

Homework 3 - Question 2c

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Data Summary

	M	SD	Min	Max	NAs
id	1186	631.2	16	2355	0
lonely1	0.41	0.49	0	1	0
lonely2	0.28	0.45	0	1	0
incadq1	3.19	0.88	1	4	0
health1	2.9	0.7	0	4	0
age1	70.88	6.23	59	86	0
educ1	13.17	1.98	6	19	0

Ordinal Probit Model Fit

z test of coefficients:

Estimate Std. Error z value Pr(>|z|)

age1.c 0.0133 0.0105 1.27 0.202

educ1.c 0.0578 0.0323 1.79 0.073 .

health1.c 0.2384 0.0947 2.52 0.012 *

1 | 2 -1.5571 0.1132 -13.75 <2e-16

2 | 3 **-0.9202 0.0838 -10.98 <2e-16**

3 | 4 0.1717 0.0719 2.39 0.017 *

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Signif. codes: 0 '0.001' '0.01' '0.05' '.' 0.1 '1'

0.01503

Model Fit Indices

Table 2: Likelihood Ratio χ^2 , R^2 , & G^2

	Log Likelihood	df	χ^2	p
2	-360.6	3	10.84	0.01263

Table 3: Logistic Regression Coefficients (β) & Corresponding Confidence Intervals (CI)

		CI_{β}	
	β	2.5 %	97.5 %
age1.c	0.0133	-0.0072	0.0339
educ1.c	0.0578	-0.0053	0.1212
health1.c	0.2384	0.0527	0.424

Table 4: Logistic Regression Odds Ratios (Φ) & Corresponding Confidence Intervals (CI) ¹

		CI_{Φ}	
	Φ	2.5 %	97.5 %
age1.c	1.0134	0.9929	1.0345
educ1.c	1.0595	0.9947	1.1288
health1.c	1.2692	1.0542	1.528

Note:

¹ Confidence intervals are based on the logistic regression model's profiled log-likelihood function, rather than the standard errors

ORDINAL PROBIT REGRESSION SUMMARY. An ordinal probit regression model was tested to investigate whether age, education, and health at baseline predicted baseline reported income adequacy. The predictors collectively accounted for a significant amount of variance in the outcome, likelihood ratio $\chi^2(3) = 10.84, p < .05$. However, only baseline health independently predicted income adequacy at baseline, $b = .2384, SE = .0947, p < .05$; such that point increases in baseline health were each associated with approximately 23% increases in baseline income adequacy. Overall, the model accounted for 1.5% of the variance in reported baseline income adequacy (*McFadden's pseudo- R^2* = 0.015).

COMPARISON WITH CUMULATIVE LOGISTIC MODEL. The above described ordinal probit regression analysis findings only differ from the cumulative findings in terms of the magnitude of the coefficients and, somewhat in terms of total model's variance explained (i.e., *McFadden's pseudo- R^2* = 0.015 versus 0.013 in the logistic analysis).

Overall, however, the same conclusions made based on the cumulative logistic regression model can be made based on findings from the probit model analysis here.