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1. a. The low deviance of 2.85 suggests that there does exist homogenous association between safety equipment use, ejection, and type of injury. The interaction term coefficients -2.3996, 1.7173, and -2.7978 suggests negative association between seatbelt and ejection, positive association between seatbelt and nonfatal injury, and negative association between ejection and nonfatal injury, which make realistic sense.

R code

X <- rep(x = c('Seat belt', 'None'), each = 4)

Y <- rep(x = c('Yes', 'No'), each = 2)

Z <- rep(x = c('Nonfatal', 'Fatal'), times = 4)

count <- c(1105, 14, 411111, 483, 4624, 497, 157342, 1008)

df <- data.frame(

X = as.factor(x = X),

Y = as.factor(x = Y),

Z = as.factor(x = Z),

count = count

)

stats::glm(formula = count ~ X + Y + Z + X:Y + X:Z + Y:Z, data = df, family = poisson)

1. log( ) = + + + +

X and Z are conditionally dependent on Y. XY and XZ have marginal association as conditional associations.