Igor Ashley Will Katya Saleh Oleg Vika Alex 1 2 3 4 5 6 7 8

```
interactions_high <- readRDS("data/high_performance_sessions.RData")
unique(interactions_high$session)
```

```
## [1] 2103 2104 2105 2108 2112 2114 2115 2118
```

```
unique(interactions_high$sender_id)
```

```
## [1] 6 2 4 7 3 5
```

```
size <- nrow(interactions_high)
```

```
# Create a dataframe with names
attribute_table <- data.frame(id = 0:8, name = c("All", "Igor", "Ashley", "Will",
    "Katya", "Saleh", "Oleg", "Vika", "Alex"), stringsAsFactors = FALSE)
attribute_table <- na.omit(attribute_table)
attribute_table$Sender_male <- ifelse(attribute_table$name %in% c("Igor", "Will",
    "Saleh", "Oleg", "Alex"), 1, ifelse(attribute_table$name %in% c("Ashley", "Katya",
    "Vika"), 0, NA))
attribute_table$Receiver_male <- ifelse(attribute_table$name %in% c("Igor", "Will",
    "Saleh", "Oleg", "Alex"), 1, ifelse(attribute_table$name %in% c("Ashley", "Katya",
    "Vika"), 0, NA))

attributes <- attribute_table %>%
    dplyr::select(-name)

head(attributes)
```

```
##   id Sender_male Receiver_male
## 1  0          NA            NA
## 2  1           1             1
## 3  2           0             0
## 4  3           1             1
## 5  4           0             0
## 6  5           1             1
```

```
interactions_high <- interactions_high[interactions_high$session %in% c(2104, 2105,
    2108), ]


attributes <- attributes[attributes$id %in% interactions_high$sender_id, ]

dim(interactions_high)
```

```
## [1] 2768    7
```

```
size <- nrow(attributes)

head(attributes)
```

```
##   id Sender_male Receiver_male
## 3  2           0             0
## 4  3           1             1
## 5  4           0             0
## 6  5           1             1
## 7  6           1             1
## 8  7           0             0
```

Model 1 Baseline Model

```
edgelist_high <- interactions_high[, c("time", "sender_id", "receiver_id")]
# Assuming 'dataframe' is your dataframe and 'time' is the column name
attributes$intercept <- 1
r <- nrow(interactions_high)
edgelist_high <- rbind(edgelist_high, c(r + 1, NA, NA))
set.seed(1000)
```

```
mod1 <- rem.dyad(edgelist = edgelist_high, n = size, effects = c("CovSnd"), covar = list(CovSnd = attril
    ordinal = TRUE, hessian = TRUE)
```

```
## Prepping edgelist.
## Checking/prepping covariates.
## Computing preliminary statistics
## Fitting model
## Obtaining goodness-of-fit statistics
```

```
summary(mod1)
```

```
## Relational Event Model (Ordinal Likelihood)
##
##            Estimate Std.Err Z value Pr(>|z|)
## CovSnd.1 -4.491e+11     NaN     NaN      NaN
## Null deviance: 18128.38 on 2665 degrees of freedom
## Residual deviance: -5.479012e+14 on 2664 degrees of freedom
##  Chi-square: 5.479012e+14 on 1 degrees of freedom, asymptotic p-value 0
## AIC: -5.479012e+14 AICC: -5.479012e+14 BIC: -5.479012e+14
```

Model 2

```
CovSnd1 <- cbind(attributes[, c("intercept", "Sender_male")])
```

```
mod2 <- rem.dyad(edgelist_high, n = size, effects = c("CovSnd"), covar = list(CovSnd = CovSnd1),
    ordinal = TRUE, hessian = TRUE)
```

```
## Prepping edgelist.
## Checking/prepping covariates.
```

```
## Computing preliminary statistics
## Fitting model
## Obtaining goodness-of-fit statistics
```

```
summary(mod2)
```

```
## Relational Event Model (Ordinal Likelihood)
##
##            Estimate Std.Err Z value Pr(>|z|)
## CovSnd.1 -158978221     NaN     NaN      NaN
## CovSnd.2    -192066     NaN     NaN      NaN
## Null deviance: 18128.38 on 2665 degrees of freedom
## Residual deviance: -1.93605e+11 on 2663 degrees of freedom
##  Chi-square: 1.93605e+11 on 2 degrees of freedom, asymptotic p-value 0
## AIC: -1.93605e+11 AICC: -1.93605e+11 BIC: -1.93605e+11
```

```
coef_names2 <- c("Intercept", "Sender_male")
names(mod2$coef) <- coef_names2
summary(mod2)
```

```
## Relational Event Model (Ordinal Likelihood)
##
##               Estimate Std.Err Z value Pr(>|z|)
## Intercept   -158978221     NaN     NaN      NaN
## Sender_male    -192066     NaN     NaN      NaN
## Null deviance: 18128.38 on 2665 degrees of freedom
## Residual deviance: -1.93605e+11 on 2663 degrees of freedom
##  Chi-square: 1.93605e+11 on 2 degrees of freedom, asymptotic p-value 0
## AIC: -1.93605e+11 AICC: -1.93605e+11 BIC: -1.93605e+11
```

```
inputs <- c(intercept = 1, Sender_male = 1)
hazard_male_send <- exp(sum(mod2$coef * inputs))
cat(-hazard_male_send)
```

```
## 0
```

Model 3

```
CovSnd <- cbind(attributes[, c("intercept", "Sender_male")])

CovRec <- cbind(attributes[, c("Receiver_male")])

mod3 <- rem.dyad(edgelist_high, n = size, effects = c("CovSnd", "CovRec"), covar = list(CovSnd = CovSnd
    CovRec = CovRec), ordinal = TRUE, hessian = TRUE)
```

```
## Prepping edgelist.
## Checking/prepping covariates.
## Computing preliminary statistics
## Fitting model
## Obtaining goodness-of-fit statistics
```

```r
coef_names3 <- c("Intercept", "Sender_male", "Receiver_male")
names(mod3$coef) <- coef_names3

summary(mod3)
```

```
## Relational Event Model (Ordinal Likelihood)
##
##                   Estimate     Std.Err     Z value  Pr(>|z|)
## Intercept     -2.9872e+11  2.8435e-03 -1.0505e+14 < 2.2e-16 ***
## Sender_male   -2.9069e+09         NaN         NaN       NaN
## Receiver_male  1.9920e+09  1.3831e-03  1.4402e+12 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Null deviance: 18128.38 on 2665 degrees of freedom
## Residual deviance: -3.527367e+14 on 2662 degrees of freedom
##  Chi-square: 3.527367e+14 on 3 degrees of freedom, asymptotic p-value 0
## AIC: -3.527367e+14 AICC: -3.527367e+14 BIC: -3.527367e+14
```