

Contingency Table

2. The American Journal of Public Health (July 1995) reported on a population-based study of trauma in Hispanic children. One of the objectives of the study was to compare the use of protective devices in motor vehicles used to transport Hispanic and non-Hispanic white children. Data was collected for 792 randomly selected children from the San Diego County Regionalized Trauma System. The data are given in the table below. Test the claim that seatbelt usage depends on ethnic status. Test at the 0.01 significance level. Provide a one sentence statement to accompany your conclusion. What are the implications of the hypothesis test? Explain.

	Hispanic	Non-Hispanic White
Seatbelts worn	31	148
Seatbelts not worn	283	330

Ho: Seatbelt usage is independent from ethnic status
 Claim \longrightarrow H1: Seatbelt usage depends on ethnic status

$$\alpha = 0.01$$

	Hispanic	Non-Hispanic White	Totals
Seatbelt Worn	31 (70.967)	148 (108.03)	179
Seatbelt Not Worm	283 (243.03)	330 (369.97)	613
Totals	314	478	792

Test Statistic

$$\chi^2 = \sum \frac{(O - E)^2}{E} \quad \chi^2 \approx \frac{(31 - 70.967)^2}{70.967} + \dots + \frac{(330 - 369.97)^2}{369.97} \approx \boxed{48.185}$$

P_Value
 $\approx 3.9 \text{ E-}12$
 ≈ 0.0000000000039

Reject Ho

There is sufficient evidence to support the claim that seatbelt usage depends on ethnic status.