

FINAL EXAM PART 2

CJC 206: Criminal Justice Statistics
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DIRECTIONS: Go to Sakai – Resources – Final Exam and download the Final Exam Excel file. You will write or type your answers on this portion of the exam and submit both this completed document and the completed Excel sheet through Sakai via your drop box. **Part 2 is worth 21 points total.**

As a researcher in the Illinois Department of Juvenile Justice (IDJJ), you are interested in understanding the recidivism of juveniles who are released from Illinois Youth Centers (IYC) across the state. IYC are secure facilities that hold youth who have been adjudicated delinquent by the juvenile justice system. Youth are given an indeterminate sentence, after which they can be released back to their community or placed on parole with specific conditions. The researcher has data on youth in IDJJ facilities who exited during a 12-month period and collected data on their outcomes after they were released, including new arrests and returns to IDJJ facilities. The data set for this sample includes the youth ID number, race, offense type, total number of arrests prior to incarceration, total number of arrests after release, and return to prison (yes/no).

- 1) You want to determine if youth with different offense types have different numbers of arrests after they are released. This may help you design intervention programs for youth with higher likelihoods of re-offending. Your dataset has offense type categorized as person offense, property offense, or drug offense. Arrests after release is coded as total number of arrests. Use the tab labeled Q1 to answer the following questions:

- a. Formulate the null hypothesis (1 point).

$$H_0: \mu_{\text{Person}} = \mu_{\text{Property}} = \mu_{\text{Drug}}$$

- b. Formulate a non-directional alternative hypothesis (1 point).

H_A : At least one of the means is different

- c. What is the value of the F ratio for this test? What is the p value for this test (2 points)?

$$F = 8.029, p = 0.001.$$

- d. Based on the output, do you reject or fail to reject the null hypothesis? State your conclusion (3 points).

We reject H_0 at the $\alpha = .05$ level. There is sufficient evidence ($p = .001$) that at least one of the means is different.

- 2) You also want to determine if there is a relationship between the race of youth being released and whether or not they return to prison in the next three years. This will help you understand if IDJJ needs to develop culturally-sensitive interventions in its facilities. Your dataset has race coded as white, black and Latinx. Return to prison is coded as returned or did not return. Use the tab labeled Q2 to answer the following questions:

- a. Formulate the null hypothesis (1 point).

H_0 : There is no association between race of youth being released and whether or not they return to prison in the next three years.

- b. Formulate a non-directional alternative hypothesis (1 point).

H_A : There is an association between race of youth being released and whether or not they return to prison in the next three years.

- c. What is the value of the X^2 for this test? What is the p value for this test (2 points)?

$X^2 = 12.325$, $p = 0.002$.

- d. Using the provided post hoc coefficient, what can you say about the strength of this association (1 point)?

The association between the two variables is very weak ($V = .1$).

- e. Based on the output, do you reject or fail to reject the null hypothesis? State your conclusion (3 points).

We reject H_0 at the $\alpha = .05$ level. There is sufficient evidence ($p = .002$) that there is an association between the two variables.

- 3) For your last analysis, you want to know if there's a relationship between the number of prior arrests a youth had before incarceration and the number of arrests they have after they are released from IDJJ. Knowing specifics about this relationship can help you determine which youth may need more intensive supervision while on parole. Your dataset has prior arrests coded as total number of prior arrests. Post release arrests is coded as total number of arrests after release. Use the tab labeled Q3 to answer the following questions:

- a. What is the value of Pearson's r for this test (1 point)?

$r = 0.504$.

- b. What can you say about this association based on the value of r ? How much of the variance in post-release arrests is accounted for by prior arrests (2 points)?

The association between the two variables is moderate ($r = .504$).

- c. What is the value of the *coefficient* for prior arrests? What does this tell you about the relationship with post release arrests (3 points)?

$b = 0.554$. For every 1 additional prior arrest, we can expect post-release arrests for the same subject to increase by approximately 0.554.

Congratulations and enjoy your break!