Lab Descriptives

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Lab-Wide Descriptives

Write up for lab's descriptive statistics for ICMPC 15. Data here is already split based on the Screening.R script.

```
# Import Data
library(data.table)
```

```
## Warning: package 'data.table' was built under R version 3.4.2
```

```
library(psych)
#---------------------------------------------------
icmpc <- fread("../data/aggregated_data/AnalysisData-Deletion.csv")
dropped <- fread("../data/aggregated_data/DropList.csv")
#---------------------------------------------------
```

Write Up

The following is the code used to generate the first paragraph of descriptives.

```
# Total
nrow(icmpc) + nrow(dropped)
```

```
## [1] 254
```

```
# Dropped
dropped[Outlier == "YES", .(subjectNo,Outlier, OutlierReason)]
```

```
##    subjectNo Outlier         OutlierReason
## 1:      1007     YES             LOW TSPAN
## 2:       519     YES            LOW RAVENS
## 3:       532     YES            LOW RAVENS
## 4:       961     YES LOW RAVENS, LOW OSPAN
## 5:       970     YES            LOW RAVENS
## 6:       980     YES             LOW TSPAN
```

```
dropped[Exclude == "YES", .(subjectNo,Exclude, ExcludeReason)]
```

```
##    subjectNo Exclude              ExcludeReason
## 1:      1305     YES Self Reported Hearing Loss
## 2:       509     YES Self Reported Hearing Loss
## 3:       537     YES Self Reported Hearing Loss
## 4:       544     YES Self Reported Hearing Loss
## 5:       545     YES Self Reported Hearing Loss
## 6:       717     YES Self Reported Hearing Loss
## 7:       719     YES Self Reported Hearing Loss
## 8:       907     YES Self Reported Hearing Loss
## 9:       953     YES                         YES
```

```
dropped[ExcludeReason == "Self Reported Hearing Loss"]
```

```
##    subjectNo Exclude              ExcludeReason Outlier OutlierReason DROP
## 1:      1305     YES Self Reported Hearing Loss      NO          NONE  YES
## 2:       509     YES Self Reported Hearing Loss      NO          NONE  YES
## 3:       537     YES Self Reported Hearing Loss      NO          NONE  YES
## 4:       544     YES Self Reported Hearing Loss      NO          NONE  YES
## 5:       545     YES Self Reported Hearing Loss      NO          NONE  YES
## 6:       717     YES Self Reported Hearing Loss      NO          NONE  YES
## 7:       719     YES Self Reported Hearing Loss      NO          NONE  YES
## 8:       907     YES Self Reported Hearing Loss      NO          NONE  YES
```

```
# Sample
nrow(icmpc)
```

```
## [1] 239
```

```
describe(icmpc$goldage)
```

```
##    vars   n  mean   sd median trimmed  mad min max range skew kurtosis
## X1    1 239 19.72 2.74     19   19.26 1.48  17  43    26 4.72    30.28
##      se
## X1 0.18
```

```
table(icmpc$ravenSex)
```

```
##
## female   male
##    148     91
```

```
#-------------------------------------------------
```

Sample Descriptives

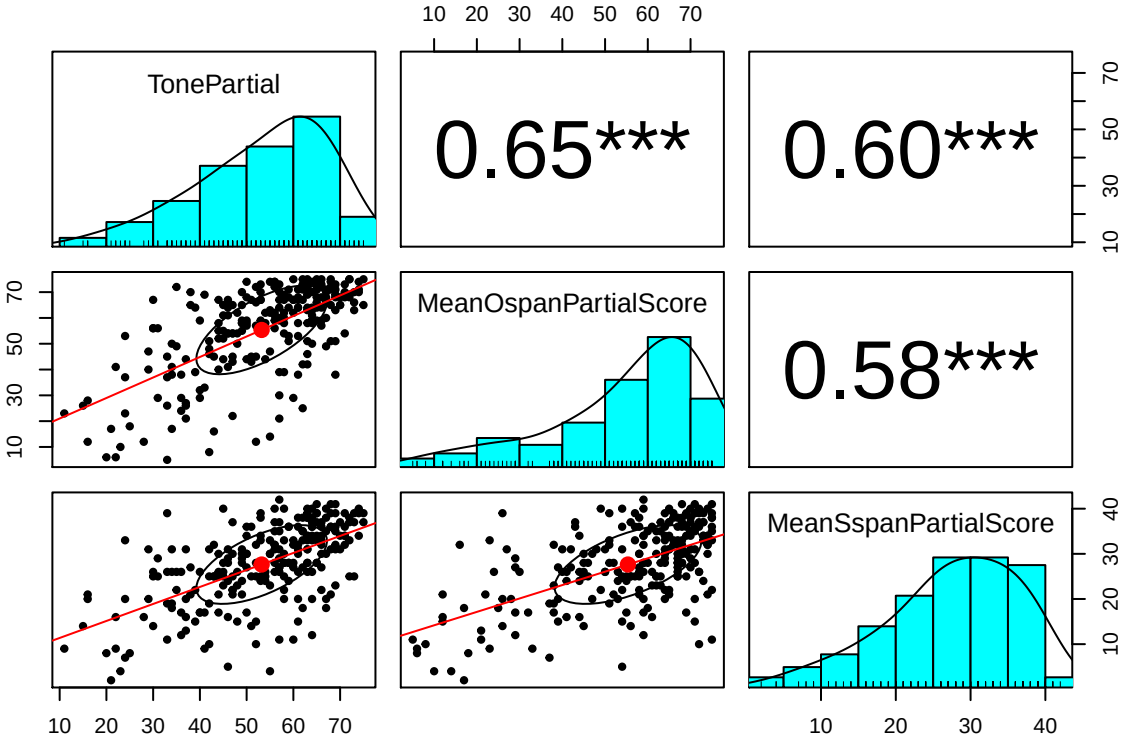
Two hundred fifty-four students enrolled at Louisiana State University completed the study. We recruited students, mainly in the Department of Psychology and the School of Music. The criteria inclusion in the analysis included reporting no hearing loss, not actively taking medication that would alter cognitive performance, and individuals whose performance on any task performed greater than 3 standard deviations from the mean score of that task. Using these criteria, eight participants were not eligible due to self reporting hearing loss, one participant removed for age, and six participants were eliminated as univariate outliers due to performance on one or more of the tasks of working memory capaicity. Thus, 239 participants met the criteria for inclusion. The eligible participants were between the ages of 17 and 43 (M = 19.72, SD = 2.74; 148 females). Participants volunteered, received course credit, or were paid $20.

Cognitive Task Descriptives

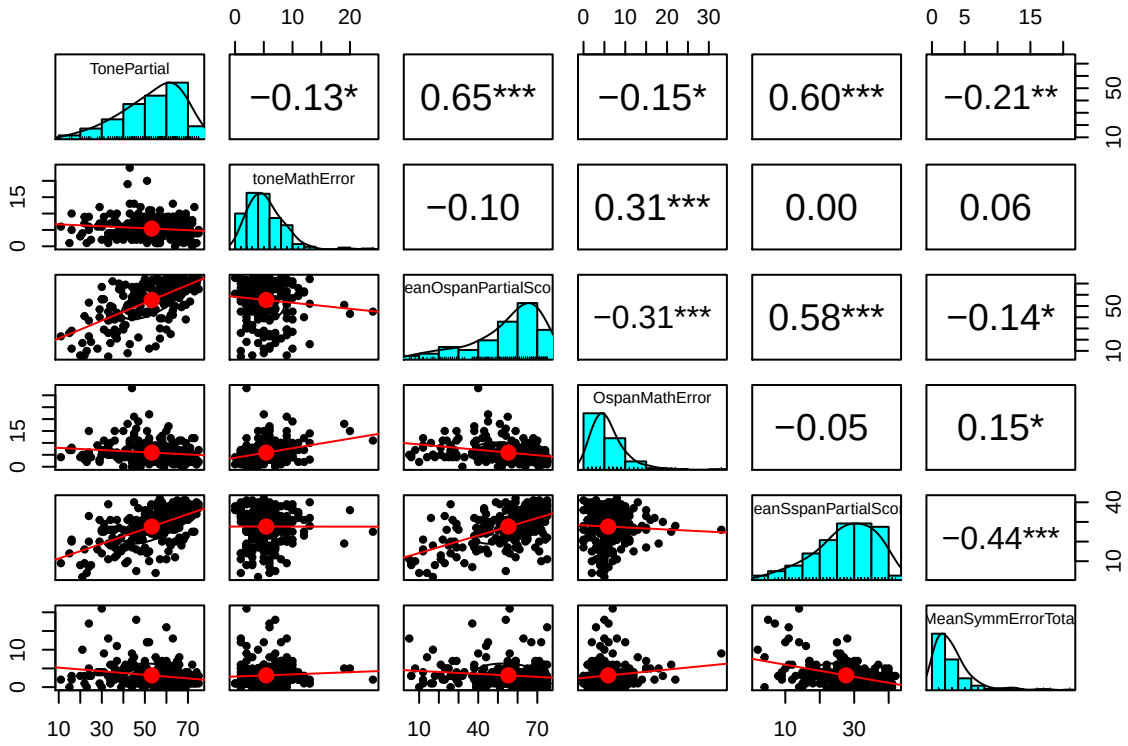
All variables used for modeling approximated nomral distributions. Processing errors for each task were positively skewed for the complex span tasks simlar to Unsworth, Redick, Heitz, Broadway, and Engle (2009). Positive and significant correlations were found between the three tasks measuring working memory capacity (WMC) and the two measuring general fluid intelligence (Gf). The recall scores negatively correlated with the reported number of errors in each task, suggesting that rehearsal processes were effectively limited by the processing tasks (Unsworth et al., 2009). Given the relationships between the WMC and Gf tasks, a composite measure of both were created by averaging the z-scores of the respective tasks.

Related Plots

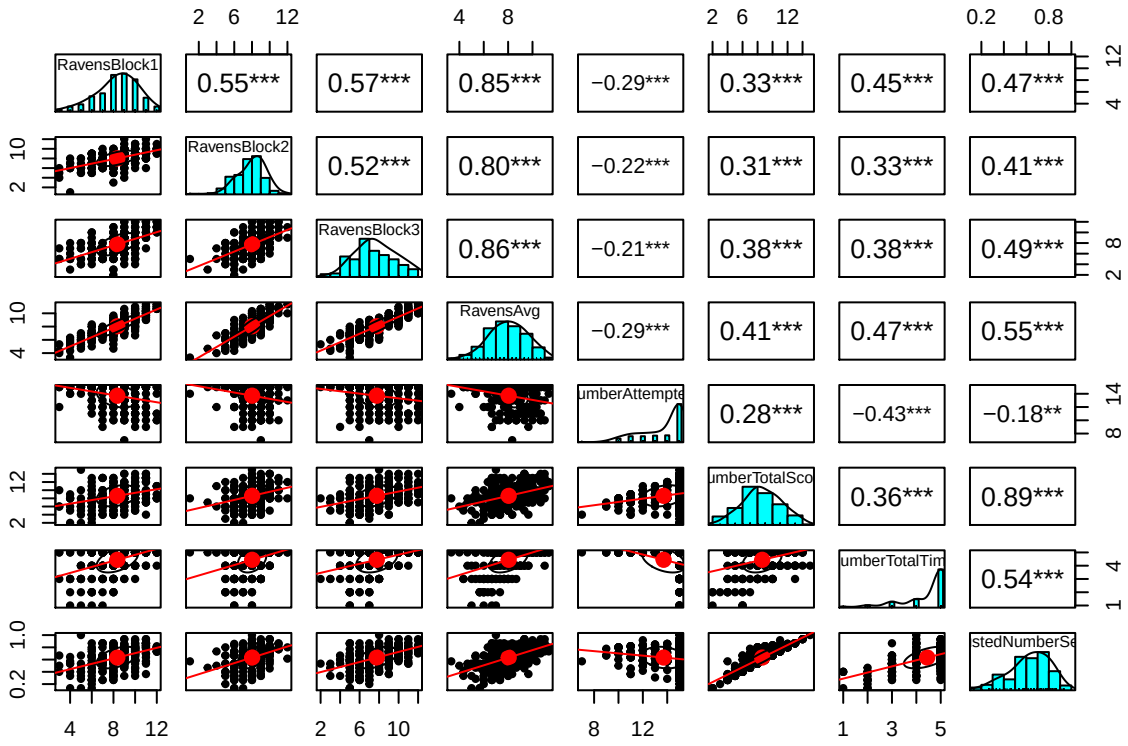
```
#=============================================================================================================
# All WMC Correlate Positive and Significant with each other
wmc <- icmpc[, .(TonePartial,
                 MeanOspanPartialScore,
                 MeanSspanPartialScore)]
pairs.panels(wmc, lm = TRUE, stars = TRUE)
```



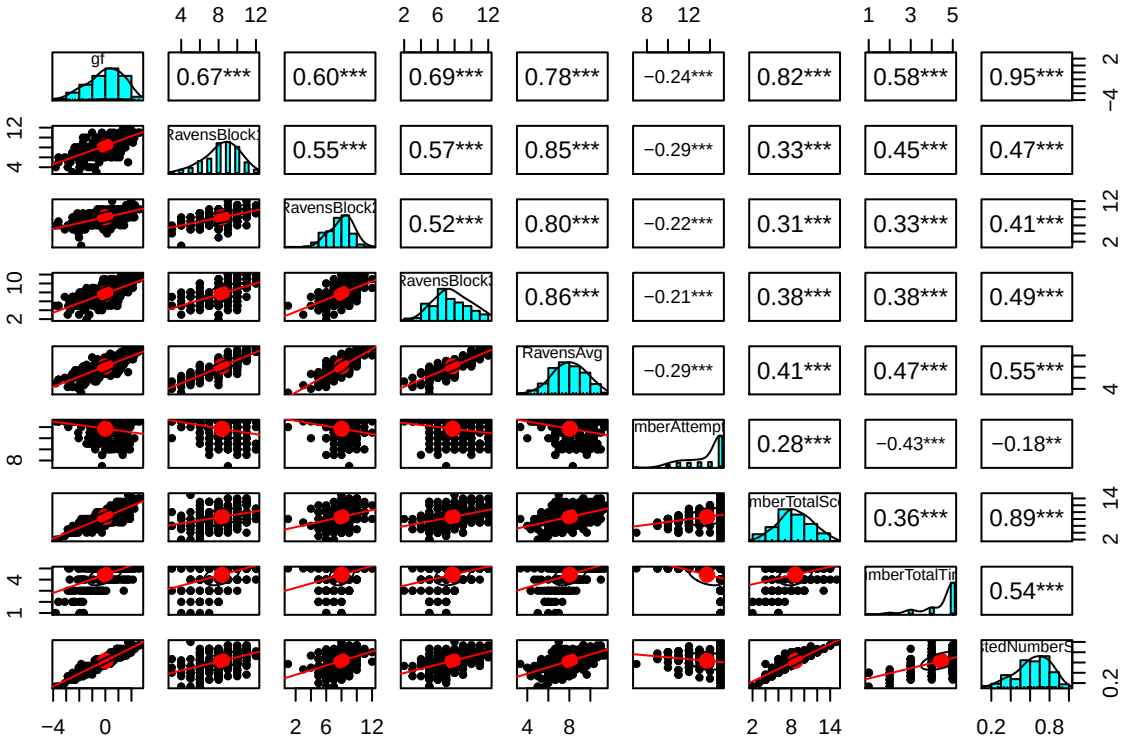

```
# And each task should negatively correlate with own processing task
negatives <- icmpc[, .(TonePartial, toneMathError,
                       MeanOspanPartialScore, OspanMathError,
                       MeanSspanPartialScore, MeanSymmErrorTotal )]

pairs.panels(negatives, lm = TRUE, stars = TRUE)
```



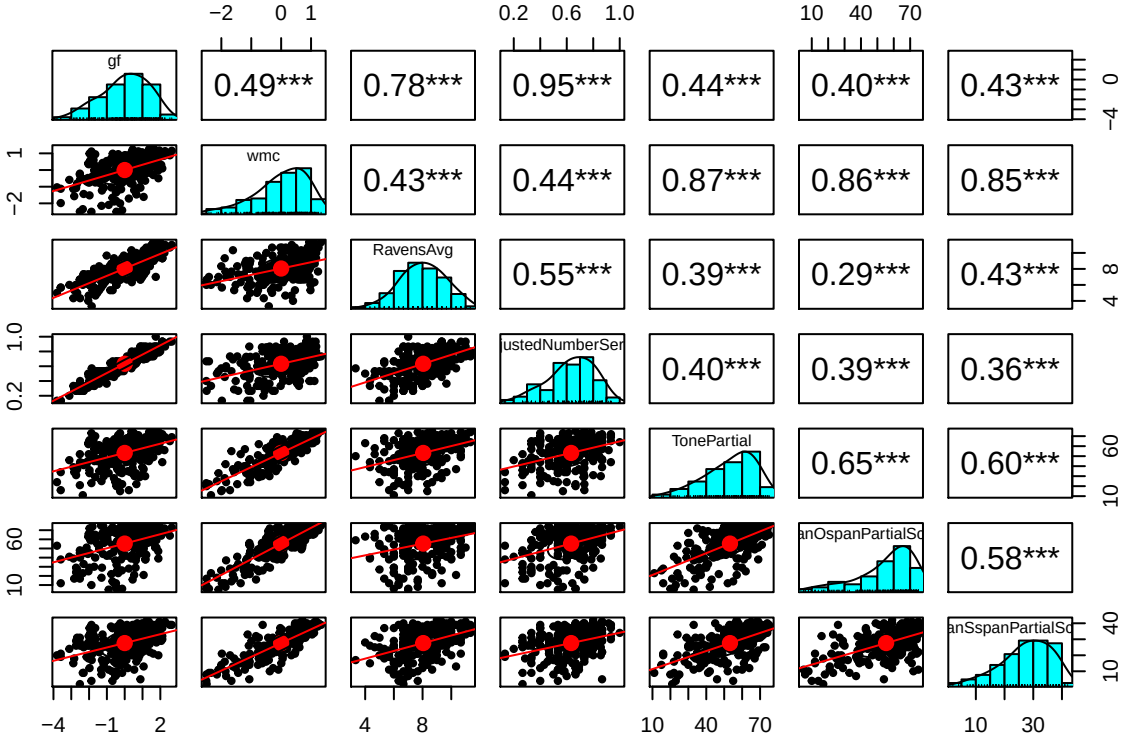

```
#-------------------------------------------------
# Above Correlations Suggest Creating new WMC composite

icmpc[, wmc := ((scale(TonePartial)+scale(MeanOspanPartialScore)+scale(MeanSspanPartialScore))/3)]
#-------------------------------------------------
# Check that Gf are both measuring the same
# Create New Gf Variables

icmpc[, AdjustedNumberSeries := NumberTotalScore/NumberAttempted]
icmpc[, RavensAvg := RavensTotaljv/3]
gfscores <- icmpc[, .(RavensBlock1, RavensBlock2, RavensBlock3,RavensAvg, NumberAttempted, NumberTotalS

pairs.panels(gfscores, lm = TRUE, stars = TRUE)
```




```
#-----------------------------------------------------
# Above Correlations Suggest Creating new GF composite

icmpc[, gf := (scale(AdjustedNumberSeries) + scale(RavensAvg)/2)]

gfscores <- icmpc[, .(gf,RavensBlock1, RavensBlock2, RavensBlock3,RavensAvg, NumberAttempted, NumberTota

pairs.panels(gfscores, lm = TRUE, stars = TRUE)
```




```
#---------------------------------------------------
# Look at composites and their original scores

compositeComparer <- icmpc[, .(gf, wmc, RavensAvg, AdjustedNumberSeries, TonePartial, MeanOspanPartialS

pairs.panels(compositeComparer, lm = TRUE, stars = TRUE)
```



```
#=============================================================================================
```