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FINAL DAYS

Sale Ends
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How to: Multinomial Logistic Regression

Dependent variable with 3 or more *Unordered* categories

Examples

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

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

Model Fit Statistics
 Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr>ChiX ²
Likelihood Ratio	297.928	4	<.0001
Score	359.627	4	0.0070
Wald	325.143	4	0.0104

Analysis of Maximum Likelihood Estimates

Parameter	Rel.Type	DF	Estimate	Standard Error	Wald X ²	Pr>ChiSq
Gender(M)	1	1	0.3165	0.0930	11.59	0.0007

Odds Ratio Estimates

Effect	Point Est.	95% Wald Confidence Limits
Gender(M)	1.372	1.144 1.647

SAS Default: Highest value category is the reference for model

In this sample of college students, when controlling for age, **men are 37% more likely** than women to be in a **dating relationship** than they are to be in a cohabiting relationship

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;
```

Score Test for the Proportional Odds Assumption

Chi-Square	DF	Pr>ChiSq
26.0873	20	0.2875

Model Fit Statistics
 Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr>ChiX ²
Likelihood Ratio	26.3250	10	0.0033
Score	24.2294	10	0.0070
Wald	23.0886	10	0.0104

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald X ²	Pr>ChiSq
Drinkprob	1	1.7401	0.5868	8.792	0.0030

Odds Ratio Estimates

Effect	Point Est.	95% Wald Confidence Limits
Drinkprob	5.698	1.804 17.997

SAS Default: Predicts the probability of being in lowest category

In this sample, the odds of a person with a drinking problem having **negative social support** is nearly **6 times higher** than a person without a drinking problem

more reasons
to borrow
CODE

@ **THE SAS DEPOT**

for your stats toolkit

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!!!**

Allison, P. (2012) Logistic Regression Using SAS: Theory and Application. (2nd edition) SAS Publishing.