Earth Agency Project Update

Consulting Group C3

2/12/2021

1 Summary

There are four dependent variables of interest (MeanS, Bio, comAntJscore, comBioJFtotal). Previous analysis convinced us to combine the levels of these variables in the following manner:

For Children:

Variable	Original levels	We combined	New levels
MeanSeverity	0, 1, 2, 3	1 & 2	0, 1, 3, 4
Bio	?	?	?
comAntJscore	?	?	?
comBioJFtotal	?	?	?

For Adults:

Variable	Original levels	We combined	New levels
MeanSeverity	0, 1, 2, 3	0 & 1	0, 2, 3
Bio	?	?	?
comAntJscore	?	?	?
comBioJFtotal	?	?	?

For each of these eight dependent variables (4 for children, 4 for adults) we have included the following six predictor variables in an ordinal regression model:
Condition, Agency_Language, SRFactsTotal, SRTotal, Gender, inagencyscore.
For children we have added: Location & OrderS For adults we have added: FirstLang

Previous analysis has convinced us to use an ordinal regression model.

The models and their summaries are organized below:

2.1.1 Children: Mean Severity Score

```
## Call:
## polr(formula = MeanS ~ Condition + Agency_Language + SRFactsTotal +
##     SRTotal + Gender + Location + inagencyscore + OrderS, data = children1)
##
## Coefficients:
##                     Value Std. Error  t value
```

```
## Condition2       -2.47820     1.2085 -2.05059
## Condition3       -3.00673     1.3998 -2.14798
## Agency_Language2  3.39598     1.2474  2.72247
## Agency_Language3  3.55909     1.4433  2.46591
## SRFactsTotal      0.41486     0.1461  2.83969
## SRTotal           0.06626     0.5423  0.12218
## Gender2          -0.02947     0.5915 -0.04982
## LocationLab      -0.87444     0.9476 -0.92283
## LocationSchool   -0.62369     0.6847 -0.91088
## inagencyscore    -0.08471     0.1474 -0.57475
## OrderSSB          1.34551     0.6363  2.11445
##
## Intercepts:
##     Value    Std. Error t value
## 0|1  -3.7597   2.4197    -1.5538
## 1|3   3.1554   2.1580     1.4622
## 3|4 174.0064   2.1580    80.6318
##
## Residual Deviance: 87.76137
## AIC: 115.7614
```

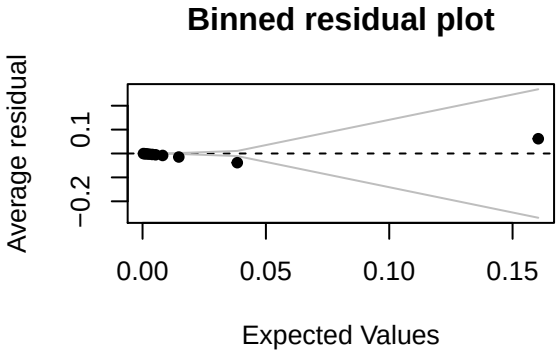
```
##                         Value Std. Error     t value     p value
## Condition2        -2.47819965  1.2085319 -2.05058690 0.040307194
## Condition3        -3.00672621  1.3997931 -2.14797909 0.031715417
## Agency_Language2   3.39598158  1.2473906  2.72246844 0.006479622
## Agency_Language3   3.55908606  1.4433151  2.46591057 0.013666545
## SRFactsTotal       0.41485996  0.1460934  2.83968931 0.004515749
## SRTotal            0.06626375  0.5423333  0.12218271 0.902754316
## Gender2           -0.02947052  0.5915271 -0.04982108 0.960264965
## LocationLab       -0.87444403  0.9475641 -0.92283363 0.356093914
## LocationSchool    -0.62369500  0.6847174 -0.91087949 0.362358873
## inagencyscore     -0.08470525  0.1473777 -0.57474951 0.565460721
## OrderSSB           1.34550899  0.6363414  2.11444521 0.034477260
## 0|1               -3.75967779  2.4196727 -1.55379600 0.120233086
## 1|3                3.15538722  2.1580377  1.46215575 0.143698534
## 3|4              174.00641424  2.1580377 80.63177718 0.000000000
```

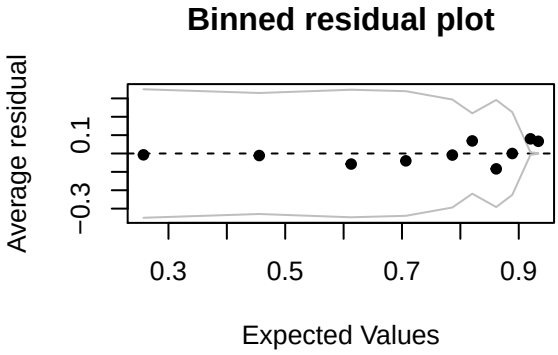
```
## Single term deletions
##
## Model:
## MeanS ~ Condition + Agency_Language + SRFactsTotal + SRTotal +
##     Gender + Location + inagencyscore + OrderS
##                  Df    AIC     LRT Pr(>Chi)
## <none>              115.76
## Condition         2 118.56  6.8015 0.033348 *
## Agency_Language   2 123.44 11.6841 0.002903 **
## SRFactsTotal      1 122.89  9.1271 0.002518 **
## SRTotal           1 113.78  0.0149 0.902693
## Gender            1 113.76  0.0025 0.960236
## Location          2 112.86  1.0990 0.577247
## inagencyscore     1 114.09  0.3326 0.564134
## OrderS            1 118.60  4.8352 0.027885 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

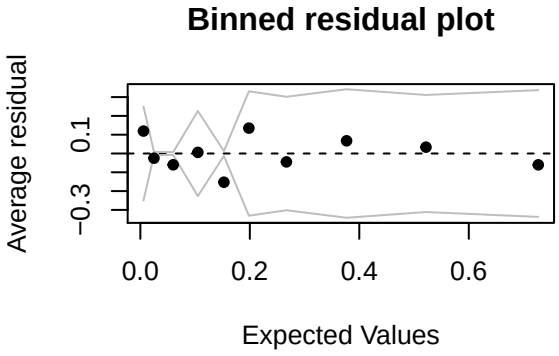
```
##            0          1    3 4
## 0          0  2.0000000  0.0 0
## 1          0 61.0000000  4.0 0
## 3          0 11.0000000 11.0 0
## 4          0  0.0000000  0.0 0
## percantage 0  0.9384615  0.5 0
```

```
## Misclassification error is: 0.1910112
```

```
## ------------------------------------------------------
## Test for     X2  df  probability
## ------------------------------------------------------
## Omnibus          0   11  1
## Condition2       0   1   1
## Condition3       0   1   1
## Agency_Language2 0   1   1
## Agency_Language3 0   1   1
## SRFactsTotal     0   1   1
## SRTotal          0   1   1
## Gender2          0   1   1
## LocationLab      0   1   1
## LocationSchool       0   1   1
## inagencyscore        0   1   1
## OrderSSB     0   1   1
## ------------------------------------------------------
##
## H0: Parallel Regression Assumption holds
```







2.1.2 Adults: Mean Severity Score

```
## Call:
## polr(formula = MeanS ~ Condition + Agency_Language + SRFactsTotal +
##     SRTotal + Gender + inagencyscore + FirstLang, data = adult1)
##
## Coefficients:
##                     Value Std. Error t value
## Condition2         0.5946    0.47845  1.2428
## Condition3         1.0159    0.60886  1.6686
## Agency_Language2   0.4655    0.54561  0.8531
## Agency_Language3 -0.1513    0.65060 -0.2326
## SRFactsTotal     -0.0725    0.06483 -1.1182
## SRTotal           0.2566    0.15204  1.6878
## Gender2           0.6335    0.38433  1.6482
## inagencyscore     0.1750    0.07627  2.2943
## FirstLang1       -1.0887    0.42813 -2.5429
##
## Intercepts:
##     Value   Std. Error t value
## 0|2  2.8372  1.5553     1.8242
## 2|3  5.5860  1.6299     3.4273
##
## Residual Deviance: 232.5789
## AIC: 254.5789
```

```
##                         Value Std. Error    t value      p value
## Condition2         0.59460831 0.47844679  1.2427888 0.2139456699
## Condition3         1.01592896 0.60885813  1.6685808 0.0952004918
## Agency_Language2   0.46547528 0.54560668  0.8531334 0.3935853292
## Agency_Language3 -0.15134202 0.65060046 -0.2326190 0.8160572825
## SRFactsTotal     -0.07249537 0.06483442 -1.1181618 0.2634979054
## SRTotal           0.25661077 0.15203811  1.6878057 0.0914485422
## Gender2           0.63345094 0.38432625  1.6482115 0.0993092799
## inagencyscore     0.17498005 0.07626610  2.2943357 0.0217712235
## FirstLang1       -1.08869633 0.42812588 -2.5429351 0.0109925634
## 0|2               2.83721272 1.55532007  1.8241986 0.0681220512
## 2|3               5.58599471 1.62986762  3.4272690 0.0006096849
```

```
## Single term deletions
##
## Model:
## MeanS ~ Condition + Agency_Language + SRFactsTotal + SRTotal +
##     Gender + inagencyscore + FirstLang
##                  Df    AIC    LRT Pr(>Chi)
## <none>              254.58
## Condition         2 253.79 3.2161  0.20028
## Agency_Language   2 251.46 0.8761  0.64530
## SRFactsTotal      1 253.84 1.2600  0.26165
## SRTotal           1 255.45 2.8752  0.08996 .
## Gender            1 255.34 2.7596  0.09667 .
## inagencyscore     1 258.00 5.4250  0.01985 *
## FirstLang         1 259.15 6.5737  0.01035 *
```

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

##       0     2 3
## 0 32.00 25.00 0
## 2 17.00 44.00 1
## 3  2.00 12.00 0
##    0.56  0.71 0

## Misclassification error is: 0.4285714

## ------------------------------------------------------
## Test for     X2  df  probability
## ------------------------------------------------------
## Omnibus          10.37   9   0.32
## Condition2       0.87    1   0.35
## Condition3       1.84    1   0.17
## Agency_Language2 0.46    1   0.5
## Agency_Language3 1.48    1   0.22
## SRFactsTotal     3.35    1   0.07
## SRTotal          0.01    1   0.94
## Gender2          3.42    1   0.06
## inagencyscore        0   1   0.95
## FirstLang1       3.06    1   0.08
## ------------------------------------------------------
##
## H0: Parallel Regression Assumption holds
```