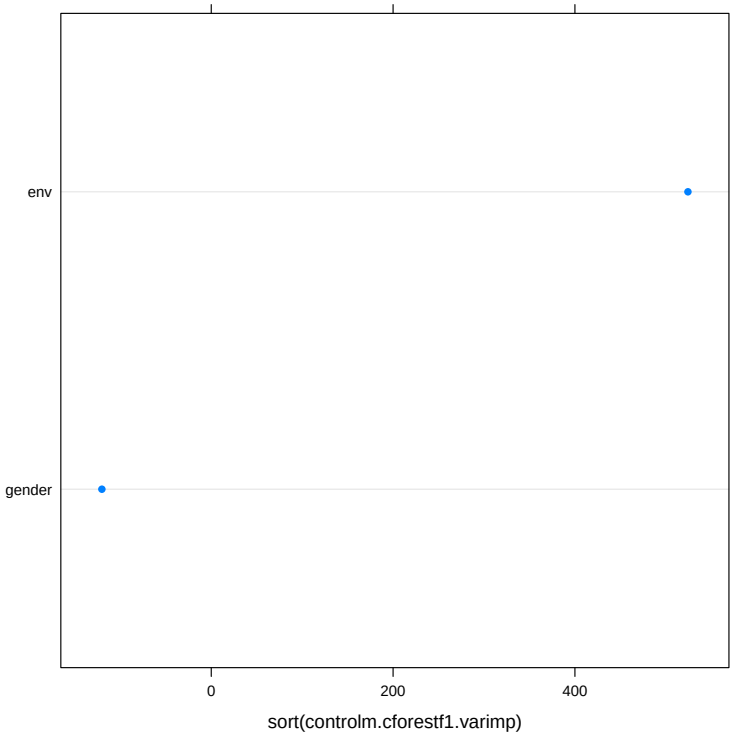
CLASS, GENDER, AND SUBSTRATE ERASURE IN SOCIOLINGUISTIC CHANGE: A SOCIOPHONETIC STUDY OF SCHWA IN DERACIALIZING SOUTH AFRICAN ENGLISH:

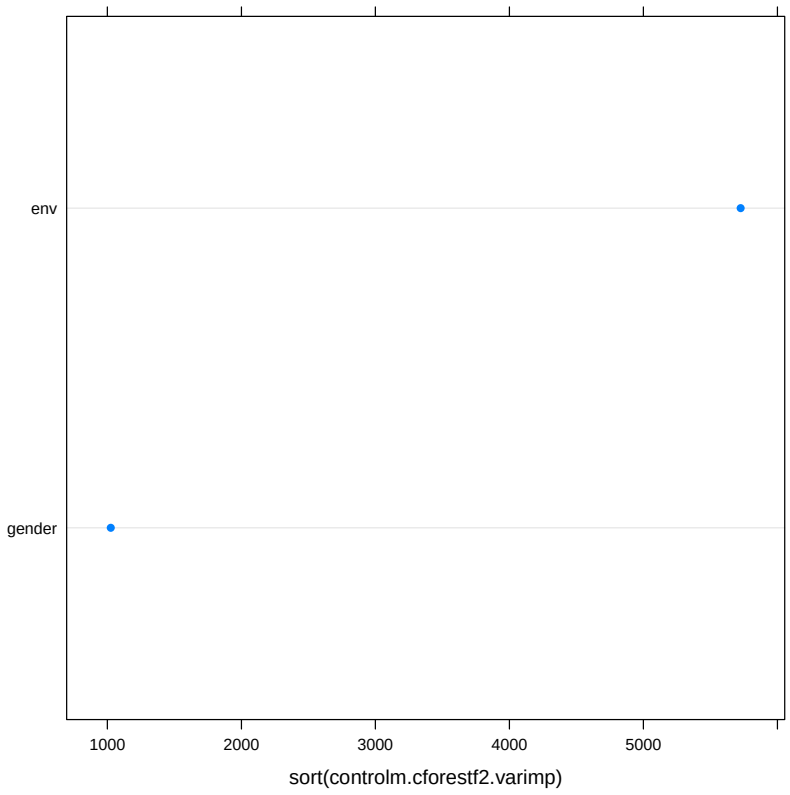
ONLINE SUPPLEMENTARY MATERIALS 3b: MEDIAL 'E-SCHWA'

RAJEND MESTHRIE
University of Cape Town

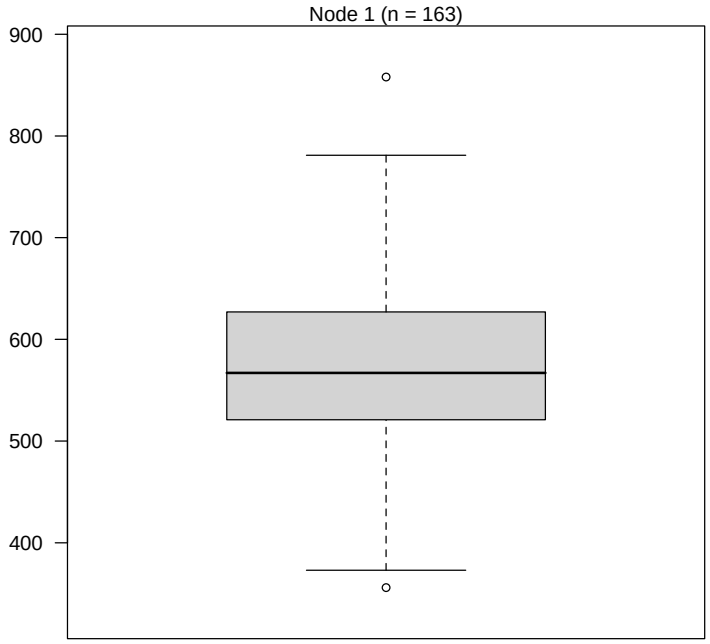
m ENVIRONMENT = medial schwa; second subtype: medial 'e-schwa'

CONTROL GROUP (WHITES): AMPLIFICATION OF DETAILS IN §4.4 OF THE MAIN TEXT. Medial environment, for 'e'. 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.

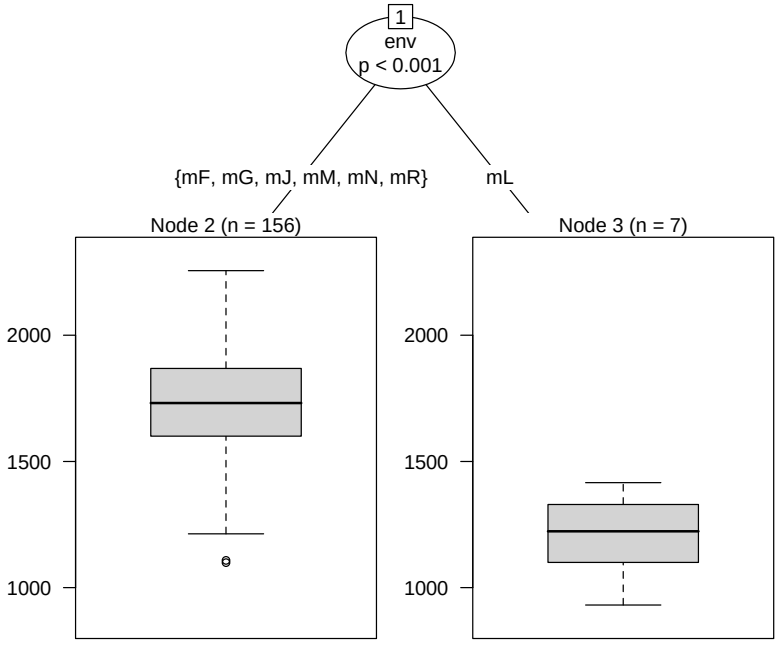



env
gender
1000
2000
3000
4000
5000
sort(controlm.cforestf2.varimp)

F1 controlm for e by gender, env



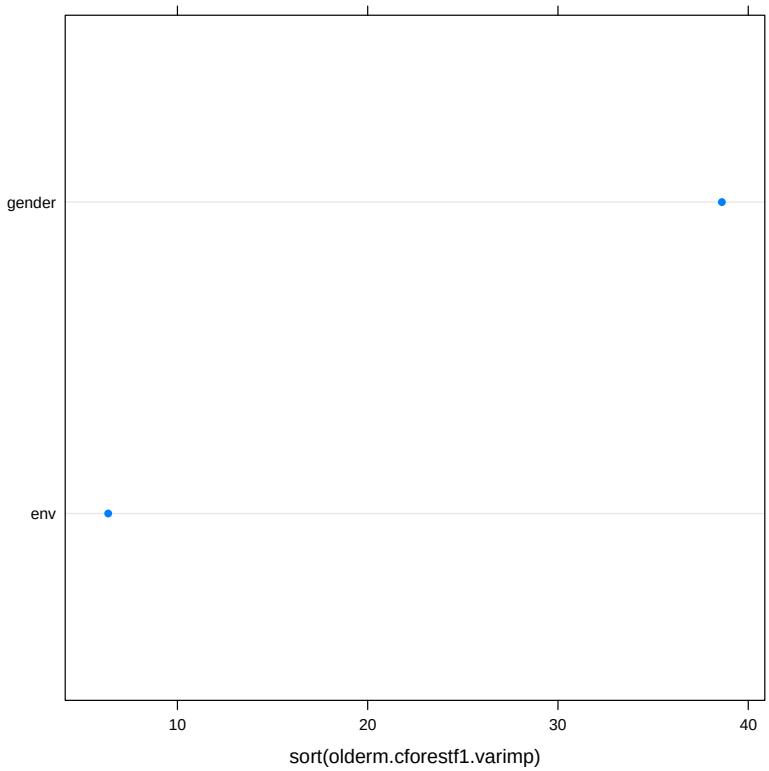
F2 controlm for e by gender, env

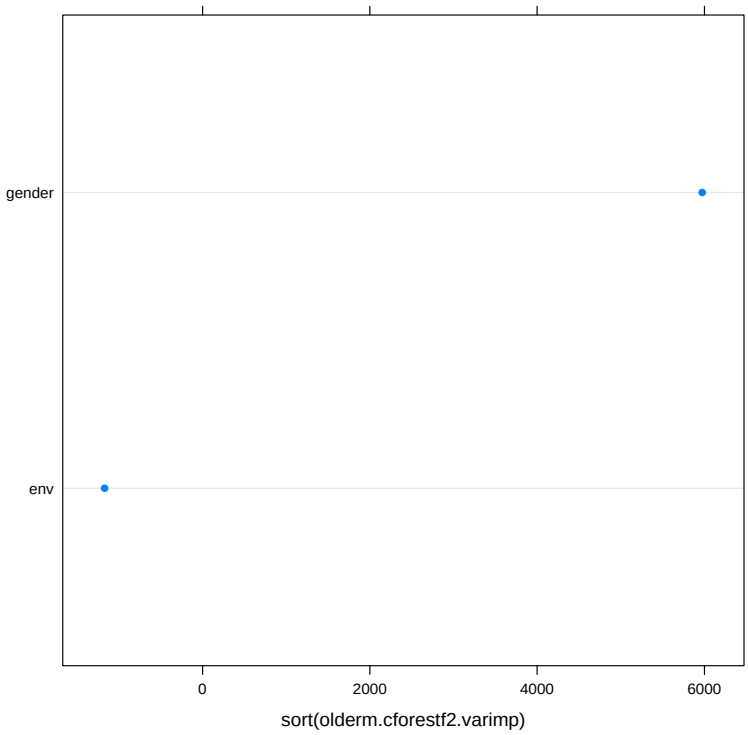


```
> controlm$env <- relevel(controlm $env, ref="mG")
> lmer=lmer(f1 ~ gender + env + (1|speaker) + (1|word), datc
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f1 ~ gender + env + (1 | speaker) + (1 | word)
   Data: controlm[controlm$vowel == "e", ]

REML criterion at convergence: 1797.8

Scaled residuals:
    Min      1Q  Median      3Q     Max
-2.5092 -0.5070 -0.1062  0.4672  2.4858

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept) 2732.1   52.27
 speaker  (Intercept)  259.3   16.10
 Residual             3587.0   59.89
Number of obs: 163, groups:  word, 94; speaker, 12

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  557.544     14.646  16.900  38.069   <2e-16 ***
genderM       -3.051     16.312   6.320  -0.187   0.8575
envmF         35.031     49.804  40.370   0.703   0.4859
envmJ        101.092     49.460  46.100   2.044   0.0467 *
envmL         74.891     35.556  67.250   2.106   0.0389 *
envmM         45.108     58.980  98.040   0.765   0.4462
envmN         27.203     16.384  58.910   1.660   0.1022
envmR        -13.470     53.284  63.550  -0.253   0.8012
```

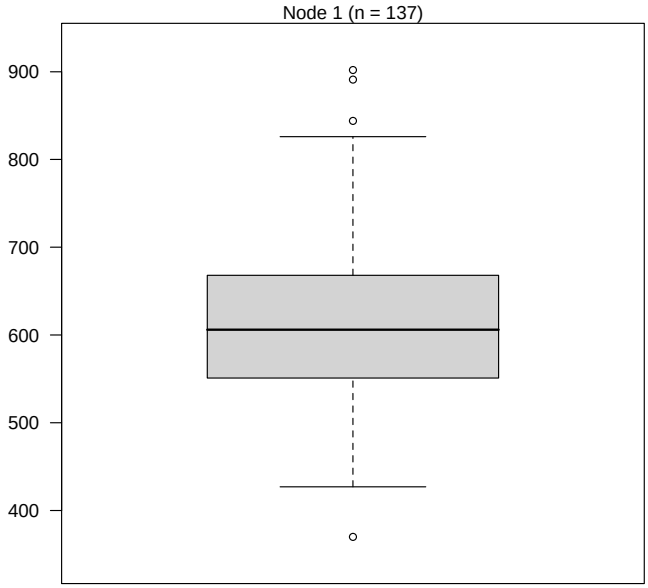
```
> controlm$env <- relevel(controlm $env, ref="mG")
> lmer=lmer(f2 ~ gender + env + (1|speaker) + (1|word), data= co
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f2 ~ gender + env + (1 | speaker) + (1 | word)
   Data: controlm[controlm$vowel == "e", ]

REML criterion at convergence: 2092.1

Scaled residuals:
     Min       1Q   Median       3Q      Max
-2.63450 -0.53854  0.07509  0.54655  2.62377

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept) 12344    111.10
 speaker  (Intercept)  1618     40.22
 Residual             27396    165.52
Number of obs: 163, groups:  word, 94; speaker, 12

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  1717.09      36.12   18.83  47.543  < 2e-16 ***
genderM        31.98      41.37    7.64   0.773   0.4628
envmF         -12.85     118.35   45.95  -0.109   0.9140
envmJ         199.69     118.85   59.82   1.680   0.0981 .
envmL        -549.10      87.15   85.56  -6.301 1.24e-08 ***
envmM        -210.12     147.78  121.17  -1.422   0.1576
envmN         -39.74      39.82   70.36  -0.998   0.3216
envmR         172.11     130.24   80.87   1.322   0.1900
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

OLDER CONTROL GROUP (BLACK SPEAKERS; §4.4). Medial environment, for ‘e’. 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.

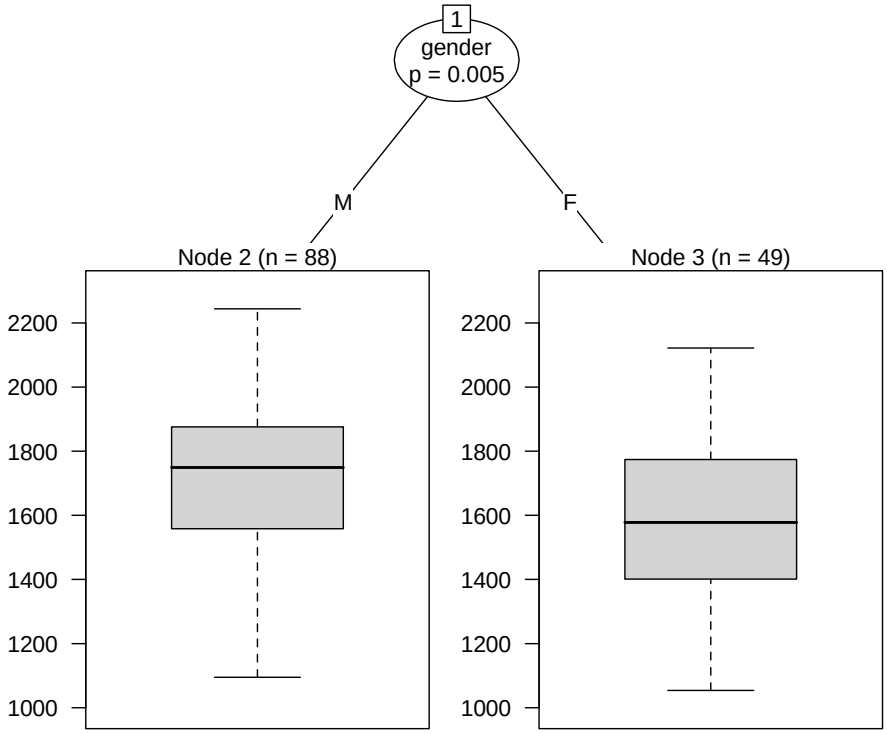




F1 olderm for e by gender, env



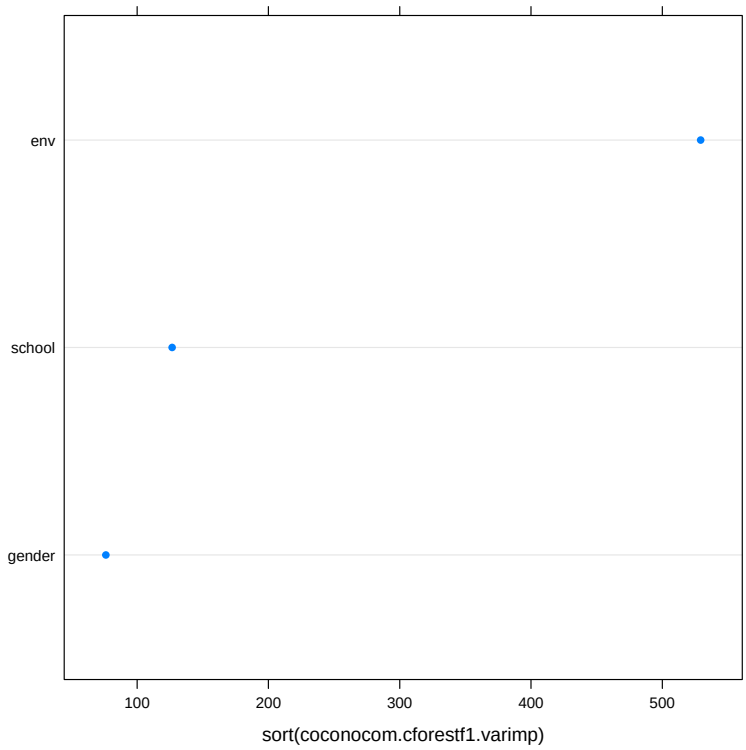
F2 olderm for e by gender, env

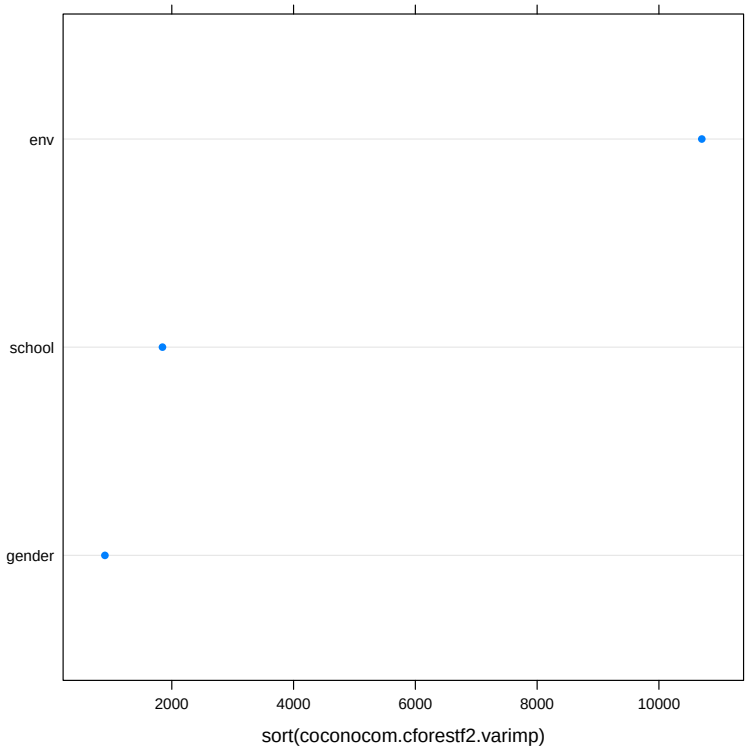


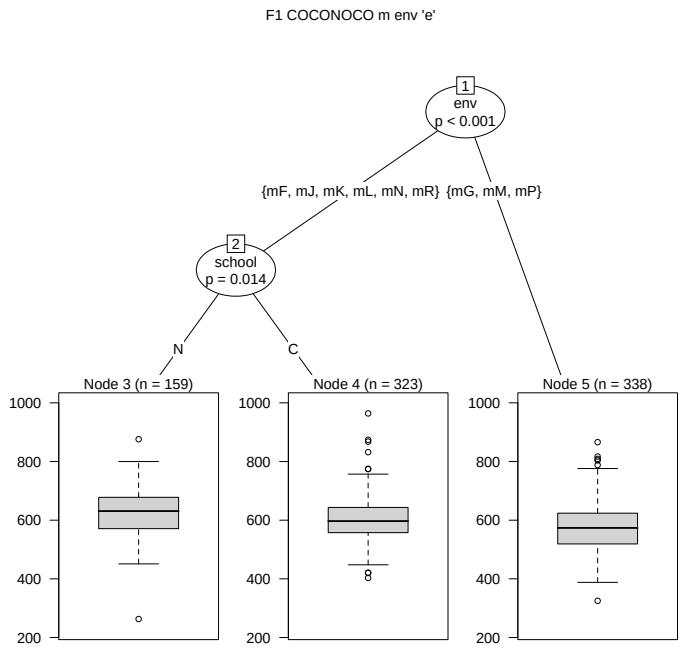
```
> olderm$env <- relevel(olderm$env, ref="mG")
> lmer=lmer(f1 ~ gender + env + (1|speaker) + (1|word), data= ol
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f1 ~ gender + env + (1 | speaker) + (1 | word)
   Data: olderm[olderm$vowel == "e", ]

REML criterion at convergence: 1546.1

Scaled residuals:
    Min      1Q  Median      3Q     Max
-2.2832 -0.5526 -0.1211  0.5828  2.9014

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept) 2971.4   54.51
 speaker  (Intercept)  562.2   23.71
 Residual             5901.3   76.82
Number of obs: 137, groups:  word, 71; speaker, 12

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  590.998     24.183  15.810  24.439 5.55e-14 ***
genderM       12.087     23.968   5.840   0.504   0.6325
envmJ        -22.750     51.273  88.600  -0.444   0.6583
envmK         57.594     70.089  90.920   0.822   0.4134
envmL         31.390     52.845  71.520   0.594   0.5544
envmM         33.373     55.915  70.980   0.597   0.5525
envmN          9.701     23.833  60.940   0.407   0.6854
envmR         92.468     41.949  94.300   2.204   0.0299 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

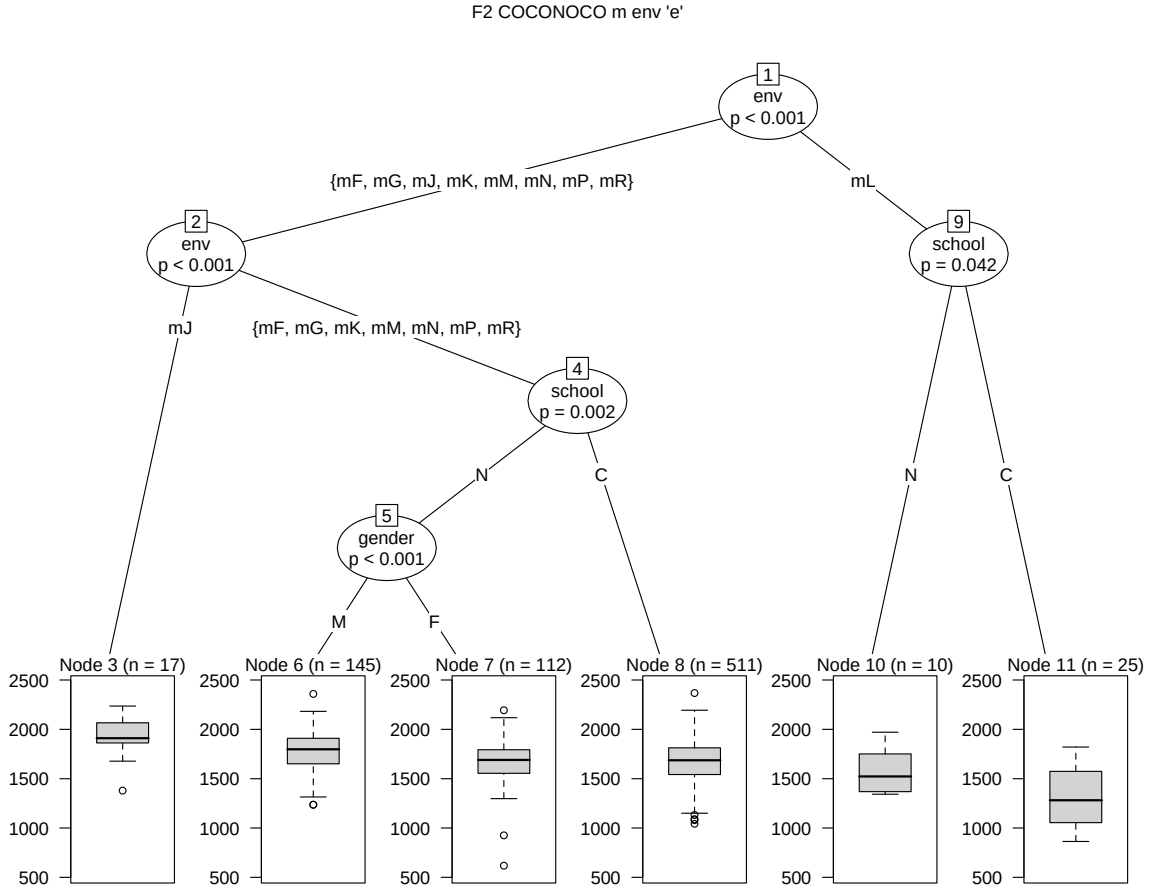
```
> olderm$env <- relevel(olderm$env, ref="mG")
> lmer=lmer(f2 ~ gender + env + (1|speaker) + (1|word), data= ol
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f2 ~ gender + env + (1 | speaker) + (1 | word)
   Data: olderm[olderm$vowel == "e", ]

REML criterion at convergence: 1801.5

Scaled residuals:
    Min      1Q  Median      3Q     Max
-2.3828 -0.5373  0.0546  0.5393  1.9675

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept) 17244    131.3
 speaker  (Intercept)     0      0.0
 Residual             46777    216.3
Number of obs: 137, groups:  word, 71; speaker, 12

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  1606.31      55.10   80.64  29.155   <2e-16 ***
genderM       123.13      48.60  121.91   2.534   0.0126 *
envmJ          54.13     136.23  100.83   0.397   0.6920
envmK         -38.87     185.91  102.92  -0.209   0.8348
envmL         -85.93     136.75   69.46  -0.628   0.5318
envmM         148.42     145.46   78.10   1.020   0.3107
envmN         -35.18      62.66   66.63  -0.561   0.5764
envmR        -171.38     109.33   99.23  -1.568   0.1202
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

CORE GROUP (YOUNGER BLACK SPEAKERS; §4.5). Medial environment, for ‘e’. 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 'e'
1
env
p < 0.001
{mF, mJ, mK, mL, mN, mR}
{mG, mM, mP}
2
school
p = 0.014
N
C
Node 3 (n = 159)
Node 4 (n = 323)
Node 5 (n = 338)
1000
800
600
400
200


F2 COCONOCO m env 'e'
1
env
p < 0.001
{mF, mG, mJ, mK, mM, mN, mP, mR}
mL
2
env
p < 0.001
9
school
p = 0.042
mJ
{mF, mG, mK, mM, mN, mP, mR}
4
school
p = 0.002
N
C
N
C
5
gender
p < 0.001
M
F
Node 3 (n = 17)
Node 6 (n = 145)
Node 7 (n = 112)
Node 8 (n = 511)
Node 10 (n = 10)
Node 11 (n = 25)
2500
2000
1500
1000
500

```
> 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  26580 26579.8     1  52.01  4.4327    0.0401 *
gender   1548  1548.1     1  44.55  0.1429    0.7072
env    224807 28100.8     8 320.38  5.2159 3.823e-06 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> summary(lmer)
Linear mixed model fit by REML ['merModLmerTest']
Formula: f1 ~ school + gender + env + (1 | speaker) + (1 | word)
   Data: coconocom[coconocom$vowel == "e", ]

REML criterion at convergence: 9375.5

Scaled residuals:
    Min      1Q  Median      3Q     Max
-5.0441 -0.6040 -0.0091  0.5373  4.6722

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept)  457.4   21.39
 speaker  (Intercept)  422.9   20.57
 Residual             5387.5   73.40
Number of obs: 820, groups:  word, 312; speaker, 53

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  624.496     32.773 675.100  19.055   <2e-16 ***
schoolN       17.724      8.419  52.000   2.105   0.0401 *
genderM        3.080      8.148  44.600   0.378   0.7072
envmG        -58.941     32.564 644.000  -1.810   0.0708 .
envmJ        -24.941     37.695 608.500  -0.662   0.5084
envmK        -25.149     37.463 563.400  -0.671   0.5023
envmL        -11.538     35.245 564.600  -0.327   0.7435
envmM        -45.936     35.539 562.500  -1.293   0.1967
envmN        -26.340     32.484 632.800  -0.811   0.4178
envmP        -74.865     55.296 724.100  -1.354   0.1762
envmR         35.105     38.218 688.700   0.919   0.3587
---
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  170095  170095     1  51.87  5.3580   0.02462 *
gender   63590   63590     1  44.64  1.4885   0.22885
env    2154706  269338     8 332.66  9.1196 2.386e-11 ***
---
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 == "e", ]

REML criterion at convergence: 10887

Scaled residuals:
    Min      1Q  Median      3Q     Max
-4.0116 -0.5363  0.0465  0.5661  2.8937

Random effects:
 Groups   Name        Variance Std.Dev.
 word     (Intercept) 12256    110.71
 speaker  (Intercept)  3465     58.86
 Residual             29534    171.86
Number of obs: 820, groups:  word, 312; speaker, 53

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  1648.00      89.27  491.50  18.461  < 2e-16 ***
schoolN        52.70      22.77   51.90   2.315  0.02462 *
genderM        27.06      22.18   44.60   1.220  0.22885
envmG          15.75      88.94  469.90   0.177  0.85951
envmJ         255.05     103.80  431.90   2.457  0.01440 *
envmK         -21.16     104.33  383.70  -0.203  0.83935
envmL        -281.38      97.62  420.60  -2.882  0.00415 **
envmM         -58.34      98.33  434.90  -0.593  0.55328
envmN           3.80      88.86  462.20   0.043  0.96591
envmP        -226.40     148.87  508.80  -1.521  0.12893
envmR         -72.50     102.58  578.20  -0.707  0.48003
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

[rajend.mesthrie@uct.ac.za]