489 Data

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df <- read\_sav("Your Beliefs About Memory, Disclosure, and Child Testimony\_April 8, 2019\_12.05.sav")

## Select the variables relevant to my study  
  
df1 <- df %>%  
 dplyr::select("Q35\_1", "Q35\_2", "Q35\_5", "Q35\_9", "Q35\_12", "Q48\_1", "Q48\_2", "Q48\_5", "Q48\_9", "Q48\_12", "Q49\_1", "Q49\_2", "Q49\_5", "Q49\_9", "Q49\_12", "Q50\_1", "Q50\_2", "Q50\_5", "Q50\_9", "Q50\_12", "Q51\_1", "Q51\_2", "Q51\_5", "Q51\_9", "Q51\_12", "Q52\_1", "Q52\_2", "Q52\_5", "Q52\_9", "Q52\_12", "Q59\_1", "Q59\_2", "Q59\_5", "Q59\_9", "Q59\_12", "Q60\_1", "Q60\_2", "Q60\_5", "Q60\_9", "Q60\_12", "Q61\_1", "Q61\_2", "Q61\_5", "Q61\_9", "Q61\_12", "Q62\_1", "Q62\_2", "Q62\_5", "Q62\_9", "Q62\_12", "Q63\_1", "Q63\_2", "Q63\_5", "Q63\_9", "Q63\_12")  
  
## Rename the variables so they can be worked with  
  
df1 <- rename(df1, MemChild.TD.3to5 = Q35\_1, MemChild.TD.6to11 = Q35\_2, MemChild.ID = Q35\_5, MemAdult.TD = Q35\_9, MemAdult.ID = Q35\_12, SugChild1.TD.3to5 = Q48\_1, SugChild1.TD.6to11 = Q48\_2, SugChild1.ID = Q48\_5, SugAdult1.TD = Q48\_9, SugAdult1.ID = Q48\_12, SugChild2.TD.3to5 = Q49\_1, SugChild2.TD.6to11 = Q49\_2, SugChild2.ID = Q49\_5, SugAdult2.TD = Q49\_9, SugAdult2.ID = Q49\_12, SugChild3.TD.3to5 = Q50\_1, SugChild3.TD.6to11 = Q50\_2, SugChild3.ID = Q50\_5, SugAdult3.TD = Q50\_9, SugAdult3.ID = Q50\_12, SugChild4.TD.3to5 = Q51\_1, SugChild4.TD.6to11 = Q51\_2, SugChild4.ID = Q51\_5, SugAdult4.TD = Q51\_9, SugAdult4.ID = Q51\_12, SugChild5.TD.3to5 = Q52\_1, SugChild5.TD.6to11 = Q52\_2, SugChild5.ID = Q52\_5, SugAdult5.TD = Q52\_9, SugAdult5.ID = Q52\_12, TestChild1.TD.3to5 = Q59\_1, TestChild1.TD.6to11 = Q59\_2, TestChild1.ID = Q59\_5, TestAdult1.TD = Q59\_9, TestAdult1.ID = Q59\_12, TestChild2.TD.3to5 = Q60\_1, TestChild2.TD.6to11 = Q60\_2, TestChild2.ID = Q60\_5, TestAdult2.TD = Q60\_9, TestAdult2.ID = Q60\_12, TestChild3.TD.3to5 = Q61\_1, TestChild3.TD.6to11 = Q61\_2, TestChild3.ID = Q61\_5, TestAdult3.TD = Q61\_9, TestAdult3.ID = Q61\_12, TestChild4.TD.3to5 = Q62\_1, TestChild4.TD.6to11 = Q62\_2, TestChild4.ID = Q62\_5, TestAdult4.TD = Q62\_9, TestAdult4.ID = Q62\_12, TestChild5.TD.3to5 = Q63\_1, TestChild5.TD.6to11 = Q63\_2, TestChild5.ID = Q63\_5, TestAdult5.TD = Q63\_9, TestAdult5.ID = Q63\_12)  
  
## Amalgamate the 3 measures so they are further simplified  
  
id\_test\_child <- paste0("TestChild",1:5,".ID")  
id\_mem\_child <- paste0("MemChild.ID")  
id\_sug\_child <- paste0("SugChild",1:5,".ID")  
  
td\_test\_3\_5 <- paste0("TestChild",1:5,".TD.3to5")  
td\_mem\_3\_5 <- paste0("MemChild.TD.3to5")  
td\_sug\_3\_5 <- paste0("SugChild",1:5,".TD.3to5")  
  
td\_test\_6\_11 <- paste0("TestChild",1:5,".TD.6to11")  
td\_mem\_6\_11 <- paste0("MemChild.TD.6to11")  
td\_sug\_6\_11 <- paste0("SugChild",1:5,".TD.6to11")  
  
id\_test\_adult <- paste0("TestAdult",1:5,".ID")  
id\_mem\_adult <- paste0("MemAdult.ID")  
id\_sug\_adult <- paste0("SugAdult",1:5,".ID")  
  
td\_test\_adult <- paste0("TestAdult",1:5,".TD")  
td\_mem\_adult <- paste0("MemAdult.TD")  
td\_sug\_adult <- paste0("SugAdult",1:5,".TD")  
  
## Coalesce these measures into one simple value to make additional analyses easier to code  
  
short <-   
c(id\_test\_child, id\_mem\_child, id\_sug\_child, td\_test\_3\_5, td\_mem\_3\_5, td\_sug\_3\_5, td\_test\_6\_11, td\_mem\_6\_11, td\_sug\_6\_11, id\_test\_adult, id\_mem\_adult, id\_sug\_adult, td\_test\_adult, td\_mem\_adult, td\_sug\_adult)

## Select the demographic variables and rename them  
  
df2 <- df %>%  
 dplyr::select("Q6", "Q7", "Q9", "Q10")  
  
df2 <- rename(df2, Age = Q6, Gender = Q7, Education\_Level = Q9, Parent = Q10) %>%  
 mutate(Age = factor(Age,   
 levels = c(1,2,3,4,5,6),  
 labels = c("(18 – 24)", "(25 – 34)",  
 "(35 – 44)", "(45 – 54)", "(55 – 64)",  
 "(65+)")),  
 Gender = factor(Gender,   
 levels = c(1, 2, 3),  
 labels = c("Male", "Female", "Non-Binary")),  
 Education\_Level = factor(Education\_Level,  
 levels = c(1, 2, 3),  
 labels = c("None", "Secondary", "Tertiary")),  
 Parent = factor(Parent,  
 levels = c(1, 2),  
 labels = c("Yes", "No")))  
  
tabnz <- df2 %>%  
 select(Age, Gender, Education\_Level, Parent)  
  
df2\_described <-   
prettyR::describe(df2)

## Description of df2

## Take out the DK responses  
df1[,paste0(short, "\_bin")] <- lapply(df1[,short], function(x){  
 car::recode(x, "1 = 0; 2 = 0; 3 = 0; 4 = 0; 5 = 0; 6 = 0; 7 = 1")})

## Registered S3 methods overwritten by 'car':  
## method from  
## influence.merMod lme4  
## cooks.distance.influence.merMod lme4  
## dfbeta.influence.merMod lme4  
## dfbetas.influence.merMod lme4

df1[,short] <- lapply(df1[,short], function(x){  
 car::recode(x, "1 = 1; 2 = 2; 3 = 3; 4 = 4; 5 = 5; 6 = 6; else = NA")})  
  
perc\_dn <-   
(sum(rowSums(df1[,paste0(short, "\_bin")])) / (nrow(df1[,paste0(short, "\_bin")]) \* ncol(df1[,paste0(short, "\_bin")]))) \* 100

## Descriptive Statistics  
  
df1$id\_test\_child <- rowMeans(df1[id\_test\_child], na.rm = T)  
df1$id\_mem\_child <- rowMeans(df1[id\_mem\_child], na.rm = T)  
df1$id\_sug\_child <- rowMeans(df1[id\_sug\_child], na.rm = T)  
  
df1$td\_test\_3\_5 <- rowMeans(df1[td\_test\_3\_5], na.rm = T)  
df1$td\_mem\_3\_5 <- rowMeans(df1[td\_mem\_3\_5], na.rm = T)  
df1$td\_sug\_3\_5 <- rowMeans(df1[td\_sug\_3\_5], na.rm = T)  
  
df1$td\_test\_6\_11 <- rowMeans(df1[td\_test\_6\_11], na.rm = T)  
df1$td\_mem\_6\_11 <- rowMeans(df1[td\_mem\_6\_11], na.rm = T)  
df1$td\_sug\_6\_11 <- rowMeans(df1[td\_sug\_6\_11], na.rm = T)  
  
df1$id\_test\_adult <- rowMeans(df1[id\_test\_adult], na.rm = T)  
df1$id\_mem\_adult <- rowMeans(df1[id\_mem\_adult], na.rm = T)  
df1$id\_sug\_adult <- rowMeans(df1[id\_sug\_adult], na.rm = T)  
  
df1$td\_test\_adult <- rowMeans(df1[td\_test\_adult], na.rm = T)  
df1$td\_mem\_adult <- rowMeans(df1[td\_mem\_adult], na.rm = T)  
df1$td\_sug\_adult <- rowMeans(df1[td\_sug\_adult], na.rm = T)  
  
domain\_list <- list("id\_mem\_child",  
 "id\_test\_child",   
 "id\_sug\_child",  
 "td\_mem\_3\_5",  
 "td\_test\_3\_5",  
 "td\_sug\_3\_5",  
 "td\_mem\_6\_11",  
 "td\_test\_6\_11",  
 "td\_sug\_6\_11",  
 "id\_mem\_adult",  
 "id\_test\_adult",  
 "id\_sug\_adult",  
 "td\_mem\_adult",  
 "td\_test\_adult",  
 "td\_sug\_adult")  
  
measure\_names <- c("Memory - CWID",  
 "Ability to Testify - CWID",  
 "Suggestibility - CWID",  
 "Memory - TD 3-5 year olds",  
 "Ability to Testify in Court - TD 3-5 year olds",  
 "Suggestibility - TD 3-5 year olds",  
 "Memory - TD 6-11 year olds",  
 "Ability to Testify in Court - TD 6-11 year olds",  
 "Suggestibility - TD 6-11 year olds",  
 "Memory - AWID",  
 "Ability to Testify - AWID",  
 "Suggestibility - AWID",  
 "Memory - TD Adult",  
 "Ability to Testify - TD Adult",  
 "Suggestibility - TD Adult"  
 )  
  
domain\_out <-   
lapply(domain\_list, function(x){  
 data.frame(Mean = round(mean(df1[[x]], na.rm = T), 2),  
 SD = round(sd(df1[[x]], na.rm = T), 2)  
 )  
 }) %>%  
 do.call(rbind, .) %>%  
 cbind(measure\_names, .)  
  
library(papaja)

## Loading required package: tinylabels

apa\_table(domain\_out, caption = "Means and standard deviations of measures in the study")

(#tab:data4)

Means and standard deviations of measures in the study

|  |  |  |
| --- | --- | --- |
| measure\_names | Mean | SD |
| Memory - CWID | 2.98 | 1.32 |
| Ability to Testify - CWID | 3.41 | 0.99 |
| Suggestibility - CWID | 4.07 | 1.03 |
| Memory - TD 3-5 year olds | 2.66 | 1.40 |
| Ability to Testify in Court - TD 3-5 year olds | 3.18 | 0.93 |
| Suggestibility - TD 3-5 year olds | 4.06 | 1.03 |
| Memory - TD 6-11 year olds | 3.59 | 1.33 |
| Ability to Testify in Court - TD 6-11 year olds | 3.82 | 0.87 |
| Suggestibility - TD 6-11 year olds | 4.02 | 0.90 |
| Memory - AWID | 3.67 | 1.30 |
| Ability to Testify - AWID | 3.85 | 0.97 |
| Suggestibility - AWID | 3.71 | 1.02 |
| Memory - TD Adult | 5.24 | 1.37 |
| Ability to Testify - TD Adult | 4.92 | 0.64 |
| Suggestibility - TD Adult | 3.08 | 1.12 |

measure\_list <- list(id\_test\_child,   
 id\_sug\_child,  
 td\_test\_3\_5,  
 td\_sug\_3\_5,  
 td\_test\_6\_11,  
 td\_sug\_6\_11,  
 id\_test\_adult,  
 id\_sug\_adult,  
 td\_test\_adult,  
 td\_sug\_adult)  
  
measure\_names <- c("Ability to Testify - CWID",  
 "Suggestibility - CWID",  
 "Ability to Testify in Court - TD 3-5 year olds",  
 "Suggestibility - TD 3-5 year olds",  
 "Ability to Testify in Court - TD 6-11 year olds",  
 "Suggestibility - TD 6-11 year olds",  
 "Ability to Testify - AWID",  
 "Suggestibility - AWID",  
 "Ability to Testify - TD Adult",  
 "Suggestibility - TD Adult"  
 )  
  
rel\_list <-   
lapply(measure\_list, function(x){  
 scale\_out <- ufs::scaleStructure(df1[c(x)])  
 data.frame(alpha = scale\_out$output$cronbach.alpha,  
 omega = scale\_out$output$omega.psych,  
 H = scale\_out$output$coefficientH)  
 }) %>%  
 do.call(rbind, .) %>%  
 cbind(measure\_names, .)

## Loading required namespace: GPArotation

apa\_table(rel\_list)

(#tab:reliability)

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|  |  |  |  |
| --- | --- | --- | --- |
| measure\_names | alpha | omega | H |
| Ability to Testify - CWID | 0.70 | 0.80 | 0.85 |
| Suggestibility - CWID | 0.71 | 0.76 | 0.80 |
| Ability to Testify in Court - TD 3-5 year olds | 0.68 | 0.78 | 0.84 |
| Suggestibility - TD 3-5 year olds | 0.70 | 0.84 | 0.84 |
| Ability to Testify in Court - TD 6-11 year olds | 0.69 | 0.78 | 0.85 |
| Suggestibility - TD 6-11 year olds | 0.69 | 0.75 | 0.83 |
| Ability to Testify - AWID | 0.72 | 0.87 | 0.89 |
| Suggestibility - AWID | 0.75 | 0.80 | 0.85 |
| Ability to Testify - TD Adult | 0.38 | 0.75 | 0.76 |
| Suggestibility - TD Adult | 0.76 | 0.82 | 0.84 |

## LEMR (Linear Effects Mixed Regression)  
df1$id <- paste0("id\_", 1:nrow(df1))  
  
df1\_long <- df1[c("id\_test\_child", "id\_mem\_child", "id\_sug\_child", "td\_test\_3\_5", "td\_mem\_3\_5", "td\_sug\_3\_5", "td\_test\_6\_11", "td\_mem\_6\_11", "td\_sug\_6\_11", "id\_test\_adult", "id\_mem\_adult", "id\_sug\_adult", "td\_test\_adult", "td\_mem\_adult", "td\_sug\_adult", "id")] %>%  
 pivot\_longer(., -id) %>%  
 separate(., "name", into = c("type", "cat", "age", "age2")) %>%  
 mutate(., target = paste0(type, age)) %>%  
 mutate(., target = factor(target, levels = c("td3", "idchild", "td6", "idadult", "tdadult")))

## Warning: Expected 4 pieces. Missing pieces filled with `NA` in 6102 rows [1, 2,  
## 3, 10, 11, 12, 13, 14, 15, 16, 17, 18, 25, 26, 27, 28, 29, 30, 31, 32, ...].

lmer\_out <- lmer("value ~ target \* cat + (1|id)", data = df1\_long)  
  
sjPlot::tab\_model(lmer\_out)

value

Predictors

Estimates

CI

p

(Intercept)

2.66

2.58 – 2.75

<0.001

target [idchild]

0.33

0.21 – 0.44

<0.001

target [td6]

0.93

0.82 – 1.04

<0.001

target [idadult]

1.01

0.90 – 1.13

<0.001

target [tdadult]

2.58

2.47 – 2.69

<0.001

cat [sug]

1.40

1.29 – 1.50

<0.001

cat [test]

0.52

0.41 – 0.63

<0.001

target [idchild] \* cat[sug]

-0.32

-0.48 – -0.16

<0.001

target [td6] \* cat [sug]

-0.97

-1.12 – -0.82

<0.001

target [idadult] \* cat[sug]

-1.37

-1.53 – -1.20

<0.001

target [tdadult] \* cat[sug]

-3.56

-3.72 – -3.41

<0.001

target [idchild] \* cat[test]

-0.10

-0.26 – 0.06

0.202

target [td6] \* cat [test]

-0.29

-0.44 – -0.14

<0.001

target [idadult] \* cat[test]

-0.36

-0.52 – -0.20

<0.001

target [tdadult] \* cat[test]

-0.85

-1.00 – -0.70

<0.001

Random Effects

σ2

1.01

τ00 id

0.20

ICC

0.16

N id

678

Observations

9434

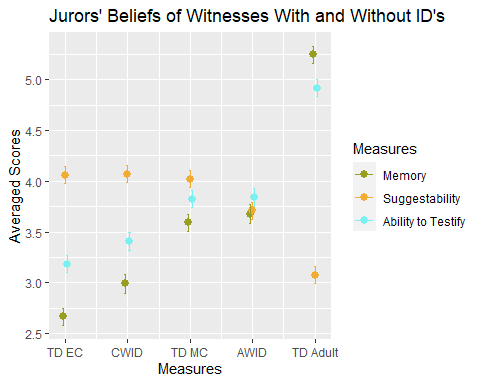
Marginal R2 / Conditional R2

0.274 / 0.393

sjPlot::plot\_model(lmer\_out, type = "int") +  
 labs(title = "Jurors' Beliefs of Witnesses With and Without ID's",  
 x = "Measures",  
 y = "Averaged Scores") +  
 labs(color = "Measures") +  
 scale\_color\_manual(values = c("#989E21", "#F0AD32", "#7AF0F0"), labels = c("Memory", "Suggestability", "Ability to Testify")) +  
 scale\_x\_continuous(labels=c("td3" = "TD EC",  
 "idchild" = "CWID",  
 "td6" = "TD MC",  
 "idadult" = "AWID",  
 "tdadult" = "TD Adult"))

## Scale for 'colour' is already present. Adding another scale for 'colour',  
## which will replace the existing scale.

## Scale for 'x' is already present. Adding another scale for 'x', which will  
## replace the existing scale.



rep1 <- report::report(lmer\_out)  
  
# Try to get estimated marginal means from the emmeans package  
  
emdf <- emmeans::emmeans(lmer\_out, specs = pairwise ~ target:cat)

## Note: D.f. calculations have been disabled because the number of observations exceeds 3000.  
## To enable adjustments, add the argument 'pbkrtest.limit = 9434' (or larger)  
## [or, globally, 'set emm\_options(pbkrtest.limit = 9434)' or larger];  
## but be warned that this may result in large computation time and memory use.

## Note: D.f. calculations have been disabled because the number of observations exceeds 3000.  
## To enable adjustments, add the argument 'lmerTest.limit = 9434' (or larger)  
## [or, globally, 'set emm\_options(lmerTest.limit = 9434)' or larger];  
## but be warned that this may result in large computation time and memory use.

emdf1 <- emdf$contrasts %>%  
 data.frame() %>%  
 dplyr::select(., contrast, estimate, p.value) %>%  
 mutate(p.value = round(p.value, 3))  
  
apa\_table(emdf1)

(#tab:lemranalysis)

\*\*

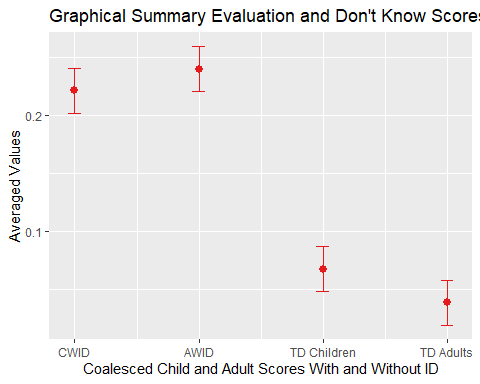
|  |  |  |
| --- | --- | --- |
| contrast | estimate | p.value |
| td3 mem - idchild mem | -0.33 | 0.00 |
| td3 mem - td6 mem | -0.93 | 0.00 |
| td3 mem - idadult mem | -1.01 | 0.00 |
| td3 mem - tdadult mem | -2.58 | 0.00 |
| td3 mem - td3 sug | -1.40 | 0.00 |
| td3 mem - idchild sug | -1.41 | 0.00 |
| td3 mem - td6 sug | -1.36 | 0.00 |
| td3 mem - idadult sug | -1.04 | 0.00 |
| td3 mem - tdadult sug | -0.41 | 0.00 |
| td3 mem - td3 test | -0.52 | 0.00 |
| td3 mem - idchild test | -0.74 | 0.00 |
| td3 mem - td6 test | -1.16 | 0.00 |
| td3 mem - idadult test | -1.17 | 0.00 |
| td3 mem - tdadult test | -2.25 | 0.00 |
| idchild mem - td6 mem | -0.60 | 0.00 |
| idchild mem - idadult mem | -0.69 | 0.00 |
| idchild mem - tdadult mem | -2.25 | 0.00 |
| idchild mem - td3 sug | -1.07 | 0.00 |
| idchild mem - idchild sug | -1.08 | 0.00 |
| idchild mem - td6 sug | -1.03 | 0.00 |
| idchild mem - idadult sug | -0.72 | 0.00 |
| idchild mem - tdadult sug | -0.09 | 0.98 |
| idchild mem - td3 test | -0.19 | 0.06 |
| idchild mem - idchild test | -0.42 | 0.00 |
| idchild mem - td6 test | -0.83 | 0.00 |
| idchild mem - idadult test | -0.85 | 0.00 |
| idchild mem - tdadult test | -1.93 | 0.00 |
| td6 mem - idadult mem | -0.08 | 0.99 |
| td6 mem - tdadult mem | -1.65 | 0.00 |
| td6 mem - td3 sug | -0.47 | 0.00 |
| td6 mem - idchild sug | -0.48 | 0.00 |
| td6 mem - td6 sug | -0.43 | 0.00 |
| td6 mem - idadult sug | -0.11 | 0.79 |
| td6 mem - tdadult sug | 0.52 | 0.00 |
| td6 mem - td3 test | 0.41 | 0.00 |
| td6 mem - idchild test | 0.19 | 0.06 |
| td6 mem - td6 test | -0.23 | 0.00 |
| td6 mem - idadult test | -0.24 | 0.00 |
| td6 mem - tdadult test | -1.32 | 0.00 |
| idadult mem - tdadult mem | -1.57 | 0.00 |
| idadult mem - td3 sug | -0.38 | 0.00 |
| idadult mem - idchild sug | -0.39 | 0.00 |
| idadult mem - td6 sug | -0.34 | 0.00 |
| idadult mem - idadult sug | -0.03 | 1.00 |
| idadult mem - tdadult sug | 0.60 | 0.00 |
| idadult mem - td3 test | 0.49 | 0.00 |
| idadult mem - idchild test | 0.27 | 0.00 |
| idadult mem - td6 test | -0.15 | 0.48 |
| idadult mem - idadult test | -0.16 | 0.36 |
| idadult mem - tdadult test | -1.24 | 0.00 |
| tdadult mem - td3 sug | 1.18 | 0.00 |
| tdadult mem - idchild sug | 1.17 | 0.00 |
| tdadult mem - td6 sug | 1.22 | 0.00 |
| tdadult mem - idadult sug | 1.54 | 0.00 |
| tdadult mem - tdadult sug | 2.17 | 0.00 |
| tdadult mem - td3 test | 2.06 | 0.00 |
| tdadult mem - idchild test | 1.84 | 0.00 |
| tdadult mem - td6 test | 1.42 | 0.00 |
| tdadult mem - idadult test | 1.41 | 0.00 |
| tdadult mem - tdadult test | 0.33 | 0.00 |
| td3 sug - idchild sug | -0.01 | 1.00 |
| td3 sug - td6 sug | 0.04 | 1.00 |
| td3 sug - idadult sug | 0.35 | 0.00 |
| td3 sug - tdadult sug | 0.98 | 0.00 |
| td3 sug - td3 test | 0.88 | 0.00 |
| td3 sug - idchild test | 0.66 | 0.00 |
| td3 sug - td6 test | 0.24 | 0.00 |
| td3 sug - idadult test | 0.22 | 0.01 |
| td3 sug - tdadult test | -0.86 | 0.00 |
| idchild sug - td6 sug | 0.05 | 1.00 |
| idchild sug - idadult sug | 0.36 | 0.00 |
| idchild sug - tdadult sug | 0.99 | 0.00 |
| idchild sug - td3 test | 0.89 | 0.00 |
| idchild sug - idchild test | 0.67 | 0.00 |
| idchild sug - td6 test | 0.25 | 0.00 |
| idchild sug - idadult test | 0.23 | 0.01 |
| idchild sug - tdadult test | -0.84 | 0.00 |
| td6 sug - idadult sug | 0.31 | 0.00 |
| td6 sug - tdadult sug | 0.94 | 0.00 |
| td6 sug - td3 test | 0.84 | 0.00 |
| td6 sug - idchild test | 0.62 | 0.00 |
| td6 sug - td6 test | 0.20 | 0.02 |
| td6 sug - idadult test | 0.18 | 0.08 |
| td6 sug - tdadult test | -0.89 | 0.00 |
| idadult sug - tdadult sug | 0.63 | 0.00 |
| idadult sug - td3 test | 0.53 | 0.00 |
| idadult sug - idchild test | 0.30 | 0.00 |
| idadult sug - td6 test | -0.11 | 0.79 |
| idadult sug - idadult test | -0.13 | 0.67 |
| idadult sug - tdadult test | -1.21 | 0.00 |
| tdadult sug - td3 test | -0.11 | 0.83 |
| tdadult sug - idchild test | -0.33 | 0.00 |
| tdadult sug - td6 test | -0.75 | 0.00 |
| tdadult sug - idadult test | -0.76 | 0.00 |
| tdadult sug - tdadult test | -1.84 | 0.00 |
| td3 test - idchild test | -0.22 | 0.01 |
| td3 test - td6 test | -0.64 | 0.00 |
| td3 test - idadult test | -0.65 | 0.00 |
| td3 test - tdadult test | -1.73 | 0.00 |
| idchild test - td6 test | -0.42 | 0.00 |
| idchild test - idadult test | -0.43 | 0.00 |
| idchild test - tdadult test | -1.51 | 0.00 |
| td6 test - idadult test | -0.01 | 1.00 |
| td6 test - tdadult test | -1.09 | 0.00 |
| idadult test - tdadult test | -1.08 | 0.00 |

report::report(emdf1)

## The data contains 105 observations of the following variables:  
## - contrast: 105 entries, such as idadult mem - idadult sug (0.95%%); idadult mem - idadult test (0.95%%); idadult mem - idchild sug (0.95%%) and 102 others (0 missing)  
## - estimate: n = 105, Mean = -0.24, SD = 0.94, Median = -0.23, MAD = 0.91, range: [-2.58, 2.17], Skewness = 0.11, Kurtosis = 2.51e-03, 0% missing  
## - p.value: n = 105, Mean = 0.11, SD = 0.29, Median = 0.00, MAD = 0.00, range: [0, 1], Skewness = 2.55, Kurtosis = 4.86, 0% missing

## Analyse the DK responses  
  
df1$dn\_id <- rowMeans(df1[paste0(c(id\_test\_child, id\_mem\_child, id\_sug\_child), "\_bin")])  
df1$dn\_td <- rowMeans(df1[paste0(c(td\_test\_3\_5, td\_mem\_3\_5, td\_sug\_3\_5, td\_test\_6\_11, td\_mem\_6\_11, td\_sug\_6\_11), "\_bin")])  
df1$dn\_id\_ad <- rowMeans(df1[paste0(c(id\_test\_adult, id\_mem\_adult, id\_sug\_adult), "\_bin")])  
df1$dn\_td\_ad <- rowMeans(df1[paste0(c(td\_test\_adult, td\_mem\_adult, td\_sug\_adult), "\_bin")])  
  
dn\_long <-   
 df1 %>%  
 select(., dn\_id, dn\_td, dn\_id\_ad, dn\_td\_ad, id) %>%  
 pivot\_longer(., -id)  
  
lmer\_out <- lmer(value ~ name + (1|id), dn\_long)  
  
lm\_out <- lm(value ~ name , dn\_long)  
  
sjPlot::plot\_model(lmer\_out, type = "pred")$name +  
 labs(title = "Graphical Summary Evaluation and Don't Know Scores for Each Age-Group",  
 x = "Coalesced Child and Adult Scores With and Without ID",  
 y = "Averaged Values") +  
 scale\_x\_continuous(labels=c("dn\_id" = "CWID",  
 "dn\_id\_ad" = "AWID",  
 "dn\_td" = "TD Children",  
 "dn\_td\_ad" = "TD Adults"))+  
 aes(color = "green") +  
 theme(legend.position = "none")

## Scale for 'x' is already present. Adding another scale for 'x', which will  
## replace the existing scale.



summary(lmer\_out)

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [  
## lmerModLmerTest]  
## Formula: value ~ name + (1 | id)  
## Data: dn\_long  
##   
## REML criterion at convergence: -357.6  
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -2.2526 -0.6309 0.0338 0.3925 3.5368   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## id (Intercept) 0.03182 0.1784   
## Residual 0.03454 0.1858   
## Number of obs: 2712, groups: id, 678  
##   
## Fixed effects:  
## Estimate Std. Error df t value Pr(>|t|)   
## (Intercept) 2.210e-01 9.893e-03 1.603e+03 22.336 <2e-16 \*\*\*  
## namedn\_id\_ad 1.864e-02 1.009e-02 2.031e+03 1.846 0.065 .   
## namedn\_td -1.533e-01 1.009e-02 2.031e+03 -15.190 <2e-16 \*\*\*  
## namedn\_td\_ad -1.825e-01 1.009e-02 2.031e+03 -18.079 <2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr) nmdn\_d\_ nmdn\_t  
## namedn\_id\_d -0.510   
## namedn\_td -0.510 0.500   
## namedn\_td\_d -0.510 0.500 0.500

summary(lm\_out)

##   
## Call:  
## lm(formula = value ~ name, data = dn\_long)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.23961 -0.22097 -0.03915 0.03312 0.93235   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.220971 0.009893 22.336 <2e-16 \*\*\*  
## namedn\_id\_ad 0.018638 0.013991 1.332 0.183   
## namedn\_td -0.153325 0.013991 -10.959 <2e-16 \*\*\*  
## namedn\_td\_ad -0.182489 0.013991 -13.043 <2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.2576 on 2708 degrees of freedom  
## Multiple R-squared: 0.1078, Adjusted R-squared: 0.1068   
## F-statistic: 109 on 3 and 2708 DF, p-value: < 2.2e-16

emmeans::emmeans(lmer\_out, pairwise ~ name)

## $emmeans  
## name emmean SE df lower.CL upper.CL  
## dn\_id 0.2210 0.00989 1603 0.2016 0.2404  
## dn\_id\_ad 0.2396 0.00989 1603 0.2202 0.2590  
## dn\_td 0.0676 0.00989 1603 0.0482 0.0871  
## dn\_td\_ad 0.0385 0.00989 1603 0.0191 0.0579  
##   
## Degrees-of-freedom method: kenward-roger   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## dn\_id - dn\_id\_ad -0.0186 0.0101 2031 -1.846 0.2519   
## dn\_id - dn\_td 0.1533 0.0101 2031 15.190 <.0001   
## dn\_id - dn\_td\_ad 0.1825 0.0101 2031 18.079 <.0001   
## dn\_id\_ad - dn\_td 0.1720 0.0101 2031 17.036 <.0001   
## dn\_id\_ad - dn\_td\_ad 0.2011 0.0101 2031 19.925 <.0001   
## dn\_td - dn\_td\_ad 0.0292 0.0101 2031 2.889 0.0204   
##   
## Degrees-of-freedom method: kenward-roger   
## P value adjustment: tukey method for comparing a family of 4 estimates