Assignment 2

Stats 2

**Due**: Last day of finals week

1. **Regression:** For the following question, use the dataset called “social2” that has the following variables:

|  |  |  |
| --- | --- | --- |
| 1 | ciccomp | This scale measures classroom interracial climate. It consists of perceptions of the interracial climate of the classroom, e.g., “The teacher in this class is fair to all races.” Higher scores = higher perceptions that interracial climate is “good” |
| 2 | qdicomp | The QDI is a practical, self-administered instrument with 30 items divided into three validated subscales: General (Cognitive) Attitudes Toward Racial Diversity/Multiculturalism, Affective Attitudes Toward More Personal Contact (Closeness) with Racial Diversity, and Attitudes Toward Women's Equity. Lower scores indicate higher levels of prejudice and discrimination tendencies. |
| 4 | eicomp | The Ethnic Identity Scale assesses three distinct components of ethnic-racial identity: (a) exploration, or the degree to which individuals have explored their ethnicity; (b) resolution, or the degree to which they have resolved what their ethnic identity means to them; and (c) affirmation, or the affect (positive or negative) that they associate with their ethnic-group membership. Higher values = stronger ethnic identity. |
| 5 | Gender | 1= male, 2 = female |

Using this dataset, formulate a theoretically robust research question that is intriguing. For each independent variable, define a hypothesis and apply multiple linear regression techniques to illuminate the hypotheses you present. Discuss any potential violations of model assumptions, effect sizes, and interpret the coefficients. Include a write-up and a table of the results (2-3 paragraphs).

2) **Logistic Regression/ Odds and Odds Ratios:** Use the data depress.csv. The data were collected to obtain estimates of depression prevalence and potential risk and protective factors. The study variables encompassed several types, including demographics, life events, stressors, physical health, health services utilization, medication use, lifestyle, and social support.

Use the following variables

|  |  |
| --- | --- |
| Variable |  |
| Drink | 1 heavy drinker yes  2 heavy drinker no  You may want to recode this into 0/1 to make it easier to interpret |
| Gender | 1 male  2 female |
| Unemployed | 0 employed  1 unemployed |
| Cases | 0 not clinically depressed  1 clinically depress |

Complete the following table by supplying the cell frequencies

|  |  |  |
| --- | --- | --- |
|  | Gender | |
|  | Male | Female |
| Regular Drinker |  |  |
| No |  |  |
| Yes |  |  |

What are the odds that a male is a regular drinker?

What are the odds that a female is a regular drinker?

What is the odds ratio? That is, what are the odds that a male, relative to a female, is a regular drinker?

Repeat the tabulation above separately for persons who are depressed and for persons who are not depressed. Interpret the odds ratio and make conclusions.

Fit a logistic regression model. Use DRINK as the dependent variable and UNEPMPLOYED, CASES, and FEMALE as independent variables.

Write out the logit model for this analysis

Estimate and interpret the results, not any interesting significant differences

Predict the probability of being a regular drinker for males and females who are unemployed and have clinical depression. Use a cutoff value of .70.

Does the addition of the three independent variables significantly improve model fit over the null model (i.e., the one w/out any independent variables)?

1. **Latent Class Analysis:** The data set lca.csv contains information on the drinking behavior of adults. Research has identified three typologies of drinkers labeled abstainers, social drinkers and alcoholics and has identified that females are more likely to abstain from drinking compared to males. Use this data to: (1) Create a model that categorizes people into three different types of drinkers; (2) calculates the prevalence of persons who fall into each of the three categories; (3) describe whether the three class model provides a relatively better fit to the data compared to the two- or four- class model; (4) and using the 3-class model predict the odds of females (=1) compared to males (=0) being in the latent class of abstainers. Write a one-paragraph summary of your findings.

**Class 1 Class 2 Class 3 Item Label**

0.909 0.923 0.315 I like to drink

0.338 0.546 0.164 I drink hard liquor

0.067 0.427 0.036 I have drank in the morning

0.066 0.418 0.056 I have drank at work

0.220 0.766 0.045 I drink to get drunk

0.320 0.471 0.183 I like the taste of alcohol

0.113 0.513 0.098 I drink help me sleep

0.140 0.620 0.110 Drinking interferes with my relationships

0.325 0.349 0.188 I frequently visit bars

1. **Factor Analysis.** For this problem, we are using 175 case data containing eleven subscales from the WISC-R subscale available in the file wiscsem.sav. The WISC Test (Wechsler Intelligence Scale for Children) is an IQ test administered to children between the ages of 6 and 16 by school districts and psychologists. These are the variables we will use for the analysis. The results are available in the JASP file.

• info (Information)

• comp (Comprehension)

• arith (Arithmetic)

• simil (Similarities)

• vocab (Vocabulary)

• digit (Digit Span)

• pictcomp (Picture Completion)

• parang (Picture Arrangement)

• block (Block Design)

• object(Object Assembly)

1. Provide a table of univariate statistics that includes the mean, sd, min, max and range of each variable.
2. Provide a table of the correlation matrix for the variables
3. Perform an exploratory factor analysis of the variables. How many factors describe the underlying structure?
4. Write a paragraph describing the results.
5. **Path Analysis: Moderated Mediation.** The data set employee.sav contains data from research on a sample of 213 call center employees. The focus of this research was to gain a deeper understanding of how and why employees experience burnout. The following scales will be used in the analysis:

(1) *Leader as a Social Context Questionnaire (TSCQ, adapted; Curran, Hill, & Niemiec, 2013).* This measure assesses perceived provision of structure from leaders (e.g., rules, limits, expectations, help, support, feedback). An example item from this instrument is: “my manager always tells us what they expect of us at work”. Participants indicated the extent to which they believed each of 8 items on a 7-point Likert-type scale ranging from 1 (not at all true) to 7 (very true) to be true. The 8 items have been averaged to yield a manager structure variable called “structure”

(2) *Controlling Manager Behavior Scale (CMBS; Bartholomew et al., 2010).* This measure assesses perceived provision of psychological control from managers. An example item from this instrument is: “My manager pays me less attention if I have displeased them”. Participants indicated the extent to which they believed each of 4 items on a 7-point Likert-type scale ranging from 1 (not at all true) to 7 (very true) to be true. The 4 items have been averaged to yield a manager control variable called “Control”.

(3) *Psychological Disconnection Scale (PDS; Bartholomew et al., 2011).* This measure assesses employees’ perceived sense of disconnection at work. An example item from this instrument is: “I feel others at work can be dismissive of me.” Participants indicated the extent to which they believed each of 12 items on a 7-point Likert-type scale ranging from 1 (not at all true) to 7 (very true) to be true. The 12 items have been averaged to yield a disconnection variable called “Disconnection”.

(4) *Work Burnout Questionnaire (WBQ, exhaustion subscale; Masasch).* This measure assessed employees’ perceived exhaustion at work. An example item from this instrument is: “I feel physically worn out at work” Participants indicated the experiences of each of 5 items on a 5-point Likert-type scale ranging from 1 (almost never) to 7 (almost always). The 5 items have been averaged to yield an exhaustion variable called “Exhaustion”.

Using these variables, test the following hypotheses: (1) whether employee exhaustion can be explained by manager control through perceptions of disconnection. Theoretically, controlling behavior by managers can contribute to employee exhaustion by fostering a sense of disconnection with coworkers. In other words, does disconnection mediate the relationship between manager control and employee exhaustion? Calculate the direct, indirect, and total effects using the Process macro in SPSS (model 4).

(2) The second research question examines whether the effect of manager structure (help, support, feedback) on employee exhaustion is conditional on manager control (i.e., moderated), as shown in Model 1. The theory here is that structure from managers (i.e., help, support, feedback) is an important predictor of employees' exhaustion, but that the magnitude and direction of this prediction will depend heavily on how that structure is conveyed. Use the Johnson-Neyman technique to identify the regions of significance where the moderator is significant.

OPTIONAL: (3) test whether the conditional indirect effect of disconnection on employee exhaustion is conditional on manager structure, i.e. (moderated mediation). Report the index of moderated mediation. Select the appropriate theoretical and statistical models and include them in your response. Write up a one-paragraph summary of your findings.

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