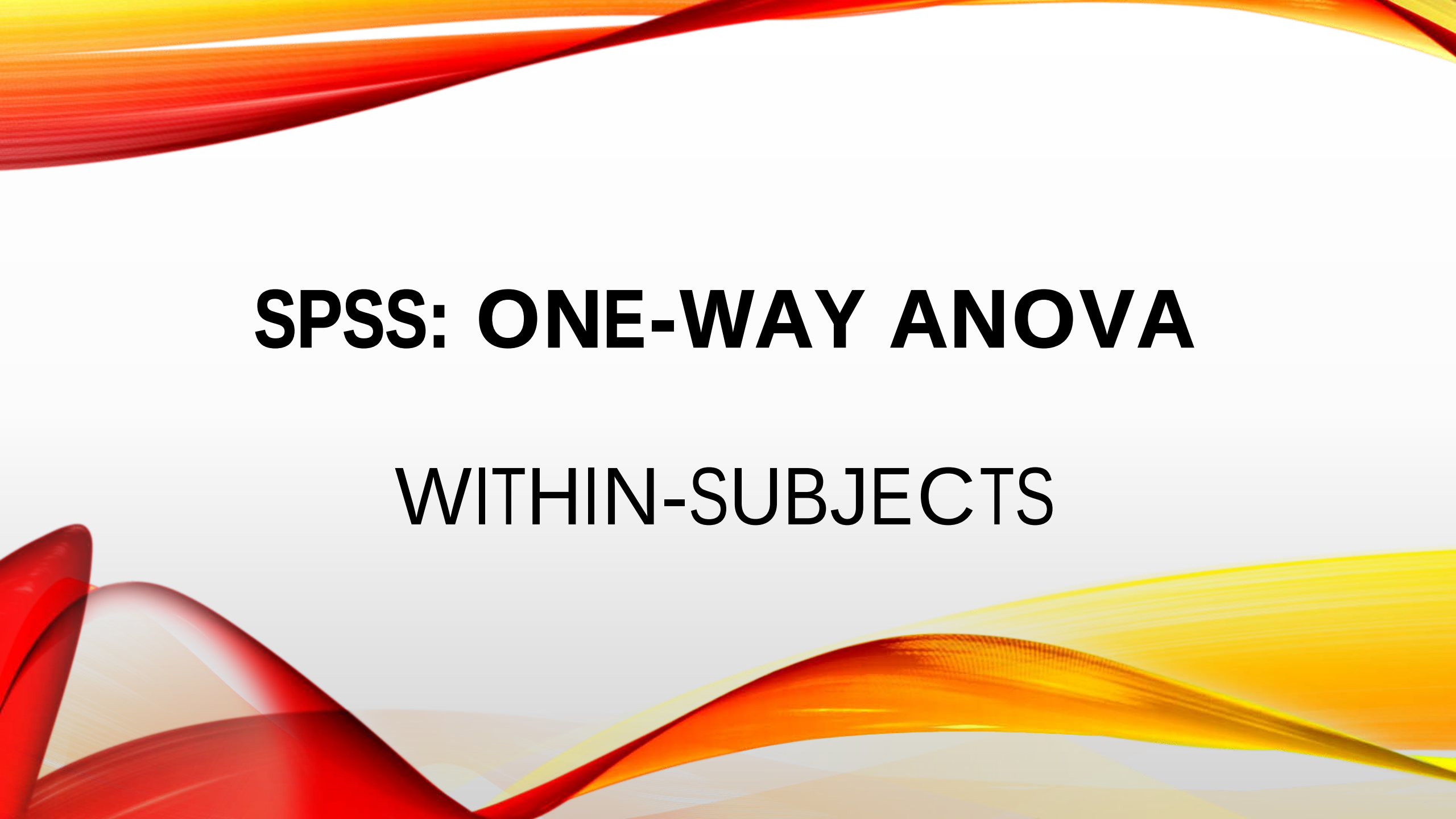




SPSS: ONE-WAY ANOVA

WITHIN-SUBJECTS



ONE-WAY ANOVA

- Within-subjects design = Repeated measures ANOVA
- Compares the mean scores on some continuous variable for ***the same groups of participants on three or more occasions / across three or more conditions***
 - *One group of participants; three+ levels/conditions*



THINGS TO REMEMBER

- One-way ANOVA is used when you have **three or more levels** to an independent variable.
- Parametric test – relies on a number of assumptions relating to data
- ANOVA tests the probability that the sets of scores (for your three+ conditions) came from the same population.
 - A significant finding ($p < .05$) allows us to determine that they did not come from the same population, and are significantly different

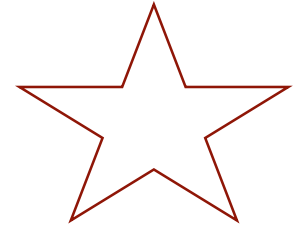
ASSUMPTIONS AND REQUIREMENTS FOR DATA

1. The DV should be measured on a continuous scale – interval or ratio
2. Random sampling should be employed where possible
3. Independent observations:
 - a) Independent and identically distributed variables
4. Normal distribution of scores on the DV
5. No significant outliers
6. Sphericity assumed
 - a) Assumption that the variance of the population scores across all three conditions is equal
 - b) Mauchly's Test of Sphericity ($p > .05$)!

STUDY EXAMPLE

- Exploring the effect of traffic light colours on reaction times in drivers

- NOTE: we need...



- One set of participants that provides *three or more* sets of scores
 - One for Red, one for Amber, one for Green
- You still have **one categorical IV** (colour of traffic light: red / amber / green) and **one continuous DV** (reaction time measured for all conditions)

RESULTS

$F(df1, df2) = F\text{-value}, p < / > .05, np^2 = \underline{\hspace{1cm}}$

$F(2, 18) = .4.73, p < .05, np^2 = .34$

$F(2, 18) = .4.73, p = .02, np^2 = .34$

Significant
main effect of
colour

INTERPRETING RESULTS

- A one-way repeated measures ANOVA was conducted to assess differences in reaction times (in milliseconds) to traffic lights; red, amber and green. Results show there was a significant main effect of colour of traffic light on participants reaction times; $F(2, 18) = 4.73$, $p = .02$, $\eta^2 = .34$



PAIRWISE COMPARISONS

If the main effect of your IV is significant, the information in the pairwise comparisons table will allow us to determine where the significant difference lies across the three groups. If needed, you should report these with the associated mean scores (where necessary) and Sig. values.

INTERPRETING RESULTS

- A one-way repeated measures ANOVA was conducted to assess differences in reaction times (in milliseconds) to traffic lights; red, amber and green. Results show there was a significant main effect of colour of traffic light on participants reaction times; $F(2, 18) = 4.73$, $p = .02$. **Pairwise comparisons across the three conditions show that there was a significant difference in reaction times to the red light ($M = 26.50$) and the amber light ($M = 32.60$; $p = .02$), but no significant difference between reaction times to the red and green lights ($p > .05$), or amber and green ($p > .05$).**