Results

Emma Sims, Jonathan Trattner, and S. Mason Garrison

November 02 2022

# Data

## Import

### Depression

## \* Removing package(s) from library 'C:/Users/emmas/AppData/Local/R/win-library/4.2' ...

## Error in if (!renv\_file\_exists(path)) {: the condition has length > 1

### Crime

## \* Removing package(s) from library 'C:/Users/emmas/AppData/Local/R/win-library/4.2' ...

## Error in if (!renv\_file\_exists(path)) {: the condition has length > 1

### age

## Clean

## DELIN\_AVERAGE CESD7\_1994 CESD20\_1992 CESD7\_1992 AGE\_1979  
## DELIN\_AVERAGE 1.00000000 0.032315828 0.070362038 0.06623573 -0.102555376  
## CESD7\_1994 0.03231583 1.000000000 0.424334727 0.42387813 0.002552166  
## CESD20\_1992 0.07036204 0.424334727 1.000000000 0.90160212 -0.009842645  
## CESD7\_1992 0.06623573 0.423878134 0.901602117 1.00000000 -0.015353187  
## AGE\_1979 -0.10255538 0.002552166 -0.009842645 -0.01535319 1.000000000

## SubjectTag CASEID RACE SEX DELIN\_AVERAGE   
## Min. : 100 Min. : 1 1:2002 0:6283 Min. :0.0000   
## 1st Qu.: 317225 1st Qu.: 3172 2:3174 1:6403 1st Qu.:0.0000   
## Median : 634350 Median : 6344 3:7510 Median :0.1333   
## Mean : 634350 Mean : 6344 Mean :0.2974   
## 3rd Qu.: 951475 3rd Qu.: 9515 3rd Qu.:0.3750   
## Max. :1268600 Max. :12686 Max. :5.6250   
## NA's :861   
## MINORITY CESD7\_1994 CESD20\_1992 CESD7\_1992   
## blackorhispanic :5176 Min. : 0.00 Min. : 0.000 Min. : 0.000   
## nonblackhispanic:7510 1st Qu.: 0.00 1st Qu.: 3.000 1st Qu.: 1.000   
## Median : 3.00 Median : 7.000 Median : 3.000   
## Mean : 3.77 Mean : 9.754 Mean : 4.201   
## 3rd Qu.: 6.00 3rd Qu.:14.000 3rd Qu.: 6.000   
## Max. :21.00 Max. :59.000 Max. :21.000   
## NA's :3811 NA's :3708 NA's :3755   
## AGE\_1979   
## Min. :14.0   
## 1st Qu.:16.0   
## Median :18.0   
## Mean :17.9   
## 3rd Qu.:20.0   
## Max. :22.0   
##

## Summarize

# Data Linking

#link dyads  
  
dsLinks <- Links79PairExpanded  
dsLinks$R <- dsLinks$RFull  
dsLinking <- dsLinks  
  
outcomeNames <- c("MINORITY",  
 "SEX",  
 "CESD20\_1992",  
 "DELIN\_AVERAGE",  
 "CESD7\_1994",  
 "CESD7\_1992",  
 "AGE\_1979")  
  
# only full full sibs  
dsSingle\_G1 <- CreatePairLinksSingleEntered(  
 outcomeDataset = df\_spsp\_gen1,  
 linksPairDataset = dsLinking[dsLinking$RelationshipPath == "Gen1Housemates" &  
 dsLinking$RFull == .5,],  
 outcomeNames = outcomeNames,  
 subject1Qualifier = "\_S1",  
 subject2Qualifier = "\_S2"  
)  
  
  
  
  
set.seed(18)  
  
  
  
df\_dyad\_delinq <- dsSingle\_G1 %>%  
 drop\_na(contains("DELIN\_AVERAGE")) %>%  
 discord\_data(  
 outcome = "DELIN\_AVERAGE",  
 predictors = c("CESD7\_1992",  
 "CESD20\_1992",  
 "CESD7\_1994",  
 "AGE\_1979"),  
 id = "ExtendedID",  
 sex = "SEX",  
 race = "MINORITY",  
 pair\_identifiers = c("\_S1", "\_S2"),  
 demographics = "both"  
 ) %>%  
 mutate(  
 # sex is 0 for girl; and 1 for boy  
 SEX\_all4 = case\_when(  
 # boyboy  
 SEX\_1 == 1 &  
 SEX\_2 == 1 ~ "BoyBoy",  
 # girlboy  
 SEX\_1 == 0 &  
 SEX\_2 == 1 ~ "GirlBoy",  
 #opposite  
 SEX\_1 == 1 &  
 SEX\_2 == 0 ~ "BoyGirl",  
 #girgirl  
 SEX\_1 == 0 &  
 SEX\_2 == 0 ~ "GirlGirl"  
 ),  
 #opposite  
 SEX\_all3 = case\_when(  
 SEX\_1 == 1 & SEX\_2 == 1 ~ "BoyBoy",  
 # boyboy  
 SEX\_1 == 0 &  
 SEX\_2 == 1 ~ "mixed",  
 # girlboy  
 SEX\_1 == 1 &  
 SEX\_2 == 0 ~ "mixed",  
 #opposite  
 SEX\_1 == 0 &  
 SEX\_2 == 0 ~ "GirlGirl"  
 )  
 )  
  
  
  
df\_dyad\_CESD20\_1992 <- dsSingle\_G1 %>%  
 drop\_na(contains("CESD20\_1992")) %>%  
 discord\_data(  
 outcome = "CESD20\_1992",  
 predictors = c("CESD7\_1992",  
 "DELIN\_AVERAGE",  
 "CESD7\_1994",  
 "AGE\_1979"),  
 id = "ExtendedID",  
 sex = "SEX",  
 race = "MINORITY",  
 pair\_identifiers = c("\_S1", "\_S2"),  
 demographics = "both"  
 ) %>%  
 mutate(  
 # sex is 0 for girl; and 1 for boy  
 SEX\_all4 = case\_when(  
 # boyboy  
 SEX\_1 == 1 &  
 SEX\_2 == 1 ~ "BoyBoy",  
 # girlboy  
 SEX\_1 == 0 &  
 SEX\_2 == 1 ~ "GirlBoy",  
 #opposite  
 SEX\_1 == 1 &  
 SEX\_2 == 0 ~ "BoyGirl",  
 #girgirl  
 SEX\_1 == 0 &  
 SEX\_2 == 0 ~ "GirlGirl"  
 ),  
 #opposite  
 SEX\_all3 = case\_when(  
 SEX\_1 == 1 & SEX\_2 == 1 ~ "BoyBoy",  
 # boyboy  
 SEX\_1 == 0 &  
 SEX\_2 == 1 ~ "mixed",  
 # girlboy  
 SEX\_1 == 1 &  
 SEX\_2 == 0 ~ "mixed",  
 #opposite  
 SEX\_1 == 0 &  
 SEX\_2 == 0 ~ "GirlGirl"  
 )  
 )  
  
df\_dyad\_CESD7\_1992 <- dsSingle\_G1 %>%  
 drop\_na(contains("CESD7\_1992")) %>%  
 discord\_data(  
 outcome = "CESD7\_1992",  
 predictors = c("CESD20\_1992",  
 "DELIN\_AVERAGE",  
 "CESD7\_1994",  
 "AGE\_1979"),  
 id = "ExtendedID",  
 sex = "SEX",  
 race = "MINORITY",  
 pair\_identifiers = c("\_S1", "\_S2"),  
 demographics = "both"  
 ) %>%  
 mutate(  
 # sex is 0 for girl; and 1 for boy  
 SEX\_all4 = case\_when(  
 # boyboy  
 SEX\_1 == 1 &  
 SEX\_2 == 1 ~ "BoyBoy",  
 # girlboy  
 SEX\_1 == 0 &  
 SEX\_2 == 1 ~ "GirlBoy",  
 #opposite  
 SEX\_1 == 1 &  
 SEX\_2 == 0 ~ "BoyGirl",  
 #girgirl  
 SEX\_1 == 0 &  
 SEX\_2 == 0 ~ "GirlGirl"  
 ),  
 #opposite  
 SEX\_all3 = case\_when(  
 SEX\_1 == 1 & SEX\_2 == 1 ~ "BoyBoy",  
 # boyboy  
 SEX\_1 == 0 &  
 SEX\_2 == 1 ~ "mixed",  
 # girlboy  
 SEX\_1 == 1 &  
 SEX\_2 == 0 ~ "mixed",  
 #opposite  
 SEX\_1 == 0 &  
 SEX\_2 == 0 ~ "GirlGirl"  
 )  
 )  
  
  
df\_dyad\_CESD7\_1994 <- dsSingle\_G1 %>%  
 drop\_na(contains("CESD7\_1994")) %>%  
 discord\_data(  
 outcome = "CESD7\_1994",  
 predictors = c("CESD20\_1992",  
 "DELIN\_AVERAGE",  
 "CESD7\_1992",  
 "AGE\_1979"),  
 id = "ExtendedID",  
 sex = "SEX",  
 race = "MINORITY",  
 pair\_identifiers = c("\_S1", "\_S2"),  
 demographics = "both"  
 ) %>%  
 mutate(  
 # sex is 0 for girl; and 1 for boy  
 SEX\_all4 = case\_when(  
 # boyboy  
 SEX\_1 == 1 &  
 SEX\_2 == 1 ~ "BoyBoy",  
 # girlboy  
 SEX\_1 == 0 &  
 SEX\_2 == 1 ~ "GirlBoy",  
 #opposite  
 SEX\_1 == 1 &  
 SEX\_2 == 0 ~ "BoyGirl",  
 #girgirl  
 SEX\_1 == 0 &  
 SEX\_2 == 0 ~ "GirlGirl"  
 ),  
 #opposite  
 SEX\_all3 = case\_when(  
 SEX\_1 == 1 & SEX\_2 == 1 ~ "BoyBoy",  
 # boyboy  
 SEX\_1 == 0 &  
 SEX\_2 == 1 ~ "mixed",  
 # girlboy  
 SEX\_1 == 1 &  
 SEX\_2 == 0 ~ "mixed",  
 #opposite  
 SEX\_1 == 0 &  
 SEX\_2 == 0 ~ "GirlGirl"  
 )  
 )

# classic regression

df\_classic <- df\_spsp\_gen1  
  
lm\_og\_CESD7\_1992 <- lm(DELIN\_AVERAGE ~  
 CESD7\_1992 +  
 as.factor(SEX) +  
 AGE\_1979+  
 as.factor(MINORITY) ,  
 data = df\_classic)  
  
lm\_og\_CESD7\_1992 %>%  
 tbl\_regression() %>%  
 add\_glance\_source\_note() %>%  
 modify\_header(  
 statistic ~ "\*\*t-statistic\*\*",   
 p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| CESD7\_1992 | 0.01 | 9.60 | 0.01, 0.01 | <0.001 |
| as.factor(SEX) |  |  |  |  |
| 0 | — | — | — |  |
| 1 | 0.25 | 25.2 | 0.23, 0.27 | <0.001 |
| AGE\_1979 | -0.02 | -9.02 | -0.02, -0.02 | <0.001 |
| as.factor(MINORITY) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.05 | 5.24 | 0.03, 0.07 | <0.001 |

lm\_og\_CESD20\_1992 <- lm(DELIN\_AVERAGE ~  
 CESD20\_1992 +  
 as.factor(SEX) +  
 AGE\_1979+  
 as.factor(MINORITY),  
 data = df\_classic)  
  
lm\_og\_CESD20\_1992 %>%  
 tbl\_regression() %>%  
 add\_glance\_source\_note() %>%  
 modify\_header(  
 statistic ~ "\*\*t-statistic\*\*",   
 p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| CESD20\_1992 | 0.01 | 9.72 | 0.00, 0.01 | <0.001 |
| as.factor(SEX) |  |  |  |  |
| 0 | — | — | — |  |
| 1 | 0.25 | 25.2 | 0.23, 0.27 | <0.001 |
| AGE\_1979 | -0.02 | -9.05 | -0.02, -0.02 | <0.001 |
| as.factor(MINORITY) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.05 | 5.48 | 0.03, 0.07 | <0.001 |

lm\_og\_CESD7\_1994 <- lm(DELIN\_AVERAGE ~  
 CESD7\_1994 +  
 as.factor(SEX) +  
 AGE\_1979+  
 as.factor(MINORITY) ,  
 data = df\_classic)  
  
  
  
(lm\_predog\_CESD7\_1992 <- lm(CESD7\_1992 ~  
 DELIN\_AVERAGE +  
 as.factor(SEX) +  
 AGE\_1979+  
 as.factor(MINORITY) ,  
 data = df\_classic))

##   
## Call:  
## lm(formula = CESD7\_1992 ~ DELIN\_AVERAGE + as.factor(SEX) + AGE\_1979 +   
## as.factor(MINORITY), data = df\_classic)  
##   
## Coefficients:  
## (Intercept) DELIN\_AVERAGE   
## 5.000799 0.907945   
## as.factor(SEX)1 AGE\_1979   
## -1.142182 -0.005234   
## as.factor(MINORITY)nonblackhispanic   
## -0.829392

(lm\_predog\_CESD20\_1992 <- lm(CESD20\_1992 ~  
 DELIN\_AVERAGE +  
 as.factor(SEX) +  
 AGE\_1979+  
 as.factor(MINORITY),  
 data = df\_classic))

##   
## Call:  
## lm(formula = CESD20\_1992 ~ DELIN\_AVERAGE + as.factor(SEX) + AGE\_1979 +   
## as.factor(MINORITY), data = df\_classic)  
##   
## Coefficients:  
## (Intercept) DELIN\_AVERAGE   
## 11.11514 2.10150   
## as.factor(SEX)1 AGE\_1979   
## -2.21415 0.02185   
## as.factor(MINORITY)nonblackhispanic   
## -2.61436

(lm\_predog\_CESD7\_1994 <- lm(CESD7\_1994 ~  
 DELIN\_AVERAGE+  
 as.factor(SEX) +  
 AGE\_1979+  
 as.factor(MINORITY) ,  
 data = df\_classic)  
)

##   
## Call:  
## lm(formula = CESD7\_1994 ~ DELIN\_AVERAGE + as.factor(SEX) + AGE\_1979 +   
## as.factor(MINORITY), data = df\_classic)  
##   
## Coefficients:  
## (Intercept) DELIN\_AVERAGE   
## 4.1934 0.7167   
## as.factor(SEX)1 AGE\_1979   
## -1.4936 0.0233   
## as.factor(MINORITY)nonblackhispanic   
## -0.6574

# between-family

df\_btwn <- df\_dyad\_delinq  
  
data.frame(as.factor(df\_btwn$SEX\_all4),as.factor(df\_btwn$SEX\_all3))%>%  
 summary()

## as.factor.df\_btwn.SEX\_all4. as.factor.df\_btwn.SEX\_all3.  
## BoyBoy :1022 BoyBoy :1022   
## BoyGirl :1215 GirlGirl: 898   
## GirlBoy : 549 mixed :1764   
## GirlGirl: 898

#note: you only need s1 race because they're determined by the mother  
lm\_btwfam\_sex4\_CESD7\_1992 <- lm(DELIN\_AVERAGE\_mean ~   
 CESD7\_1992\_mean +  
 SEX\_all4 +  
 AGE\_1979\_mean+  
 # factor(SEX\_1)+factor(SEX\_2)+  
 as.factor(MINORITY\_1),  
 data = df\_btwn)  
  
lm\_btwfam\_sex3\_CESD7\_1992 <- lm(DELIN\_AVERAGE\_mean ~   
 CESD7\_1992\_mean +  
 SEX\_all3 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 AGE\_1979\_mean+  
 as.factor(MINORITY\_1),  
 data = df\_btwn)  
  
  
lm\_btwfam\_sex3\_CESD20\_1992 <- lm(DELIN\_AVERAGE\_mean ~   
 CESD20\_1992\_mean +  
 SEX\_all3 +  
 AGE\_1979\_mean+  
 # factor(SEX\_1)+factor(SEX\_2)+  
 as.factor(MINORITY\_1),   
 data = df\_btwn)  
  
lm\_btwfam\_dep\_sex3\_CESD20\_1992 <- lm(CESD20\_1992\_mean ~   
 DELIN\_AVERAGE\_mean +  
 SEX\_all3 +  
 AGE\_1979\_mean+  
 # factor(SEX\_1)+factor(SEX\_2)+  
 as.factor(MINORITY\_1),   
 data = df\_btwn)  
lm\_btwfam\_sex4\_CESD20\_1992 <- lm(DELIN\_AVERAGE\_mean ~   
 CESD20\_1992\_mean +  
 SEX\_all4 +  
 AGE\_1979\_mean+  
 # factor(SEX\_1)+factor(SEX\_2)+  
 as.factor(MINORITY\_1),   
 data = df\_btwn)  
  
lm\_btwfam\_sex4\_CESD7\_1994 <- lm(DELIN\_AVERAGE\_mean ~   
 CESD7\_1994\_mean +  
 SEX\_all4 +  
 AGE\_1979\_mean+  
 # factor(SEX\_1)+factor(SEX\_2)+  
 as.factor(MINORITY\_1),  
 data = df\_btwn)  
lm\_btwfam\_sex3\_CESD7\_1994 <- lm(DELIN\_AVERAGE\_mean ~   
 CESD7\_1994\_mean +  
 SEX\_all3 +  
 AGE\_1979\_mean+  
 # factor(SEX\_1)+factor(SEX\_2)+  
 as.factor(MINORITY\_1),  
 data = df\_btwn)

# within-family analyses

#   
  
lm\_discord\_sex4\_CESD7\_1992 <- lm(data=df\_dyad\_delinq,  
 DELIN\_AVERAGE\_diff ~   
 DELIN\_AVERAGE\_mean+  
 CESD7\_1992\_diff +   
 CESD7\_1992\_mean+  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all4 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
lm\_discord\_sex3\_CESD7\_1992 <- lm(data=df\_dyad\_delinq,  
 DELIN\_AVERAGE\_diff ~   
 DELIN\_AVERAGE\_mean+  
 CESD7\_1992\_diff +   
 CESD7\_1992\_mean+  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all3 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
lm\_discord\_sex3\_CESD20\_1992 <- lm(data=df\_dyad\_delinq,  
 DELIN\_AVERAGE\_diff ~   
 DELIN\_AVERAGE\_mean +  
 CESD20\_1992\_diff +   
 CESD20\_1992\_mean +  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all3 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
lm\_discord\_sex4\_CESD20\_1992 <- lm(data=df\_dyad\_delinq,  
 DELIN\_AVERAGE\_diff ~   
 DELIN\_AVERAGE\_mean +  
 CESD20\_1992\_diff +   
 CESD20\_1992\_mean +  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all4 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
  
lm\_discord\_sex3\_CESD7\_1994 <- lm(data=df\_dyad\_delinq,  
 DELIN\_AVERAGE\_diff ~   
 DELIN\_AVERAGE\_mean +  
 CESD7\_1994\_diff +   
 CESD7\_1994\_mean +  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all3 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
lm\_discord\_sex4\_CESD7\_1994 <- lm(data=df\_dyad\_delinq,  
 DELIN\_AVERAGE\_diff ~   
 DELIN\_AVERAGE\_mean +  
 CESD7\_1994\_diff +   
 CESD7\_1994\_mean +  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all4 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
  
  
df\_dyad<-df\_dyad\_CESD7\_1992  
  
lm\_discord\_dep\_sex4\_CESD7\_1992 <- lm(data=df\_dyad,  
 CESD7\_1992\_diff ~   
 DELIN\_AVERAGE\_mean+  
 DELIN\_AVERAGE\_diff +   
 CESD7\_1992\_mean+  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all4 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
lm\_discord\_dep\_sex3\_CESD7\_1992 <- lm(data=df\_dyad,  
 CESD7\_1992\_diff ~   
 DELIN\_AVERAGE\_mean+  
 DELIN\_AVERAGE\_diff +   
 CESD7\_1992\_mean+  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all3 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
df\_dyad<-df\_dyad\_CESD20\_1992  
lm\_discord\_dep\_sex3\_CESD20\_1992 <- lm(data=df\_dyad,  
 CESD20\_1992\_diff ~   
 DELIN\_AVERAGE\_mean +  
 DELIN\_AVERAGE\_diff +   
 CESD20\_1992\_mean +  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all3 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
lm\_discord\_dep\_sex4\_CESD20\_1992 <- lm(data=df\_dyad,  
 CESD20\_1992\_diff ~   
 DELIN\_AVERAGE\_mean +  
 DELIN\_AVERAGE\_diff +   
 CESD20\_1992\_mean +  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all4 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
df\_dyad<-df\_dyad\_CESD7\_1994  
  
lm\_discord\_dep\_sex3\_CESD7\_1994 <- lm(data=df\_dyad,  
 CESD7\_1994\_diff ~   
 DELIN\_AVERAGE\_mean +  
 DELIN\_AVERAGE\_diff +   
 CESD7\_1994\_mean +  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all3 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )  
  
lm\_discord\_dep\_sex4\_CESD7\_1994 <- lm(data=df\_dyad,  
 CESD7\_1994\_diff ~   
 DELIN\_AVERAGE\_mean +  
 DELIN\_AVERAGE\_diff +   
 CESD7\_1994\_mean +  
 AGE\_1979\_diff+  
 AGE\_1979\_mean+  
 SEX\_all4 +  
 # factor(SEX\_1)+factor(SEX\_2)+  
 factor(MINORITY\_1) )

## Results

### raw

lm\_og\_CESD7\_1992 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | 0.44 | 11.1 | 0.37, 0.52 | <0.001 |
| CESD7\_1992 | 0.01 | 9.60 | 0.01, 0.01 | <0.001 |
| as.factor(SEX) |  |  |  |  |
| 0 | — | — | — |  |
| 1 | 0.25 | 25.2 | 0.23, 0.27 | <0.001 |
| AGE\_1979 | -0.02 | -9.02 | -0.02, -0.02 | <0.001 |
| as.factor(MINORITY) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.05 | 5.24 | 0.03, 0.07 | <0.001 |

lm\_og\_CESD20\_1992 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | 0.44 | 11.1 | 0.37, 0.52 | <0.001 |
| CESD20\_1992 | 0.01 | 9.72 | 0.00, 0.01 | <0.001 |
| as.factor(SEX) |  |  |  |  |
| 0 | — | — | — |  |
| 1 | 0.25 | 25.2 | 0.23, 0.27 | <0.001 |
| AGE\_1979 | -0.02 | -9.05 | -0.02, -0.02 | <0.001 |
| as.factor(MINORITY) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.05 | 5.48 | 0.03, 0.07 | <0.001 |

lm\_og\_CESD7\_1994 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | 0.47 | 11.7 | 0.39, 0.55 | <0.001 |
| CESD7\_1994 | 0.01 | 7.58 | 0.01, 0.01 | <0.001 |
| as.factor(SEX) |  |  |  |  |
| 0 | — | — | — |  |
| 1 | 0.25 | 25.2 | 0.23, 0.27 | <0.001 |
| AGE\_1979 | -0.02 | -9.26 | -0.02, -0.02 | <0.001 |
| as.factor(MINORITY) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.05 | 4.56 | 0.03, 0.07 | <0.001 |

### Btween

lm\_btwfam\_sex3\_CESD7\_1992 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | 0.75 | 9.79 | 0.60, 0.91 | <0.001 |
| CESD7\_1992\_mean | 0.02 | 7.50 | 0.01, 0.02 | <0.001 |
| SEX\_all3 |  |  |  |  |
| BoyBoy | — | — | — |  |
| GirlGirl | -0.22 | -12.3 | -0.26, -0.19 | <0.001 |
| mixed | -0.12 | -7.67 | -0.15, -0.09 | <0.001 |
| AGE\_1979\_mean | -0.03 | -5.86 | -0.03, -0.02 | <0.001 |
| as.factor(MINORITY\_1) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.08 | 5.98 | 0.05, 0.10 | <0.001 |

lm\_btwfam\_sex3\_CESD20\_1992 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | 0.76 | 9.88 | 0.61, 0.91 | <0.001 |
| CESD20\_1992\_mean | 0.01 | 7.56 | 0.01, 0.01 | <0.001 |
| SEX\_all3 |  |  |  |  |
| BoyBoy | — | — | — |  |
| GirlGirl | -0.22 | -12.3 | -0.26, -0.19 | <0.001 |
| mixed | -0.12 | -7.59 | -0.15, -0.09 | <0.001 |
| AGE\_1979\_mean | -0.03 | -5.98 | -0.03, -0.02 | <0.001 |
| as.factor(MINORITY\_1) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.08 | 6.22 | 0.06, 0.11 | <0.001 |

lm\_btwfam\_sex3\_CESD7\_1994 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | 0.78 | 10.1 | 0.63, 0.93 | <0.001 |
| CESD7\_1994\_mean | 0.02 | 7.23 | 0.01, 0.02 | <0.001 |
| SEX\_all3 |  |  |  |  |
| BoyBoy | — | — | — |  |
| GirlGirl | -0.24 | -12.8 | -0.27, -0.20 | <0.001 |
| mixed | -0.13 | -8.16 | -0.16, -0.10 | <0.001 |
| AGE\_1979\_mean | -0.03 | -5.85 | -0.03, -0.02 | <0.001 |
| as.factor(MINORITY\_1) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.08 | 5.83 | 0.05, 0.10 | <0.001 |

### Discordant

#### CESD\_7\_1992

lm\_discord\_sex3\_CESD7\_1992 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | -0.06 | -0.978 | -0.19, 0.07 | 0.3 |
| DELIN\_AVERAGE\_mean | 1.0 | 64.8 | 0.99, 1.0 | <0.001 |
| CESD7\_1992\_diff | 0.00 | 0.978 | 0.00, 0.00 | 0.3 |
| CESD7\_1992\_mean | 0.00 | -0.327 | 0.00, 0.00 | 0.7 |
| AGE\_1979\_diff | 0.00 | -2.53 | -0.01, 0.00 | 0.011 |
| AGE\_1979\_mean | 0.00 | 1.20 | 0.00, 0.01 | 0.2 |
| SEX\_all3 |  |  |  |  |
| BoyBoy | — | — | — |  |
| GirlGirl | 0.01 | 0.814 | -0.02, 0.04 | 0.4 |
| mixed | 0.07 | 4.90 | 0.04, 0.09 | <0.001 |
| factor(MINORITY\_1) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.00 | -0.406 | -0.03, 0.02 | 0.7 |

lm\_discord\_dep\_sex3\_CESD7\_1992 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | 0.01 | 0.021 | -1.2, 1.3 | >0.9 |
| DELIN\_AVERAGE\_mean | 0.03 | 0.206 | -0.26, 0.33 | 0.8 |
| DELIN\_AVERAGE\_diff | 0.10 | 1.14 | -0.07, 0.28 | 0.3 |
| CESD7\_1992\_mean | 0.69 | 36.1 | 0.65, 0.72 | <0.001 |
| AGE\_1979\_diff | 0.01 | 0.709 | -0.02, 0.05 | 0.5 |
| AGE\_1979\_mean | 0.05 | 1.35 | -0.02, 0.12 | 0.2 |
| SEX\_all3 |  |  |  |  |
| BoyBoy | — | — | — |  |
| GirlGirl | -0.02 | -0.105 | -0.31, 0.28 | >0.9 |
| mixed | 0.04 | 0.276 | -0.22, 0.29 | 0.8 |
| factor(MINORITY\_1) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.27 | 2.51 | 0.06, 0.48 | 0.012 |

# CESD\_20\_1992

The CESD\_20 depression difference was not significant.. The CESD\_20 depression score did not predict criminal behavior. This means that the difference was not meaningful above or beyond the other sources of variance. Our hypothesis was not supported. Increased depression did not lead to more crime in adolescents. The variance in criminal behavior explained by the regression model is 61.48% f(6, 2950) = 787.4, p = < 2.2e-16. The Sex Sibling 1 was significant t(2950) = 5.141, p= 2.91e-07. Sex Sibling 2 was signifcant t(2950) = -6.513, p = 8.62e-11.

lm\_discord\_sex3\_CESD20\_1992 %>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | -0.07 | -1.01 | -0.20, 0.06 | 0.3 |
| DELIN\_AVERAGE\_mean | 1.0 | 65.6 | 1.0, 1.1 | <0.001 |
| CESD20\_1992\_diff | 0.00 | 0.376 | 0.00, 0.00 | 0.7 |
| CESD20\_1992\_mean | 0.00 | -0.376 | 0.00, 0.00 | 0.7 |
| AGE\_1979\_diff | -0.01 | -2.60 | -0.01, 0.00 | 0.009 |
| AGE\_1979\_mean | 0.00 | 1.21 | 0.00, 0.01 | 0.2 |
| SEX\_all3 |  |  |  |  |
| BoyBoy | — | — | — |  |
| GirlGirl | 0.01 | 0.854 | -0.02, 0.04 | 0.4 |
| mixed | 0.07 | 5.07 | 0.04, 0.09 | <0.001 |
| factor(MINORITY\_1) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | -0.01 | -0.516 | -0.03, 0.02 | 0.6 |

lm\_discord\_sex3\_CESD7\_1994%>%  
 gtsummary::tbl\_regression(intercept=TRUE) %>%  
 gtsummary::add\_glance\_source\_note(  
 label = list(statistic ~ "F-Statistic",  
 df ~ "DF1",  
 df.residual ~ "DF2"),  
 include = c(r.squared, statistic, df, df.residual, p.value, nobs)  
 ) %>%  
 gtsummary::modify\_header(  
 statistic ~ "\*\*t-Statistic\*\*", p.value ~ "\*\*p-value\*\*"  
 )

## Table printed with `knitr::kable()`, not {gt}. Learn why at  
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html  
## To suppress this message, include `message = FALSE` in the code chunk header.

| **Characteristic** | **Beta** | **t-Statistic** | **95% CI** | **p-value** |
| --- | --- | --- | --- | --- |
| (Intercept) | -0.05 | -0.698 | -0.18, 0.08 | 0.5 |
| DELIN\_AVERAGE\_mean | 1.0 | 64.6 | 0.99, 1.1 | <0.001 |
| CESD7\_1994\_diff | 0.00 | -0.784 | 0.00, 0.00 | 0.4 |
| CESD7\_1994\_mean | 0.00 | -1.31 | -0.01, 0.00 | 0.2 |
| AGE\_1979\_diff | -0.01 | -2.84 | -0.01, 0.00 | 0.005 |
| AGE\_1979\_mean | 0.00 | 0.906 | 0.00, 0.01 | 0.4 |
| SEX\_all3 |  |  |  |  |
| BoyBoy | — | — | — |  |
| GirlGirl | 0.02 | 1.13 | -0.01, 0.05 | 0.3 |
| mixed | 0.07 | 5.22 | 0.04, 0.10 | <0.001 |
| factor(MINORITY\_1) |  |  |  |  |
| blackorhispanic | — | — | — |  |
| nonblackhispanic | 0.00 | -0.069 | -0.02, 0.02 | >0.9 |

# Results

We examined the relationship between depression and crime in three distinct stages. First, we looked at the overall relationship without accounting for family structure. Second, we looked at the between-family relationships. between-family analyses report the relationships between the within-family average AFI and various measures of ability. Lastly we looked at the within-family relationships. Throughout, this process we also examined whether gender, race, and age impacted these dynamics.

## Unadjusted

Unadjusted univariate and bivariate descriptive statistics were consist with what others have found in this literature. See tables X and Y. Of note,

## Between-Family

We examined the between-family results. We tested whether the sibling average for delinquency was associated with sibling averages in depression. We examined this relationship in both directions, in other words we examined whether delinquency predicted depression or whether depression predicted delinquency. Results, as expected, were similar. Accordingly we report results looking at , and direct interested readers to the appendix. Similarly, we focused on the CES-D 20 as our measure of depression, but include results for the other two variants in the appendix. We discuss the variants of these models, when the results differ.

### Depression predicting deliquency

library(lm.beta)  
lm\_result <- lm.beta(lm\_btwfam\_sex3\_CESD20\_1992)  
print(lm\_result)

##   
## Call:  
## lm(formula = DELIN\_AVERAGE\_mean ~ CESD20\_1992\_mean + SEX\_all3 +   
## AGE\_1979\_mean + as.factor(MINORITY\_1), data = df\_btwn)  
##   
## Standardized Coefficients::  
## (Intercept) CESD20\_1992\_mean   
## NA 0.1364200   
## SEX\_all3GirlGirl SEX\_all3mixed   
## -0.2609600 -0.1609127   
## AGE\_1979\_mean as.factor(MINORITY\_1)nonblackhispanic   
## -0.1056989 0.1120316

summary(lm\_result)

##   
## Call:  
## lm(formula = DELIN\_AVERAGE\_mean ~ CESD20\_1992\_mean + SEX\_all3 +   
## AGE\_1979\_mean + as.factor(MINORITY\_1), data = df\_btwn)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.5901 -0.2179 -0.0894 0.1158 4.0089   
##   
## Coefficients:  
## Estimate Standardized Std. Error t value  
## (Intercept) 0.757994 NA 0.076722 9.880  
## CESD20\_1992\_mean 0.007589 0.136420 0.001004 7.562  
## SEX\_all3GirlGirl -0.221737 -0.260960 0.018068 -12.272  
## SEX\_all3mixed -0.118151 -0.160913 0.015576 -7.585  
## AGE\_1979\_mean -0.026023 -0.105699 0.004350 -5.982  
## as.factor(MINORITY\_1)nonblackhispanic 0.082235 0.112032 0.013227 6.217  
## Pr(>|t|)   
## (Intercept) < 2e-16 \*\*\*  
## CESD20\_1992\_mean 5.27e-14 \*\*\*  
## SEX\_all3GirlGirl < 2e-16 \*\*\*  
## SEX\_all3mixed 4.41e-14 \*\*\*  
## AGE\_1979\_mean 2.47e-09 \*\*\*  
## as.factor(MINORITY\_1)nonblackhispanic 5.78e-10 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.3522 on 2951 degrees of freedom  
## (727 observations deleted due to missingness)  
## Multiple R-squared: 0.08008, Adjusted R-squared: 0.07852   
## F-statistic: 51.38 on 5 and 2951 DF, p-value: < 2.2e-16

result\_coef <- coef(lm\_result)  
writeup\_btw<-summary(lm\_result)  
result\_r2<-round(writeup\_btw$adj.r.squared,4)  
result\_f<-round(writeup\_btw$fstatistic['value'],4)  
result\_ndf<-round(writeup\_btw$fstatistic['numdf'],0)  
result\_ddf<-round(writeup\_btw$fstatistic['dendf'],0)  
result\_n <-length(writeup\_btw$residuals)  
result\_predictor\_mean <- round(result\_coef['CESD7\_1992\_mean'],4)  
result\_age\_mean <- round(result\_coef['AGE\_1979\_mean'],4)  
result\_gg <- round(result\_coef['SEX\_all3GirlGirl'],4)  
result\_bg <- round(result\_coef['SEX\_all3mixed'],4)  
result\_minority <- round(result\_coef['as.factor(MINORITY\_1)nonblackhispanic'],4)

Sibling averages of CESD-20 were used to predict sibling averages of delinquency. Table X presents the regression results (n =2957). The F-statistic (51.3772,df1=5,df2=2951) was significant, and the adjusted R was 0.0785. A standard-deviation increase in the average PREDICTOR predicted a statistically significant increase of NA standard deviations in the average of the siblings’ average delinquency score. As expected, gender composition, age, and minority status were also predictive. Relative to the reference group of brothers, families with one (-0.1609) or two (-0.261) sisters had lower averages in OUTCOME. Similarly, older sibling pairs were predictive of lower levels of OUTCOME (-0.1057). Relative to the reference group (of respondents classified as either Black or Hispanic), had 0.112 standard deviationsfor average of the siblings’ delinquency measure.

### Deliquency predicting depression

library(lm.beta)  
  
lm\_result <- lm.beta(lm\_btwfam\_dep\_sex3\_CESD20\_1992)  
print(lm\_result)

##   
## Call:  
## lm(formula = CESD20\_1992\_mean ~ DELIN\_AVERAGE\_mean + SEX\_all3 +   
## AGE\_1979\_mean + as.factor(MINORITY\_1), data = df\_btwn)  
##   
## Standardized Coefficients::  
## (Intercept) DELIN\_AVERAGE\_mean   
## NA 0.139346230   
## SEX\_all3GirlGirl SEX\_all3mixed   
## 0.113720128 0.058290349   
## AGE\_1979\_mean as.factor(MINORITY\_1)nonblackhispanic   
## 0.001341393 -0.207409054

summary(lm\_result)

##   
## Call:  
## lm(formula = CESD20\_1992\_mean ~ DELIN\_AVERAGE\_mean + SEX\_all3 +   
## AGE\_1979\_mean + as.factor(MINORITY\_1), data = df\_btwn)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -12.743 -4.639 -1.306 3.391 35.784   
##   
## Coefficients:  
## Estimate Standardized Std. Error t value  
## (Intercept) 9.019354 NA 1.406974 6.410  
## DELIN\_AVERAGE\_mean 2.504907 0.139346 0.331248 7.562  
## SEX\_all3GirlGirl 1.736992 0.113720 0.335013 5.185  
## SEX\_all3mixed 0.769378 0.058290 0.285379 2.696  
## AGE\_1979\_mean 0.005937 0.001341 0.079515 0.075  
## as.factor(MINORITY\_1)nonblackhispanic -2.736789 -0.207409 0.236577 -11.568  
## Pr(>|t|)   
## (Intercept) 1.68e-10 \*\*\*  
## DELIN\_AVERAGE\_mean 5.27e-14 \*\*\*  
## SEX\_all3GirlGirl 2.31e-07 \*\*\*  
## SEX\_all3mixed 0.00706 \*\*   
## AGE\_1979\_mean 0.94049   
## as.factor(MINORITY\_1)nonblackhispanic < 2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 6.4 on 2951 degrees of freedom  
## (727 observations deleted due to missingness)  
## Multiple R-squared: 0.06035, Adjusted R-squared: 0.05875   
## F-statistic: 37.9 on 5 and 2951 DF, p-value: < 2.2e-16

result\_coef <- coef(lm\_result)  
writeup\_btw<-summary(lm\_result)  
result\_r2<-round(writeup\_btw$adj.r.squared,4)  
result\_f<-round(writeup\_btw$fstatistic['value'],4)  
result\_ndf<-round(writeup\_btw$fstatistic['numdf'],0)  
result\_ddf<-round(writeup\_btw$fstatistic['dendf'],0)  
result\_n <-length(writeup\_btw$residuals)  
result\_predictor\_mean <- round(result\_coef['CESD7\_1992\_mean'],4)  
result\_age\_mean <- round(result\_coef['AGE\_1979\_mean'],4)  
result\_gg <- round(result\_coef['SEX\_all3GirlGirl'],4)  
result\_bg <- round(result\_coef['SEX\_all3mixed'],4)  
result\_minority <- round(result\_coef['as.factor(MINORITY\_1)nonblackhispanic'],4)

Sibling averages of delinquency were used to predict sibling averages of depression. Table X presents the regression results (n =2957). The F-statistic (37.9041,df1=5,df2=2951) was significant, and the adjusted R was 0.0588. A standard-deviation increase in the average PREDICTOR predicted a statistically significant increase of NA standard deviations in the average of the siblings’ OUTCOME. As expected, gender composition and minority status were also predictive, whereas age was not. Relative to the reference group of brothers, families with one (0.0583) or two (0.1137) sisters had higher averages in depression. Relative to the reference group, non-Black non-Hispanic families had higher family levels of depression (b = -0.2074).

## Sibling Difference Score

We then implemented within-family versions of the between-family results we presented in the previous subsection. Specifically, we modeled the relationship of sibling differences in depression and differences in delinquency. We modeled them in both directions, while controlling for the means of outcomes and predictors. Just as we did in the between-family analyses, we applied these models to the other measures of depression. They are available in the appendix, but we make note of any meaningful differences.

### Deliquency predicting depression

library(lm.beta)  
lm\_result <- lm.beta(lm\_discord\_dep\_sex3\_CESD20\_1992)  
print(lm\_result)

##   
## Call:  
## lm(formula = CESD20\_1992\_diff ~ DELIN\_AVERAGE\_mean + DELIN\_AVERAGE\_diff +   
## CESD20\_1992\_mean + AGE\_1979\_diff + AGE\_1979\_mean + SEX\_all3 +   
## factor(MINORITY\_1), data = df\_dyad)  
##   
## Standardized Coefficients::  
## (Intercept) DELIN\_AVERAGE\_mean   
## NA -0.0025636378   
## DELIN\_AVERAGE\_diff CESD20\_1992\_mean   
## 0.0085205027 0.6217410984   
## AGE\_1979\_diff AGE\_1979\_mean   
## -0.0367004727 0.0036912070   
## SEX\_all3GirlGirl SEX\_all3mixed   
## -0.0009515551 0.0065340279   
## factor(MINORITY\_1)nonblackhispanic   
## 0.0600961472

summary(lm\_result)

##   
## Call:  
## lm(formula = CESD20\_1992\_diff ~ DELIN\_AVERAGE\_mean + DELIN\_AVERAGE\_diff +   
## CESD20\_1992\_mean + AGE\_1979\_diff + AGE\_1979\_mean + SEX\_all3 +   
## factor(MINORITY\_1), data = df\_dyad)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -33.074 -3.440 -0.577 3.037 27.264   
##   
## Coefficients:  
## Estimate Standardized Std. Error t value  
## (Intercept) 0.5351347 NA 1.4017666 0.382  
## DELIN\_AVERAGE\_mean -0.0559165 -0.0025636 0.3327354 -0.168  
## DELIN\_AVERAGE\_diff 0.1139549 0.0085205 0.1964112 0.580  
## CESD20\_1992\_mean 0.7543906 0.6217411 0.0182126 41.421  
## AGE\_1979\_diff -0.1021855 -0.0367005 0.0406924 -2.511  
## AGE\_1979\_mean 0.0198212 0.0036912 0.0786655 0.252  
## SEX\_all3GirlGirl -0.0176352 -0.0009516 0.3330957 -0.053  
## SEX\_all3mixed 0.1046431 0.0065340 0.2827305 0.370  
## factor(MINORITY\_1)nonblackhispanic 0.9621949 0.0600961 0.2394040 4.019  
## Pr(>|t|)   
## (Intercept) 0.7027   
## DELIN\_AVERAGE\_mean 0.8666   
## DELIN\_AVERAGE\_diff 0.5618   
## CESD20\_1992\_mean < 2e-16 \*\*\*  
## AGE\_1979\_diff 0.0121 \*   
## AGE\_1979\_mean 0.8011   
## SEX\_all3GirlGirl 0.9578   
## SEX\_all3mixed 0.7113   
## factor(MINORITY\_1)nonblackhispanic 5.99e-05 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 6.331 on 2948 degrees of freedom  
## (230 observations deleted due to missingness)  
## Multiple R-squared: 0.376, Adjusted R-squared: 0.3743   
## F-statistic: 222.1 on 8 and 2948 DF, p-value: < 2.2e-16

result\_coef <- coef(lm\_result)  
writeup\_wth <- summary(lm\_result)  
result\_r2 <- round(writeup\_wth$adj.r.squared,4)  
result\_f <- round(writeup\_wth$fstatistic['value'],4)  
result\_ndf <- round(writeup\_wth$fstatistic['numdf'],0)  
result\_ddf <- round(writeup\_wth$fstatistic['dendf'],0)  
result\_n <- length(writeup\_wth$residuals)  
result\_outcome\_mean <- round(result\_coef['CESD20\_1992\_mean'],4)  
result\_predictor\_mean <- round(result\_coef['DELIN\_AVERAGE\_mean'],4)  
result\_predictor\_diff <- round(result\_coef['DELIN\_AVERAGE\_diff'],4)  
result\_age\_mean <- round(result\_coef['AGE\_1979\_mean'],4)  
result\_age\_diff <- round(result\_coef['AGE\_1979\_diff'],4)  
result\_gg <- round(result\_coef['SEX\_all3GirlGirl'],4)  
result\_bg <- round(result\_coef['SEX\_all3mixed'],4)  
result\_minority <- round(result\_coef['as.factor(MINORITY\_1)nonblackhispanic'],4)

Sibling differences in PREDICTOR were used to predict differences in OUTCOME, controlling for family level gender composition, family minority status, and sibling averages of both OUTCOME and PREDICTOR. Table X displays the results of MODEL. The CESD20 model reports the averages and differences where depression is measured using CESD20 (n =2957). The CESD7.92 model reports the averages and differences where depression is measured using CESD7 in 1992 (n =2957). The CESD7.94 reports the averages and differences where depression is measured using CESD7 in 1992 (n =2957).

* above is done

All three models reveal similar results. Averages of OUTCOME were significant predictors of differences in OUTCOME (p ). A one standard deviation increase in the sibling average of OUTCOME predicted a 0.6217 increase in average OUTCOME difference, controlling for all over variables in the model. (We don’t encourage people to interpret these coefficients deeply).

In the CESD20 model, the sibling difference in age was a significant predictor of differences in OUTCOME (p ). A one standard deviation increase in the average difference in age predicted -0.0367 decrease in the AFI difference between siblings. All other variables were not significant, including all kin difference variables. The adjusted R varied slightly by Gen2 linking (Mixed , Daughters , Sons ).