

Odds ratio interpretation for categorical distal outcomes using DCAT

The odds ratios are computed from the following probabilities given in the first column of the DCAT distal outcome output under the heading EQUALITY TESTS OF MEANS/PROBABILITIES ACROSS CLASSES:

(category J in class K/category 1 in class K)/(category J in the last class/category 1 in the last class)

This definition implies that the odds ratio is always 1 for the first category in each class and that the odds ratios are always 1 for all categories of the last class.

As an example, the odds ratio of 0.325 for category 2 of class 2 in Table 1 below is computed as

$(0.389/0.611)/(0.545/0.278) = 0.63666/1.960 = 0.3248$.

Table 1: EQUALITY TESTS OF MEANS/PROBABILITIES ACROSS CLASSES

CAT

	Prob	S.E.	Odds Ratio
Class 1			
Category 1	0.013	0.013	1.000
Category 2	0.000	0.000	0.000
Category 3	0.987	0.013	118.361
Class 2			
Category 1	0.611	0.049	1.000
Category 2	0.389	0.049	0.325
Category 3	0.000	0.000	0.000
Class 3			
Category 1	0.278	0.063	1.000
Category 2	0.545	0.075	1.000
Category 3	0.177	0.076	1.000

In some applications the probability is zero for category 1 in the last class which gives division by zero for all odds ratios. This gives ORs of zero. An example is seen in Table 2 below where no informative ORs are obtained.

Table 2: EQUALITY TESTS OF MEANS/PROBABILITIES ACROSS CLASSES

CAT (original)

	Prob	S.E.	Odds Ratio
Class 1			
Category 1	0.987	0.013	1.000
Category 2	0.000	0.000	0.000
Category 3	0.013	0.013	0.000
Class 2			
Category 1	0.177	0.076	1.000
Category 2	0.545	0.075	0.000
Category 3	0.278	0.063	0.000
Class 3			
Category 1	0.000	0.000	1.000
Category 2	0.389	0.049	1.000
Category 3	0.611	0.049	1.000

To avoid the zero ORs, the categories of the categorical distal outcome can be re-ordered using DEFINE as the negative of the original distal outcome. It is also desirable to not have a zero probability for any of the categories in the last class since again that would lead to division by zero. This can be avoided by re-ordering the classes using SVALUES to give starting values together with STARTS=0. The results in Table 1 are obtained by this re-ordering of the Table 2 categories and classes.