

# ☆ STATS 2: GRAPH SHAPES CHEAT SHEET ☆

1. FACTORIAL ANOVA: INTERACTION GRAPHS	
SHAPE	MEANING
<b>PARALLEL LINES</b> 	<b>NO INTERACTION</b> • Any difference between lines = main effect
<b>CROSSING LINES</b> 	<b>INTERACTION</b> • Effect of one IV depends on the other IV
<b>DIVERGING LINES</b> 	<b>INTERACTION</b> • Difference between lines changes across levels
<b>CONVERGING LINES</b> 	<b>INTERACTION</b> • Difference between lines changes across levels

**RULE:** ONLY PARALLEL LINES = NO INTERACTION  
 ANY NON-PARALLEL LINES = INTERACTION

2. RESIDUAL PLOTS (FROM REGRESSION)	
SHAPE	MEANING
<b>GOOD (HOMOSCEDASTIC)</b> 	Random cloud around 0 ✓ Assumption met
<b>FUNNEL SHAPE</b> 	Spread increases (or decreases) ✗ Heteroscedasticity (assumption violated)
<b>CURVED PATTERN</b> 	Curvature in residuals ✗ Non-linearity (assumption violated)
<b>OUTLIER(S)</b> 	Possible outlier(s) worth checking

3. CORRELATION SCATTERPLOTS	
SHAPE	MEANING
<b>POSITIVE LINEAR</b> 	Positive linear relationship → Pearson OK
<b>NEGATIVE LINEAR</b> 	Negative linear relationship → Pearson OK
<b>MONOTONIC CURVED</b> 	Monotonic relationship (curved) → Spearman OK → Pearson may not be ideal
<b>U-SHAPE / INVERTED U</b> 	Non-monotonic relationship → Pearson ✗ → Spearman ✗

4. DISTRIBUTION SHAPES	
SHAPE	MEANING
<b>NORMAL (BELL SHAPE)</b> 	Approximately normal ✓ Parametric tests OK
<b>RIGHT SKEWED</b> 	Long tail on the right → Consider transforming or non-parametric test
<b>LEFT SKEWED</b> 	Long tail on the left → Consider transforming or non-parametric test
<b>BIMODAL</b> 	Two peaks → Something unusual in the data

5. REPEATED MEASURES (PROFILES OVER TIME/CONDITIONS)	
SHAPE	MEANING
<b>PARALLEL PROFILES</b> 	<b>No interaction</b> • Differences between people/groups are consistent over time
<b>NON-PARALLEL PROFILES</b> 	<b>Interaction</b> • Change over time depends on group/condition

**QUICK REMINDERS**

- **TABLES** tell you **IF** something is significant.
- **GRAPHS** tell you **HOW** the effects look.

**OUTPUT RECOGNITION (STATA)**

- rvfplot → Residual plot
- marginsplot → Interaction / profile plot
- histogram / kdensity → Distribution
- scatter → Correlation
- lfit / qfit line → Line of best fit

**EXAM TIP**

If you're not sure what to conclude, **LOOK** at the graph shape + **CHECK** the table. Don't rely on one or the other!

GRAPHS SUGGEST. TABLES CONFIRM. ♥