APA Style

Focused on statistics

For EDUC/PSY 6600

American Psychological Association (APA) Format

Now using the 6th edition

Used for:

- Theses
- Dissertations
- Paper/Journal Articles
- Presentations/Posters
- Homework for this course (most importantly!)

APA Format: numbers

- If number < 10 then write it out (“four” instead of 4)
- Use zero “0” before decimal (0.25 instead of .25)
- Do not report any decimal places if you are reporting something that can only be a whole number (n = 5 not n = 5.0)
- Report exact p-values (unless less than .001 then report p < .001)
- No leading zero on p-values (p = .006 not p = 0.006)

For numbers...	Round to...	SPSS	Report
Greater than 100	Whole number	1034.963	1035
10 - 100	1 decimal place	11.4378	11.4
0.10 - 10	2 decimal places	4.3682	4.37
0.001 - 0.10	3 decimal places	0.0352	0.035
Less than 0.001	As many digits as needed for non-zero	0.00038	0.0004

APA format: Abbreviations

Abbreviations using Latin letters, such as mean (*M*) and standard deviation (*SD*), should be italicised, while abbreviations using Greek letters, such as partial eta-squared (η_p^2), should not be italicised and can be written out in full if you cannot use Greek letters. There should be a space before and after equal signs. The abbreviations should only be used inside of parentheses; spell out the names otherwise.

Inferential statistics should generally be reported in the style of:
"*statistic*(degrees of freedom) = value, *p* = value, *effect size statistic* = value"

Statistic	Example
Mean and standard deviation	$M = 3.45$, $SD = 1.21$
Mann-Whitney	$U = 67.5$, $p = .034$, $r = .38$
Wilcoxon signed-ranks	$Z = 4.21$, $p < .001$
Sign test	$Z = 3.47$, $p = .001$
t-test	$t(19) = 2.45$, $p = .031$, $d = 0.54$
ANOVA	$F(2, 1279) = 6.15$, $p = .002$, $\eta_p^2 = 0.010$
Pearson's correlation	$r(1282) = .13$, $p < .001$

APA format: analysis

- Referencing analysis method?
  - Common: no
  - Rare or new: yes
- Descriptive statistics:
  - Abbreviations (spell out if not followed by stats)
    - OKAY: …scores were higher for males (M = 5, SD = 6)…
    - NOT: …the M was higher for males…
- Inferential statistics :
  - Distributions, df, N (sometimes), tests statistics, p-values, effect size, …
  - t(32) = 4.75, p < 0.05, Cohen’s d = 0.87

APA format: Analysis -examples

Statistic	Purpose	APA Style	Description
Descriptive Statistics			
Mean	To provide an estimate of the population from which the sample was selected.	*M* = _____	Indicates the center point of the distribution and serves as the reference point for nearly all other statistics.
Standard Deviation	To provide an estimate of the amount of variability/dispersion in the distribution of population scores.	*SD* = _____	Indicates the variability of scores around their respective mean. Zero indicates no variability.

Descriptive Statistics: The purpose of the descriptive statistics is to provide the reader with an idea about the basic elements of the group(s) being studied. Note that this also forms the basis of the in-text presentation of descriptive statistics for the inferential analyses below.

On the quiz, the nine students had a mean score of 7.00 (*SD* = 1.23). Scores of 6.00, 7.00, and 8.00 represented the 25th, 50th, and 75th percentiles, respectively.

APA format: Analysis -examples

Means and standard deviations should be given either in the text or in a table, but not both.

Descriptive Statistics

	N	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
age	2351	25.480	.1638	7.9445	1.869	.050	3.930	.101
Valid N (listwise)	2351							

- The average age of participants was 25.5 years (*SD* = 7.94).
- The age of participants ranged from 18 to 70 years (*M* = 25.5, *SD* = 7.94). Age was non-normally distributed, with skewness of 1.87 (*SE* = 0.05) and kurtosis of 3.93 (*SE* = 0.10)
- Participants were 98 men and 132 women aged 17 to 25 years (men: *M* = 19.2, *SD* = 2.32; women: *M* = 19.6, *SD* = 2.54).

APA format: results

- Results may presented as: text, tables, or figures
- Rules of thumb:
  - TEXT if < 4 numbers/statistics
  - TABLE if 4 to 20 numbers/statistics
  - FIGURE if 20+ numbers/statistics
- **Pick the method that best communicates the results/message**
- Symbols & abbreviations
  - N vs. n
  - Italicized
  - *See pages 141-144 of APA publication manual (reading "AR2" p 20-23)*

APA format: results - Examples

Significance Tests			
One Sample t Test	To compare a single sample mean to a population mean when the population standard deviation is not known	$t(df) =$ ____, $p =$ ____.	A small probability is obtained when the statistic is sufficiently large, indicating that the two means significantly differ from each other.
Independent Samples t Test	To compare two sample means when the samples are from a single-factor between-subjects design.		
Related Samples t Test	To compare two sample means when the samples are from a single-factor within-subjects design.		

Independent Samples t Test: For this analysis, the emphasis is on comparing the means from two groups. Here again the summary and the inferential statistics focus on the difference.

An independent sample *t* test showed that the difference in quiz scores between the control group ($n = 4$, $M = 6.00$, $SD = 0.82$) and the experimental group ($n = 4$, $M = 8.00$, $SD = .82$) were statistically significant, $t(6) = -3.46$, $p = .013$, 95% CI [-3.41, -0.59], d = -2.45.

APA format: results - Examples

Report degrees of freedom in parentheses. The statistics *t*, *p* and Cohen's *d* should be reported and italicised.

One-sample t-test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
female	31	4.503	.6957	.1250
male	31	3.4581	.73179	.13143

One-Sample Test

	Test Value = 3.5					
					95% CI	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
female	8.029	30	.000	1.0032	.748	1.258
male	-.319	30	.752	-.04194	-.3104	.2265

- One-sample t-test indicated that femininity preferences were greater than the chance level of 3.5 for female faces ($M = 4.50$, $SD = 0.70$), $t(30) = 8.01$, $p < .001$, $d = 1.44$, but not for male faces ($M = 3.46$, $SD = 0.73$), $t(30) = -0.32$, $p = .75$, $d = 0.057$.
- The number of masculine faces chosen out of 20 possible was compared to the chance value of 10 using a one-sample t-test. Masculine faces were chosen more often than chance, $t(76) = 4.35$, $p = .004$, $d = 0.35$.

APA format: Tables

- **Must be able to stand on its own**
- Number tables sequentially in text (Table 1, Table 2, ect.)
- Only 3-4 tables per manuscript (different for theses/disertations)
- Results Table types
  - Descriptive statistics for N or n (or both)
  - Inferential statistics for ANOVA, MLR, ect.
  - Both descriptive AND inferential info in the same table -> USE HEADINGS to organize
- Data not applicable: leave blank
- Data not obtained/not computable: use a dash “-”

APA format: Tables

Title (top)

- Descriptive
- First Letter of Each Word in CAPS
- No period at the end
- Appears on row below
- “Table 1”
- Title may be italicized

Caption and Notes (bottom)

General Note

- Explains/qualifies info in table, symbols, abbreviations
- No explanation for basic stats (M, SD, no. N, n)

Specific Note

- Begin on a new line, flush left
- Define superscripts [a, b, c]

Probability note

- Begin on a new line, flush left
- * p < 0.05, ** p < 0.01, *** p < 0.001, **** p < 0.0001

APA format: Tables - Examples

Descriptive Statistics with Confidence Intervals: This table is useful for removing the basic descriptive statistics (the means and standard deviations) and the confidence intervals from the text.

	Group or Condition 1		Group or Condition 2	
Variable	*M* (*SD*)	95% CI	*M* (*SD*)	95% CI
Outcome Variable 1	5.67 (.58)	[4.23, 7.10]	7.33 (.58)	[5.90, 8.77]
Outcome Variable 2	5.67 (.58)	[4.23, 7.10]	7.67 (1.15)	[4.80, 10.54]
Outcome Variable 3	6.33 (.58)	[4.90, 7.77]	8.67 (.58)	[7.23, 10.10]

APA format: Tables - Examples

Table 1. Basic characteristics in 26 subjects (mean values ± SD)

Variable	Endurance athletes (n = 9)	Power and fast-power athletes (n = 9)	Controls (n = 8)
Age (years)	23.9 ± 3.2	22.3 ± 2.6	25.6 ± 2.2
Height (cm)	178.5 ± 6.78	175.6 ± 5.59	177.3 ± 7.2
Body weight (kg)	70.34 ± 6.63	70.15 ± 8.62	73.2 ± 7.28
BSA (m^2)	1.88 ± 0.12	1.84 ± 0.13	1.90 ± 0.20
VO_{2max} ($ml.kg^{-1}.min^{-1}$)	67.05 ± 4.58**	56.65 ± 5.15	No data
Resting heart rate (min^{-1})	52.1 ± 5.8*	57.6 ± 8.2**	64.3 ± 8.1**

Asterisks between the numbers show the degree of difference between the given groups; asterisks after the controls' values show the degree of difference between endurance athletes and controls (*$p < 0.05$; **$p < 0.005$; ***$p < 0.001$); BSA = body surface area

APA format: Figures

- Includes: charts, graphs, photos, drawings, images, etc.
- Must stand on its own: simple BUT illustrates a point
- Number tables sequentially in text (Figure1, Figure2, etc.)
- Caption
  - Appears **below** figure, immediately after “Figure 1” on same row
  - NOT a title, NOT capitalized
    - Brief, but descriptive explanation of figure
    - After 1st sentence, add clarifying info
- Legend
  - Same font style and size as in figure

APA format: Figures - Examples

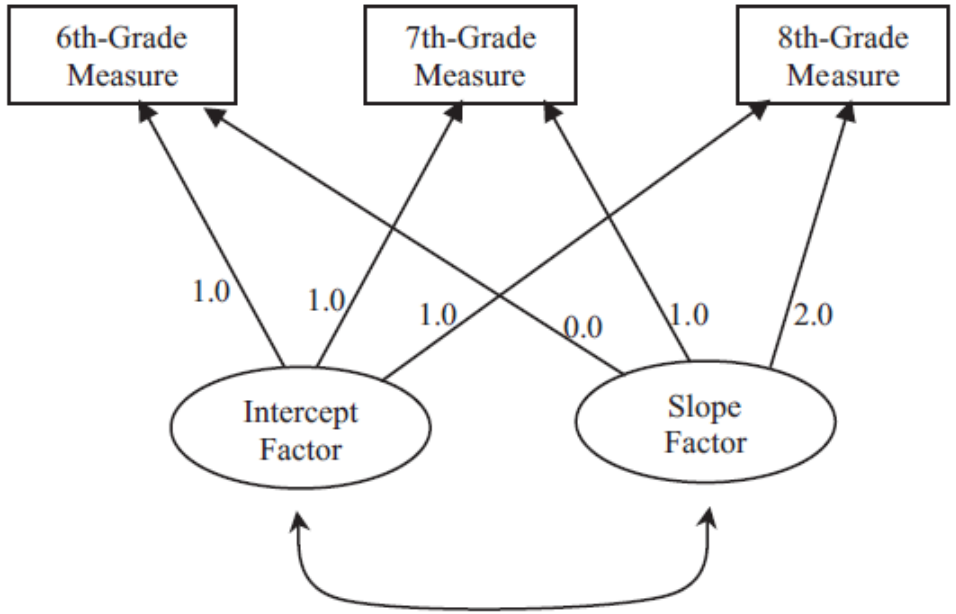

Figure 1. Basic latent growth model with three waves of measurement.

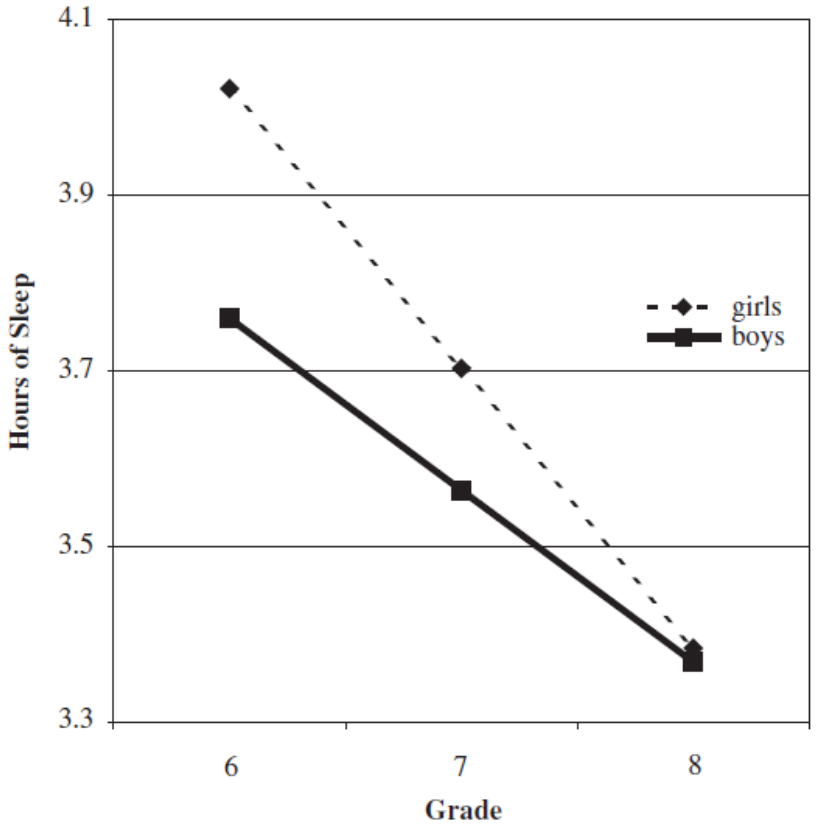

Figure 2. Hours of sleep by sex of adolescent. Girls: sixth grade, $M = 4.02$, seventh grade, $M = 3.70$, eighth grade, $M = 3.38$; Boys: sixth grade, $M = 3.76$, seventh grade, $M = 3.56$, eighth grade, $M = 3.37$. 3 = 7 hr of sleep; 4 = 8 hr of sleep.