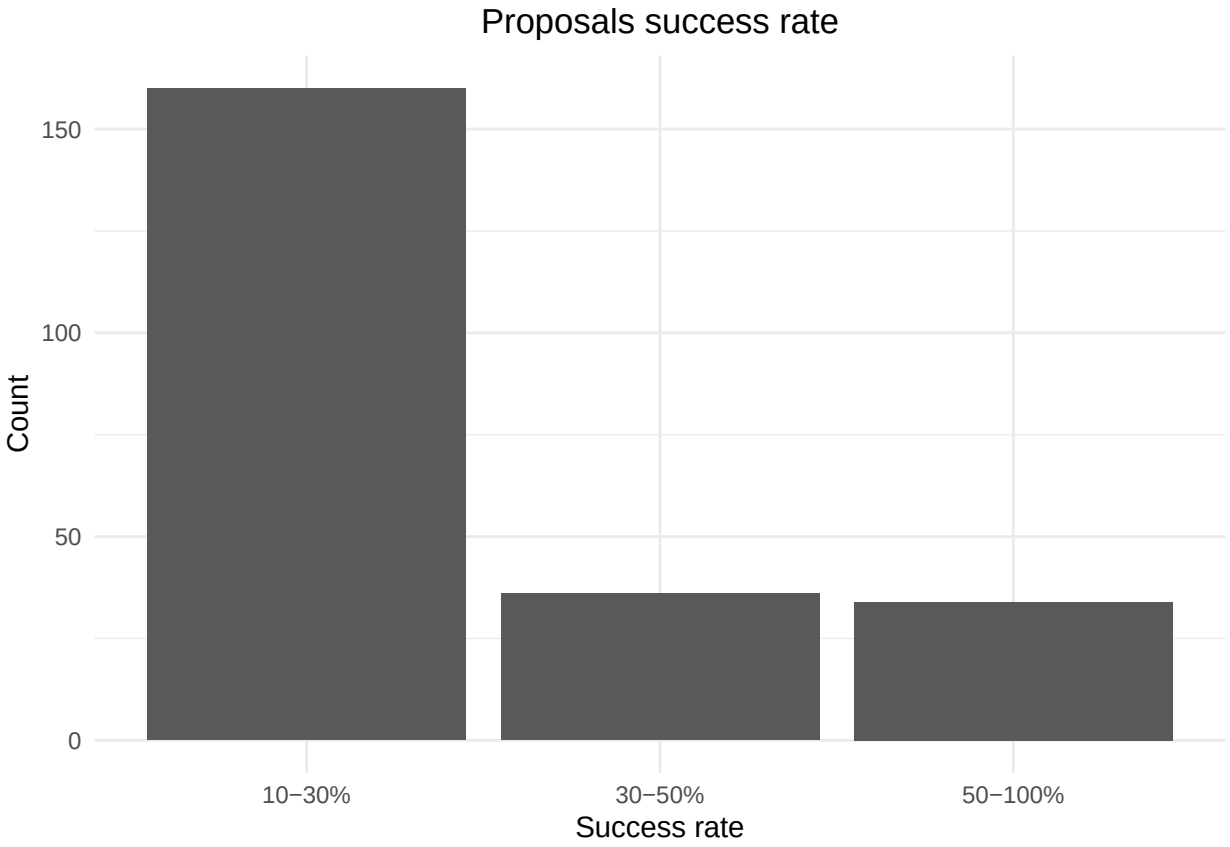
Ordinal Logistic Regression or Proportional Odds Logistic Regression


Proposals success rate
150
100
50
0
Count
10−30%
30−50%
50−100%
Success rate

Model with NP1 as reference

```
## Call:
## polr(formula = SR ~ H + NP + AGR, data = lm_DF, Hess = TRUE)
##
## Coefficients:
##       Value Std. Error t value
## H    0.2832     0.1682   1.684
## NP2 -1.0726     0.3289  -3.262
## NP3 -1.7962     0.4600  -3.905
## AGR  0.1377     0.0897   1.535
##
## Intercepts:
##     Value   Std. Error t value
## 1|2  2.0188  0.8821     2.2886
## 2|3  3.0728  0.8982     3.4210
##
## Residual Deviance: 344.2966
## AIC: 356.2966
```

```
##          Value Std. Error   t value p value
## H    0.2831598  0.1681753  1.683718  0.0922
## NP2 -1.0726172  0.3288548 -3.261674  0.0011
## NP3 -1.7961635  0.4600075 -3.904639  0.0001
## AGR  0.1377015  0.0896999  1.535136  0.1248
## 1|2  2.0188171  0.8821250  2.288584  0.0221
## 2|3  3.0727571  0.8981963  3.421031  0.0006
```

Model with NP3 as reference

```
## Call:
## polr(formula = SR ~ H + NP + AGR, data = lm_DF, Hess = TRUE)
##
## Coefficients:
##      Value Std. Error t value
## H   0.2831     0.1682   1.684
## NP1 1.7962     0.4600   3.905
## NP2 0.7236     0.4765   1.519
## AGR 0.1377     0.0897   1.535
##
## Intercepts:
##     Value  Std. Error t value
## 1|2 3.8149 0.9245     4.1264
## 2|3 4.8688 0.9481     5.1355
##
## Residual Deviance: 344.2966
## AIC: 356.2966
```

```
##         Value Std. Error  t value p value
## H   0.2831319 0.16816801 1.683625  0.0923
## NP1 1.7962069 0.46001185 3.904697  0.0001
## NP2 0.7236202 0.47650062 1.518613  0.1289
## AGR 0.1376928 0.08969941 1.535047  0.1248
## 1|2 3.8148622 0.92449518 4.126427  0.0000
## 2|3 4.8688050 0.94807731 5.135451  0.0000
```

Model with all variables NP1, DWH5 and DS1 as reference

```
## Call:
## polr(formula = SR ~ H + AGR + NP + DWH + DS, data = lm_DF, Hess = TRUE)
##
## Coefficients:
##        Value Std. Error    t value
## H     0.2424  1.615e-01  1.501e+00
## AGR   0.1748  9.480e-02  1.844e+00
## NP3  -1.6993  4.771e-01 -3.562e+00
## NP2  -1.1688  3.454e-01 -3.384e+00
## DWH1 -0.4501  1.248e+00 -3.606e-01
## DWH2 16.6851  3.853e-07  4.330e+07
## DWH3  1.2069  5.665e-01  2.130e+00
## DWH4  0.5854  3.766e-01  1.555e+00
## DS2  -1.3482  6.132e-01 -2.199e+00
## DS3  -1.3974  5.907e-01 -2.366e+00
##
## Intercepts:
##     Value         Std. Error    t value
## 1|2        1.2368        1.0578        1.1693
## 2|3        2.4015        1.0685        2.2477
##
## Residual Deviance: 322.2447
## AIC: 346.2447
```

```
##           Value   Std. Error       t value p value
## H     0.2423979 1.615168e-01  1.500760e+00  0.1334
## AGR   0.1748366 9.479777e-02  1.844311e+00  0.0651
## NP3  -1.6992966 4.770545e-01 -3.562060e+00  0.0004
## NP2  -1.1688439 3.454181e-01 -3.383852e+00  0.0007
## DWH1 -0.4500757 1.248220e+00 -3.605740e-01  0.7184
## DWH2 16.6851235 3.853385e-07  4.329992e+07  0.0000
## DWH3  1.2068630 5.664800e-01  2.130460e+00  0.0331
## DWH4  0.5853794 3.765523e-01  1.554577e+00  0.1200
## DS2  -1.3482203 6.131683e-01 -2.198777e+00  0.0279
## DS3  -1.3974296 5.907004e-01 -2.365716e+00  0.0180
## 1|2   1.2368193 1.057765e+00  1.169276e+00  0.2423
## 2|3   2.4015119 1.068453e+00  2.247652e+00  0.0246
```

Model with all variables, NP3, DWH1 and DS1 as reference

```
## Call:
## polr(formula = SR ~ H + AGR + NP + DWH + DS, data = lm_DF, Hess = TRUE)
##
## Coefficients:
##        Value Std. Error    t value
## H     0.2424  1.615e-01  1.501e+00
## AGR   0.1748  9.480e-02  1.844e+00
## NP1   1.6993  4.771e-01  3.562e+00
## NP2   0.5305  5.018e-01  1.057e+00
## DWH5  0.4504  1.248e+00  3.608e-01
## DWH2 17.2730  8.838e-06  1.954e+06
## DWH3  1.6572  1.317e+00  1.258e+00
## DWH4  1.0357  1.261e+00  8.213e-01
## DS2  -1.3483  6.132e-01 -2.199e+00
## DS3  -1.3975  5.907e-01 -2.366e+00
##
## Intercepts:
##     Value        Std. Error   t value
## 1|2       3.3864       1.5448       2.1921
## 2|3       4.5511       1.5614       2.9148
##
## Residual Deviance: 322.2447
## AIC: 346.2447
```

```
##           Value   Std. Error       t value p value
## H     0.2423920 1.615152e-01  1.500738e+00  0.1334
## AGR   0.1748300 9.479760e-02  1.844246e+00  0.0651
## NP1   1.6993315 4.770562e-01  3.562120e+00  0.0004
## NP2   0.5304756 5.018165e-01  1.057111e+00  0.2905
## DWH5  0.4503681 1.248287e+00  3.607889e-01  0.7183
## DWH2 17.2730039 8.838296e-06  1.954336e+06  0.0000
## DWH3  1.6571931 1.317128e+00  1.258187e+00  0.2083
## DWH4  1.0357263 1.261152e+00  8.212540e-01  0.4115
## DS2  -1.3482722 6.131692e-01 -2.198858e+00  0.0279
## DS3  -1.3975011 5.907016e-01 -2.365833e+00  0.0180
## 1|2   3.3863591 1.544821e+00  2.192073e+00  0.0284
## 2|3   4.5510596 1.561356e+00  2.914812e+00  0.0036
```