```
high_perf_collab <- readRDS("data/surv_object_high.RDS")
REM.data <- readRDS("data/REM_data_high.RDS")</pre>
# base model
base_model0 <- coxph(high_perf_collab ~ 1, data = REM.data)</pre>
print(summary(base_model0))
## Call: coxph(formula = high_perf_collab ~ 1, data = REM.data)
##
## Null model
##
    log likelihood= -60467.39
    n = 515830
# sender model
model1 <- coxph(high_perf_collab ~ sender + 1, data = REM.data)</pre>
print(summary(model1))
## Call:
## coxph(formula = high_perf_collab ~ sender + 1, data = REM.data)
##
    n= 515830, number of events= 5089
##
##
                                    z Pr(>|z|)
##
            coef exp(coef) se(coef)
## sender6 -0.32336  0.72371  0.04259 -7.592 3.14e-14 ***
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' ' 1
##
##
         exp(coef) exp(-coef) lower .95 upper .95
## sender3
           0.6945
                     1.440
                           0.6409
                                     0.7526
           0.6394
                     1.564
                             0.5822
                                      0.7022
## sender5
## sender6
           0.7237
                     1.382
                             0.6658
                                    0.7867
           0.8127
                     1.230 0.7505
## sender7
                                      0.8802
## Concordance= 0.538 (se = 0.005)
## Likelihood ratio test= 126.7 on 4 df, p=<2e-16
## Wald test
                    = 130 on 4 df, p = < 2e - 16
## Score (logrank) test = 131.3 on 4 df, p=<2e-16
# receiver model
model2 <- coxph(high_perf_collab ~ target + 1, data = REM.data)</pre>
print(summary(model2))
## Call:
## coxph(formula = high_perf_collab ~ target + 1, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
            coef exp(coef) se(coef)
                                     z Pr(>|z|)
```

```
## target5 -0.59370
                   0.55228  0.04778 -12.425  < 2e-16 ***
## target7 -0.27270 0.76132 0.04067 -6.704 2.02e-11 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
         exp(coef) exp(-coef) lower .95 upper .95
## target3
            0.8856
                      1.129
                              0.8173
                                       0.9596
## target5
            0.5523
                      1.811
                              0.5029
                                       0.6065
                              0.5999
## target6
            0.6521
                      1.533
                                       0.7089
## target7
            0.7613
                      1.314
                              0.7030
                                       0.8245
##
## Concordance= 0.555 (se = 0.005)
                                    p=<2e-16
## Likelihood ratio test= 212.1 on 4 df,
## Wald test
                    = 207.7 on 4 df,
                                      p=<2e-16
## Score (logrank) test = 211.1 on 4 df,
                                      p=<2e-16
# sender - receiver model
model3 <- coxph(high_perf_collab ~ sender + target + 1, data = REM.data)</pre>
print(summary(model3))
## Call:
## coxph(formula = high_perf_collab ~ sender + target + 1, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
##
             coef exp(coef) se(coef)
                                       z Pr(>|z|)
## sender3 -0.36077   0.69714   0.04129   -8.737   < 2e-16 ***
## sender6 -0.35837   0.69881   0.04291   -8.352   < 2e-16 ***
## target5 -0.63165  0.53171  0.04798 -13.165  < 2e-16 ***
## target6 -0.47105   0.62435   0.04287 -10.989   < 2e-16 ***
## target7 -0.30487 0.73722 0.04084 -7.465 8.36e-14 ***
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
##
         exp(coef) exp(-coef) lower .95 upper .95
            0.6971
                      1.434
                              0.6429
## sender3
                                       0.7559
## sender5
            0.6026
                      1.659
                              0.5485
                                       0.6622
## sender6
            0.6988
                      1.431
                              0.6424
                                       0.7601
## sender7
            0.8020
                      1.247
                              0.7403
                                       0.8687
## target3
           0.8385
                      1.193
                              0.7734
                                       0.9091
## target5
            0.5317
                      1.881
                              0.4840
                                       0.5841
## target6
                      1.602
                              0.5740
            0.6243
                                       0.6791
## target7
            0.7372
                      1.356
                              0.6805
                                       0.7987
##
## Concordance= 0.58 (se = 0.005)
## Likelihood ratio test= 358.9 on 8 df,
                                      p=<2e-16
                                     p=<2e-16
## Wald test
                    = 357.4 on 8 df,
## Score (logrank) test = 362.6 on 8 df, p=<2e-16
```

```
# dialogue act model
model4 <- coxph(high_perf_collab ~ eventAttribute + 1, data = REM.data)</pre>
print(summary(model4))
## Call:
## coxph(formula = high_perf_collab ~ eventAttribute + 1, data = REM.data)
##
    n= 515830, number of events= 5089
##
##
                               coef exp(coef) se(coef)
                                                         z Pr(>|z|)
## eventAttributedisruption
                            -0.32806
                                    0.72032 0.12885 -2.546
                                      1.13018 0.10357 1.182
## eventAttributefloor-grabber 0.12238
                                                             0.2374
## eventAttributequestion
                            1.49971
                                      4.48038 0.08143 18.416
                                                             <2e-16 ***
## eventAttributestatement
                                     9.92965 0.07865 29.188
                            2.29553
                                                             <2e-16 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
                            exp(coef) exp(-coef) lower .95 upper .95
## eventAttributedisruption
                              0.7203
                                        1.3883
                                                 0.5596
                                                          0.9273
                              1.1302
                                        0.8848
                                                 0.9226
                                                           1.3845
## eventAttributefloor-grabber
## eventAttributequestion
                              4.4804
                                        0.2232
                                                 3.8194
                                                          5.2557
## eventAttributestatement
                              9.9297
                                        0.1007
                                                 8.5112 11.5845
##
## Concordance= 0.745 (se = 0.003)
## Likelihood ratio test= 3465 on 4 df,
                                      p=<2e-16
## Wald test
                     = 2412 on 4 df,
                                      p=<2e-16
## Score (logrank) test = 3320 on 4 df,
                                      p=<2e-16
# sender and dialogue act model
model5 <- coxph(high_perf_collab ~ sender + eventAttribute, data = REM.data)</pre>
print(summary(model5))
## Call:
## coxph(formula = high_perf_collab ~ sender + eventAttribute, data = REM.data)
    n= 515830, number of events= 5089
##
##
##
                               coef exp(coef) se(coef)
                                                          z Pr(>|z|)
                            -0.28592  0.75132  0.04101  -6.972  3.13e-12 ***
## sender3
## sender5
                            ## sender6
                            ## sender7
                            ## eventAttributedisruption
                            ## eventAttributefloor-grabber 0.11523
                                    1.12213 0.10358
                                                       1.113 0.26590
## eventAttributequestion
                                    4.52973 0.08147 18.542 < 2e-16 ***
                            1.51066
## eventAttributestatement
                            2.31378 10.11262 0.07868 29.407 < 2e-16 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
                            exp(coef) exp(-coef) lower .95 upper .95
                                       1.33098
## sender3
                              0.7513
                                                 0.6933
                                                          0.8142
## sender5
                              0.5304
                                       1.88540
                                                 0.4829
                                                          0.5825
## sender6
                              0.6656
                                       1.50235
                                               0.6123
                                                          0.7236
```

```
## sender7
                                 0.7850
                                           1.27383
                                                      0.7249
                                                               0.8502
## eventAttributedisruption
                                           1.44300
                                                     0.5382
                                                               0.8923
                                 0.6930
## eventAttributefloor-grabber
                                 1.1221
                                           0.89116
                                                     0.9160
                                                               1.3747
## eventAttributequestion
                                 4.5297
                                           0.22076
                                                     3.8612
                                                               5.3140
## eventAttributestatement
                                10.1126
                                           0.09889
                                                     8.6674
                                                              11.7988
##
## Concordance= 0.759 (se = 0.003)
## Likelihood ratio test= 3670 on 8 df,
                                          p=<2e-16
## Wald test
                       = 2622
                               on 8 df.
                                          p=<2e-16
## Score (logrank) test = 3541 on 8 df,
                                          p=<2e-16
# combined model
model6 <- coxph(high_perf_collab ~ sender * eventAttribute, data = REM.data)</pre>
print(summary(model6))
## Call:
## coxph(formula = high_perf_collab ~ sender * eventAttribute, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
                                          coef exp(coef) se(coef)
##
                                                                      z Pr(>|z|)
## sender3
                                      -0.44992
                                                0.63768 0.21960 -2.049 0.04048
## sender5
                                      -0.22835
                                                0.79584 0.23430 -0.975 0.32976
## sender6
                                      -0.85102
                                                0.42698 0.27027 -3.149 0.00164
## sender7
                                      -0.44353
                                               0.64177 0.21618 -2.052 0.04020
## eventAttributedisruption
                                      -0.22967
                                                0.79480 0.21785 -1.054 0.29177
## eventAttributefloor-grabber
                                      -0.08712
                                                0.91657 0.19913 -0.438 0.66175
## eventAttributequestion
                                       1.31732
                                                3.73341 0.15344
                                                                  8.585
                                                                         < 2e-16
## eventAttributestatement
                                                9.58127 0.14693 15.381
                                       2.25981
                                                                         < 2e-16
## sender3:eventAttributedisruption
                                      -0.42254
                                                ## sender5:eventAttributedisruption
                                      -0.27567
                                                0.75906 0.47417 -0.581 0.56099
## sender6:eventAttributedisruption
                                       0.65725
                                                1.92949 0.40330 1.630
                                                                         0.10316
## sender7:eventAttributedisruption
                                      -0.44679
                                                0.63968 0.41693 -1.072 0.28390
## sender3:eventAttributefloor-grabber 0.27360
                                                1.31469 0.29784 0.919 0.35829
## sender5:eventAttributefloor-grabber
                                       0.13933
                                                1.14951 0.32958 0.423 0.67247
## sender6:eventAttributefloor-grabber
                                       0.53924
                                                1.71470 0.34765 1.551
                                                                         0.12088
## sender7:eventAttributefloor-grabber 0.24513
                                                1.27779 0.29965 0.818 0.41333
## sender3:eventAttributequestion
                                                1.15354 0.23601 0.605 0.54505
                                       0.14283
## sender5:eventAttributequestion
                                                1.06849 0.24982 0.265 0.79087
                                       0.06625
## sender6:eventAttributequestion
                                       0.57616
                                                1.77919 0.28265 2.038 0.04150
## sender7:eventAttributequestion
                                       0.26770
                                                1.30695 0.23163 1.156 0.24779
## sender3:eventAttributestatement
                                       0.19162
                                                1.21121 0.22520 0.851 0.39485
## sender5:eventAttributestatement
                                                0.51016 0.24255 -2.775
                                      -0.67303
                                                                         0.00552
## sender6:eventAttributestatement
                                       0.40273
                                                1.49590 0.27540 1.462 0.14365
## sender7:eventAttributestatement
                                       0.19910
                                                1.22031 0.22180 0.898 0.36937
##
## sender3
## sender5
## sender6
## sender7
## eventAttributedisruption
## eventAttributefloor-grabber
## eventAttributequestion
## eventAttributestatement
                                      ***
```

```
## sender3:eventAttributedisruption
## sender5:eventAttributedisruption
## sender6:eventAttributedisruption
## sender7:eventAttributedisruption
## sender3:eventAttributefloor-grabber
## sender5:eventAttributefloor-grabber
## sender6:eventAttributefloor-grabber
## sender7:eventAttributefloor-grabber
## sender3:eventAttributequestion
## sender5:eventAttributequestion
## sender6:eventAttributequestion
## sender7:eventAttributequestion
## sender3:eventAttributestatement
## sender5:eventAttributestatement
                                        **
## sender6:eventAttributestatement
## sender7:eventAttributestatement
  Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
                                        exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                           0.6377
                                                       1.5682
                                                                 0.4147
                                                                           0.9807
## sender5
                                           0.7958
                                                       1.2565
                                                                 0.5028
                                                                           1.2597
## sender6
                                           0.4270
                                                       2.3420
                                                                 0.2514
                                                                           0.7252
## sender7
                                                       1.5582
                                                                           0.9804
                                           0.6418
                                                                 0.4201
## eventAttributedisruption
                                           0.7948
                                                       1.2582
                                                                 0.5186
                                                                           1.2181
## eventAttributefloor-grabber
                                           0.9166
                                                       1.0910
                                                                 0.6204
                                                                           1.3541
## eventAttributequestion
                                           3.7334
                                                       0.2679
                                                                 2.7637
                                                                           5.0433
## eventAttributestatement
                                           9.5813
                                                       0.1044
                                                                 7.1839
                                                                          12.7787
## sender3:eventAttributedisruption
                                           0.6554
                                                       1.5258
                                                                 0.3336
                                                                           1.2876
## sender5:eventAttributedisruption
                                           0.7591
                                                       1.3174
                                                                 0.2997
                                                                           1.9226
## sender6:eventAttributedisruption
                                           1.9295
                                                       0.5183
                                                                 0.8753
                                                                           4.2533
## sender7:eventAttributedisruption
                                           0.6397
                                                       1.5633
                                                                 0.2825
                                                                           1.4483
## sender3:eventAttributefloor-grabber
                                           1.3147
                                                       0.7606
                                                                 0.7333
                                                                           2.3569
## sender5:eventAttributefloor-grabber
                                                       0.8699
                                                                           2.1931
                                           1.1495
                                                                 0.6025
## sender6:eventAttributefloor-grabber
                                           1.7147
                                                       0.5832
                                                                 0.8675
                                                                           3.3893
## sender7:eventAttributefloor-grabber
                                                                           2.2989
                                           1.2778
                                                       0.7826
                                                                 0.7102
## sender3:eventAttributequestion
                                           1.1535
                                                       0.8669
                                                                 0.7263
                                                                           1.8320
## sender5:eventAttributequestion
                                                       0.9359
                                                                 0.6548
                                                                           1.7435
                                           1.0685
## sender6:eventAttributequestion
                                           1.7792
                                                       0.5621
                                                                 1.0224
                                                                           3.0961
                                                                           2.0579
## sender7:eventAttributequestion
                                           1.3070
                                                       0.7651
                                                                 0.8300
## sender3:eventAttributestatement
                                                                 0.7790
                                                                           1.8833
                                           1.2112
                                                       0.8256
## sender5:eventAttributestatement
                                           0.5102
                                                       1.9602
                                                                 0.3171
                                                                           0.8207
## sender6:eventAttributestatement
                                           1.4959
                                                       0.6685
                                                                 0.8719
                                                                           2.5664
## sender7:eventAttributestatement
                                           1.2203
                                                       0.8195
                                                                 0.7901
                                                                           1.8848
## Concordance= 0.761 (se = 0.003)
## Likelihood ratio test= 3757
                                 on 24 df,
                                             p=<2e-16
## Wald test
                         = 2721
                                 on 24 df,
                                             p=<2e-16
## Score (logrank) test = 3829
                                 on 24 df,
                                             p=<2e-16
# format print all model results
for (model in list(base_model0, model1, model2, model3, model4, model5, model6)) {
  print(summary(model))
}
```

```
## Call: coxph(formula = high_perf_collab ~ 1, data = REM.data)
##
## Null model
    log likelihood= -60467.39
##
    n = 515830
## Call:
## coxph(formula = high_perf_collab ~ sender + 1, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
##
            coef exp(coef) se(coef)
                                    z Pr(>|z|)
## sender3 -0.36453
                 ## sender5 -0.44728
                 ## sender6 -0.32336  0.72371  0.04259 -7.592 3.14e-14 ***
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
         exp(coef) exp(-coef) lower .95 upper .95
##
## sender3
           0.6945
                      1.440
                             0.6409
                             0.5822
## sender5
           0.6394
                      1.564
                                      0.7022
## sender6
           0.7237
                      1.382
                             0.6658
                                      0.7867
## sender7
           0.8127
                      1.230
                             0.7505
                                      0.8802
##
## Concordance= 0.538 (se = 0.005)
## Likelihood ratio test= 126.7 on 4 df,
                                     p=<2e-16
## Wald test = 130 on 4 df, p=<2e-16
## Score (logrank) test = 131.3 on 4 df, p=<2e-16
##
## Call:
## coxph(formula = high_perf_collab ~ target + 1, data = REM.data)
##
##
   n= 515830, number of events= 5089
##
##
            coef exp(coef) se(coef)
                                     z Pr(>|z|)
## target5 -0.59370
                 0.55228 0.04778 -12.425 < 2e-16 ***
## target6 -0.42748
                  0.65215 0.04259 -10.036 < 2e-16 ***
## target7 -0.27270
                 ## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
         exp(coef) exp(-coef) lower .95 upper .95
## target3
           0.8856
                      1.129
                             0.8173
                                      0.9596
## target5
           0.5523
                      1.811
                             0.5029
                                      0.6065
                      1.533
                             0.5999
                                      0.7089
## target6
           0.6521
## target7
           0.7613
                      1.314
                             0.7030
                                      0.8245
##
## Concordance= 0.555 (se = 0.005)
## Likelihood ratio test= 212.1 on 4 df,
                                     p=<2e-16
                    = 207.7 on 4 df,
## Wald test
                                     p=<2e-16
## Score (logrank) test = 211.1 on 4 df,
                                    p=<2e-16
##
## Call:
```

```
## coxph(formula = high_perf_collab ~ sender + target + 1, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
              coef exp(coef) se(coef)
                                           z Pr(>|z|)
                     0.69714  0.04129  -8.737  < 2e-16 ***
## sender3 -0.36077
## sender5 -0.50645 0.60263 0.04806 -10.538 < 2e-16 ***
## sender6 -0.35837   0.69881   0.04291   -8.352   < 2e-16 ***
## sender7 -0.22070
                   ## target3 -0.17615
                   0.83849 0.04126 -4.269 1.96e-05 ***
## target5 -0.63165
                    0.53171 0.04798 -13.165 < 2e-16 ***
                    0.62435 0.04287 -10.989 < 2e-16 ***
## target6 -0.47105
## target7 -0.30487
                    ## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' ' 1
##
##
          exp(coef) exp(-coef) lower .95 upper .95
## sender3
             0.6971
                        1.434
                                 0.6429
                                           0.7559
## sender5
             0.6026
                         1.659
                                 0.5485
                                           0.6622
## sender6
             0.6988
                         1.431
                                 0.6424
                                           0.7601
## sender7
             0.8020
                        1.247
                                 0.7403
                                           0.8687
## target3
             0.8385
                        1.193
                                 0.7734
                                           0.9091
## target5
             0.5317
                         1.881
                                 0.4840
                                           0.5841
## target6
             0.6243
                        1.602
                                 0.5740
                                           0.6791
## target7
             0.7372
                         1.356
                                 0.6805
                                           0.7987
## Concordance= 0.58 (se = 0.005)
                                         p=<2e-16
## Likelihood ratio test= 358.9 on 8 df,
                      = 357.4 on 8 df,
## Wald test
                                          p=<2e-16
                                          p=<2e-16
## Score (logrank) test = 362.6 on 8 df,
##
## Call:
## coxph(formula = high_perf_collab ~ eventAttribute + 1, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
##
                                  coef exp(coef) se(coef)
                                                             z Pr(>|z|)
                                        0.72032 0.12885 -2.546
## eventAttributedisruption
                             -0.32806
                                                                 0.0109 *
## eventAttributefloor-grabber 0.12238
                                        1.13018
                                                0.10357 1.182
                                                                 0.2374
                                        4.48038 0.08143 18.416
## eventAttributequestion
                              1.49971
                                                                 <2e-16 ***
## eventAttributestatement
                              2.29553
                                        9.92965 0.07865 29.188
                                                                 <2e-16 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
                              exp(coef) exp(-coef) lower .95 upper .95
                                                              0.9273
## eventAttributedisruption
                                0.7203
                                           1.3883
                                                     0.5596
## eventAttributefloor-grabber
                                1.1302
                                           0.8848
                                                     0.9226
                                                              1.3845
## eventAttributequestion
                                4.4804
                                           0.2232
                                                     3.8194
                                                              5.2557
                                           0.1007
## eventAttributestatement
                                9.9297
                                                     8.5112 11.5845
## Concordance= 0.745 (se = 0.003)
## Likelihood ratio test= 3465 on 4 df,
                                         p=<2e-16
## Wald test
                       = 2412 on 4 df,
                                         p=<2e-16
## Score (logrank) test = 3320 on 4 df,
                                         p=<2e-16
```

```
##
## Call:
  coxph(formula = high_perf_collab ~ sender + eventAttribute, data = REM.data)
##
##
     n= 515830, number of events= 5089
##
                                   coef exp(coef) se(coef)
##
                                                                 z Pr(>|z|)
## sender3
                               -0.28592
                                          0.75132  0.04101  -6.972  3.13e-12 ***
## sender5
                               -0.63414
                                          0.53039
                                                  0.04784 -13.255
                                                                    < 2e-16 ***
## sender6
                               -0.40703
                                          0.66562 0.04260 -9.555
                                                                    < 2e-16 ***
## sender7
                               -0.24203
                                          0.78503 0.04068
                                                           -5.949 2.69e-09 ***
## eventAttributedisruption
                               -0.36673
                                          0.69300
                                                  0.12897
                                                            -2.844
                                                                   0.00446 **
## eventAttributefloor-grabber 0.11523
                                         1.12213 0.10358
                                                             1.113
                                                                    0.26590
                                          4.52973 0.08147
                                                                   < 2e-16 ***
## eventAttributequestion
                                1.51066
                                                           18.542
                                2.31378 10.11262 0.07868 29.407 < 2e-16 ***
## eventAttributestatement
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
##
                               exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                  0.7513
                                            1.33098
                                                       0.6933
                                                                 0.8142
## sender5
                                  0.5304
                                            1.88540
                                                       0.4829
                                                                 0.5825
## sender6
                                  0.6656
                                            1.50235
                                                       0.6123
                                                                 0.7236
## sender7
                                                       0.7249
                                  0.7850
                                            1.27383
                                                                 0.8502
## eventAttributedisruption
                                  0.6930
                                            1.44300
                                                       0.5382
                                                                 0.8923
                                                       0.9160
                                                                 1.3747
## eventAttributefloor-grabber
                                  1.1221
                                            0.89116
## eventAttributequestion
                                  4.5297
                                            0.22076
                                                       3.8612
                                                                 5.3140
## eventAttributestatement
                                 10.1126
                                            0.09889
                                                       8.6674
                                                                11.7988
## Concordance= 0.759 (se = 0.003)
                                           p=<2e-16
## Likelihood ratio test= 3670
                                on 8 df,
## Wald test
                        = 2622
                                on 8 df,
                                           p = < 2e - 16
## Score (logrank) test = 3541
                                on 8 df,
                                           p=<2e-16
##
## Call:
  coxph(formula = high_perf_collab ~ sender * eventAttribute, data = REM.data)
##
##
     n= 515830, number of events= 5089
##
##
                                           coef exp(coef) se(coef)
                                                                        z Pr(>|z|)
## sender3
                                       -0.44992
                                                  0.63768 0.21960 -2.049
                                                                           0.04048
## sender5
                                       -0.22835
                                                  0.79584 0.23430 -0.975
## sender6
                                       -0.85102
                                                  0.42698 0.27027 -3.149
                                                                           0.00164
## sender7
                                       -0.44353
                                                  0.64177
                                                          0.21618 -2.052
                                                                           0.04020
## eventAttributedisruption
                                       -0.22967
                                                  0.79480 0.21785 -1.054
                                                                           0.29177
## eventAttributefloor-grabber
                                       -0.08712
                                                  0.91657 0.19913 -0.438
                                                                           0.66175
                                                                           < 2e-16
## eventAttributequestion
                                        1.31732
                                                  3.73341 0.15344
                                                                    8.585
## eventAttributestatement
                                        2.25981
                                                  9.58127
                                                           0.14693 15.381
                                                                           < 2e-16
## sender3:eventAttributedisruption
                                       -0.42254
                                                  0.65538 0.34457 -1.226
                                                                           0.22009
## sender5:eventAttributedisruption
                                       -0.27567
                                                  0.75906 0.47417 -0.581
                                                                           0.56099
## sender6:eventAttributedisruption
                                        0.65725
                                                  1.92949
                                                          0.40330
                                                                    1.630
                                                                           0.10316
                                                  0.63968 0.41693 -1.072
                                                                           0.28390
## sender7:eventAttributedisruption
                                       -0.44679
## sender3:eventAttributefloor-grabber 0.27360
                                                  1.31469 0.29784 0.919 0.35829
                                                  1.14951 0.32958 0.423 0.67247
## sender5:eventAttributefloor-grabber
                                        0.13933
## sender6:eventAttributefloor-grabber 0.53924
                                                  1.71470 0.34765 1.551 0.12088
```

```
## sender7:eventAttributefloor-grabber
                                         0.24513
                                                    1.27779
                                                             0.29965
                                                                      0.818
                                                                             0.41333
## sender3:eventAttributequestion
                                                             0.23601
                                                                      0.605
                                         0.14283
                                                    1.15354
                                                                             0.54505
                                         0.06625
                                                                             0.79087
## sender5:eventAttributequestion
                                                    1.06849
                                                             0.24982
                                                                      0.265
## sender6:eventAttributequestion
                                                    1.77919
                                                             0.28265
                                                                      2.038
                                                                             0.04150
                                         0.57616
## sender7:eventAttributequestion
                                         0.26770
                                                    1.30695
                                                             0.23163
                                                                      1.156
                                                                             0.24779
## sender3:eventAttributestatement
                                                                      0.851
                                                                             0.39485
                                         0.19162
                                                    1.21121
                                                             0.22520
## sender5:eventAttributestatement
                                        -0.67303
                                                    0.51016
                                                             0.24255 - 2.775
                                                                              0.00552
## sender6:eventAttributestatement
                                                                             0.14365
                                         0.40273
                                                    1.49590
                                                             0.27540
                                                                      1.462
   sender7:eventAttributestatement
                                         0.19910
                                                    1.22031 0.22180
                                                                      0.898
                                                                             0.36937
##
## sender3
## sender5
## sender6
                                        **
## sender7
## eventAttributedisruption
## eventAttributefloor-grabber
## eventAttributequestion
                                        ***
## eventAttributestatement
## sender3:eventAttributedisruption
## sender5:eventAttributedisruption
## sender6:eventAttributedisruption
## sender7:eventAttributedisruption
## sender3:eventAttributefloor-grabber
## sender5:eventAttributefloor-grabber
## sender6:eventAttributefloor-grabber
## sender7:eventAttributefloor-grabber
## sender3:eventAttributequestion
## sender5:eventAttributequestion
## sender6:eventAttributequestion
## sender7:eventAttributequestion
## sender3:eventAttributestatement
## sender5:eventAttributestatement
                                        **
## sender6:eventAttributestatement
  sender7:eventAttributestatement
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
                                        exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                           0.6377
                                                       1.5682
                                                                 0.4147
                                                                           0.9807
## sender5
                                                       1.2565
                                                                 0.5028
                                                                           1.2597
                                           0.7958
## sender6
                                                       2.3420
                                                                 0.2514
                                                                           0.7252
                                           0.4270
## sender7
                                           0.6418
                                                       1.5582
                                                                 0.4201
                                                                           0.9804
## eventAttributedisruption
                                           0.7948
                                                       1.2582
                                                                 0.5186
                                                                           1.2181
## eventAttributefloor-grabber
                                                       1.0910
                                                                 0.6204
                                                                           1.3541
                                           0.9166
## eventAttributequestion
                                           3.7334
                                                       0.2679
                                                                 2.7637
                                                                           5.0433
## eventAttributestatement
                                                       0.1044
                                                                 7.1839
                                                                           12.7787
                                           9.5813
## sender3:eventAttributedisruption
                                           0.6554
                                                       1.5258
                                                                 0.3336
                                                                           1.2876
## sender5:eventAttributedisruption
                                           0.7591
                                                       1.3174
                                                                 0.2997
                                                                           1.9226
## sender6:eventAttributedisruption
                                           1.9295
                                                       0.5183
                                                                 0.8753
                                                                           4.2533
## sender7:eventAttributedisruption
                                           0.6397
                                                       1.5633
                                                                 0.2825
                                                                           1.4483
## sender3:eventAttributefloor-grabber
                                                       0.7606
                                                                 0.7333
                                                                           2.3569
                                           1.3147
## sender5:eventAttributefloor-grabber
                                           1.1495
                                                       0.8699
                                                                 0.6025
                                                                           2.1931
                                                                 0.8675
## sender6:eventAttributefloor-grabber
                                           1.7147
                                                       0.5832
                                                                           3.3893
## sender7:eventAttributefloor-grabber
                                           1.2778
                                                       0.7826
                                                                 0.7102
                                                                           2.2989
```

```
## sender3:eventAttributequestion
                                           1.1535
                                                      0.8669
                                                                0.7263
                                                                          1.8320
## sender5:eventAttributequestion
                                           1.0685
                                                      0.9359
                                                                0.6548
                                                                          1.7435
                                                                1.0224
## sender6:eventAttributequestion
                                           1.7792
                                                      0.5621
                                                                          3.0961
## sender7:eventAttributequestion
                                                                0.8300
                                                                          2.0579
                                           1.3070
                                                      0.7651
## sender3:eventAttributestatement
                                           1.2112
                                                      0.8256
                                                                0.7790
                                                                          1.8833
## sender5:eventAttributestatement
                                           0.5102
                                                      1.9602
                                                                0.3171
                                                                          0.8207
## sender6:eventAttributestatement
                                           1.4959
                                                      0.6685
                                                                0.8719
                                                                          2.5664
## sender7:eventAttributestatement
                                           1.2203
                                                      0.8195
                                                                0.7901
                                                                          1.8848
##
## Concordance= 0.761 (se = 0.003)
## Likelihood ratio test= 3757 on 24 df,
                                            p=<2e-16
## Wald test
                        = 2721 on 24 df,
                                             p = < 2e - 16
## Score (logrank) test = 3829 on 24 df,
                                            p = < 2e - 16
low_perf_collab <- readRDS("data/surv_object_low.RDS")</pre>
REM.data <- readRDS("data/REM_data_low.RDS")</pre>
# base model
base_model0 <- coxph(low_perf_collab ~ 1, data = REM.data)</pre>
print(summary(base_model0))
## Call: coxph(formula = low_perf_collab ~ 1, data = REM.data)
##
## Null model
     log likelihood= -72477.67
     n= 642212
# sender model
model1 <- coxph(low_perf_collab ~ sender + 1, data = REM.data)</pre>
print(summary(model1))
## Call:
## coxph(formula = low_perf_collab ~ sender + 1, data = REM.data)
##
##
     n= 642212, number of events= 5981
##
##
               coef exp(coef) se(coef)
                                              z Pr(>|z|)
## sender3 -0.20117 0.81777 0.03736 -5.385 7.24e-08 ***
                      0.53406  0.04533  -13.837  < 2e-16 ***
## sender5 -0.62725
## sender6 -0.21457
                     0.80689 0.03934 -5.454 4.92e-08 ***
## sender7 -0.06602
                     0.93611 0.03827 -1.725
                                                 0.0845 .
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' '1
##
##
           exp(coef) exp(-coef) lower .95 upper .95
                                   0.7600
## sender3
              0.8178
                          1.223
                                              0.8799
## sender5
              0.5341
                          1.872
                                   0.4887
                                              0.5837
## sender6
              0.8069
                          1.239
                                   0.7470
                                              0.8716
## sender7
              0.9361
                          1.068
                                   0.8685
                                              1.0090
##
## Concordance= 0.55 (se = 0.004)
## Likelihood ratio test= 229.9 on 4 df,
                                           p=<2e-16
## Wald test
                        = 210.6 on 4 df,
                                           p=<2e-16
## Score (logrank) test = 215.1 on 4 df,
                                            p = < 2e - 16
```

```
# receiver model
model2 <- coxph(low_perf_collab ~ target + 1, data = REM.data)</pre>
print(summary(model2))
## Call:
## coxph(formula = low_perf_collab ~ target + 1, data = REM.data)
##
   n= 642212, number of events= 5981
##
##
            coef exp(coef) se(coef)
                                     z Pr(>|z|)
## target3 -0.27388
                 ## target5 -0.65684
                 ## target6 -0.29591
## target7 -0.20253
                 0.81666 0.03822 -5.299 1.17e-07 ***
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' ' 1
##
         exp(coef) exp(-coef) lower .95 upper .95
           0.7604
                     1.315
                             0.7067
## target3
           0.5185
                     1.929
                             0.4744
                                     0.5667
## target5
## target6
           0.7439
                     1.344
                             0.6888
                                     0.8034
## target7
           0.8167
                     1.225
                             0.7577
                                     0.8802
##
## Concordance= 0.554 (se = 0.004)
## Likelihood ratio test= 229 on 4 df,
                                  p=<2e-16
## Wald test
                   = 218.5 on 4 df, p=<2e-16
## Score (logrank) test = 222.8 on 4 df,
                                   p=<2e-16
# sender - receiver model
model3 <- coxph(low_perf_collab ~ sender + target + 1, data = REM.data)</pre>
print(summary(model3))
## Call:
## coxph(formula = low_perf_collab ~ sender + target + 1, data = REM.data)
##
   n= 642212, number of events= 5981
##
            coef exp(coef) se(coef)
##
                                     z Pr(>|z|)
## sender5 -0.71029  0.49150  0.04556 -15.591  < 2e-16 ***
## sender6 -0.23585   0.78990   0.03963   -5.951   2.66e-09 ***
                 0.91607 0.03871 -2.265
## sender7 -0.08766
                                        0.0235 *
## target3 -0.26953
                 ## target5 -0.73247
                  ## target6 -0.29613
## target7 -0.17823
                  ## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
         exp(coef) exp(-coef) lower .95 upper .95
## sender3
           0.8081
                     1.237
                             0.7508
                                     0.8697
## sender5
           0.4915
                     2.035
                             0.4495
                                     0.5374
## sender6
           0.7899
                     1.266
                                     0.8537
                             0.7309
```

```
1.092
## sender7
            0.9161
                               0.8491
                                        0.9883
## target3
                             0.7097
                      1.309
            0.7637
                                        0.8219
            0.4807
                                        0.5256
## target5
                       2.080
                               0.4396
## target6
            0.7437
                       1.345
                               0.6881
                                        0.8037
## target7
            0.8368
                       1.195
                               0.7757
                                        0.9026
##
## Concordance= 0.59 (se = 0.004)
## Likelihood ratio test= 518 on 8 df,
                                     p=<2e-16
## Wald test
                     = 488.3 on 8 df, p=<2e-16
## Score (logrank) test = 500.2 on 8 df,
                                      p=<2e-16
# dialogue act model
model4 <- coxph(low_perf_collab ~ eventAttribute + 1, data = REM.data)</pre>
print(summary(model4))
## Call:
## coxph(formula = low_perf_collab ~ eventAttribute + 1, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
##
                               coef exp(coef) se(coef)
                                                         z Pr(>|z|)
                           ## eventAttributedisruption
## eventAttributefloor-grabber 0.13058 1.13949 0.09223 1.416 0.156816
## eventAttributequestion
                          1.42539 4.15948 0.07320 19.474 < 2e-16 ***
                            2.36037 10.59485 0.07003 33.706 < 2e-16 ***
## eventAttributestatement
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
                            exp(coef) exp(-coef) lower .95 upper .95
## eventAttributedisruption
                              0.6794 1.47185
                                                0.5495
                                                        0.840
## eventAttributefloor-grabber
                              1.1395
                                       0.87758
                                                 0.9511
                                                          1.365
                                                 3.6036
                                                          4.801
## eventAttributequestion
                              4.1595
                                       0.24041
## eventAttributestatement
                             10.5948
                                       0.09439
                                                 9.2360
                                                        12.154
## Concordance= 0.753 (se = 0.003)
## Likelihood ratio test= 4836 on 4 df,
                                      p=<2e-16
## Wald test = 3439 on 4 df,
                                      p=<2e-16
## Score (logrank) test = 4890 on 4 df,
                                      p=<2e-16
# sender and dialogue act model
model5 <- coxph(low_perf_collab ~ sender + eventAttribute, data = REM.data)</pre>
print(summary(model5))
## coxph(formula = low_perf_collab ~ sender + eventAttribute, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
##
                               coef exp(coef) se(coef)
                                                          z Pr(>|z|)
## sender3
                           ## sender5
                           -0.59018  0.55422  0.04536  -13.012  < 2e-16 ***
## sender6
                           -0.28040 0.75548 0.03933 -7.130 1.00e-12 ***
                           ## sender7
```

```
## eventAttributedisruption
                              -0.37951
                                        0.68419 0.10829 -3.505 0.000457 ***
## eventAttributefloor-grabber 0.13002
                                        1.13885 0.09224
                                                           1.410 0.158643
                                                                 < 2e-16 ***
## eventAttributequestion
                              1.43486
                                        4.19904 0.07321 19.599
## eventAttributestatement
                               2.36035 10.59468
                                                0.07006 33.692 < 2e-16 ***
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
                              exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                 0.8569
                                          1.16701
                                                     0.7964
                                                               0.9220
## sender5
                                 0.5542
                                          1.80432
                                                     0.5071
                                                               0.6058
## sender6
                                 0.7555
                                          1.32366
                                                     0.6994
                                                               0.8160
## sender7
                                                     0.7778
                                 0.8383
                                          1.19285
                                                               0.9036
## eventAttributedisruption
                                 0.6842
                                          1.46157
                                                     0.5534
                                                               0.8460
## eventAttributefloor-grabber
                                 1.1389
                                          0.87808
                                                     0.9505
                                                              1.3645
## eventAttributequestion
                                          0.23815
                                                     3.6378
                                 4.1990
                                                               4.8469
## eventAttributestatement
                                10.5947
                                          0.09439
                                                     9.2354
                                                              12.1540
##
## Concordance= 0.766 (se = 0.003)
## Likelihood ratio test= 5027
                                         p=<2e-16
                              on 8 df,
## Wald test
                       = 3612
                              on 8 df,
                                         p=<2e-16
## Score (logrank) test = 5061 on 8 df,
                                         p=<2e-16
# combined model
model6 <- coxph(low_perf_collab ~ sender * eventAttribute, data = REM.data)</pre>
print(summary(model6))
## Call:
## coxph(formula = low_perf_collab ~ sender * eventAttribute, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
                                          coef exp(coef) se(coef)
##
                                                                     z Pr(>|z|)
## sender3
                                      0.21356
                                                1.23808 0.19484
                                                                 1.096 0.273034
## sender5
                                                        0.20897
                                                                  0.222 0.824431
                                      0.04636
                                                1.04745
## sender6
                                                -0.57702
## sender7
                                      0.29328
                                                1.34081
                                                        0.20533
                                                                  1.428 0.153209
## eventAttributedisruption
                                                1.04729 0.20898 0.221 0.825015
                                      0.04620
## eventAttributefloor-grabber
                                      0.37273
                                                1.45170 0.18741 1.989 0.046711
## eventAttributequestion
                                                5.16977 0.15332 10.715 < 2e-16
                                      1.64283
## eventAttributestatement
                                      2.63092 13.88650 0.14626 17.988 < 2e-16
## sender3:eventAttributedisruption
                                     -0.45298
                                                0.63573  0.28978 -1.563  0.118003
## sender5:eventAttributedisruption
                                     -1.27414
                                                0.27967   0.38765   -3.287   0.001013
## sender6:eventAttributedisruption
                                      0.11312
                                                1.11976 0.35822 0.316 0.752174
## sender7:eventAttributedisruption
                                     -0.85408
                                                ## sender3:eventAttributefloor-grabber -0.39006
                                                0.67701 0.26182 -1.490 0.136266
## sender5:eventAttributefloor-grabber -1.10363
                                                0.33167 0.32557 -3.390 0.000699
## sender6:eventAttributefloor-grabber
                                      0.62074
                                                1.86030 0.31875 1.947 0.051486
## sender7:eventAttributefloor-grabber -0.44849
                                                0.63859 0.27525 -1.629 0.103231
## sender3:eventAttributequestion
                                     -0.58318
                                                ## sender5:eventAttributequestion
                                     -0.43221
                                                0.64907 0.22661 -1.907 0.056482
## sender6:eventAttributequestion
                                      0.56140
                                                1.75313 0.27241 2.061 0.039317
## sender7:eventAttributequestion
                                     -0.45394
                                                0.63512  0.22127  -2.052  0.040217
## sender3:eventAttributestatement
                                     -0.31324
                                                0.73107  0.20000  -1.566  0.117298
## sender5:eventAttributestatement
                                     -0.71841
                                                0.48753  0.21679  -3.314  0.000920
```

```
## sender6:eventAttributestatement
                                         0.18942
                                                    1.20855 0.26537 0.714 0.475349
  sender7:eventAttributestatement
                                        -0.48958
                                                    0.61289 0.21045 -2.326 0.020004
##
## sender3
## sender5
## sender6
## sender7
## eventAttributedisruption
  eventAttributefloor-grabber
## eventAttributequestion
## eventAttributestatement
                                        ***
## sender3:eventAttributedisruption
## sender5:eventAttributedisruption
                                        **
## sender6:eventAttributedisruption
## sender7:eventAttributedisruption
## sender3:eventAttributefloor-grabber
## sender5:eventAttributefloor-grabber ***
## sender6:eventAttributefloor-grabber
## sender7:eventAttributefloor-grabber
## sender3:eventAttributequestion
                                        **
## sender5:eventAttributequestion
## sender6:eventAttributequestion
## sender7:eventAttributequestion
## sender3:eventAttributestatement
## sender5:eventAttributestatement
                                        ***
  sender6:eventAttributestatement
  sender7:eventAttributestatement
  Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
##
##
                                        exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                            1.2381
                                                      0.80770
                                                                 0.8451
                                                                            1.8138
## sender5
                                            1.0475
                                                      0.95470
                                                                  0.6954
                                                                            1.5776
## sender6
                                           0.5616
                                                                 0.3368
                                                                            0.9363
                                                      1.78072
## sender7
                                            1.3408
                                                      0.74582
                                                                  0.8966
                                                                            2.0052
## eventAttributedisruption
                                            1.0473
                                                      0.95485
                                                                 0.6953
                                                                            1.5774
## eventAttributefloor-grabber
                                            1.4517
                                                      0.68885
                                                                 1.0054
                                                                            2.0960
## eventAttributequestion
                                                      0.19343
                                                                 3.8280
                                                                            6.9819
                                           5.1698
## eventAttributestatement
                                                      0.07201
                                                                10.4255
                                                                           18.4965
                                          13.8865
## sender3:eventAttributedisruption
                                           0.6357
                                                      1.57300
                                                                 0.3603
                                                                            1.1218
## sender5:eventAttributedisruption
                                           0.2797
                                                      3.57564
                                                                 0.1308
                                                                            0.5979
## sender6:eventAttributedisruption
                                                      0.89305
                                                                 0.5549
                                                                            2.2597
                                           1.1198
## sender7:eventAttributedisruption
                                           0.4257
                                                      2.34921
                                                                 0.2088
                                                                            0.8678
## sender3:eventAttributefloor-grabber
                                                                 0.4053
                                           0.6770
                                                      1.47708
                                                                            1.1310
## sender5:eventAttributefloor-grabber
                                           0.3317
                                                      3.01508
                                                                 0.1752
                                                                            0.6278
## sender6:eventAttributefloor-grabber
                                                                 0.9960
                                                                            3.4746
                                            1.8603
                                                      0.53755
## sender7:eventAttributefloor-grabber
                                            0.6386
                                                      1.56595
                                                                 0.3723
                                                                            1.0953
## sender3:eventAttributequestion
                                            0.5581
                                                      1.79173
                                                                 0.3685
                                                                            0.8454
## sender5:eventAttributequestion
                                           0.6491
                                                      1.54066
                                                                 0.4163
                                                                            1.0120
## sender6:eventAttributequestion
                                            1.7531
                                                      0.57041
                                                                  1.0279
                                                                            2.9901
                                                                            0.9799
## sender7:eventAttributequestion
                                           0.6351
                                                      1.57451
                                                                 0.4116
## sender3:eventAttributestatement
                                           0.7311
                                                      1.36785
                                                                 0.4940
                                                                            1.0819
                                                                 0.3188
## sender5:eventAttributestatement
                                           0.4875
                                                      2.05117
                                                                            0.7456
## sender6:eventAttributestatement
                                            1.2085
                                                      0.82744
                                                                 0.7184
                                                                            2.0330
```

```
## sender7:eventAttributestatement
                                       0.6129
                                                 1.63162
                                                           0.4057
                                                                     0.9258
##
## Concordance= 0.769 (se = 0.003)
## Likelihood ratio test= 5115 on 24 df,
                                         p=<2e-16
                                         p=<2e-16
## Wald test
                      = 3644 on 24 df,
## Score (logrank) test = 5334 on 24 df,
                                         p=<2e-16
# format print all model results
for (model in list(base_model0, model1, model2, model3, model4, model5, model6)) {
 print(summary(model))
}
## Call: coxph(formula = low_perf_collab ~ 1, data = REM.data)
##
## Null model
    log likelihood= -72477.67
    n= 642212
## Call:
## coxph(formula = low perf collab ~ sender + 1, data = REM.data)
##
    n= 642212, number of events= 5981
##
##
##
              coef exp(coef) se(coef)
                                          z Pr(>|z|)
                    0.81777 0.03736 -5.385 7.24e-08 ***
## sender3 -0.20117
## sender5 -0.62725
                    0.53406  0.04533  -13.837  < 2e-16 ***
## sender6 -0.21457   0.80689   0.03934   -5.454   4.92e-08 ***
## sender7 -0.06602 0.93611 0.03827 -1.725
                                              0.0845 .
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
          exp(coef) exp(-coef) lower .95 upper .95
             0.8178
                        1.223
                                 0.7600
## sender3
## sender5
             0.5341
                        1.872
                                 0.4887
                                          0.5837
## sender6
             0.8069
                        1.239
                                 0.7470
                                          0.8716
## sender7
             0.9361
                        1.068
                                 0.8685
                                          1.0090
## Concordance= 0.55 (se = 0.004)
## Likelihood ratio test= 229.9 on 4 df,
                                        p=<2e-16
                      = 210.6 on 4 df,
                                         p=<2e-16
## Wald test
## Score (logrank) test = 215.1 on 4 df,
                                         p=<2e-16
##
## Call:
## coxph(formula = low_perf_collab ~ target + 1, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
##
              coef exp(coef) se(coef)
                                          z Pr(>|z|)
                    ## target3 -0.27388
## target5 -0.65684
                    0.51849 0.04535 -14.483 < 2e-16 ***
                    ## target6 -0.29591
## target7 -0.20253
                    0.81666 0.03822 -5.299 1.17e-07 ***
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' ' 1
##
```

```
exp(coef) exp(-coef) lower .95 upper .95
## target3
                                 0.7067
             0.7604
                        1.315
                                          0.8182
                                 0.4744
                                          0.5667
## target5
             0.5185
                        1.929
             0.7439
                        1.344
                                 0.6888
                                          0.8034
## target6
## target7
             0.8167
                        1.225
                                 0.7577
                                          0.8802
##
## Concordance= 0.554 (se = 0.004)
## Likelihood ratio test= 229 on 4 df,
                                       p = < 2e - 16
                                         p=<2e-16
## Wald test
                      = 218.5 on 4 df,
## Score (logrank) test = 222.8 on 4 df,
                                         p=<2e-16
##
## Call:
## coxph(formula = low_perf_collab ~ sender + target + 1, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
##
              coef exp(coef) se(coef)
                                          z Pr(>|z|)
## sender3 -0.21308
                    0.80809 0.03749 -5.683 1.32e-08 ***
## sender5 -0.71029
                    0.49150 0.04556 -15.591 < 2e-16 ***
## sender6 -0.23585
                   0.78990 0.03963 -5.951 2.66e-09 ***
## sender7 -0.08766
                   0.91607 0.03871 -2.265
                                              0.0235 *
## target3 -0.26953
                    ## target5 -0.73247
                    0.74369 0.03962 -7.475 7.72e-14 ***
## target6 -0.29613
                    ## target7 -0.17823
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
          exp(coef) exp(-coef) lower .95 upper .95
##
## sender3
             0.8081
                        1.237
                                 0.7508
                                          0.8697
## sender5
             0.4915
                        2.035
                                 0.4495
                                          0.5374
## sender6
             0.7899
                        1.266
                                 0.7309
                                          0.8537
## sender7
             0.9161
                        1.092
                                 0.8491
                                          0.9883
                                 0.7097
## target3
             0.7637
                        1.309
                                          0.8219
## target5
             0.4807
                        2.080
                                 0.4396
                                          0.5256
             0.7437
                                          0.8037
## target6
                        1.345
                                 0.6881
## target7
             0.8368
                        1.195
                                 0.7757
                                          0.9026
##
## Concordance= 0.59 (se = 0.004)
## Likelihood ratio test= 518 on 8 df,
                                       p=<2e-16
                      = 488.3 on 8 df, p=<2e-16
## Wald test
## Score (logrank) test = 500.2 on 8 df,
                                         p=<2e-16
## Call:
## coxph(formula = low_perf_collab ~ eventAttribute + 1, data = REM.data)
##
    n= 642212, number of events= 5981
##
##
                                 coef exp(coef) se(coef)
                                                            z Pr(>|z|)
## eventAttributedisruption
                             -0.38652
                                       0.67941 0.10827 -3.570 0.000357 ***
                                       1.13949 0.09223 1.416 0.156816
## eventAttributefloor-grabber 0.13058
## eventAttributequestion
                              1.42539
                                       4.15948 0.07320 19.474 < 2e-16 ***
## eventAttributestatement
                              2.36037 10.59485 0.07003 33.706 < 2e-16 ***
## ---
```

```
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
                             exp(coef) exp(-coef) lower .95 upper .95
                               0.6794
                                         1.47185
                                                   0.5495
                                                              0.840
## eventAttributedisruption
## eventAttributefloor-grabber
                                1.1395
                                         0.87758
                                                   0.9511
                                                              1.365
## eventAttributequestion
                                                   3.6036
                                                              4.801
                                4.1595
                                         0.24041
## eventAttributestatement
                              10.5948
                                         0.09439
                                                   9.2360
                                                            12.154
##
## Concordance= 0.753 (se = 0.003)
## Likelihood ratio test= 4836 on 4 df,
                                        p=<2e-16
## Wald test
                      = 3439 on 4 df,
                                        p=<2e-16
## Score (logrank) test = 4890 on 4 df,
                                        p = < 2e - 16
## Call:
## coxph(formula = low_perf_collab ~ sender + eventAttribute, data = REM.data)
##
    n= 642212, number of events= 5981
##
##
##
                                coef exp(coef) se(coef)
                                                            z Pr(>|z|)
## sender3
                             ## sender5
                             -0.59018  0.55422  0.04536  -13.012  < 2e-16 ***
## sender6
                             -0.28040 0.75548 0.03933 -7.130 1.00e-12 ***
## sender7
                                       -0.17634
                                       0.68419 0.10829 -3.505 0.000457 ***
## eventAttributedisruption
                            -0.37951
## eventAttributefloor-grabber 0.13002
                                       1.13885 0.09224
                                                         1.410 0.158643
## eventAttributequestion
                             1.43486
                                       4.19904 0.07321 19.599 < 2e-16 ***
## eventAttributestatement
                             2.36035 10.59468 0.07006 33.692 < 2e-16 ***
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
##
                             exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                0.8569
                                         1.16701
                                                   0.7964
                                                             0.9220
## sender5
                                0.5542
                                         1.80432
                                                   0.5071
                                                             0.6058
## sender6
                                0.7555
                                         1.32366
                                                   0.6994
                                                             0.8160
## sender7
                                0.8383
                                         1.19285
                                                   0.7778
                                                            0.9036
## eventAttributedisruption
                               0.6842
                                        1.46157
                                                   0.5534
                                                            0.8460
## eventAttributefloor-grabber
                               1.1389
                                       0.87808
                                                   0.9505
                                                          1.3645
## eventAttributequestion
                               4.1990
                                         0.23815
                                                   3.6378
                                                            4.8469
## eventAttributestatement
                              10.5947
                                         0.09439
                                                   9.2354
                                                            12.1540
##
## Concordance= 0.766 (se = 0.003)
## Likelihood ratio test= 5027 on 8 df,
                                        p=<2e-16
## Wald test
                      = 3612 on 8 df.
                                        p=<2e-16
## Score (logrank) test = 5061 on 8 df,
                                        p = < 2e - 16
##
## Call:
## coxph(formula = low_perf_collab ~ sender * eventAttribute, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
##
                                        coef exp(coef) se(coef)
                                                                   z Pr(>|z|)
## sender3
                                     ## sender5
                                     0.04636
                                               1.04745 0.20897 0.222 0.824431
                                    -0.57702   0.56157   0.26083   -2.212   0.026950
## sender6
```

```
## sender7
                                         0.29328
                                                   1.34081 0.20533 1.428 0.153209
## eventAttributedisruption
                                                   1.04729 0.20898 0.221 0.825015
                                         0.04620
                                                   1.45170
                                                           0.18741 1.989 0.046711
## eventAttributefloor-grabber
                                        0.37273
## eventAttributequestion
                                         1.64283
                                                   5.16977
                                                            0.15332 10.715
## eventAttributestatement
                                        2.63092
                                                  13.88650
                                                            0.14626 17.988
## sender3:eventAttributedisruption
                                                            0.28978 -1.563 0.118003
                                       -0.45298
                                                   0.63573
## sender5:eventAttributedisruption
                                       -1.27414
                                                            0.38765 -3.287 0.001013
                                                   0.27967
## sender6:eventAttributedisruption
                                        0.11312
                                                   1.11976
                                                            0.35822 0.316 0.752174
## sender7:eventAttributedisruption
                                        -0.85408
                                                   0.42568
                                                            0.36342 -2.350 0.018768
## sender3:eventAttributefloor-grabber -0.39006
                                                   0.67701
                                                            0.26182 -1.490 0.136266
## sender5:eventAttributefloor-grabber -1.10363
                                                   0.33167
                                                            0.32557 -3.390 0.000699
## sender6:eventAttributefloor-grabber
                                                   1.86030
                                                           0.31875 1.947 0.051486
                                        0.62074
## sender7:eventAttributefloor-grabber -0.44849
                                                   0.63859
                                                            0.27525 -1.629 0.103231
## sender3:eventAttributequestion
                                                           0.21187 -2.753 0.005914
                                       -0.58318
                                                   0.55812
## sender5:eventAttributequestion
                                        -0.43221
                                                   0.64907
                                                            0.22661 -1.907 0.056482
## sender6:eventAttributequestion
                                        0.56140
                                                   1.75313
                                                            0.27241
                                                                     2.061 0.039317
## sender7:eventAttributequestion
                                                            0.22127 -2.052 0.040217
                                        -0.45394
                                                   0.63512
## sender3:eventAttributestatement
                                       -0.31324
                                                   0.73107
                                                            0.20000 -1.566 0.117298
  sender5:eventAttributestatement
                                       -0.71841
                                                   0.48753
                                                           0.21679 -3.314 0.000920
## sender6:eventAttributestatement
                                        0.18942
                                                   1.20855
                                                           0.26537 0.714 0.475349
  sender7:eventAttributestatement
                                       -0.48958
                                                   0.61289 0.21045 -2.326 0.020004
##
## sender3
## sender5
## sender6
## sender7
## eventAttributedisruption
## eventAttributefloor-grabber
## eventAttributequestion
## eventAttributestatement
                                        ***
## sender3:eventAttributedisruption
## sender5:eventAttributedisruption
                                       **
## sender6:eventAttributedisruption
## sender7:eventAttributedisruption
## sender3:eventAttributefloor-grabber
## sender5:eventAttributefloor-grabber ***
## sender6:eventAttributefloor-grabber
## sender7:eventAttributefloor-grabber
## sender3:eventAttributequestion
## sender5:eventAttributequestion
## sender6:eventAttributequestion
## sender7:eventAttributequestion
## sender3:eventAttributestatement
## sender5:eventAttributestatement
                                        ***
## sender6:eventAttributestatement
## sender7:eventAttributestatement
  Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
                                       exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                                     0.80770
                                                                0.8451
                                                                          1.8138
                                           1.2381
## sender5
                                                                0.6954
                                                                          1.5776
                                           1.0475
                                                     0.95470
## sender6
                                           0.5616
                                                     1.78072
                                                                0.3368
                                                                          0.9363
## sender7
                                           1.3408
                                                     0.74582
                                                                0.8966
                                                                          2.0052
```

```
## eventAttributedisruption
                                        1.0473
                                                  0.95485
                                                             0.6953
                                                                       1.5774
                                                             1.0054
## eventAttributefloor-grabber
                                                  0.68885
                                                                       2.0960
                                        1.4517
## eventAttributequestion
                                        5.1698
                                                  0.19343
                                                             3.8280
                                                                       6.9819
## eventAttributestatement
                                        13.8865
                                                  0.07201
                                                            10.4255
                                                                     18.4965
## sender3:eventAttributedisruption
                                        0.6357
                                                  1.57300
                                                             0.3603
                                                                      1.1218
## sender5:eventAttributedisruption
                                                             0.1308
                                                                    0.5979
                                        0.2797
                                                  3.57564
## sender6:eventAttributedisruption
                                        1.1198
                                                  0.89305
                                                             0.5549
                                                                       2.2597
## sender7:eventAttributedisruption
                                        0.4257
                                                  2.34921
                                                             0.2088
                                                                       0.8678
## sender3:eventAttributefloor-grabber
                                        0.6770
                                                  1.47708
                                                             0.4053
                                                                       1.1310
## sender5:eventAttributefloor-grabber
                                        0.3317
                                                  3.01508
                                                             0.1752
                                                                       0.6278
## sender6:eventAttributefloor-grabber
                                        1.8603
                                                  0.53755
                                                             0.9960
                                                                       3.4746
## sender7:eventAttributefloor-grabber
                                        0.6386
                                                  1.56595
                                                             0.3723
                                                                       1.0953
## sender3:eventAttributequestion
                                        0.5581
                                                  1.79173
                                                             0.3685
                                                                      0.8454
## sender5:eventAttributequestion
                                        0.6491
                                                  1.54066
                                                             0.4163
                                                                      1.0120
## sender6:eventAttributequestion
                                        1.7531
                                                  0.57041
                                                             1.0279
                                                                       2.9901
## sender7:eventAttributequestion
                                        0.6351
                                                  1.57451
                                                             0.4116
                                                                       0.9799
## sender3:eventAttributestatement
                                        0.7311
                                                  1.36785
                                                             0.4940
                                                                       1.0819
## sender5:eventAttributestatement
                                        0.4875
                                                  2.05117
                                                             0.3188
                                                                       0.7456
## sender6:eventAttributestatement
                                        1.2085
                                                  0.82744
                                                             0.7184
                                                                       2.0330
## sender7:eventAttributestatement
                                        0.6129
                                                  1.63162
                                                             0.4057
                                                                       0.9258
## Concordance= 0.769 (se = 0.003)
## Likelihood ratio test= 5115 on 24 df,
                                          p=<2e-16
                                         p=<2e-16
                       = 3644 on 24 df,
## Wald test
## Score (logrank) test = 5334 on 24 df,
                                         p=<2e-16
# code to fetch and comapre lwo and high for each ondel and print one by one
low_models <- readRDS("data/low_perf_models.RDS")</pre>
high_models <- readRDS("data/high_perf_models.RDS")</pre>
# highlight model in yellow
for (i in 1:length(low_models)) {
 cat("\n######### \t Model ", i-1, "\t #########\n")
 cat("-----\n")
 print(summary(low models[[i]]))
 cat("-----\n")
 print(summary(high_models[[i]]))
}
##
## ###########
                    Model 0
                                ############
## ----- Low -----
## Call: coxph(formula = low_perf_collab ~ 1, data = REM.data)
##
## Null model
##
    log likelihood= -72477.67
    n = 642212
## ----- High -----
## Call: coxph(formula = high_perf_collab ~ 1, data = REM.data)
##
## Null model
## log likelihood= -60467.39
    n= 515830
##
```

```
##
## ###########
            Model 1 ###########
## ----- Low -----
## Call:
## coxph(formula = low_perf_collab ~ sender + 1, data = REM.data)
##
  n= 642212, number of events= 5981
##
           coef exp(coef) se(coef)
##
                              z Pr(>|z|)
## sender7 -0.06602 0.93611 0.03827 -1.725 0.0845 .
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
##
        exp(coef) exp(-coef) lower .95 upper .95
                1.223
## sender3
         0.8178
                         0.7600
## sender5 0.5341
                  1.872
                          0.4887
                                  0.5837
## sender6
          0.8069
                   1.239
                          0.7470
                                 0.8716
## sender7
          0.9361
                   1.068
                          0.8685
                                  1.0090
##
## Concordance= 0.55 (se = 0.004)
## Likelihood ratio test= 229.9 on 4 df, p=<2e-16
## Wald test = 210.6 on 4 df, p=<2e-16
## Score (logrank) test = 215.1 on 4 df, p=<2e-16
## ----- High -----
## Call:
## coxph(formula = high_perf_collab ~ sender + 1, data = REM.data)
##
##
  n= 515830, number of events= 5089
##
           coef exp(coef) se(coef) z Pr(>|z|)
##
## sender3 -0.36453   0.69452   0.04100 -8.892   < 2e-16 ***
## sender6 -0.32336  0.72371  0.04259 -7.592  3.14e-14 ***
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
        exp(coef) exp(-coef) lower .95 upper .95
## sender3 0.6945
                1.440 0.6409
                                0.7526
                          0.5822 0.7022
## sender5 0.6394
                   1.564
          0.7237
                   1.382
## sender6
                        0.6658
                                  0.7867
                   1.230
                        0.7505
## sender7
          0.8127
                                  0.8802
## Concordance= 0.538 (se = 0.005)
## Likelihood ratio test= 126.7 on 4 df, p=<2e-16
## Wald test = 130 on 4 df, p=<2e-16
## Score (logrank) test = 131.3 on 4 df, p=<2e-16
##
##
               Model 2
## #########
                         ###########
```

```
## ----- Low -----
## Call:
## coxph(formula = low_perf_collab ~ target + 1, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
             coef exp(coef) se(coef)
                                        z Pr(>|z|)
                  ## target3 -0.27388
## target5 -0.65684   0.51849   0.04535 -14.483   < 2e-16 ***
## target6 -0.29591 0.74386 0.03926 -7.536 4.84e-14 ***
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
##
         exp(coef) exp(-coef) lower .95 upper .95
## target3
            0.7604
                       1.315
                               0.7067
## target5
            0.5185
                       1.929
                               0.4744
                                        0.5667
## target6
            0.7439
                       1.344
                               0.6888
                                        0.8034
                               0.7577
## target7
            0.8167
                       1.225
                                        0.8802
## Concordance= 0.554 (se = 0.004)
## Likelihood ratio test= 229 on 4 df, p=<2e-16
                     = 218.5 on 4 df, p=<2e-16
## Wald test
## Score (logrank) test = 222.8 on 4 df, p=<2e-16
##
## ----- High -----
## Call:
## coxph(formula = high_perf_collab ~ target + 1, data = REM.data)
##
##
   n= 515830, number of events= 5089
##
##
             coef exp(coef) se(coef)
                                   z Pr(>|z|)
## target3 -0.12153  0.88556  0.04095 -2.968
## target5 -0.59370  0.55228  0.04778 -12.425  < 2e-16 ***
## target6 -0.42748
                  0.65215  0.04259 -10.036  < 2e-16 ***
## target7 -0.27270 0.76132 0.04067 -6.704 2.02e-11 ***
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' ' 1
##
         exp(coef) exp(-coef) lower .95 upper .95
            0.8856
                               0.8173
## target3
                       1.129
            0.5523
                       1.811
                               0.5029
                                        0.6065
## target5
## target6
            0.6521
                       1.533
                               0.5999
                                        0.7089
## target7
            0.7613
                       1.314
                               0.7030
                                        0.8245
## Concordance= 0.555 (se = 0.005)
                                      p=<2e-16
## Likelihood ratio test= 212.1 on 4 df,
## Wald test
                     = 207.7 on 4 df, p=<2e-16
## Score (logrank) test = 211.1 on 4 df,
                                       p=<2e-16
##
##
## ##########
                  Model 3
                             ############
## ----- Low -----
## Call:
```

```
## coxph(formula = low_perf_collab ~ sender + target + 1, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
            coef exp(coef) se(coef)
                                       z Pr(>|z|)
## sender5 -0.71029 0.49150 0.04556 -15.591 < 2e-16 ***
## sender6 -0.23585 0.78990 0.03963 -5.951 2.66e-09 ***
## sender7 -0.08766 0.91607 0.03871 -2.265
                                          0.0235 *
## target3 -0.26953  0.76373  0.03746  -7.196  6.21e-13 ***
## target5 -0.73247
                   0.74369  0.03962  -7.475  7.72e-14 ***
## target6 -0.29613
## ---
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
##
         exp(coef) exp(-coef) lower .95 upper .95
## sender3
            0.8081
                      1.237
                              0.7508
            0.4915
                      2.035
                              0.4495
## sender5
                                       0.5374
## sender6
           0.7899
                      1.266
                              0.7309
                                       0.8537
## sender7
           0.9161
                      1.092
                              0.8491
                                       0.9883
## target3
                      1.309
           0.7637
                              0.7097
                                       0.8219
## target5
            0.4807
                      2.080
                              0.4396
                                       0.5256
## target6
            0.7437
                      1.345
                              0.6881
                                       0.8037
## target7
            0.8368
                      1.195
                              0.7757
                                       0.9026
## Concordance= 0.59 (se = 0.004)
## Likelihood ratio test= 518 on 8 df, p=<2e-16
           = 488.3 on 8 df,
                                     p=<2e-16
## Wald test
## Score (logrank) test = 500.2 on 8 df,
                                      p=<2e-16
## ----- High -----
## coxph(formula = high_perf_collab ~ sender + target + 1, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
##
             coef exp(coef) se(coef)
                                       z Pr(>|z|)
## sender3 -0.36077
                 0.69714 0.04129 -8.737 < 2e-16 ***
## sender5 -0.50645   0.60263   0.04806 -10.538   < 2e-16 ***
## sender6 -0.35837   0.69881   0.04291   -8.352   < 2e-16 ***
## sender7 -0.22070   0.80196   0.04081   -5.408   6.38e-08 ***
## target3 -0.17615
                  0.83849 0.04126 -4.269 1.96e-05 ***
                 0.53171 0.04798 -13.165 < 2e-16 ***
## target5 -0.63165
## target6 -0.47105
                   ## target7 -0.30487
                   ## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
         exp(coef) exp(-coef) lower .95 upper .95
## sender3
            0.6971
                      1.434
                              0.6429
                                       0.7559
## sender5
            0.6026
                      1.659
                              0.5485
                                       0.6622
## sender6
            0.6988
                      1.431
                              0.6424
                                       0.7601
## sender7
            0.8020
                      1.247
                              0.7403
                                       0.8687
```

```
1.193
## target3
            0.8385
                               0.7734
                                        0.9091
                               0.4840
## target5
            0.5317
                      1.881
                                        0.5841
                               0.5740
## target6
            0.6243
                       1.602
                                        0.6791
## target7
            0.7372
                       1.356
                               0.6805
                                        0.7987
## Concordance= 0.58 (se = 0.005)
## Likelihood ratio test= 358.9 on 8 df, p=<2e-16
## Wald test
                     = 357.4 on 8 df,
                                       p=<2e-16
## Score (logrank) test = 362.6 on 8 df,
                                      p=<2e-16
##
##
## ##########
                              ############
                   Model 4
## ----- Low -----
## coxph(formula = low_perf_collab ~ eventAttribute + 1, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
                               coef exp(coef) se(coef)
##
                                                          z Pr(>|z|)
## eventAttributedisruption
                            ## eventAttributefloor-grabber 0.13058 1.13949 0.09223 1.416 0.156816
## eventAttributequestion
                             1.42539 4.15948 0.07320 19.474 < 2e-16 ***
                             2.36037 10.59485 0.07003 33.706 < 2e-16 ***
## eventAttributestatement
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
                            exp(coef) exp(-coef) lower .95 upper .95
## eventAttributedisruption
                              0.6794 1.47185
                                                  0.5495
                                                         0.840
## eventAttributefloor-grabber
                              1.1395
                                       0.87758
                                                  0.9511
                                                          1.365
## eventAttributequestion
                              4.1595 0.24041
                                                 3.6036
                                                          4.801
                                                 9.2360 12.154
## eventAttributestatement
                              10.5948 0.09439
##
## Concordance= 0.753 (se = 0.003)
## Likelihood ratio test= 4836 on 4 df,
                                       p=<2e-16
## Wald test
             = 3439 on 4 df,
                                       p = < 2e - 16
## Score (logrank) test = 4890 on 4 df,
                                       p=<2e-16
## ----- High -----
## Call:
## coxph(formula = high_perf_collab ~ eventAttribute + 1, data = REM.data)
##
    n= 515830, number of events= 5089
##
##
                                coef exp(coef) se(coef)
                                                          z Pr(>|z|)
## eventAttributedisruption
                            1.13018 0.10357 1.182
## eventAttributefloor-grabber 0.12238
                                                              0.2374
## eventAttributequestion
                             1.49971
                                      4.48038 0.08143 18.416
                                                              <2e-16 ***
                             2.29553 9.92965 0.07865 29.188
## eventAttributestatement
                                                              <2e-16 ***
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
                            exp(coef) exp(-coef) lower .95 upper .95
## eventAttributedisruption
                             0.7203
                                        1.3883
                                                  0.5596 0.9273
## eventAttributefloor-grabber
                              1.1302
                                        0.8848
                                                  0.9226
                                                           1.3845
```

```
## eventAttributequestion 4.4804 0.2232
## eventAttributestatement 9.9297 0.1007
                                               3.8194
                                                      5.2557
                                              8.5112 11.5845
## Concordance= 0.745 (se = 0.003)
## Likelihood ratio test= 3465 on 4 df, p=<2e-16
## Wald test = 2412 on 4 df, p=<2e-16
## Score (logrank) test = 3320 on 4 df, p=<2e-16
##
##
## ##########
                            ############
                 Model 5
## ----- Low -----
## Call:
## coxph(formula = low_perf_collab ~ sender + eventAttribute, data = REM.data)
##
##
    n= 642212, number of events= 5981
##
##
                              coef exp(coef) se(coef)
                                                       z Pr(>|z|)
## sender3
                          ## sender5
                          -0.59018  0.55422  0.04536  -13.012  < 2e-16 ***
                          -0.28040 0.75548 0.03933 -7.130 1.00e-12 ***
## sender6
                          ## sender7
## eventAttributedisruption -0.37951 0.68419 0.10829 -3.505 0.000457 ***
## eventAttributefloor-grabber 0.13002 1.13885 0.09224
                                                   1.410 0.158643
## eventAttributequestion 1.43486 4.19904 0.07321 19.599 < 2e-16 ***
                         2.36035 10.59468 0.07006 33.692 < 2e-16 ***
## eventAttributestatement
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
                          exp(coef) exp(-coef) lower .95 upper .95
## sender3
                            0.8569
                                    1.16701
                                             0.7964 0.9220
## sender5
                             0.5542
                                     1.80432
                                               0.5071
                                                       0.6058
## sender6
                            0.7555
                                   1.32366
                                             0.6994
                                                     0.8160
## sender7
                            0.8383 1.19285
                                             0.7778
                                                     0.9036
## eventAttributedisruption
                            0.6842 1.46157
                                             0.5534 0.8460
                                             0.9505
                                                      1.3645
## eventAttributefloor-grabber 1.1389 0.87808
## eventAttributequestion
                           4.1990 0.23815
                                             3.6378 4.8469
## eventAttributestatement 10.5947 0.09439 9.2354 12.1540
##
## Concordance= 0.766 (se = 0.003)
## Likelihood ratio test= 5027 on 8 df, p=<2e-16
## Wald test = 3612 on 8 df, p=<2e-16
## Score (logrank) test = 5061 on 8 df,
                                    p=<2e-16
## ----- High -----
## coxph(formula = high_perf_collab ~ sender + eventAttribute, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
##
                              coef exp(coef) se(coef)
                                                      z Pr(>|z|)
## sender3
                          -0.28592  0.75132  0.04101  -6.972  3.13e-12 ***
                          ## sender5
## sender6
                          -0.40703   0.66562   0.04260   -9.555   < 2e-16 ***
                          ## sender7
```

```
## eventAttributedisruption
                               -0.36673
                                          0.69300 0.12897 -2.844 0.00446 **
## eventAttributefloor-grabber 0.11523
                                          1.12213 0.10358
                                                             1.113
                                                                    0.26590
## eventAttributequestion
                                          4.52973
                                                            18.542
                               1.51066
                                                  0.08147
                                                                   < 2e-16 ***
## eventAttributestatement
                                2.31378 10.11262
                                                  0.07868 29.407 < 2e-16 ***
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
##
                               exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                  0.7513
                                            1.33098
                                                       0.6933
                                                                 0.8142
## sender5
                                  0.5304
                                            1.88540
                                                       0.4829
                                                                 0.5825
## sender6
                                  0.6656
                                            1.50235
                                                       0.6123
                                                                 0.7236
## sender7
                                  0.7850
                                            1.27383
                                                       0.7249
                                                                 0.8502
                                                       0.5382
## eventAttributedisruption
                                  0.6930
                                            1.44300
                                                                 0.8923
## eventAttributefloor-grabber
                                            0.89116
                                                                1.3747
                                  1.1221
                                                       0.9160
## eventAttributequestion
                                  4.5297
                                            0.22076
                                                       3.8612
                                                                 5.3140
## eventAttributestatement
                                 10.1126
                                            0.09889
                                                       8.6674
                                                                11.7988
##
## Concordance= 0.759 (se = 0.003)
## Likelihood ratio test= 3670 on 8 df,
                                           p=<2e-16
## Wald test
                       = 2622
                               on 8 df,
                                           p=<2e-16
## Score (logrank) test = 3541
                               on 8 df,
                                           p=<2e-16
##
##
## ##########
                                 ############
                    Model 6
   ----- Low -----
  coxph(formula = low_perf_collab ~ sender * eventAttribute, data = REM.data)
##
##
##
     n= 642212, number of events= 5981
##
##
                                           coef exp(coef) se(coef)
                                                                        z Pr(>|z|)
## sender3
                                        0.21356
                                                  1.23808 0.19484 1.096 0.273034
## sender5
                                        0.04636
                                                  1.04745
                                                          0.20897 0.222 0.824431
## sender6
                                       -0.57702
                                                  0.56157
                                                          0.26083 -2.212 0.026950
                                       0.29328
                                                  1.34081
                                                          0.20533
                                                                   1.428 0.153209
## sender7
## eventAttributedisruption
                                       0.04620
                                                  1.04729 0.20898 0.221 0.825015
## eventAttributefloor-grabber
                                       0.37273
                                                  1.45170 0.18741 1.989 0.046711
## eventAttributequestion
                                       1.64283
                                                  5.16977
                                                          0.15332 10.715 < 2e-16
## eventAttributestatement
                                       2.63092
                                                          0.14626 17.988 < 2e-16
                                                 13.88650
## sender3:eventAttributedisruption
                                      -0.45298
                                                  0.63573
                                                          0.28978 -1.563 0.118003
## sender5:eventAttributedisruption
                                      -1.27414
                                                  0.27967
                                                          0.38765 -3.287 0.001013
## sender6:eventAttributedisruption
                                                 1.11976 0.35822 0.316 0.752174
                                       0.11312
## sender7:eventAttributedisruption
                                       -0.85408
                                                  0.42568 0.36342 -2.350 0.018768
## sender3:eventAttributefloor-grabber -0.39006
                                                  0.67701 0.26182 -1.490 0.136266
## sender5:eventAttributefloor-grabber -1.10363
                                                  0.33167  0.32557  -3.390  0.000699
## sender6:eventAttributefloor-grabber 0.62074
                                                          0.31875 1.947 0.051486
                                                  1.86030
## sender7:eventAttributefloor-grabber -0.44849
                                                  0.63859
                                                          0.27525 -1.629 0.103231
## sender3:eventAttributequestion
                                       -0.58318
                                                  0.55812 0.21187 -2.753 0.005914
## sender5:eventAttributequestion
                                       -0.43221
                                                  0.64907 0.22661 -1.907 0.056482
## sender6:eventAttributequestion
                                       0.56140
                                                  1.75313 0.27241
                                                                   2.061 0.039317
## sender7:eventAttributequestion
                                      -0.45394
                                                  0.63512 0.22127 -2.052 0.040217
## sender3:eventAttributestatement
                                      -0.31324
                                                  0.73107  0.20000  -1.566  0.117298
## sender5:eventAttributestatement
                                      -0.71841
                                                  0.48753 0.21679 -3.314 0.000920
                                                  1.20855 0.26537 0.714 0.475349
## sender6:eventAttributestatement
                                       0.18942
```

```
## sender7:eventAttributestatement
                                        -0.48958
                                                   0.61289 0.21045 -2.326 0.020004
##
## sender3
## sender5
## sender6
## sender7
## eventAttributedisruption
## eventAttributefloor-grabber
## eventAttributequestion
## eventAttributestatement
                                        ***
## sender3:eventAttributedisruption
## sender5:eventAttributedisruption
                                        **
## sender6:eventAttributedisruption
## sender7:eventAttributedisruption
## sender3:eventAttributefloor-grabber
## sender5:eventAttributefloor-grabber ***
## sender6:eventAttributefloor-grabber
## sender7:eventAttributefloor-grabber
## sender3:eventAttributequestion
                                        **
## sender5:eventAttributequestion
## sender6:eventAttributequestion
## sender7:eventAttributequestion
## sender3:eventAttributestatement
## sender5:eventAttributestatement
## sender6:eventAttributestatement
  sender7:eventAttributestatement
##
  Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
##
                                        exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                           1.2381
                                                      0.80770
                                                                 0.8451
                                                                            1.8138
  sender5
                                           1.0475
                                                      0.95470
                                                                 0.6954
                                                                            1.5776
## sender6
                                           0.5616
                                                      1.78072
                                                                 0.3368
                                                                            0.9363
## sender7
                                                                            2.0052
                                           1.3408
                                                      0.74582
                                                                 0.8966
## eventAttributedisruption
                                                      0.95485
                                                                 0.6953
                                                                            1.5774
                                           1.0473
## eventAttributefloor-grabber
                                           1.4517
                                                      0.68885
                                                                 1.0054
                                                                            2.0960
## eventAttributequestion
                                           5.1698
                                                      0.19343
                                                                 3.8280
                                                                            6.9819
## eventAttributestatement
                                          13.8865
                                                      0.07201
                                                                10.4255
                                                                           18.4965
## sender3:eventAttributedisruption
                                                                 0.3603
                                           0.6357
                                                      1.57300
                                                                            1.1218
## sender5:eventAttributedisruption
                                           0.2797
                                                      3.57564
                                                                 0.1308
                                                                            0.5979
## sender6:eventAttributedisruption
                                           1.1198
                                                      0.89305
                                                                 0.5549
                                                                            2.2597
## sender7:eventAttributedisruption
                                           0.4257
                                                                 0.2088
                                                                            0.8678
                                                      2.34921
## sender3:eventAttributefloor-grabber
                                           0.6770
                                                      1.47708
                                                                 0.4053
                                                                            1.1310
## sender5:eventAttributefloor-grabber
                                           0.3317
                                                                            0.6278
                                                      3.01508
                                                                 0.1752
## sender6:eventAttributefloor-grabber
                                           1.8603
                                                      0.53755
                                                                 0.9960
                                                                            3.4746
## sender7:eventAttributefloor-grabber
                                           0.6386
                                                      1.56595
                                                                 0.3723
                                                                            1.0953
## sender3:eventAttributequestion
                                           0.5581
                                                      1.79173
                                                                 0.3685
                                                                            0.8454
## sender5:eventAttributequestion
                                           0.6491
                                                      1.54066
                                                                 0.4163
                                                                            1.0120
                                                                 1.0279
## sender6:eventAttributequestion
                                           1.7531
                                                      0.57041
                                                                            2.9901
## sender7:eventAttributequestion
                                           0.6351
                                                      1.57451
                                                                 0.4116
                                                                            0.9799
## sender3:eventAttributestatement
                                           0.7311
                                                      1.36785
                                                                 0.4940
                                                                            1.0819
## sender5:eventAttributestatement
                                           0.4875
                                                      2.05117
                                                                 0.3188
                                                                            0.7456
## sender6:eventAttributestatement
                                           1.2085
                                                      0.82744
                                                                 0.7184
                                                                            2.0330
## sender7:eventAttributestatement
                                           0.6129
                                                      1.63162
                                                                 0.4057
                                                                            0.9258
```

```
##
## Concordance= 0.769 (se = 0.003)
## Likelihood ratio test= 5115
                               on 24 df,
                                           p=<2e-16
                       = 3644 on 24 df,
## Wald test
                                           p=<2e-16
## Score (logrank) test = 5334 on 24 df,
                                           p=<2e-16
##
  ----- High -----
## Call:
  coxph(formula = high_perf_collab ~ sender * eventAttribute, data = REM.data)
##
##
    n= 515830, number of events= 5089
##
                                                                      z Pr(>|z|)
##
                                          coef exp(coef) se(coef)
## sender3
                                                 0.63768 0.21960 -2.049
                                      -0.44992
                                                                        0.04048
## sender5
                                      -0.22835
                                                 0.79584 0.23430 -0.975
                                                                         0.32976
## sender6
                                      -0.85102
                                                 0.42698
                                                          0.27027 - 3.149
                                                                         0.00164
## sender7
                                                         0.21618 -2.052
                                      -0.44353
                                                 0.64177
                                                                         0.04020
## eventAttributedisruption
                                      -0.22967
                                                 0.79480
                                                         0.21785 -1.054
## eventAttributefloor-grabber
                                      -0.08712
                                                 0.91657 0.19913 -0.438
                                                                         0.66175
## eventAttributequestion
                                       1.31732
                                                 3.73341 0.15344 8.585
                                                                         < 2e-16
## eventAttributestatement
                                       2.25981
                                                 9.58127 0.14693 15.381
                                                                         < 2e-16
## sender3:eventAttributedisruption
                                      -0.42254
                                                 -0.27567
## sender5:eventAttributedisruption
                                                 0.75906 0.47417 -0.581
                                                                         0.56099
## sender6:eventAttributedisruption
                                                 1.92949
                                                          0.40330 1.630
                                       0.65725
                                                                         0.10316
## sender7:eventAttributedisruption
                                                 0.63968 0.41693 -1.072
                                      -0.44679
                                                                         0.28390
## sender3:eventAttributefloor-grabber
                                      0.27360
                                                 1.31469
                                                        0.29784
                                                                  0.919
                                                                         0.35829
## sender5:eventAttributefloor-grabber
                                       0.13933
                                                 1.14951 0.32958
                                                                  0.423
                                                                         0.67247
## sender6:eventAttributefloor-grabber
                                                                  1.551
                                       0.53924
                                                 1.71470
                                                         0.34765
                                                                         0.12088
## sender7:eventAttributefloor-grabber
                                                 1.27779
                                                        0.29965
                                                                  0.818 0.41333
                                       0.24513
## sender3:eventAttributequestion
                                       0.14283
                                                 1.15354
                                                         0.23601
                                                                  0.605 0.54505
## sender5:eventAttributequestion
                                       0.06625
                                                 1.06849
                                                          0.24982
                                                                  0.265
                                                                         0.79087
## sender6:eventAttributequestion
                                       0.57616
                                                 1.77919
                                                          0.28265
                                                                  2.038
                                                                         0.04150
## sender7:eventAttributequestion
                                       0.26770
                                                 1.30695
                                                         0.23163
                                                                  1.156
                                                                         0.24779
## sender3:eventAttributestatement
                                                 1.21121
                                                         0.22520
                                                                  0.851
                                       0.19162
                                                                         0.39485
## sender5:eventAttributestatement
                                      -0.67303
                                                 0.51016 0.24255 -2.775
                                                                         0.00552
## sender6:eventAttributestatement
                                       0.40273
                                                 1.49590 0.27540
                                                                 1.462 0.14365
## sender7:eventAttributestatement
                                       0.19910
                                                 1.22031 0.22180 0.898 0.36937
##
## sender3
## sender5
## sender6
## sender7
## eventAttributedisruption
## eventAttributefloor-grabber
## eventAttributequestion
## eventAttributestatement
                                      ***
## sender3:eventAttributedisruption
## sender5:eventAttributedisruption
## sender6:eventAttributedisruption
## sender7:eventAttributedisruption
## sender3:eventAttributefloor-grabber
## sender5:eventAttributefloor-grabber
## sender6:eventAttributefloor-grabber
## sender7:eventAttributefloor-grabber
```

```
## sender3:eventAttributequestion
## sender5:eventAttributequestion
## sender6:eventAttributequestion
## sender7:eventAttributequestion
## sender3:eventAttributestatement
## sender5:eventAttributestatement
                                        **
## sender6:eventAttributestatement
## sender7:eventAttributestatement
## Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1
##
                                        exp(coef) exp(-coef) lower .95 upper .95
## sender3
                                           0.6377
                                                       1.5682
                                                                 0.4147
                                                                           0.9807
## sender5
                                           0.7958
                                                       1.2565
                                                                 0.5028
                                                                           1.2597
## sender6
                                           0.4270
                                                       2.3420
                                                                 0.2514
                                                                           0.7252
## sender7
                                           0.6418
                                                       1.5582
                                                                 0.4201
                                                                           0.9804
## eventAttributedisruption
                                           0.7948
                                                       1.2582
                                                                 0.5186
                                                                           1.2181
## eventAttributefloor-grabber
                                           0.9166
                                                       1.0910
                                                                 0.6204
                                                                           1.3541
                                           3.7334
## eventAttributequestion
                                                       0.2679
                                                                 2.7637
                                                                           5.0433
## eventAttributestatement
                                           9.5813
                                                       0.1044
                                                                 7.1839
                                                                           12.7787
## sender3:eventAttributedisruption
                                           0.6554
                                                       1.5258
                                                                 0.3336
                                                                           1.2876
## sender5:eventAttributedisruption
                                                       1.3174
                                                                 0.2997
                                                                           1.9226
                                           0.7591
## sender6:eventAttributedisruption
                                                                           4.2533
                                           1.9295
                                                       0.5183
                                                                 0.8753
## sender7:eventAttributedisruption
                                                                 0.2825
                                                                           1.4483
                                           0.6397
                                                       1.5633
## sender3:eventAttributefloor-grabber
                                           1.3147
                                                       0.7606
                                                                 0.7333
                                                                           2.3569
## sender5:eventAttributefloor-grabber
                                           1.1495
                                                       0.8699
                                                                 0.6025
                                                                           2.1931
## sender6:eventAttributefloor-grabber
                                           1.7147
                                                       0.5832
                                                                 0.8675
                                                                           3.3893
## sender7:eventAttributefloor-grabber
                                           1.2778
                                                       0.7826
                                                                 0.7102
                                                                           2.2989
## sender3:eventAttributequestion
                                                                 0.7263
                                           1.1535
                                                       0.8669
                                                                           1.8320
## sender5:eventAttributequestion
                                           1.0685
                                                       0.9359
                                                                 0.6548
                                                                           1.7435
## sender6:eventAttributequestion
                                           1.7792
                                                       0.5621
                                                                 1.0224
                                                                           3.0961
## sender7:eventAttributequestion
                                           1.3070
                                                       0.7651
                                                                 0.8300
                                                                           2.0579
## sender3:eventAttributestatement
                                           1.2112
                                                       0.8256
                                                                 0.7790
                                                                           1.8833
## sender5:eventAttributestatement
                                                       1.9602
                                                                           0.8207
                                           0.5102
                                                                 0.3171
## sender6:eventAttributestatement
                                           1.4959
                                                       0.6685
                                                                 0.8719
                                                                           2.5664
## sender7:eventAttributestatement
                                           1.2203
                                                       0.8195
                                                                 0.7901
                                                                           1.8848
##
## Concordance= 0.761 (se = 0.003)
## Likelihood ratio test= 3757
                                 on 24 df,
                                             p=<2e-16
## Wald test
                        = 2721
                                 on 24 df,
                                             p=<2e-16
## Score (logrank) test = 3829
                                 on 24 df,
                                             p = < 2e - 16
```