**EPID 5314 – HW12**

**Part 1:**

The missing data patterns for this dataset (consisting of individuals from waves 4 and 5) are summarized below:

Table

Description automatically generated

As shown in the output above, over 25% of individuals are missing values for the dichotomized hvyuse variable; thus, there is significant item missingness present in this data. Additionally, around 20% of individuals are missing values for all three variables (hvyuse, getpar, and gender4), which shows that there is also a great amount of wave missingness present in the data. For these reasons, it is important that we take these patterns of missingness into account when we are analyzing the data to produce valid results/conclusions.

**Part 2:**

We first test to determine whether there is significant interaction between getpar and gender4 on a multiplicative scale (using the logit link function and binomial distribution). The output below was obtained when this interaction was assessed on a multiplicative scale:

Calendar

Description automatically generated

According to this output, the relationship between perceived alcohol availability (getpar) and heavy alcohol use (hvyuse) is NOT statistically significantly moderated by gender on a multiplicative scale (**p = 0.6955 > 0.05**).

We then wanted to determine whether there is significant interaction between getpar and gender4 on an additive scale (using the identity link and binomial distribution). The output below was obtained when this interaction was assessed on an additive scale:

A picture containing table

Description automatically generated

According to this output, the relationship between perceived alcohol availability (getpar) and heavy alcohol use (hvyuse) is also NOT statistically significantly moderated by gender on an additive scale (**p = 0.6204 > 0.05**).

**Part 3:**

Since there was not significant effect modification by gender on either the multiplicative or additive scales, I will not be providing the strata-specific estimates of effect of perceived alcohol availability (getpar) on later heavy alcohol use (hvyuse) by gender (gender4).

**SAS Code**

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\* Course: Data Analysis - EPID 5314 \*

\* Assignment: HW 12 \*

\* Due Date: 12/1/2021 \*

\* Programmer(s): Jessie Ausman \*

\* Program Name: HW12 \*

\* Save Program/Log/Output: C:\Users\jessa\Desktop\EPID 5314\Homework12 \*

\* Save Data Files: C:\Users\jessa\Desktop\EPID 5314\PNC Data File\PNC Datasets \*

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/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* PART 0 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

\*read in data;

libname bios "C:\Users\jessa\Desktop\EPID 5314\PNC Data File\PNC Datasets";

**data** pnc05;

set bios.pnc05;

**run**;

**data** pnc09;

set bios.pnc09;

**run**;

**data** HW12;

merge pnc05 pnc09;

by ID;

**run**;

\*dichotomize hvyuse5 - use no as ref;

**data** HW12\_1;

set HW12;

if hvyuse5 = **1** then hvyuse = **0**; \*0 = no;

else if hvyuse5 in (**2**,**3**,**4**,**5**,**6**) then hvyuse = **1**; \*1 = yes;

else if missing(hvyuse5) then hvyuse = **.**;

**run**;

\*dichotomize getpar4 - use easy as ref;

**data** HW12\_2;

set HW12\_1;

if getpar4 = **1** then getpar = **0**; \*0 = easy;

else if getpar4 in (**2**,**3**) then getpar = **1**; \*1 = in-between/hard;

else if missing(getpar4) then getpar = **.**;

**run**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Part 1 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

\*analyze missing data patterns;

**proc** **mi** data=HW12\_2 nimpute=**0**;

var hvyuse getpar gender4;

**run**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Part 2 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

\*use PROC MI to create multiple imputations to produce a less biased beta est;

**proc** **mi** data=HW12\_2 nimpute=**20** out=out1 seed=**1**;

class hvyuse getpar gender4;

fcs logistic(hvyuse getpar gender4);

var hvyuse getpar gender4;

**run**;

/\*Multiplicative Scale\*/

**proc** **genmod** data=out1 desc;

by \_imputation\_;

class hvyuse (param=ref ref='0') getpar (param=ref ref='0') gender4 (param=ref ref='1');

model hvyuse = getpar gender4 getpar\*gender4 / covb link=logit dist=binomial;

ods output ParameterEstimates=parms

ParmInfo=info

CovB=vars;

**run**;

**proc** **mianalyze** parms=parms covb=vars parminfo=info;

modeleffects getpar gender4 getpar\*gender4;

**run**;

/\*Additive Scale\*/

**proc** **genmod** data=out1 desc;

by \_imputation\_;

class hvyuse (param=ref ref='0') getpar (param=ref ref='0') gender4 (param=ref ref='1');

model hvyuse = getpar gender4 getpar\*gender4 / covb link=identity dist=binomial;

ods output ParameterEstimates=parms

ParmInfo=info

CovB=vars;

**run**;

**proc** **mianalyze** parms=parms covb=vars parminfo=info;

modeleffects getpar gender4 getpar\*gender4;

**run**;