Exploratory Data Analysis

STAT-S 431

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Introduction

Dr. Mary Beth Nebel created this study to examine the relationship between motor skills and social defecits in children with developmental disorders. The children completed a motor skills assessment as well as completed a test for intelligence (i.e. vocabularly, general knowledge, word similarities, block patterns, and picture concepts).

This experiment seeked to provide an insight as to whether you could predict a child's social deficit based on their motor abilities.

The developmental disorders that were examined in this study were ADHD and Autism.

Research Question

Is there a statistically significant difference in predictive power of the motor skills vs. social responsivness model when we include intelligence metrics as predictors?

Filtering Data

```
full_dat = full_dat %>% drop_na(c('SecondaryDiagnosis',
                                  'CurrentlyNotTakingMeds',
                                  'CurrentlyTakingAtomoxetine',
                                  'CurrentlyTakingClonidine',
                                  'mABC_TotalStandardScore',
                                  'EdinburghHandedness_Integer'))
full_dat = subset(full_dat, visit == 1)
full_dat = subset(full_dat, !is.na(WISC_VERSION) & !is.na(SRS_VERSION))
full_dat = subset(full_dat, ADHD_Subtype %in% c('Combined',
                                                'Hyperactive/Impulsive',
                                                'Inattentive', 'No dx'))
WISC4_full_dat = subset(full_dat, WISC_VERSION == 4)
WISC5_full_dat = subset(full_dat, WISC_VERSION == 5)
```

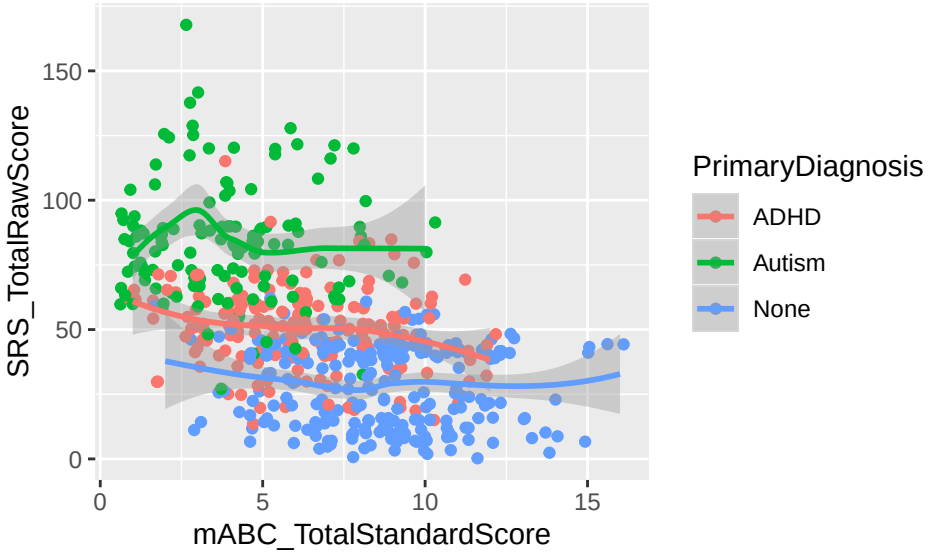
Summarizing Data

```
##
##          Combined Hyperactive/Impulsive Inattentive No dx
##   ADHD        150                     3          32     0
##   Autism       61                     2          30    39
##   None          0                     0           0   251
```

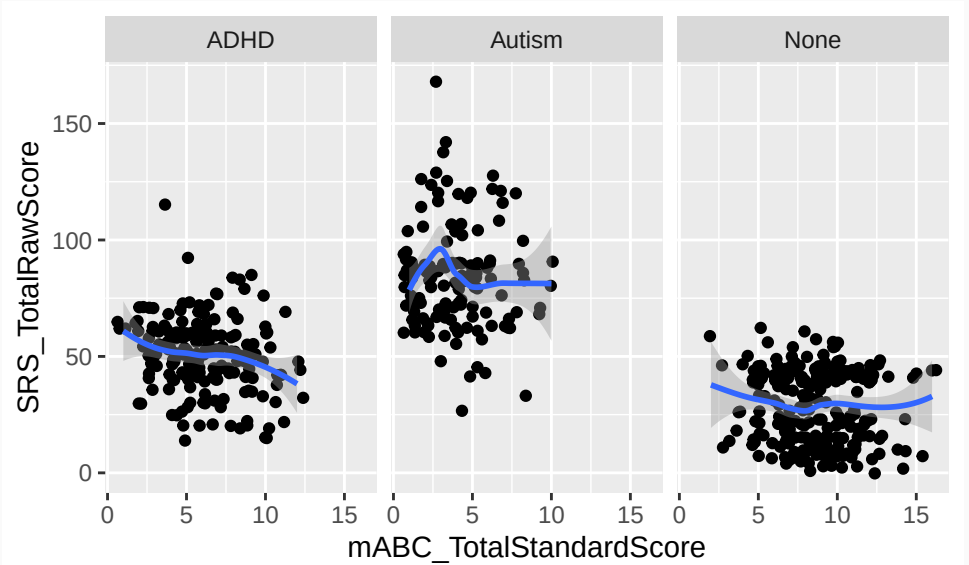
```
##
##   4   5
## 536  32
```

```
##
##          Combined Hyperactive/Impulsive Inattentive No dx
##   ADHD        150                     3          32     0
##   Autism       55                     2          20    37
##   None          0                     0           0   237
```

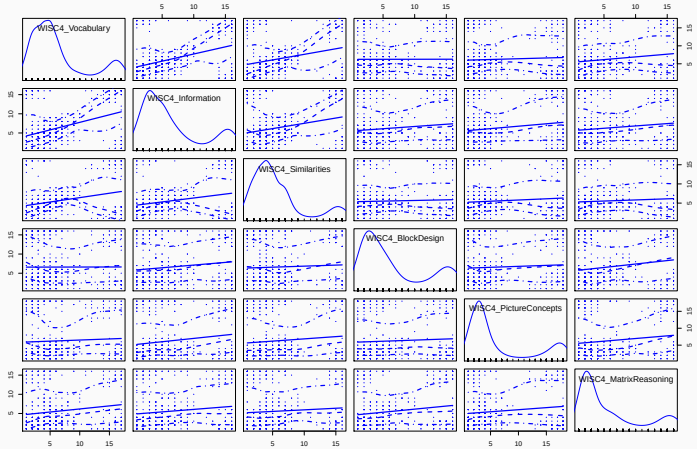
Motor Skills and Social Responsivness Score



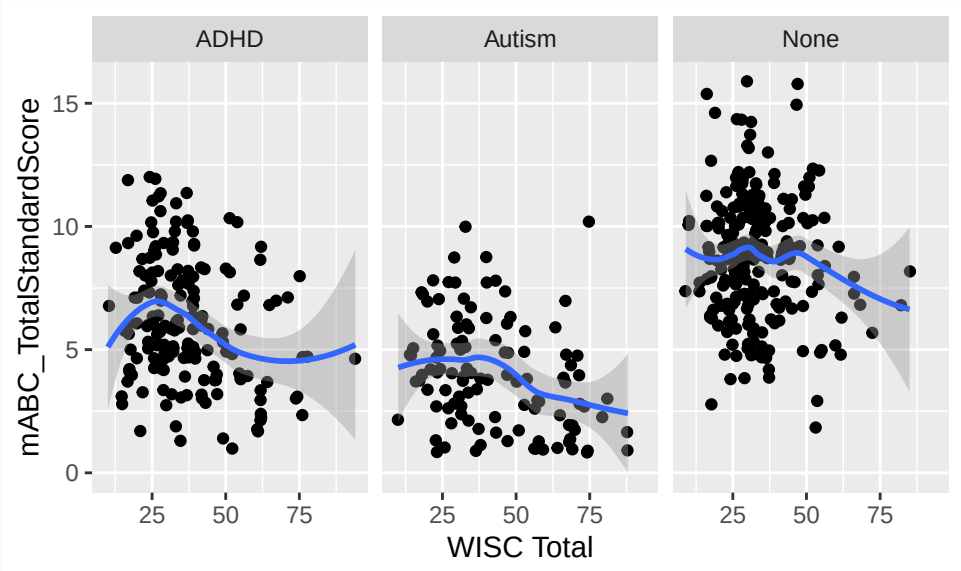
Log Motor Skills and Social Responsivness Score by Diagnosis



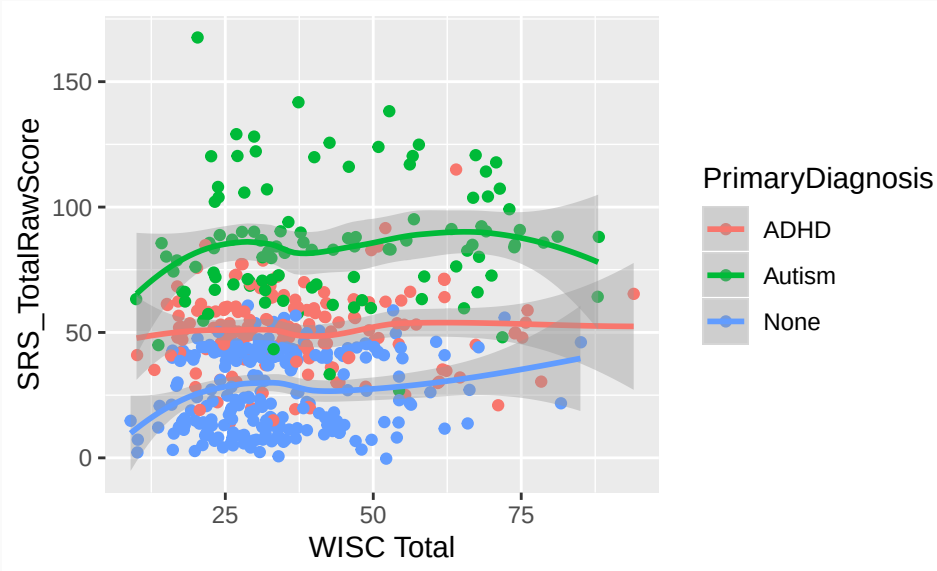
Scatterplot Matrix for WISC_4



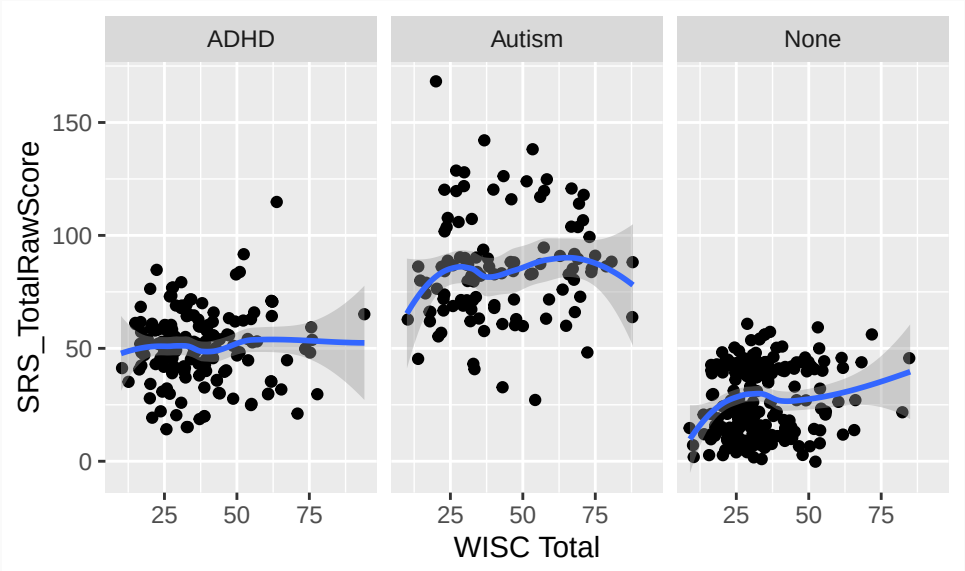
WISC Total and Motor Skills



WISC Total and Social Responsivness



WISC Total and Social Responsivness by Diagnosis



Conclusion

In general, there appears to be a negative relationship between motor skills and social responsiveness score. When broken down by primary diagnosis, there are obvious differences in the relationship for each. Specifically, in the "None" category, the relationship is close to zero, while in "Autism" and "ADHD", the overall negative trend seems to hold. Regarding our research question, when the data is not separated by diagnosis, the relationship is hard to see. However, when broken down by diagnosis, very noticable differences between the relationship appear. Additionally, the relationships between WISC4 and SRS seem much better defined than the WISC4 and mABC score, giving support that WISC could add novel predictive ability.