CLASS, GENDER, AND SUBSTRATE ERASURE IN SOCIOLINGUISTIC CHANGE: A SOCIOPHONETIC STUDY OF SCHWA IN DERACIALIZING SOUTH AFRICAN ENGLISH:

ONLINE SUPPLEMENTARY MATERIALS 3c: MEDIAL 'I-SCHWA'

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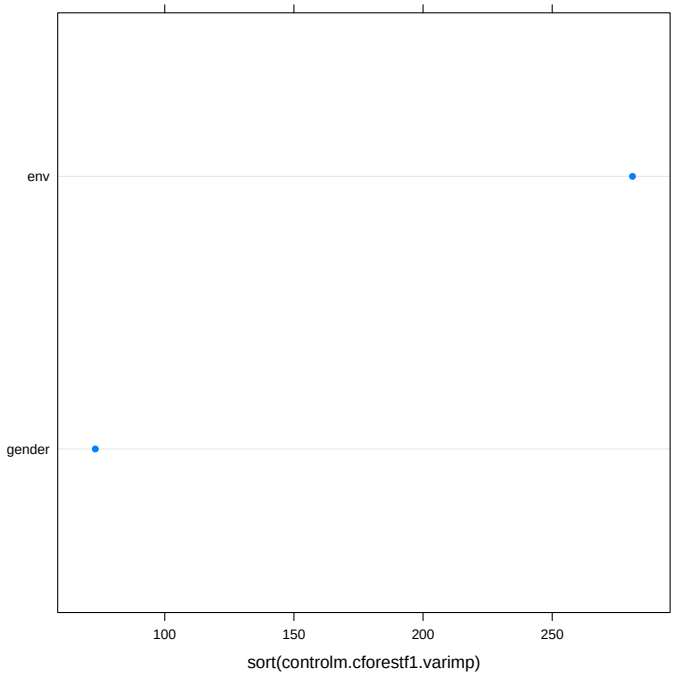
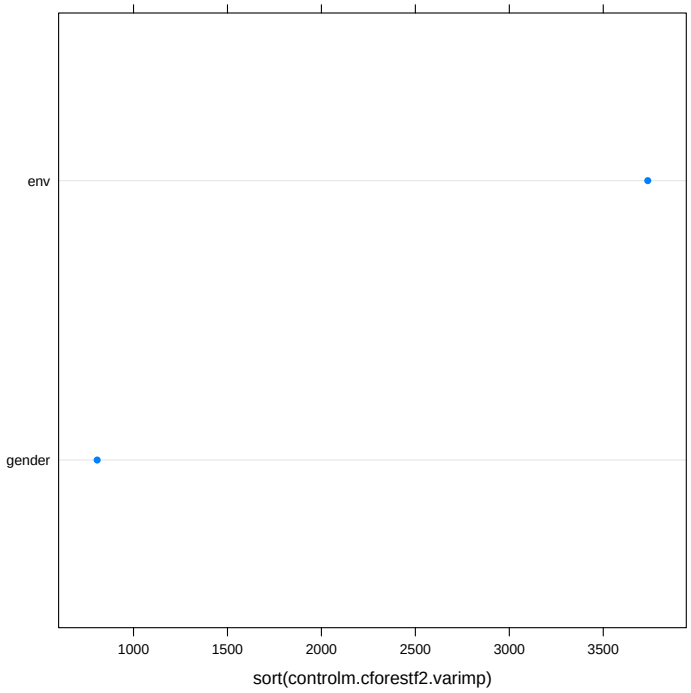
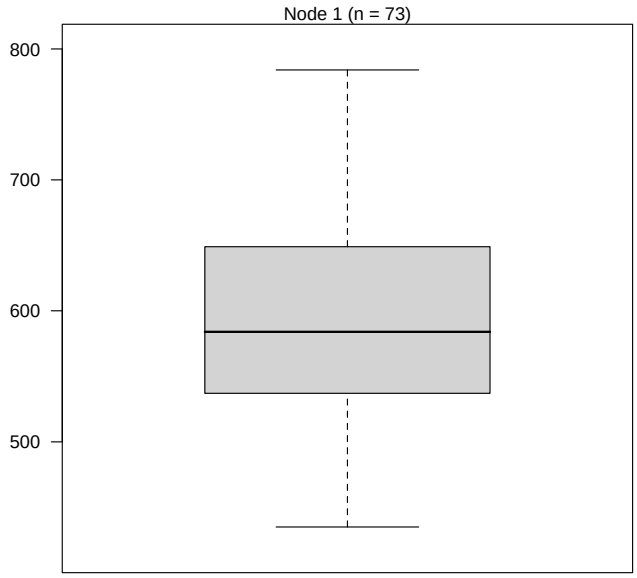
m ENVIRONMENT = medial schwa; third subtype: medial 'i-schwa'

CONTROL GROUP (WHITES): AMPLIFICATION OF DETAILS IN §4.4 OF THE MAIN TEXT. Medial environment, for 'i'. The medial environment has 162 'a', 163 'e', **seventy-three 'i'**, thirty 'o', forty-five 'u'. C-forest diagrams given below, followed by conditional inference trees and results of linear mixed-effects regression model.

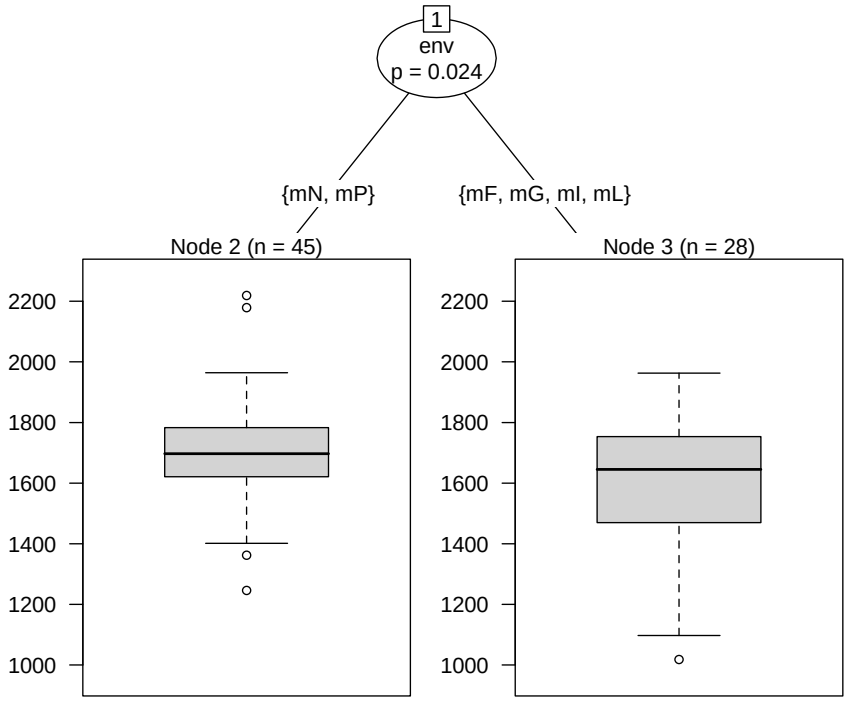



env
gender
1000
1500
2000
2500
3000
3500
sort(controlm.cforestf2.varimp)

F1 controlm for i by gender, env



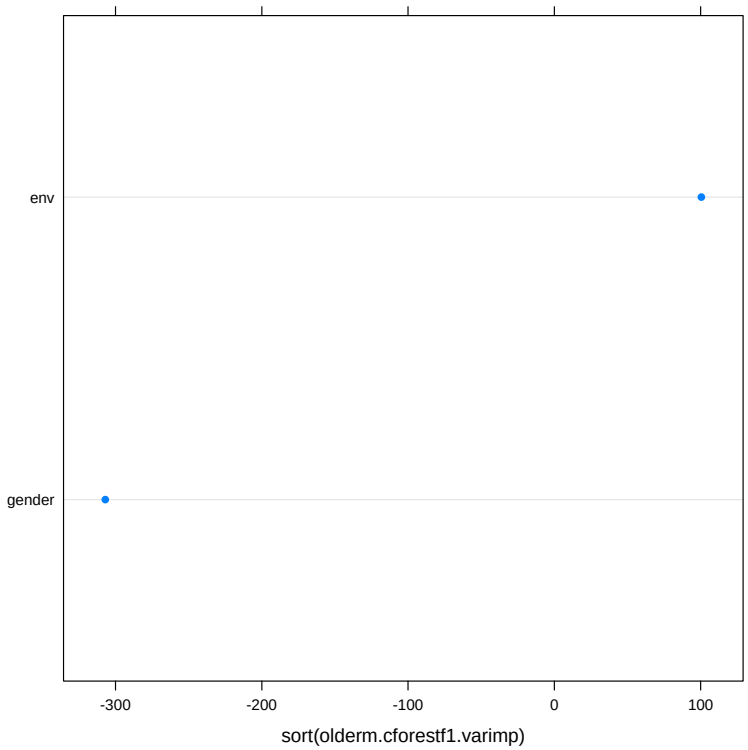
F2 controlm for i by gender, env

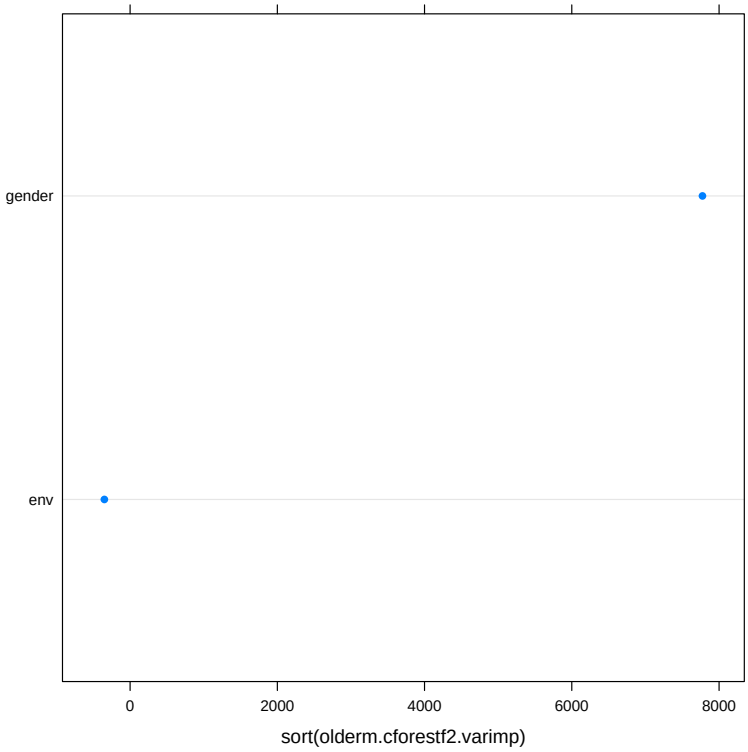


```
> controlm$env <- relevel(controlm $env, ref="mG")
> lmer=lmer(f1 ~ gender + env + (1|speaker) + (1|word), data= cor
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f1 ~ gender + env + (1 | speaker) + (1 | word)
   Data: controlm[controlm$vowel == "i", ]

REML criterion at convergence: 764.4

Scaled residuals:
    Min      1Q  Median      3Q     Max
-1.8056 -0.5418  0.0000  0.4445  1.5571

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept) 3102     55.69
 speaker  (Intercept)    0      0.00
 Residual             2897     53.83
Number of obs: 73, groups:  word, 51; speaker, 11

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  610.463     19.461  44.480  31.368   <2e-16 ***
genderM       -7.885     20.487  60.580  -0.385    0.702
envmF        -18.578     42.355  57.120  -0.439    0.663
envmI        -37.578     59.640  54.050  -0.630    0.531
envmL         67.537     79.860  53.390   0.846    0.401
envmN        -24.255     23.303  45.990  -1.041    0.303
envmP        -77.463     79.860  53.390  -0.970    0.336
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

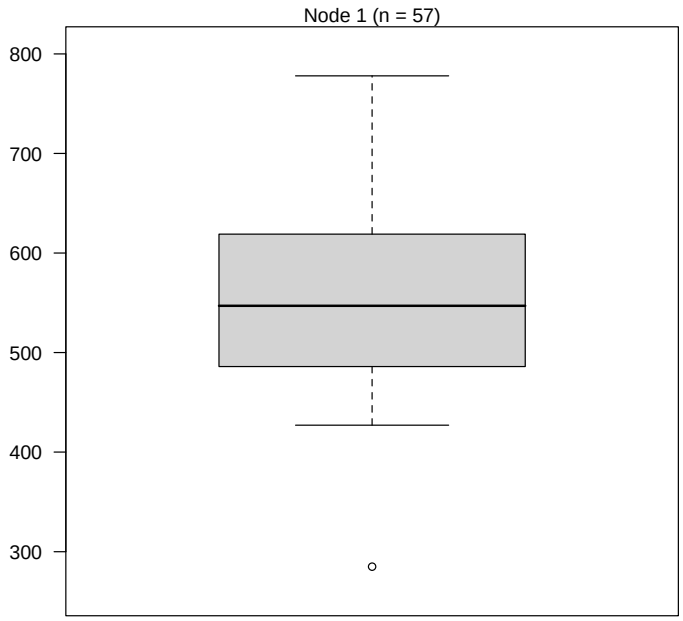
```
> controlm$env <- relevel(controlm $env, ref="mG")
> lmer=lmer(f2 ~ gender + env + (1|speaker) + (1|word), data= cont
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f2 ~ gender + env + (1 | speaker) + (1 | word)
   Data: controlm[controlm$vowel == "i", ]

REML criterion at convergence: 882.4

Scaled residuals:
     Min       1Q   Median       3Q      Max
-2.39113 -0.48451 -0.01137  0.48451  1.64591

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept) 10259    101.29
 speaker  (Intercept)  7652     87.48
 Residual             19408    139.31
Number of obs: 73, groups:  word, 51; speaker, 11

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  1610.26      57.12   17.62  28.191 4.44e-16 ***
genderM      -118.76      72.66   10.31  -1.634  0.13229
envmF        -324.59     103.94   52.77  -3.123  0.00291 **
envmI         136.88     137.64   46.59   0.994  0.32514
envmL        -180.62     181.16   43.07  -0.997  0.32431
envmN         155.48      51.40   26.30   3.025  0.00550 **
envmP          95.12     187.61   48.78   0.507  0.61446
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

OLDER CONTROL GROUP (BLACK SPEAKERS; §4.4). Medial environment, for ‘i’. The medial environment has 152 ‘a’, 137 ‘e’, **fifty-seven ‘i’**, twenty-five ‘o’, fifty-nine ‘u’. C-forest diagrams given below, followed by conditional inference trees and results of linear mixed-effects regression model.

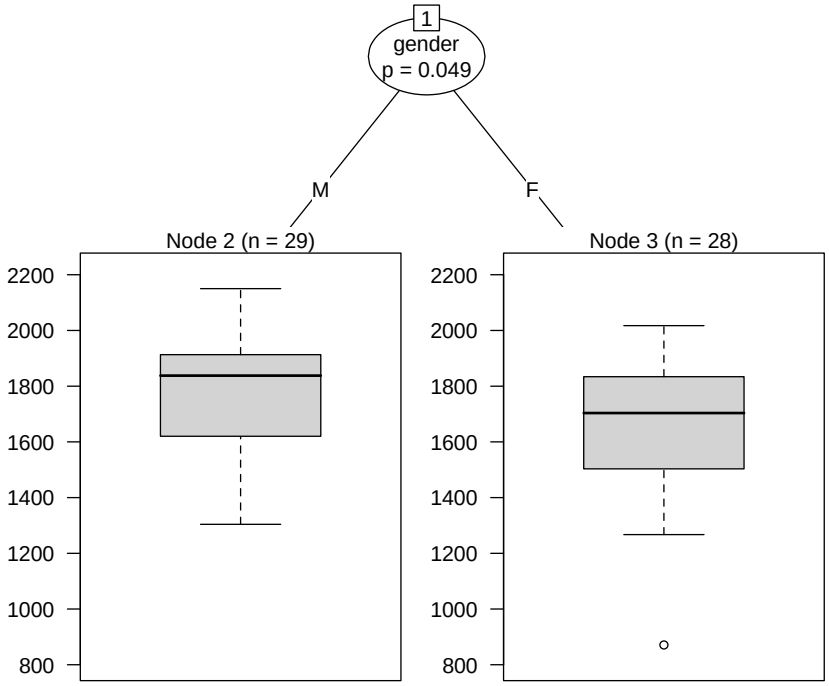




F1 olderm for i by gender, env



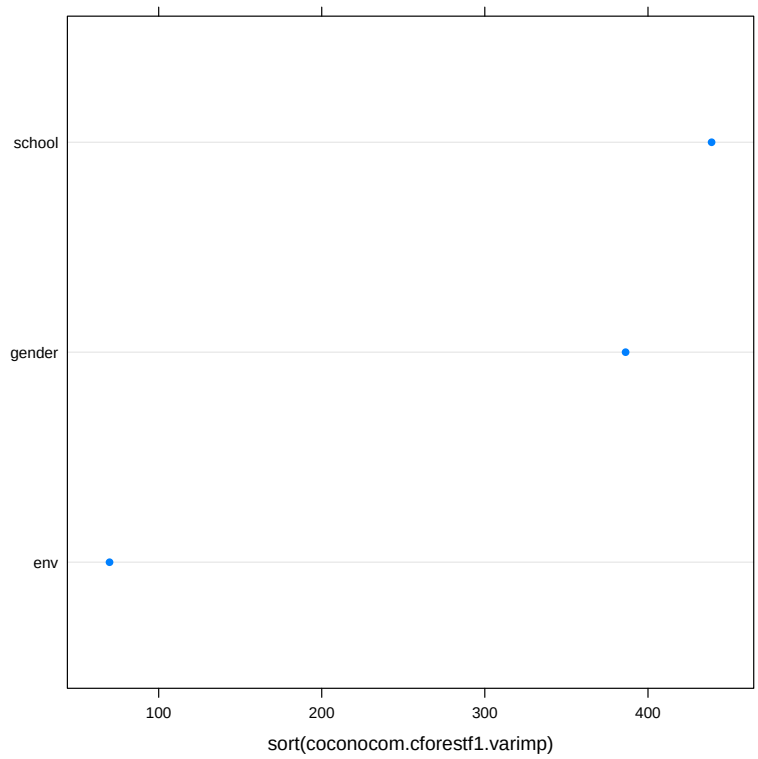
F2 olderm for i by gender, env

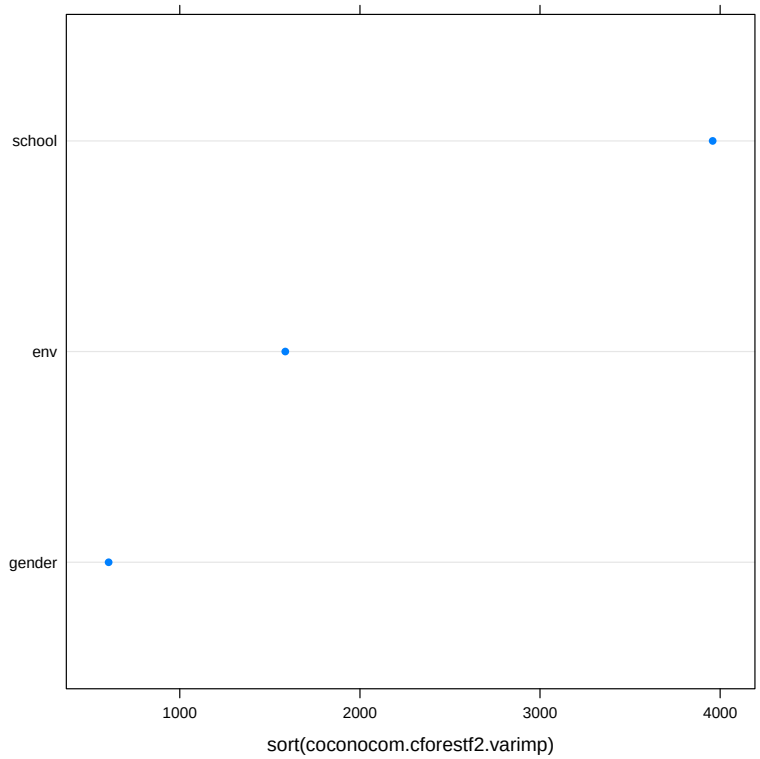


```
> olderm$env <- relevel(olderm$env, ref="mG")
> lmer=lmer(f1 ~ gender + env + (1|speaker) + (1|word), data= olde
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f1 ~ gender + env + (1 | speaker) + (1 | word)
   Data: olderm[olderm$vowel == "i", ]

REML criterion at convergence: 609.8

Scaled residuals:
     Min       1Q   Median       3Q      Max
-2.71723 -0.51574 -0.07722  0.37115  2.11465

Random effects:
 Groups   Name        Variance  Std.Dev.
 word     (Intercept) 3.657e+03 6.047e+01
 speaker  (Intercept) 4.460e-12 2.112e-06
 Residual             4.703e+03 6.858e+01
Number of obs: 57, groups:  word, 37; speaker, 12

Fixed effects:
            Estimate Std. Error     df t value Pr(>|t|)
(Intercept)   539.50      35.68  36.89  15.122   <2e-16 ***
genderM       -20.54      23.85  50.64  -0.861    0.393
envmI          38.35      64.24  21.18   0.597    0.557
envmL          82.13      77.55  15.50   1.059    0.306
envmN          18.79      37.37  38.04   0.503    0.618
envmP         142.50      98.15  40.42   1.452    0.154
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

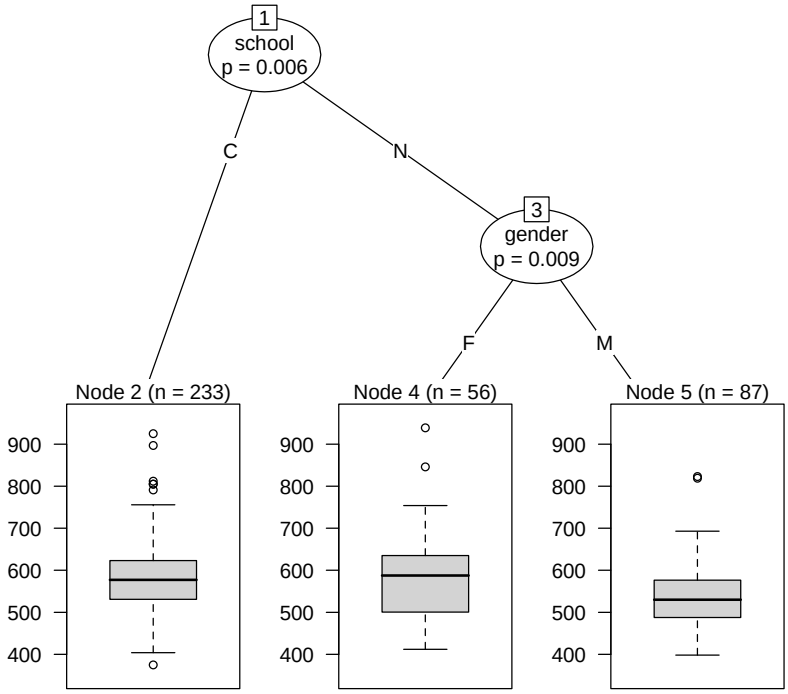
```
> olderm$env <- relevel(olderm$env, ref="mG")
> lmer=lmer(f2 ~ gender + env + (1|speaker) + (1|word), data= ol
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f2 ~ gender + env + (1 | speaker) + (1 | word)
   Data: olderm[olderm$vowel == "i", ]

REML criterion at convergence: 712.7

Scaled residuals:
    Min      1Q  Median      3Q     Max
-3.3380 -0.6018  0.1868  0.5475  1.7442

Random effects:
 Groups   Name        Variance  Std.Dev.
 word     (Intercept) 1.136e-09 3.371e-05
 speaker  (Intercept) 6.232e+03 7.894e+01
 Residual             5.085e+04 2.255e+02
Number of obs: 57, groups:  word, 37; speaker, 12

Fixed effects:
            Estimate Std. Error       df t value Pr(>|t|)
(Intercept) 1620.563     91.839   25.480  17.646 8.88e-16 ***
genderM      126.508     80.981    8.040   1.562    0.157
envmI         33.482    125.953   50.060   0.266    0.791
envmL          9.604    139.267   49.800   0.069    0.945
envmN         63.164     86.285   49.530   0.732    0.468
envmP        211.466    241.452   45.890   0.876    0.386
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

CORE GROUP (YOUNGER BLACK SPEAKERS; §4.5). Medial environment, for ‘i’. The medial environment has 682 ‘a’, 820 ‘e’, **376 ‘i’**, ninety-six ‘o’, 183 ‘u’. C-forest diagrams given below, followed by conditional inference trees and results of linear mixed-effects regression model.

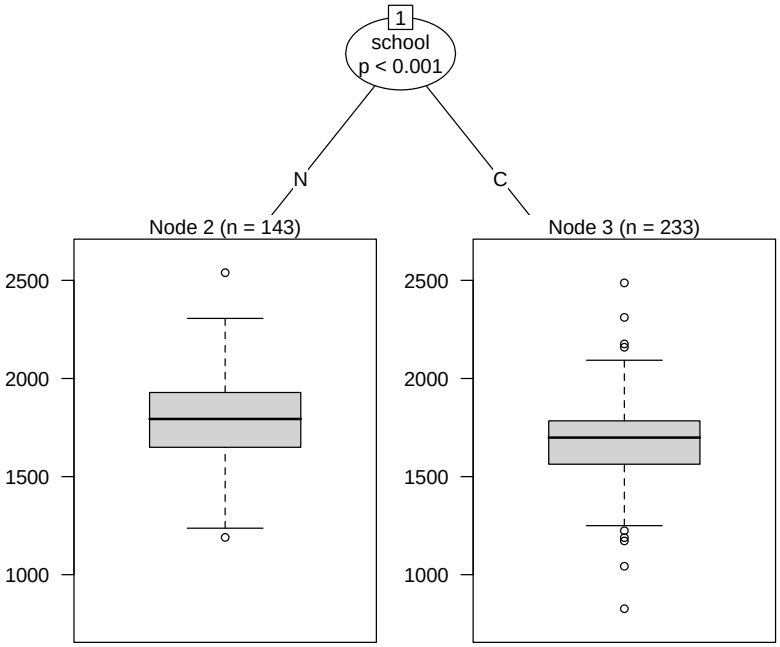




F1 COCONOCO m env 'i'



F2 COCONOCO m env 'i'



```
> lmer<-lmer(f1 ~ school + gender + env + (1|speaker) + (1|word)
> anova(lmer)
Analysis of Variance Table of type 3  with  Satterthwaite
approximation for degrees of freedom
       Sum Sq Mean Sq NumDF   DenDF F.value Pr(>F)
school  12743 12742.7     1  48.801  1.2802 0.2634
gender  15467 15467.5     1  42.747  2.6095 0.1136
env     59044  7380.5     8 136.576  1.4248 0.1914
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f1 ~ school + gender + env + (1 | speaker) + (1 | word)
   Data: coconocom[coconocom$vowel == "i", ]

REML criterion at convergence: 4260

Scaled residuals:
    Min      1Q  Median      3Q     Max
-2.4545 -0.5797 -0.0563  0.5247  4.6446

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept)  771.3   27.77
 speaker  (Intercept) 1034.5   32.16
 Residual             5180.0   71.97
Number of obs: 376, groups:  word, 142; speaker, 51

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  554.298     37.628 227.500  14.731   <2e-16 ***
schoolN      -14.316     12.652  48.800  -1.131    0.263
genderM      -20.441     12.654  42.700  -1.615    0.114
envmG         20.393     37.744 213.600   0.540    0.590
envmI         36.723     40.629 144.800   0.904    0.368
envmK         -5.015     67.690 272.000  -0.074    0.941
envmL         37.730     43.963 151.900   0.858    0.392
envmM         96.816     85.621 341.000   1.131    0.259
envmN         32.289     37.204 213.700   0.868    0.386
envmP        101.715     44.444 237.500   2.289    0.023 *
envmR         45.591     57.611 311.600   0.791    0.429
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

```
> lmer<-lmer(f2 ~ school + gender + env + (1|speaker) + (1|word)
> anova(lmer)
Analysis of Variance Table of type 3  with  Satterthwaite
approximation for degrees of freedom
       Sum Sq Mean Sq NumDF   DenDF F.value   Pr(>F)
school 408819  408819     1  50.235  9.5137 0.003311 **
gender 146867  146867     1  43.926  4.3557 0.042720 *
env    304947   38118     8 118.646  1.1418 0.340680
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f2 ~ school + gender + env + (1 | speaker) + (1 | word)
   Data: coconocom[coconocom$vowel == "i", ]

REML criterion at convergence: 4938.6

Scaled residuals:
    Min      1Q  Median      3Q     Max
-4.0442 -0.4657 -0.0015  0.5329  4.1123

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept)  4455     66.74
 speaker  (Intercept)  7007     83.71
 Residual             33385    182.72
Number of obs: 376, groups:  word, 142; speaker, 51

Fixed effects:
            Estimate Std. Error       df t value Pr(>|t|)
(Intercept) 1606.715     94.909  224.800  16.929  < 2e-16 ***
schoolN      100.119     32.460   50.200   3.084  0.00331 **
genderM       67.810     32.491   43.900   2.087  0.04272 *
envmG         58.547     95.080  205.500   0.616  0.53873
envmI          2.892    102.100  130.700   0.028  0.97745
envmK        147.215    170.799  266.400   0.862  0.38951
envmL        -30.169    110.552  142.100  -0.273  0.78533
envmM        -13.126    216.578  339.300  -0.061  0.95171
envmN         74.432     93.720  205.900   0.794  0.42799
envmP        -43.398    112.054  231.100  -0.387  0.69889
envmR        -77.562    145.470  303.900  -0.533  0.59430
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

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