**Chapter 12**

**Comparing Multiple Proportions, Test of Independence**

**and Goodness of Fit**

**Case Problem: A Bipartisan Agenda for Change**

1. Descriptive statistics

Question: Should legislative pay be cut for every day the state budget is late?

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Yes** | **No** | Totals |
| **Democrat** | 22 | 14 | 36 |
| **Independent** | 10 | 9 | 19 |
| **Republican** | 39 | 6 | 45 |
| Totals | 71 | 29 | 100 |

Percentage responding yes: Democrat, 61.1%; Independent, 52.6%; Republican, 86.7%

Preliminary conclusion: Since the percentage of Republicans that answered yes is much greater than the percentage of Democrats or Independents that answered yes, the classifications do not appear to be independent.

Question: Should there be restrictions on lobbyists?

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Yes** | **No** | Totals |
| **Democrat** | 21 | 15 | 36 |
| **Independent** | 15 | 4 | 19 |
| **Republican** | 34 | 11 | 45 |
| Totals | 70 | 30 | 100 |

Percentage responding yes: Democrat, 58.3%; Independent, 78.9%; Republican, 75.6%

Preliminary conclusion: Since the percentage of Democrats that answered yes is much less than the percentage of Independents or Republicans that answered yes, the classifications do not appear to be independent.

Question: Should there be term limits requiring legislators serve a fixed number of years?

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Yes** | **No** | Totals |
| **Democrat** | 17 | 19 | 36 |
| **Independent** | 10 | 9 | 19 |
| **Republican** | 32 | 13 | 45 |
| Totals | 59 | 41 | 100 |

Percentage responding yes: Democrat, 47.2%; Independent, 52.6%; Republican, 71.1%

Preliminary conclusion: Since the percentage of Republicans that answered yes is much higher than the percentage of Democrats or Independents that answered yes, the classifications do not appear to be independent.

2. The *p*-value associated with the test for independence is .006. Since the *p*-value is less than the level of significance, .05, we can reject the null hypothesis of independence.

3. The *p*-value associated with the test for independence is .156. Since the *p*-value is greater than the level of significance, .05, we cannot reject the null hypothesis of independence. Note that our preliminary conclusion based upon the descriptive statistics was incorrect in this case.

4. The *p*-value associated with the test for independence is .078. Since the *p*-value is greater than the level of significance, .05, we cannot reject the null hypothesis of independence. Note that our preliminary conclusion based upon the descriptive statistics was incorrect in this case.

5. There does appear to be broad support across all political lines with regard to restrictions on lobbyists and requiring legislators serve a fixed number of years. However, with regard to the issue of a legislative pay cut, the response (yes and no) and party affiliation are not independent; for this issue, the Republican respondents have a much different perspective than the Democrats or the Independents