**Chapter 6 Exercises: Solutions**

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| . xi: ocratio degree i.sex i.class sibs, link(logit)  i.sex \_Isex\_1-2 (naturally coded; \_Isex\_1 omitted)  i.class \_Iclass\_1-4 (naturally coded; \_Iclass\_1 omitted)  Continuation-ratio logit Estimates Number of obs = 4889  chi2(5) = 382.81  Prob > chi2 = 0.0000  Log Likelihood = -2483.448 Pseudo R2 = 0.0716  ------------------------------------------------------------------------------  degree | Coef. Std. Err. z P>|z| [95% Conf. Interval]  -------------+----------------------------------------------------------------  \_Isex\_2 | .0424736 .0702521 0.60 0.545 -.095218 .1801652  \_Iclass\_2 | .5993918 .1331321 4.50 0.000 .3384577 .860326  \_Iclass\_3 | 1.529331 .136248 11.22 0.000 1.26229 1.796373  \_Iclass\_4 | 1.938181 .2228056 8.70 0.000 1.50149 2.374872  sibs | -.1309609 .0126194 -10.38 0.000 -.1556945 -.1062274  ------------------------------------------------------------------------------  \_cut1 | -1.436116 .1443842 (Ancillary parameters)  \_cut2 | .9587389 .1446692  \_cut3 | -.557978 .1657415  \_cut4 | 1.583709 .1670717  ------------------------------------------------------------------------------  . xi: ocratio degree i.sex i.class sibs, link(logit) eform  i.sex \_Isex\_1-2 (naturally coded; \_Isex\_1 omitted)  i.class \_Iclass\_1-4 (naturally coded; \_Iclass\_1 omitted)  Continuation-ratio logit Estimates Number of obs = 4889  chi2(5) = 382.81  Prob > chi2 = 0.0000  Log Likelihood = -2483.448 Pseudo R2 = 0.0716  ------------------------------------------------------------------------------  degree | Odds ratio Std. Err. z P>|z| [95% Conf. Interval]  -------------+----------------------------------------------------------------  \_Isex\_2 | 1.043389 .0733002 0.60 0.545 .9091747 1.197415  \_Iclass\_2 | 1.821011 .242435 4.50 0.000 1.402782 2.363931  \_Iclass\_3 | 4.61509 .6287967 11.22 0.000 3.533505 6.027742  \_Iclass\_4 | 6.946105 1.547631 8.70 0.000 4.488372 10.74964  sibs | .877252 .0110704 -10.38 0.000 .8558206 .8992201  ------------------------------------------------------------------------------  \_cut1 | -1.436116 .1443842 (Ancillary parameters)  \_cut2 | .9587389 .1446692  \_cut3 | -.557978 .1657415  \_cut4 | 1.583709 .1670717  ------------------------------------------------------------------------------ |

2. The log likelihood ratio chi-square test statistic *LR* χ2(5) = 383.81, *p* < .001, which indicates that the model with all predictor variables provides a better fit than the null model with no independent variables.

3. For the sex predictor, logit coefficient = .042, the Wald *z* = .60, *p* = .528, and the 95% CI is [–.095, .180]; for the sibs predictor, logit coefficient = –.131, the Wald *z* = –10.38, *p* < .001, and the 95% CI is [–.156, –.106].

4.

* The predictor variable class is a categorical variable with four levels, which is coded with the xi prefix command in the analysis. ORs of three dummy variables of class are 1.821, 4.615, and 6.946. They indicate that being in the working, middle, and upper classes rather than in the lower class (i.e., the base category) is associated with the odds of having a higher degree versus having a particular degree.
* OR for sibs is .877, which indicates that with the increase of the number of brothers and sisters the odds of having a higher degree versus having a particular degree decrease.

5.The seqlogit syntax for the CR model is as follows. The output is omitted here.

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| seqlogit degree i.sex i.class sibs,tree (0: 1 2 3 4, 1: 2 3 4, 2: 3 4, 3:4)  xi: seqlogit degree i.sex i.class sibs,tree (0: 1 2 3 4, 1: 2 3 4, 2: 3 4, 3:4)  constraint define 1 [\_1\_2\_3\_4v0]\_Isex\_2=[\_2\_3\_4v1]\_Isex\_2  constraint define 2 [\_2\_3\_4v1]\_Isex\_2=[\_3\_4v2]\_Isex\_2  constraint define 3 [\_3\_4v2]\_Isex\_2=[\_4v3]\_Isex\_2  constraint define 4 [\_1\_2\_3\_4v0]\_Iclass\_2=[\_2\_3\_4v1]\_Iclass\_2  constraint define 5 [\_2\_3\_4v1]\_Iclass\_2=[\_3\_4v2]\_Iclass\_2  constraint define 6 [\_3\_4v2]\_Iclass\_2=[\_4v3]\_Iclass\_2  constraint define 7 [\_1\_2\_3\_4v0]\_Iclass\_3=[\_2\_3\_4v1]\_Iclass\_3  constraint define 8 [\_2\_3\_4v1]\_Iclass\_3=[\_3\_4v2]\_Iclass\_3  constraint define 9 [\_3\_4v2]\_Iclass\_3=[\_4v3]\_Iclass\_3  constraint define 10 [\_1\_2\_3\_4v0]\_Iclass\_4=[\_2\_3\_4v1]\_Iclass\_4  constraint define 11 [\_2\_3\_4v1]\_Iclass\_4=[\_3\_4v2]\_Iclass\_4  constraint define 12 [\_3\_4v2]\_Iclass\_4=[\_4v3]\_Iclass\_4  constraint define 13 [\_1\_2\_3\_4v0]sibs=[\_2\_3\_4v1]sibs  constraint define 14 [\_2\_3\_4v1]sibs=[\_3\_4v2]sibs  constraint define 15 [\_3\_4v2]sibs=[\_4v3]sibs  xi: seqlogit degree i.sex i.class sibs, ///  tree (0: 1 2 3 4, 1: 2 3 4, 2: 3 4, 3:4) constraints (1/15)  xi: seqlogit degree i.sex i.class sibs, ///  tree (0: 1 2 3 4, 1: 2 3 4, 2: 3 4, 3:4) constraints (1/15) or |