Pilot PCSE Analyses

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About the variables

A summary of the variables and their information including scoring

General participant info and consent

ID: assigned ID for reorganizing data

group: which group the participants were randomly assigned to (1=experimental group, 2=visual control, 3=dialogue control)

Pre-test measures

ICDbaseline: summed inventory of cognitive distortions baseline (range 0-34, higher=stronger endorsement of distortions experienced)

CFIbaseline: summed cognitive flexibility inventory

PCSEbaselineraw: raw summed score of perceived control over stressful events baseline (range 8-32, higher scores=more control)

PCSEbaseline: adjusted summed score for baseline (range of 0-24, higher scores=more control)

Post-test measures

Ftscore: final test score without penalty for wrong answers–each question is worth one point, broken up across correct number of answers (range of 0-8 with higher scores indicating better performance)

Ftpenalty: final test score with a partial penalty incorporated for incorrect answers (range of 0-8 with higher scores indicating better performance)

ICDposttest: summed inventory of cognitive distortions posttest (range 0-34, higher=stronger endorsement of distortions experienced)

ICDdiff: baseline-posttest (0=no change, negative numbers=worsening distortions, positive numbers=better distortions)

ICDcount: count of posttest "this sounds a lot like me" responses (range of 0-17, higher=more endorsed distortions)

ICDhml: split into High, Medium, and Low cognitive distortions counts (0-1=low [0], 2-6=medium [1], 7-17=high [2])

PCSEposttestraw: raw summed score of perceived control over stressful events posttest (range 8-32, higher scores=more control)

PCSEpost: adjusted summed score for posttest (range of 0-24, higher scores=more control)

PCSEdiff: difference between posttest and baseline [posttest-baseline] (0=no change, negative numbers=worsening perceived control posttest, positive numbers=better perceived control posttest)

Big Five Personality Inventory

Extroversion: Big 5 extroversion (higher numbers=more extroverted)

Agreeableness: Big 5 agreeableness (higher numbers=more agreeableness)

ConscientiousnessR: Big 5 conscientiousness reverse coded (higher numbers=lower conscientiousness)

NeuroticismR: Big 5 neuroticism reverse coded (higher numbers=lower neuroticism)

Openness: Big 5 openness (higher numbers=more openness)

Demographics

classyr: year in school (1=first-year, 2=sophomore, 3=junior, 4=senior)

age: text entry of age in years

gender: gender identified (1=man, 2=woman, 3=specified)

gendertext: text specified gender if gender=3

race: race identified (1=white, 2=Black, 3=Asian, 4=Latinx, 5=specified)

racetext: text specified race if race=5, both happened to specify Middle Eastern

```
masterstress = read.csv("data/stressdata.csv")

# here I am dropping all the other columns I'm not using
masterPCSE = masterstress[, c(1:2, 12, 14)]

# making sure the data came in properly
summary(masterPCSE)
```

```
##      ï..ID            group       PCSEbaseline      PCSEpost
##  Min.   :  1.00   Min.   :1.00   Min.   : 2.00   Min.   :11.00
##  1st Qu.: 25.75   1st Qu.:1.00   1st Qu.:15.00   1st Qu.:17.00
##  Median : 50.50   Median :2.00   Median :18.00   Median :20.00
##  Mean   : 50.50   Mean   :1.99   Mean   :17.93   Mean   :19.73
##  3rd Qu.: 75.25   3rd Qu.:3.00   3rd Qu.:21.00   3rd Qu.:23.25
##  Max.   :100.00   Max.   :3.00   Max.   :24.00   Max.   :24.00
```

```
## fix those group labels
masterPCSE$group = factor(masterPCSE$group, levels = c("1", "2", "3"), labels = c("Experimental",
    "MediaControl", "DialogueControl"))

mixedmeanstable <- psych::describe(masterPCSE)
knitr::kable(mixedmeanstable, digits = 2, caption = "Mixed Means Table")
```

Table 1: Mixed Means Table

	vars	n	mean	sd	median	trimmed	mad	min	max	range	skew	kurtosis	se
ï..ID	1	100	50.50	29.01	50.5	50.50	37.06	1	100	99	0.00	-1.24	2.90
group*	2	100	1.99	0.82	2.0	1.99	1.48	1	3	2	0.02	-1.54	0.08
PCSEbaseline	3	100	17.93	4.11	18.0	18.14	4.45	2	24	22	-0.72	1.14	0.41
PCSEpost	4	100	19.73	3.66	20.0	20.06	4.45	11	24	13	-0.50	-0.69	0.37

```
# here I'm mellting the data to long form
longdatapcse = melt(masterPCSE, id = c("ï..ID", "group"), measured = c("PCSEbaseline",
    "PCSEpost"))
# rename columns
colnames(longdatapcse) = c("subject", "group", "PCSE", "score")
# turn subject into a factor for later
longdatapcse$subject = as.factor(longdatapcse$subject)
# look to make sure everything worked -- it did!
head(longdatapcse)
```

```
##   subject        group         PCSE score
## 1       1 Experimental PCSEbaseline    24
## 2       2 Experimental PCSEbaseline    23
## 3       3 Experimental PCSEbaseline    19
## 4       4 Experimental PCSEbaseline    20
## 5       5 Experimental PCSEbaseline    18
## 6       6 Experimental PCSEbaseline    22
```

```
# an alternate way to melt data longpcseother <- gather(masterPCSE, PCSE,
# score, PCSEbaseline:PCSEpost) longpcseother$ï..ID <-
# factor(longpcseother$ï..ID) head(longpcseother)
```

```
aov_pcse <- aov(score ~ group * PCSE + Error(subject/PCSE), data = longdatapcse)
# knitr::kable(nice(aov_pcse))
summary(aov_pcse)  ##call for formatted ANOVA table using knitr
```

```
##
## Error: subject
##           Df Sum Sq Mean Sq F value Pr(>F)
## group      2  179.3   89.67   4.458  0.014 *
## Residuals 97 1950.9   20.11
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Error: subject:PCSE
##            Df Sum Sq Mean Sq F value   Pr(>F)
## PCSE        1  162.0  162.00  18.269 4.49e-05 ***
## group:PCSE  2    7.8    3.92   0.443    0.644
## Residuals  97  860.2    8.87
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
# lsr::etaSquared(aov_pcse)
model.tables(aov_pcse, "means")
```

```
## Tables of means
## Grand mean
##
## 18.83
##
##  group
##     Experimental MediaControl DialogueControl
##            20.06        18.62           17.77
## rep        68.00        66.00           66.00
##
##  PCSE
##     PCSEbaseline PCSEpost
##            17.93    19.73
## rep       100.00   100.00
##
##  group:PCSE
##                   PCSE
## group              PCSEbaseline PCSEpost
##   Experimental     19.06        21.06
##   rep              34.00        34.00
##   MediaControl     17.55        19.70
##   rep              33.00        33.00
##   DialogueControl  17.15        18.39
##   rep              33.00        33.00
```

```r
# TukeyHSD(aov_pcse)
```

```r
mixedmainPCSE <- emmeans(aov_pcse, ~PCSE)
```

```
## Note: re-fitting model with sum-to-zero contrasts
```

```
## NOTE: Results may be misleading due to involvement in interactions
```

```r
mixedmainPCSE
```

```
##  PCSE         emmean    SE  df lower.CL upper.CL
##  PCSEbaseline   17.9 0.381 169     17.2     18.7
##  PCSEpost       19.7 0.381 169     19.0     20.5
##
## Results are averaged over the levels of: group
## Warning: EMMs are biased unless design is perfectly balanced
## Confidence level used: 0.95
```

```r
btwnmainPCSE <- emmeans(aov_pcse, ~group)
```

```
## Note: re-fitting model with sum-to-zero contrasts
## NOTE: Results may be misleading due to involvement in interactions
```

```
btwnmainPCSE
```

```
##  group           emmean    SE df lower.CL upper.CL
##  Experimental      20.1 0.547 97     19.0     21.2
##  MediaControl      18.6 0.550 97     17.5     19.7
##  DialogueControl   17.8 0.550 97     16.7     18.9
##
## Results are averaged over the levels of: PCSE
## Warning: EMMs are biased unless design is perfectly balanced
## Confidence level used: 0.95
```

```
mixedinteraction <- emmeans(aov_pcse, ~PCSE | group)
```

```
## Note: re-fitting model with sum-to-zero contrasts
```

```
mixedinteraction
```

```
## group = Experimental:
##  PCSE         emmean    SE  df lower.CL upper.CL
##  PCSEbaseline   19.1 0.656 168     17.8     20.4
##  PCSEpost       21.1 0.656 168     19.8     22.4
##
## group = MediaControl:
##  PCSE         emmean    SE  df lower.CL upper.CL
##  PCSEbaseline   17.6 0.661 169     16.3     18.9
##  PCSEpost       19.7 0.661 169     18.4     21.0
##
## group = DialogueControl:
##  PCSE         emmean    SE  df lower.CL upper.CL
##  PCSEbaseline   17.2 0.661 169     15.9     18.5
##  PCSEpost       18.4 0.661 169     17.1     19.7
##
## Warning: EMMs are biased unless design is perfectly balanced
## Confidence level used: 0.95
```

```
pairs(mixedinteraction)
```

```
## group = Experimental:
##  contrast                estimate    SE df t.ratio p.value
##  PCSEbaseline - PCSEpost    -2.00 0.722 97 -2.769  0.0067
##
## group = MediaControl:
##  contrast                estimate    SE df t.ratio p.value
##  PCSEbaseline - PCSEpost    -2.15 0.733 97 -2.935  0.0042
##
## group = DialogueControl:
##  contrast                estimate    SE df t.ratio p.value
##  PCSEbaseline - PCSEpost    -1.24 0.733 97 -1.695  0.0933
```