



# Effects of Video Games on Aggression

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Do age groups and the amount  
of time spent playing video  
games affect how aggressive a  
player is?

# Dataset

1

## Dataset Details

- A survey includes questions about video game habits and questions from **Buss–Perry Aggression Questionnaire(BPAQ)**.
- There are 43 variables in the dataset
  - Timestamp = 1
  - Demographic questions = 5
  - Behavioral and BPAQ questions = 37

2

## BPAQ

- The 1992 version of the AQ is a 29-item questionnaire in which participants rank certain statements along a 5-point continuum

3

## Participants

- 147 participants
- Age = 15–32
- Gender: Female, Male

# Data Cleaning & Transformation

## Data Cleaning Steps

- Rename variables for clarity
- Handle missing data

## Variable Encoding

- Created composite aggression score (BPAQ\_score)
- Likert scale converted to numeric 1-5

# Likert Scales

## For Questions:

"Strongly disagree" = 1,

"Disagree" = 2,

"Neither agree nor disagree" = 3,

"Strongly agree" = 4,

"Agree" = 5

## For Hours:

"< 1 hour" = 1

"> 1 hour" = 2"> 2 hours" = 3"> 3 hours" = 4"> 5 hours" = 5

# Some important factors about the analysis:

- Observational study
- Factors:
  - Age group
  - Hours of Playing
- Levels
  - Age group (younger than 18, 18 and 19, older than 19)
  - Hours of Playing ("less than 1 hour", "more than 1 hour", "more than 2 hour", "more than 3 hour", "more than 5 hour")
- Treatments =  $3 \times 5 = 15$

# Unbalanced Data

age_group	hours_of_playing	n
<chr>	<dbl>	<int>
18 and 19	1	18
18 and 19	2	16
18 and 19	3	12
18 and 19	4	11
18 and 19	5	2
older than 19	1	21
older than 19	2	13
older than 19	3	8
older than 19	4	7
older than 19	5	4
younger than 18	1	12
younger than 18	2	8
younger than 18	3	5
younger than 18	4	7
younger than 18	5	3

# Two-way ANOVA Model

$$Y_{ijr} = \mu + \alpha_i + \beta_j + (\alpha\beta)_{ij} + \varepsilon_{ijr}$$

$\alpha_i$  : main effect of age group;  $i = 1, 2, 3$

$\beta_j$ : main effect of hours of playing;  $j = 1, 2, 3, 4, 5$

$(\alpha\beta)_{ij}$ : interaction effect

# Hypotheses:

$H_0$  : There is no significant interaction between age groups and hours spent playing for BPAQ score

$\times_0: \times \times_{ij} = 0$  where i (age\_group) = 1,2,3 and j(hour) = 1,2,3,4,5

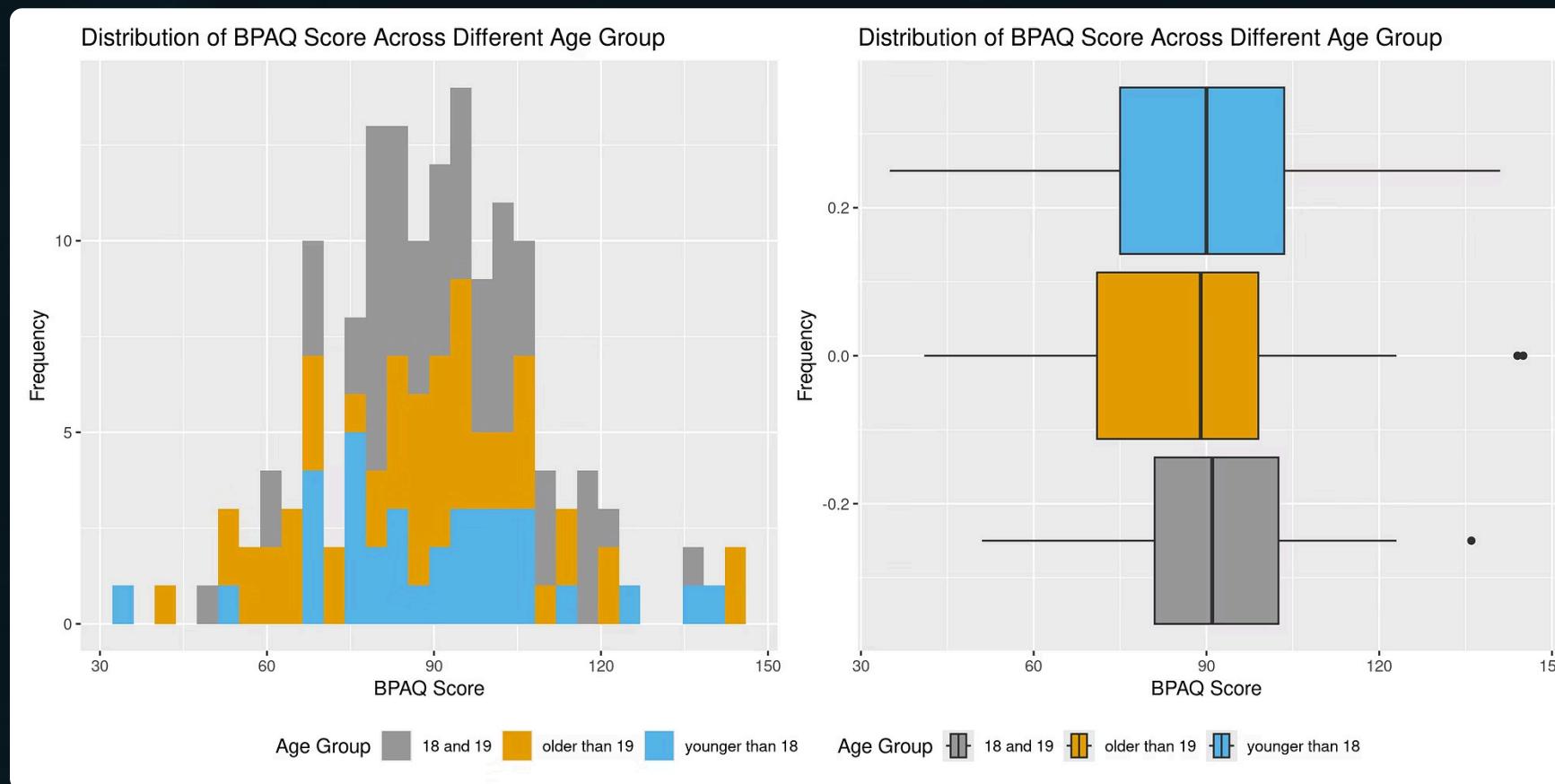
$H_{-1}$  : There is a significant interaction between age groups and hours spent playing for BPAQ score

$H_{-1}: \times \times_{ij} \neq 0$

# Distributions

## Aggression Score Distribution

- Approximately normal

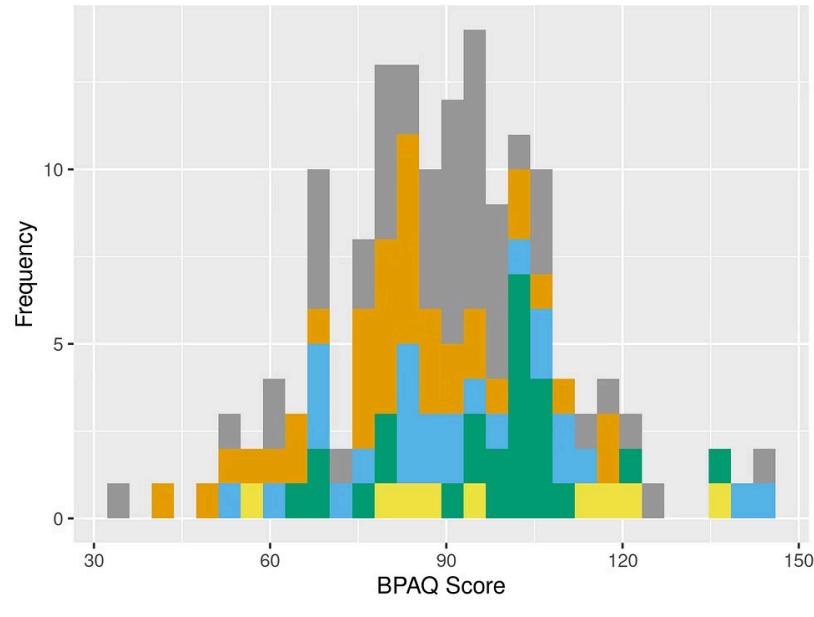


# Distributions

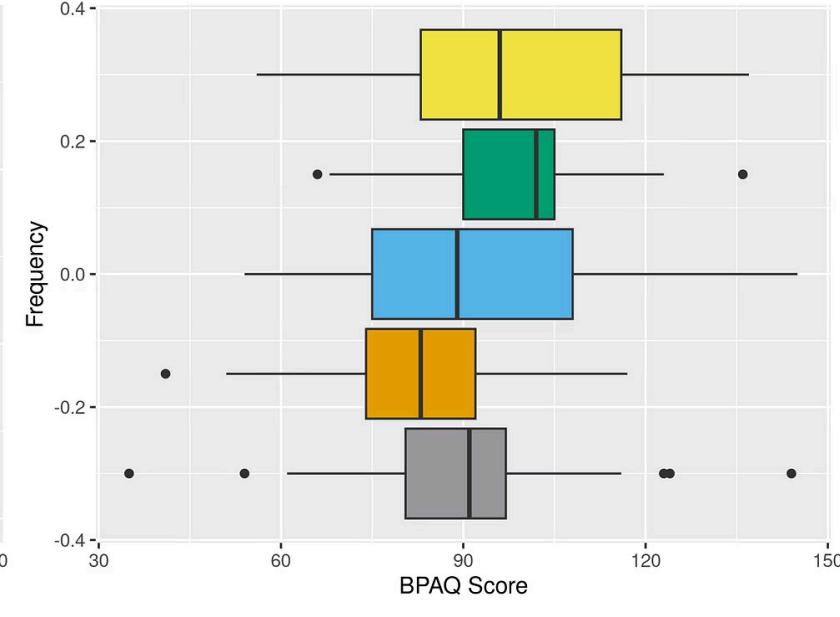
## Among Hours of Playing

- The median of BPAQ score is different among hours of playing

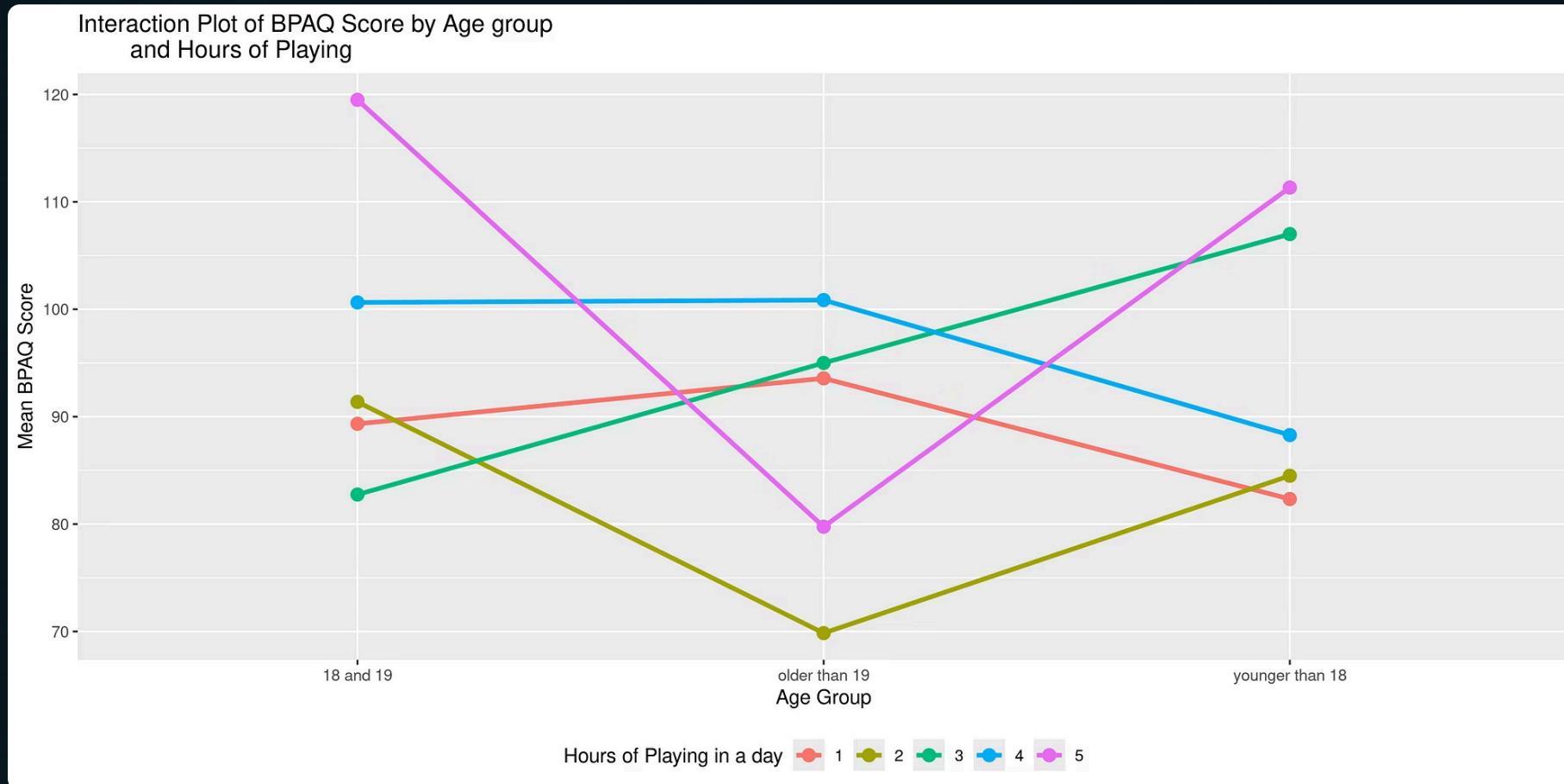
Distribution of BPAQ Score Across Different Hours of Playing



Distribution of BPAQ Score Across Different Hours of Playing



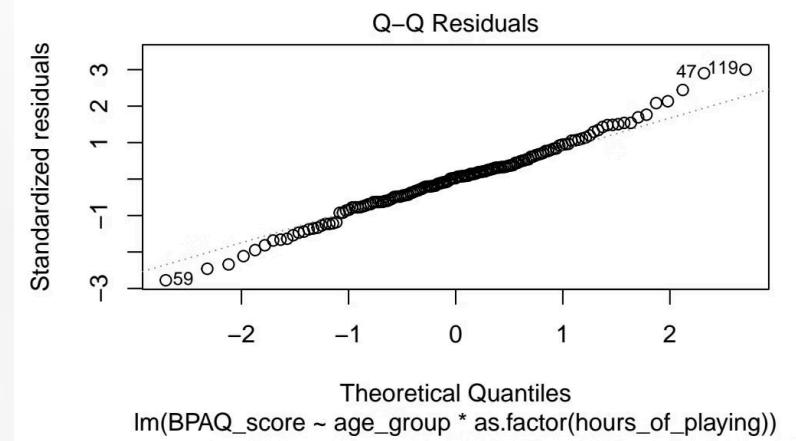
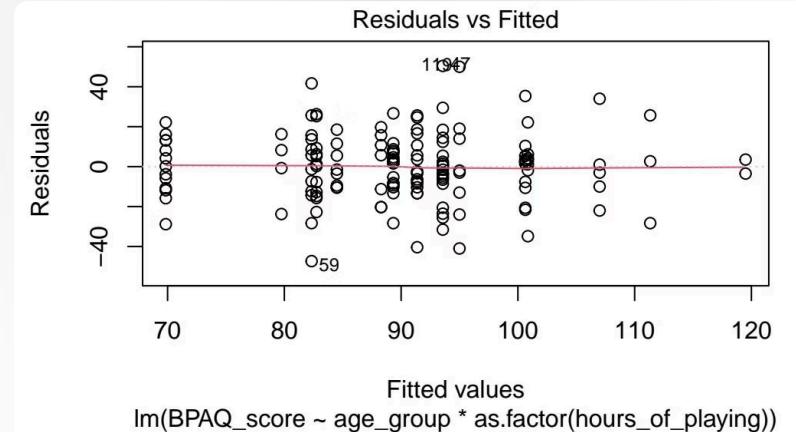
# Interaction Plot



# Checking Assumptions

Both assumptions are satisfied

- Levene's Test: F-value = 0.87, p-value = 0.5923
- Shapiro-Wilk Test: Statistic = 0.9897, p-value = 0.3568



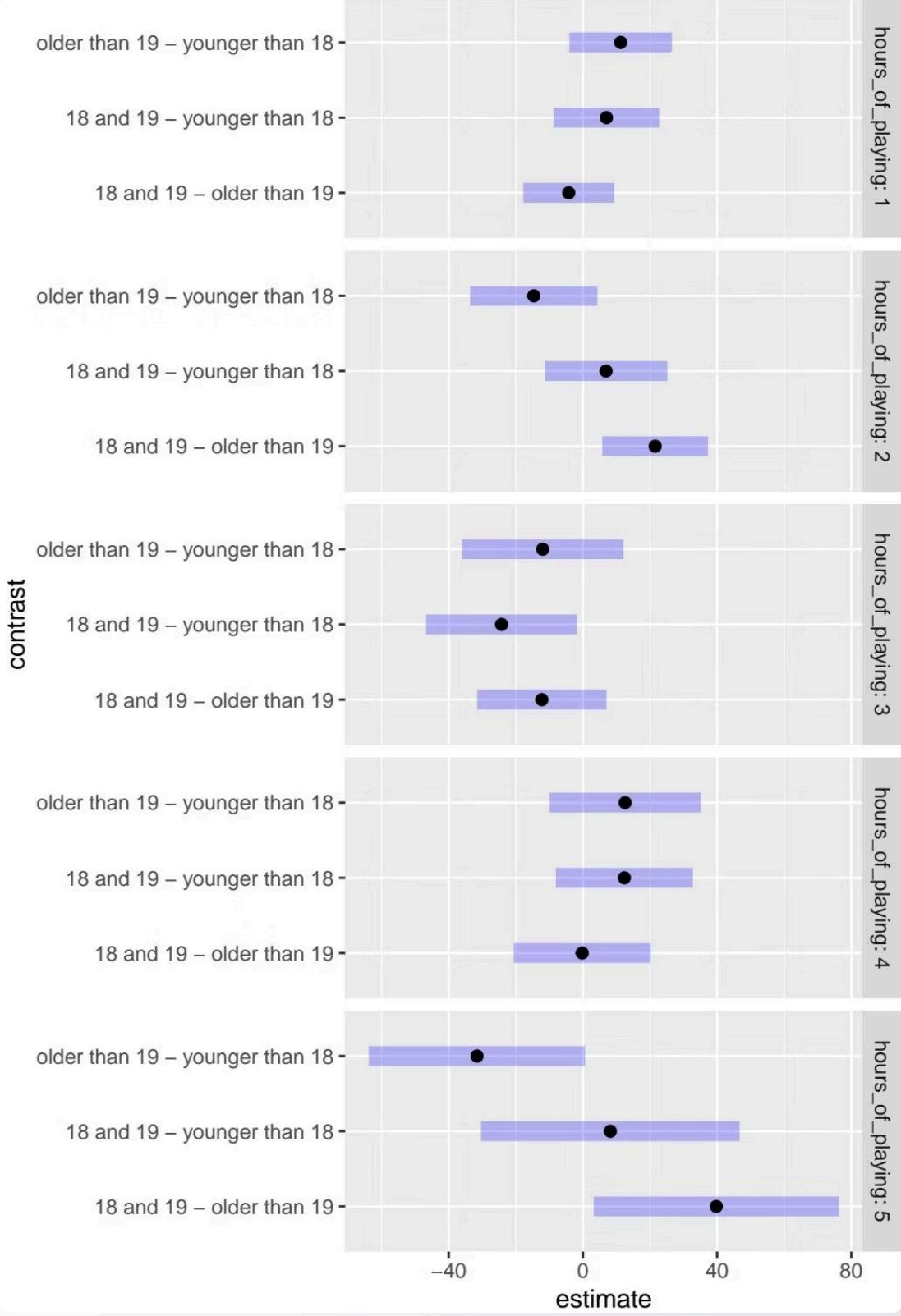
# Conclusions

Table 1: Type II ANOVA Table

	Sum Sq	Df	F value	Pr(>F)
Age Group	430.1952	2	0.67812	0.50933
Hours of Playing	4339.0619	4	3.41983	0.01073
Interaction (Age × Hours)	9683.8620	8	3.81616	0.00046
Residuals	41870.2497	132	NA	NA

- Interaction between age group and hours played significant.

# Post-Hoc Analysis



## Pairwise Comparisons

1

Play < 1 hour and > 3 hours:  
There is no difference in  
*BPAQ score* among age  
group.

2

Play > 1 hours:  
The age 18 ~ 19 have higher  
BPAQ score than the the age  
older than 19.

3

Play > 2 hours:  
The younger than 18 have  
higher BPAQ score than age  
18 ~ 19.

4

Play > 5 hours:  
The age 18 ~ 19 have higher  
BPAQ score than the the age  
older than 19.

# Limitations & Implications

- Self-report bias
- Gender Unbalanced
- Unbalanced Data
- Confounding variables
- Specific interventions
- 2-5 hours more harmful for teens

# Reference

- Dataset: <https://www.kaggle.com/datasets/muhammadshamoeel/effects-of-video-games-on-aggression-msdos-csv/data>
- BPAQ Questionnaire: <https://www.carepatron.com/files/buss-perry-aggression-questionnaires.pdf>
- Wikipedia: [https://en.wikipedia.org/wiki/Buss%20%93Perry\\_Aggression\\_Questionnaire](https://en.wikipedia.org/wiki/Buss%20%93Perry_Aggression_Questionnaire)
- Gamma. (n.d.). *Gamma – Create beautiful presentations in minutes*. Retrieved May 4, 2025, from <https://gamma.app/>