### How to: Multinomial Logistic Regression

**Dependent variable with 3 or more Unordered categories**

Examples:
- Ex. 1 Dating=1, Engaged=2, Cohabitating=3
- Ex. 2 Black, White, Latino
- Ex. 3 Victim, Perpetrator, Neither

**PROC LOGISTIC DATA=one;**
**MODEL Y = X X X ;**
**LINK=GLOGIT;**
**RUN;**

<table>
<thead>
<tr>
<th>Model Fit Statistics</th>
<th>Degrees of Freedom</th>
<th>Chi-Square</th>
<th>Pr&gt;ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Null Hypothesis: BETAI=0</td>
<td>3</td>
<td>359.627</td>
<td>0.0070</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>4</td>
<td>325.143</td>
<td>0.00104</td>
</tr>
</tbody>
</table>

Analysis of Maximum Likelihood Estimates:
- Parameter: Gender(M)
- Effect: Point Est.
- Odds Ratio Estimates
- 95% Wald Confidence Limits

**SAS Default: Highest value category is the reference for model**

### How to: Ordered Logistic Regression

**Dependent variable with 3 or more Ordered categorical dependent variable**

Examples:
- Ex. 1 Negative=1, Mixed=2, Positive=3
- Ex. 2 High, Medium, Low
- Ex. 3 Self Rated Health: Poor, Fair, Good, Excellent

**PROC LOGISTIC DATA=one;**
**MODEL Y=X X X ;**
**RUN;**

<table>
<thead>
<tr>
<th>Model Fit Statistics</th>
<th>Degrees of Freedom</th>
<th>Chi-Square</th>
<th>Pr&gt;ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Null Hypothesis: BETAI=0</td>
<td>2</td>
<td>23.086</td>
<td>0.0070</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>10</td>
<td>20.287</td>
<td>0.0033</td>
</tr>
</tbody>
</table>

Analysis of Maximum Likelihood Estimates:
- Parameter: Drinking
- Effect: Point Est.
- Odds Ratio Estimates
- 95% Wald Confidence Limits

**SAS Default: Predicts the probability of being in lowest category**

### PROC HELP;

**User Guide: Tips worth Passing On**

- If you HAVE a choice between Ordered & Multinomial Logistic Regression ➔ Pick Ordered (The Interpretation is much simpler to read and hypothesis tests are more powerful)
- Have Fun!!!


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