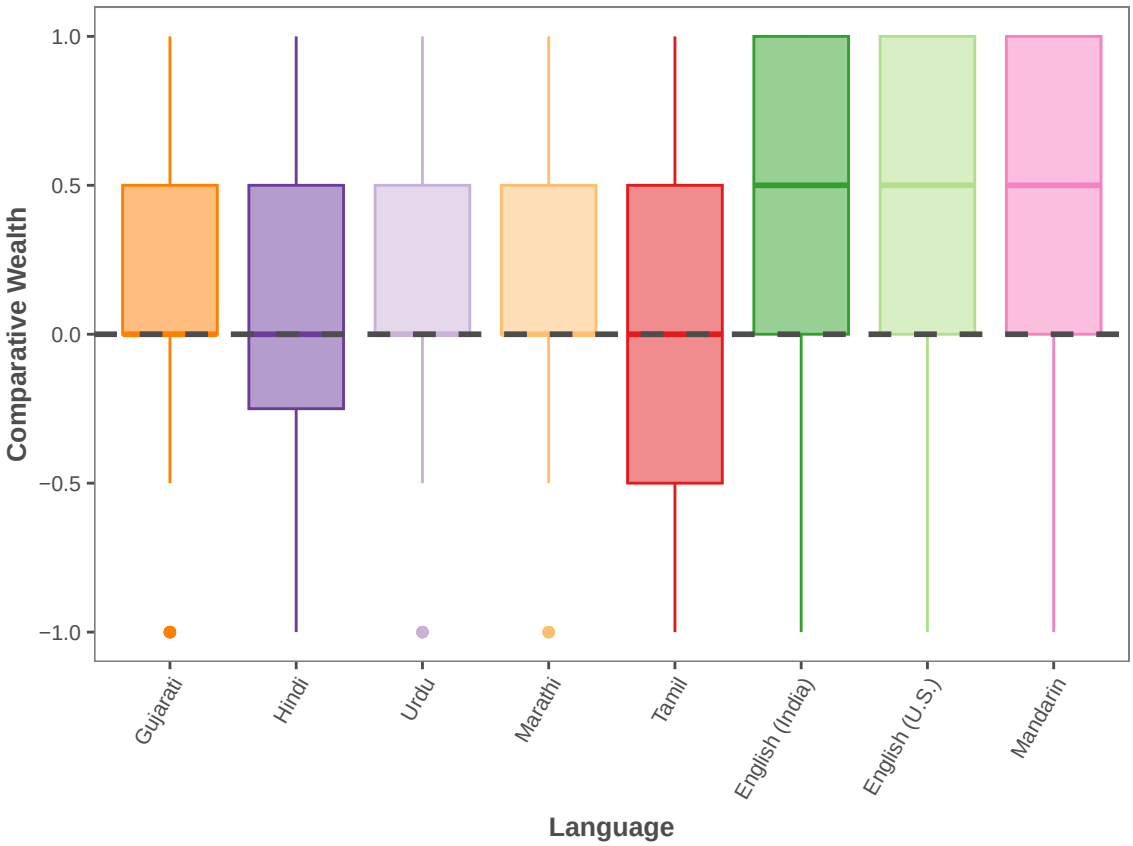
- p<0.05 ** p<0.01 *** p<0.001

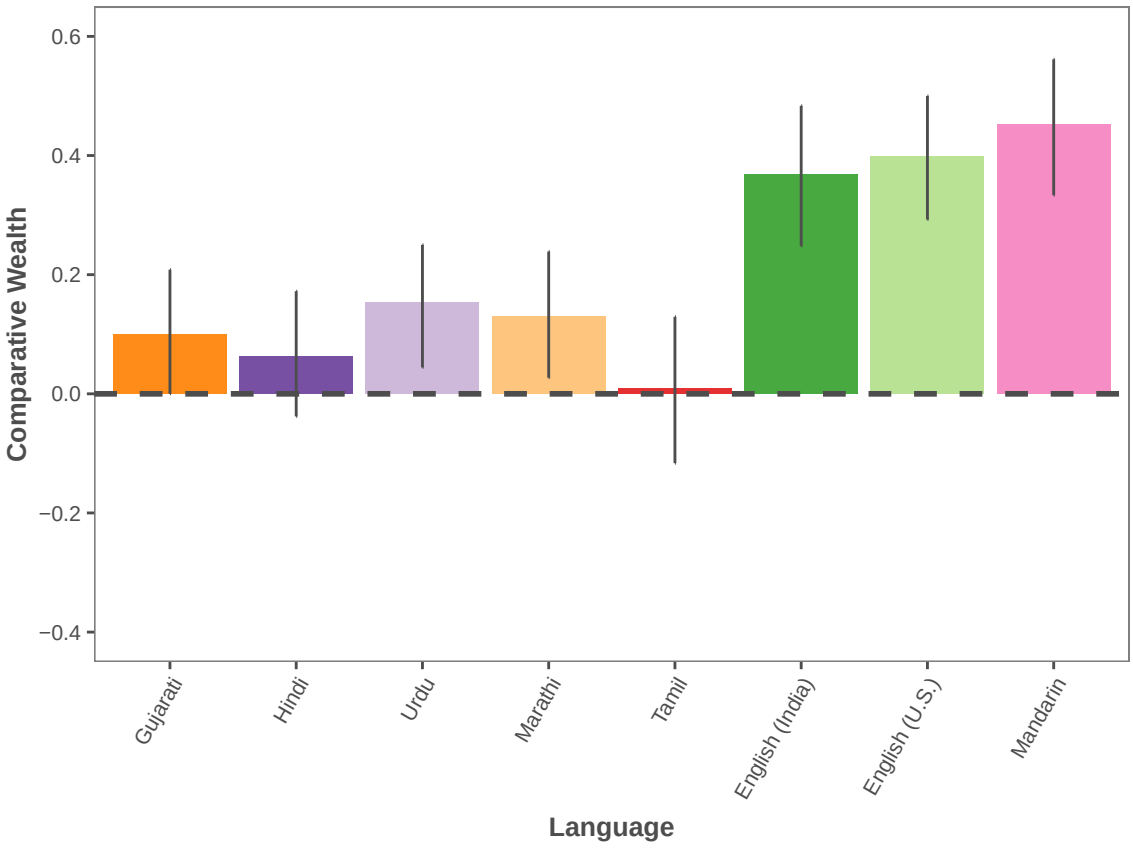
Analyzed as a Continuous Variable

Recoded responses to prompt "This speaker has. . . ":

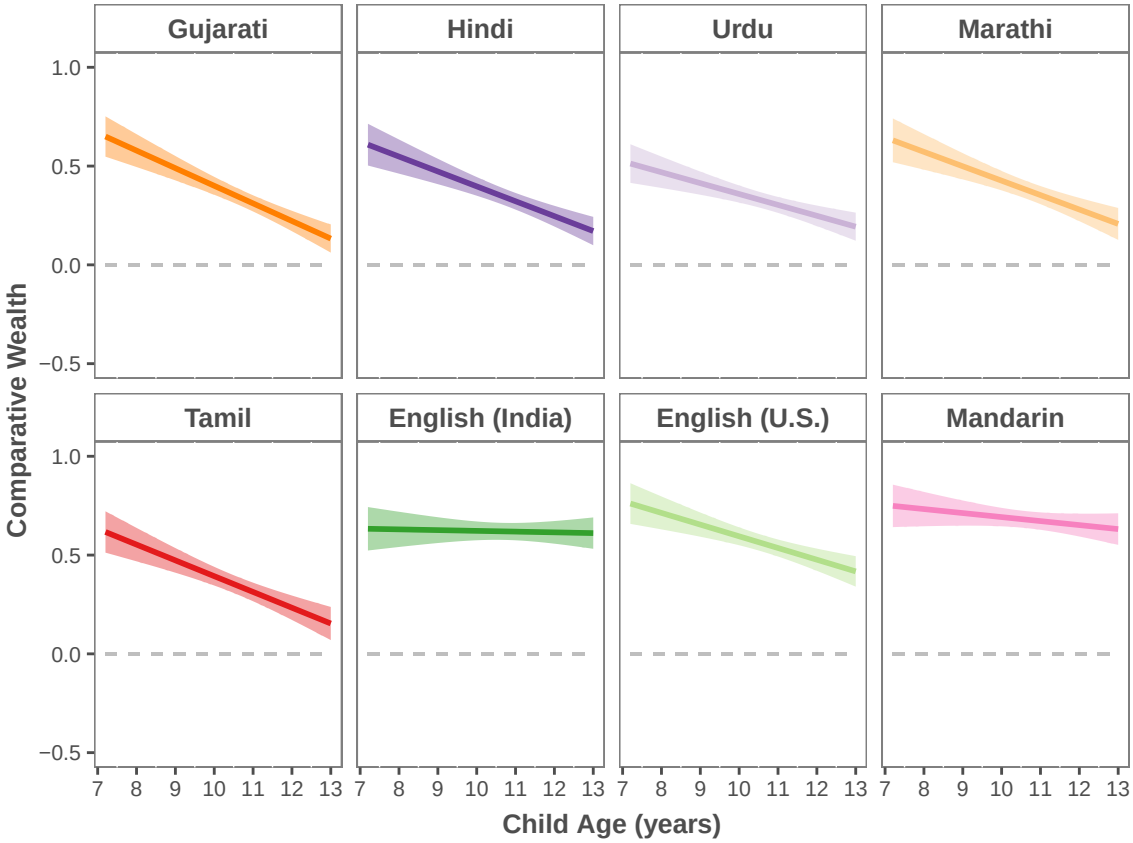
- -1: "*Less* money than the people in my city"
- 0: "*As much* money as the people in my city"
- 1: "*More* money than the people in my city"
- NA: "No Opinion"

```
## # A tibble: 8 x 2
##   language        relative_wealth
##   <fct>                     <dbl>
## 1 Gujarati                0.0676
## 2 Hindi                   0.0539
## 3 Urdu                    0.127
## 4 Marathi                 0.102
## 5 Tamil                   0.00524
## 6 English (India)         0.371
## 7 English (U.S.)          0.404
## 8 Mandarin                0.459
```


Comparative Wealth
1.0
0.5
0.0
−0.5
−1.0
Gujarati
Hindi
Urdu
Marathi
Tamil
English (India)
English (U.S.)
Mandarin
Language


Comparative Wealth
0.6
0.4
0.2
0.0
−0.2
−0.4
Gujarati
Hindi
Urdu
Marathi
Tamil
English (India)
English (U.S.)
Mandarin
Language

With Age



LMERs

Table 3: Wealth Model Fixed Effects

		2.5 %	97.5 %
(Intercept)	0.08	-0.02	0.17
languageHindi	-0.02	-0.14	0.11
languageUrdu	0.06	-0.07	0.18
languageMarathi	0.02	-0.11	0.15
languageTamil	-0.08	-0.21	0.05
languageEnglish (India)	0.30	0.18	0.43
languageEnglish (U.S.)	0.32	0.20	0.45
languageMandarin	0.38	0.25	0.51
child_age_centered	-0.04	-0.07	-0.01

Table 4: Wealth Interaction Model Fixed Effects

		2.5 %	97.5 %
(Intercept)	0.08	-0.02	0.18
languageHindi	-0.02	-0.15	0.10

		2.5 %	97.5 %
languageUrdu	0.05	-0.07	0.18
languageMarathi	0.02	-0.11	0.15
languageTamil	-0.08	-0.21	0.04
languageEnglish (India)	0.30	0.17	0.42
languageEnglish (U.S.)	0.32	0.19	0.45
languageMandarin	0.38	0.25	0.51
child_age_centered	-0.07	-0.13	0.00
languageHindi:child_age_centered	0.04	-0.05	0.12
languageUrdu:child_age_centered	0.03	-0.05	0.11
languageMarathi:child_age_centered	0.04	-0.04	0.13
languageTamil:child_age_centered	-0.03	-0.11	0.05
languageEnglish (India):child_age_centered	0.09	0.01	0.17
languageEnglish (U.S.):child_age_centered	0.02	-0.06	0.10
languageMandarin:child_age_centered	0.02	-0.06	0.11

```
## Data: w
## Models:
## wealth_lmer: coded_wealth ~ language + child_age_centered + (1 | id)
## wealth_int_lmer: coded_wealth ~ language * child_age_centered + (1 | id)
##                 npar  AIC  BIC logLik deviance Chisq Df Pr(>Chisq)
## wealth_lmer       11 3283 3342  -1631     3261
## wealth_int_lmer   18 3288 3385  -1626     3252  8.98  7       0.25

## Analysis of Deviance Table (Type II Wald chisquare tests)
##
## Response: coded_wealth
##                              Chisq Df Pr(>Chisq)
## language                    104.45  7     <2e-16 ***
## child_age_centered            5.13  1      0.024 *
## language:child_age_centered   8.92  7      0.258
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

The interaction between language and child age is not significant in predicting children's speaker–wealth associations.

```
##
## % Table created by stargazer v.5.2.3 by Marek Hlavac, Social Policy Institute. E-mail: marek.hlavac a
## % Date and time: Thu, Jun 13, 2024 - 04:33:25
## \begin{table}[!htbp] \centering
##   \caption{}
##   \label{}
## \begin{tabular}{@{\extracolsep{5pt}}lc}
## \\[-1.8ex]\hline
## \hline \\[-1.8ex]
##  & \multicolumn{1}{c}{\textit{Dependent variable:}} \\
## \cline{2-2}
## \\[-1.8ex] & coded\_wealth \\
## \hline \\[-1.8ex]
##  languageGujarati & 0.14 ($-$0.003--0.28) \\
##   languageHindi & 0.14$^{*}$ (0.001--0.28) \\
```

```
##   languageUrdu & 0.15$^{*}$ (0.01--0.29) \\
##   languageMarathi & 0.17$^{*}$ (0.02--0.31) \\
##   languageTamil & $-$0.05 ($-$0.20--0.09) \\
##   languageEnglish (India) & 0.35$^{***}$ (0.21--0.50) \\
##   languageEnglish (U.S.) & 0.34$^{***}$ (0.20--0.48) \\
##   languageMandarin & 0.59$^{***}$ (0.44--0.73) \\
##   speaker\_FEMALE & $-$0.14 ($-$0.32--0.04) \\
##   child\_age\_centered & $-$0.04$^{*}$ ($-$0.08--$-$0.003) \\
##   languageHindi:speaker\_FEMALE & 0.01 ($-$0.25--0.27) \\
##   languageUrdu:speaker\_FEMALE & 0.10 ($-$0.15--0.36) \\
##   languageMarathi:speaker\_FEMALE & 0.01 ($-$0.26--0.27) \\
##   languageTamil:speaker\_FEMALE & 0.21 ($-$0.05--0.48) \\
##   languageEnglish (India):speaker\_FEMALE & 0.19 ($-$0.08--0.45) \\
##   languageEnglish (U.S.):speaker\_FEMALE & 0.29$^{*}$ (0.03--0.55) \\
##   languageMandarin:speaker\_FEMALE & $-$0.12 ($-$0.39--0.15) \\
##  \hline \\[-1.8ex]
## Observations & 1,516 \\
## Log Likelihood & $-$1,586.00 \\
## Akaike Inf. Crit. & 3,210.00 \\
## Bayesian Inf. Crit. & 3,311.00 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:}  & \multicolumn{1}{r}{$^{*}$p$<$0.05; $^{**}$p$<$0.01; $^{***}$p$<$0.001} \\
## \end{tabular}
## \end{table}
```

Language ID

Table 5: Wealth-ID Interaction + Age Model Fixed Effects

		2.5 %	97.5 %
(Intercept)	0.32	-0.34	0.98
languageHindi	-0.01	-0.13	0.12
languageUrdu	-0.21	-0.88	0.46
languageMarathi	-0.14	-0.82	0.54
languageTamil	-0.30	-0.97	0.37
languageEnglish (India)	0.53	-0.27	1.34
languageEnglish (U.S.)	0.09	-0.69	0.87
languageMandarin	0.17	-0.51	0.85
familiar1	-0.26	-0.92	0.41
child_age_centered	-0.03	-0.07	0.00
languageUrdu:familiar1	0.41	-0.30	1.11
languageMarathi:familiar1	0.14	-0.55	0.84
languageTamil:familiar1	0.18	-0.51	0.88
languageEnglish (India):familiar1	-0.25	-1.06	0.57
languageEnglish (U.S.):familiar1	0.24	-0.55	1.04
languageMandarin:familiar1	0.22	-0.47	0.92

```
## Analysis of Deviance Table (Type II Wald chisquare tests)
##
## Response: coded_wealth
##                     Chisq Df Pr(>Chisq)
```

```
## language           103.56  7     <2e-16 ***
## familiar             0.72  1      0.395
## child_age_centered   4.01  1      0.045 *
## language:familiar    7.48  6      0.279
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Table 6: Wealth Interaction Model Fixed Effects

		2.5 %	97.5 %
(Intercept)	-0.70	-1.83	0.42
languageHindi	-0.01	-0.14	0.11
languageUrdu	0.82	-0.32	1.95
languageMarathi	0.86	-0.29	2.02
languageTamil	0.73	-0.40	1.87
languageEnglish (India)	1.51	0.26	2.76
languageEnglish (U.S.)	1.13	-0.07	2.34
languageMandarin	1.21	0.07	2.35
familiar1	0.77	-0.36	1.91
child_age_centered	-0.68	-1.25	-0.10
languageUrdu:familiar1	-0.63	-1.78	0.53
languageMarathi:familiar1	-0.89	-2.06	0.27
languageTamil:familiar1	-0.86	-2.01	0.29
languageEnglish (India):familiar1	-1.23	-2.49	0.02
languageEnglish (U.S.):familiar1	-0.81	-2.02	0.41
languageMandarin:familiar1	-0.81	-1.96	0.34
languageHindi:child_age_centered	0.03	-0.05	0.11
languageUrdu:child_age_centered	0.63	0.04	1.21
languageMarathi:child_age_centered	0.62	0.03	1.22
languageTamil:child_age_centered	0.57	-0.01	1.15
languageEnglish (India):child_age_centered	0.60	-0.07	1.27
languageEnglish (U.S.):child_age_centered	0.69	0.08	1.30
languageMandarin:child_age_centered	0.69	0.10	1.27
familiar1:child_age_centered	0.62	0.03	1.20
languageUrdu:familiar1:child_age_centered	-0.55	-1.14	0.05
languageMarathi:familiar1:child_age_centered	-0.54	-1.15	0.06
languageTamil:familiar1:child_age_centered	-0.59	-1.19	0.01
languageEnglish (India):familiar1:child_age_centered	-0.50	-1.18	0.17
languageEnglish (U.S.):familiar1:child_age_centered	-0.68	-1.30	-0.06
languageMandarin:familiar1:child_age_centered	-0.71	-1.31	-0.12

```
## Analysis of Deviance Table (Type II Wald chisquare tests)
##
## Response: coded_wealth
##                                    Chisq Df Pr(>Chisq)
## language                          103.57  7     <2e-16 ***
## familiar                            1.23  1      0.267
## child_age_centered                  3.95  1      0.047 *
## language:familiar                   8.72  6      0.190
## language:child_age_centered        10.11  7      0.182
## familiar:child_age_centered         0.22  1      0.641
## language:familiar:child_age_centered  8.78  6      0.187
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```