Conjoint Significance Testing

Tutorial

Time: 10 minutes
Skill level: Medium
Editions: Professional

Learning objective(s)

⇒ Interpreting tests of significance for conjoint questions

Illustrative problem

Data has been collected from a choice-based conjoint study. Significance testing is needed to check that key conclusions are statistically significant.

Activities

1. **Open** `C:\Program Files\Q\Examples\Eggs.Q`
2. Select **Choice-based Conjoint** in the blue drop-down menu. This is a conjoint question. Q automatically estimates the appropriate basic conjoint model (in this case, a *multinomial logit model*).

   The color of the fonts in the table indicates the results of Q's automated *tests of statistical significance*. We can see that the **Feed** attribute level of **Fed on grain and fish (high in Omega)** is significant but the **Fed only on vegetables** attribute level is not. The significance testing has been conducted by testing each coefficient against a null hypothesis that the true coefficient is 0. Thus, we can conclude that claiming an egg is high in omega-3 is preferable to making no claim or making a vegetarian claim, but nothing to be gained from a vegetarian claim.

   By default, Q uses slightly different settings to those applied by most choice modeling analysis software. Q automatically adjusts for weighting (using the *effective sample size* adjustment); this impacts how Q computes *p*-values; where weights are applied, Q's computed *p*-values will usually be higher than those of other programs. Also, by default, Q determines which cells to show as being statistically significant by applying the *false discovery rate,* which is a *multiple comparisons* procedure adjusting for Type 1 error. This causes fewer things to be highlighted than would occur if a standard cut-off rule (e.g., 0.05) was applied. The settings for automatic tests of statistical significance are controlled by selecting **Edit | Project Options…** and **Statistical Assumptions…**.
3. Click on the cell next to **Fed only on vegetables** and press α. The results of a *t*-test will be displayed.
4. Press **OK.**
5. Right-click on the table and select **Statistics – Cells** and **p**; all coefficients' *p*-values will appear.
6. Right-click on the table and select **Statistics – Cells** and **p** to remove the *p*-values.
7. Select the three cells corresponding to the **Feed** attribute in the **Coefficient** column. This tests

whether the attribute is, as a whole, statistically significant. As the test shows `At the 0.05 level of significance, the null hypothesis is rejected`, we can conclude that by the common standards used in statistical testing, this attribute is statistically significant.

8. Select all the cell and press α. This tests whether all the coefficients are equal to zero.
9. Press **OK.**
10. Select **Gender** in the brown drop-down menu. Note that nothing is in blue or red anymore. This does not mean that none of the coefficients are significantly different to 0. Rather, it tells us that there are no statistically significant differences between genders on the coefficients.