Simple Main Effect for Two-Way ANOVA (Independent Design)

Notes: The author accepts no responsibility for the topicality, correctness, completeness or quality of the information provided.

When do you need Simple (Main) Effect Tests?

After you get a significant interaction effect.

Experiment:

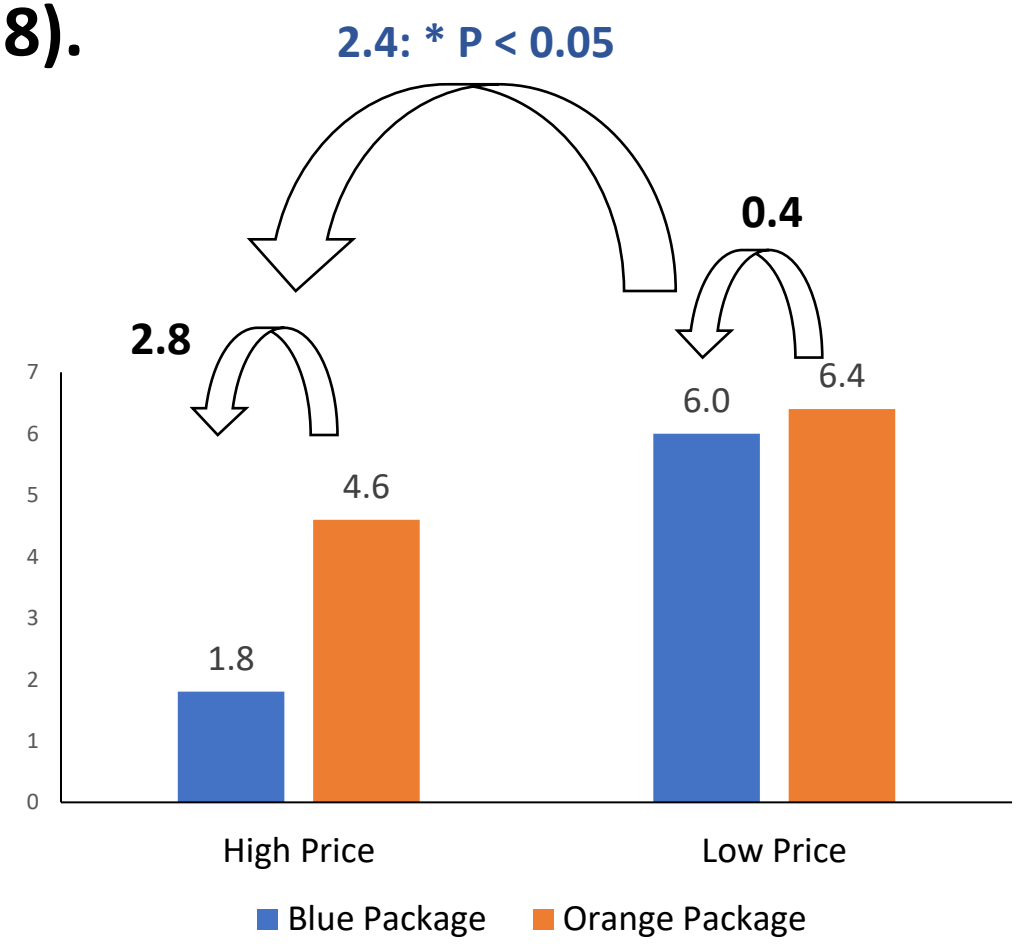
- IV: Price (High vs. Low) × Package Color (Orange vs. Blue)
- DV: Purchase Intention

	High Price	Low Price
Orange Color	$M_{\text{Intention 1}}$	$M_{\text{Intention 2}}$
Blue Color	$M_{\text{Intention 3}}$	$M_{\text{Intention 4}}$

A significant interaction effect?

A significant intention effect suggests that the difference in the low price (6.4 – 6.0 =0.4) is significantly different from the difference in the high price (4.6 – 1.8 = 2.8).

	High Price	Low Price
Orange Package	$M_{\text{Intention 1}} = 4.6$	$M_{\text{Intention 2}} = 6.4$
Blue Package	$M_{\text{Intention 3}} = 1.8$	$M_{\text{Intention 4}} = 6.0$



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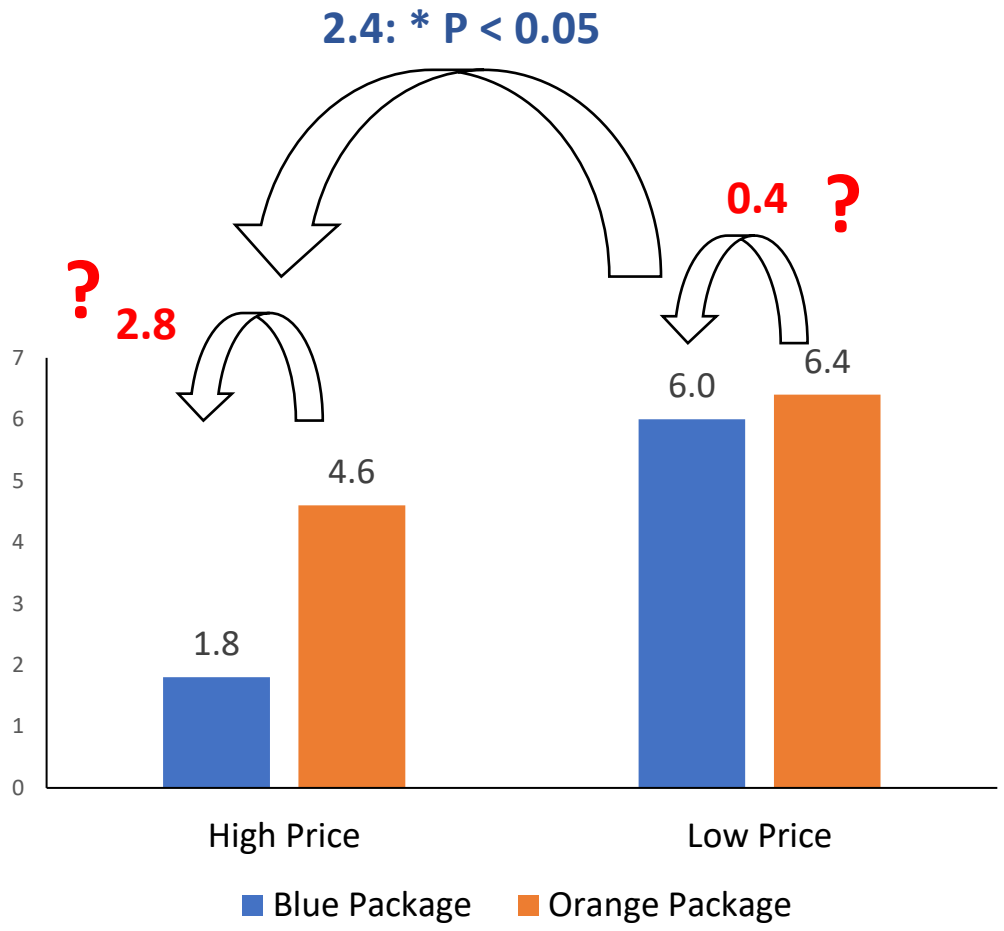
So, what is simple main effect?

Simple Main Effects tests if the effect of color on purchase intention is significant at each level of price.



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SPSS Syntax for Significant interaction effect

```
DATASET ACTIVATE DataSet1.
UNIANOVA Purchase_intention BY Prices Colors
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /EMMEANS=TABLES(Prices*Colors) compare(Colors)
  /PRINT=DESCRIPTIVE
  /CRITERIA=ALPHA(.05)
  /DESIGN=Prices Colors Prices*Colors.
```

Significant Interaction Effect

Tests of Between-Subjects Effects

Dependent Variable: Purchase_intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	65.000[a]	3	21.667	30.952	.000
Intercept	441.800	1	441.800	631.143	.000
Prices	45.000	1	45.000	64.286	.000
Colors	12.800	1	12.800	18.286	.001
Prices * Colors	7.200	1	7.200	10.286	.005
Error	11.200	16	.700		
Total	518.000	20			
Corrected Total	76.200	19			

a. R Squared = .853 (Adjusted R Squared = .825)

Simple Main Effects

Prices * Colors

Estimates

Dependent Variable: Purchase_intention

Prices	Colors	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	.00	6.000	.374	5.207	6.793
	1.00	6.400	.374	5.607	7.193
1.00	.00	1.800	.374	1.007	2.593
	1.00	4.600	.374	3.807	5.393

Pairwise Comparisons

Dependent Variable: Purchase_intention

Prices	(I) Colors	(J) Colors	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
						Lower Bound	Upper Bound
.00	.00	1.00	-.400	.529	.461	-1.522	.722
	1.00	.00	.400	.529	.461	-.722	1.522
1.00	.00	1.00	-2.800*	.529	.000	-3.922	-1.678
	1.00	.00	2.800*	.529	.000	1.678	3.922

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Univariate Tests

Dependent Variable: Purchase_intention

Prices		Sum of Squares	df	Mean Square	F	Sig.
.00	Contrast	.400	1	.400	.571	.461
	Error	11.200	16	.700		
1.00	Contrast	19.600	1	19.600	28.000	.000
	Error	11.200	16	.700		

Each F tests the simple effects of Colors within each level combination of the other effects shown. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

Report:

- **The Intention effect of Price (High vs. Low) × Package Color (Orange vs. Blue) was significant, F(1, 16) = 10.29, p = 0.005.**
- **Further, we tested the simple main effects, and found that, when the price was low, the simple main effect of color on purchase intention (M = 6.0 vs. 6.4) was not significant (F(1, 16) = 0.57, p =0.46). When the price was high, the simple main effect of color on purchase intention (M = 1.8 vs. 4.6) was significant (F(1, 16) = 28, p < 0.05).**