

Ordered Logistic Regression Examples of ordered logistic regression

- ▶ A marketing research firm wants to investigate what factors influence the size of soda (small, medium, large or extra large) that people order at a fast-food chain.
- ▶ These factors may include what type of sandwich is ordered (burger or chicken), whether or not fries are also ordered, and age of the consumer.
- ▶ While the outcome variable, size of soda, is obviously ordered, the difference between the various sizes is not consistent.
- ▶ The difference between small and medium is 10 ounces, between medium and large 8, and between large and extra large 12.

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- ▶ A researcher is interested in what factors influence medaling in Olympic swimming.
- ▶ Relevant predictors include at training hours, diet, age, and popularity of swimming in the athlete's home country.
- ▶ The researcher believes that the distance between gold and silver is larger than the distance between silver and bronze.

Ordered Logistic Regression

- ▶ A study looks at factors that influence the decision of whether to apply to graduate school.
- ▶ College juniors are asked if they are unlikely, somewhat likely, or very likely to apply to graduate school.
- ▶ Hence, our outcome variable has three categories. Data on parental educational status, whether the undergraduate institution is public or private, and current GPA is also collected.
- ▶ The researchers have reason to believe that the "distances" between these three points are not equal.
- ▶ For example, the "distance" between "*unlikely*" and "*somewhat likely*" may be shorter than the distance between "*somewhat likely*" and "*very likely*".

Ordered Logistic Regression Data Set - Graduate School Entry (ologit.csv)

- ▶ This hypothetical data set has a three level variable called **apply**, with levels "*unlikely*", "*somewhat likely*", and "*very likely*", coded 1, 2, and 3, respectively, that we will use as our outcome variable.

Ordered Logistic Regression Predictors:

- pared** , which is a 0/1 variable indicating whether at least one parent has a graduate degree;
- public** , which is a 0/1 variable where 1 indicates that the undergraduate institution is public and 0 private,
- gpa** , which is the student's grade point average.

	apply	pared	public	gpa
1	very likely	0	0	3.26
2	somewhat likely	1	0	3.21
3	unlikely	1	1	3.94
4	somewhat likely	0	0	2.81
5	somewhat likely	0	0	2.53
6	unlikely	0	1	2.59