**Binary Logistic Regression: GPA<2.0 versus Age, ACT\_ave, Gender, Have\_ACT**

Method

Link function Logit

Categorical predictor coding (1, 0)

Rows used 452

Response Information

Variable Value Count

GPA<2.0 1 89 (Event)

0 363

Total 452

Deviance Table

Source DF Adj Dev Adj Mean Chi-Square P-Value

Regression 4 28.712 7.1781 28.71 0.000

Age 1 9.473 9.4730 9.47 0.002

ACT\_ave 1 8.184 8.1835 8.18 0.004

Gender 1 3.468 3.4683 3.47 0.063

Have\_ACT 1 14.394 14.3937 14.39 0.000

Error 447 419.743 0.9390

Total 451 448.455

Model Summary

Deviance Deviance

R-Sq R-Sq(adj) AIC

6.40% 5.51% 429.74

Coefficients

Term Coef SE Coef VIF

Constant -1.121 0.592

Age -0.0537 0.0198 1.03

ACT\_ave -0.0895 0.0322 3.35

Gender

1 0.457 0.245 1.00

Have\_ACT

1 2.529 0.683 3.29

Odds Ratios for Continuous Predictors

Odds Ratio 95% CI

Age 0.9477 (0.9116, 0.9852)

ACT\_ave 0.9144 (0.8584, 0.9740)

Odds Ratios for Categorical Predictors

Level A Level B Odds Ratio 95% CI

Gender

1 0 1.5792 (0.9769, 2.5530)

Have\_ACT

1 0 12.5404 (3.2875, 47.8363)

Odds ratio for level A relative to level B

Regression Equation

P(1) = exp(Y')/(1 + exp(Y'))

Gender Have\_ACT

0 0 Y' = -1.121 - 0.05373 Age - 0.08948 ACT\_ave

0 1 Y' = 1.408 - 0.05373 Age - 0.08948 ACT\_ave

1 0 Y' = -0.6636 - 0.05373 Age - 0.08948 ACT\_ave

1 1 Y' = 1.865 - 0.05373 Age - 0.08948 ACT\_ave

Goodness-of-Fit Tests

Test DF Chi-Square P-Value

Deviance 447 419.74 0.818

Pearson 447 436.52 0.630

Hosmer-Lemeshow 8 21.56 0.006

Fits and Diagnostics for Unusual Observations

Observed

Obs Probability Fit Resid Std Resid

12 1.0000 0.1002 2.1451 2.16 R

56 1.0000 0.1364 1.9961 2.01 R

85 1.0000 0.1304 2.0184 2.02 R

95 1.0000 0.1257 2.0366 2.05 R

201 1.0000 0.0642 2.3431 2.35 R

255 1.0000 0.1193 2.0620 2.07 R

290 1.0000 0.0694 2.3101 2.34 R

319 1.0000 0.0611 2.3645 2.37 R

330 1.0000 0.1318 2.0132 2.03 R

355 0.0000 0.3120 -0.8649 -0.88 X

363 1.0000 0.1051 2.1225 2.14 R

402 1.0000 0.1130 2.0883 2.10 R

416 0.0000 0.1412 -0.5518 -0.56 X

444 0.0000 0.0943 -0.4452 -0.45 X

R Large residual

X Unusual X