

## Example Summary of Poisson Regression Analysis

We used Poisson regression to predict the number of female sexual partners during the last 3 months (SEXFNUM) from SEX of the respondent (0 = female, 1 = male) and age of first sexual intercourse (AGESEX, coded 0 = never had sex, 1 = 12 years or younger, 2 = 13/14, 3 = 15/16, 4 = 17/18, 5 = 19/20, 6 = 21–24, 7 = 25 or older, centered at 4 and renamed AGESEX\_c). Only cases that indicated they had ever had sex with a female partner were included in the analysis ( $N = 1,587$ ). Conservative data cleaning based on relatively extreme scores on Cook's D or Pearson residuals reduced the sample size to  $N = 1,558$  (a reduction of 29 cases).

An initial model with only the main effects of the variables showed a significant improvement in model fit over a model with only the intercept ( $\chi^2_{(2)} = 56.41, p < .001$ ). Addition of the interaction term improved the likelihood ratio test ( $\chi^2_{(3)} = 70.63, p < .001$ , a difference of  $\chi^2_{(1)} = 14.22, p < .001$ ). Based on the parameter estimates (Table 11.7), the regression line equation was used to predict estimated averages for males and females with both relatively early (AGESEX\_c = -2) and relatively late (AGESEX\_c = 2) initiation of sexual activity. Predicted estimates in Poisson regression represent the natural log of the predicted mean number of events, so each prediction was exponentiated to convert it to a mean rate. These are presented in Figure 11.6. As you can see, because the age of first sexual experience is later for female respondents, the average number of female partners during the preceding 3 months increases. The opposite is true for male respondents: those who had earlier sexual experiences tend to report having more female partners during the preceding 3 months than those who initiated sexual activity relatively later.