**OLS Multivariate – Practice**

For each of the models, interpret or provide the following information in narrative form:

1. $R^2$
2. F test
3. a (or constant)
4. b coefficients and the significance of each
5. Make predictions for the particular clients associated with each scenario and interpret the predictions in narrative form.

Model 1

DV = Number of hours the TV is on (I/R)
IV = Taking care of child is more work than pleasure (0/1)
IV = Consider neighborhood safe (0/1)
IV = % of childhood spent in poverty (I/R)
IV = Years of education of the head of household (I/R)

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .337[a] | .114 | .112 | 3.53621 |

a. Predictors: (Constant), finedhd, taking care child more work than pleas, consider the neighborhood safe?, % of childhd in poverty

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2976.750 | 4 | 744.187 | 59.512 | .000[a] |
| | Residual | 23234.393 | 1858 | 12.505 | | |
| | Total | 26211.142 | 1862 | | | |

a. Predictors: (Constant), finedhd, taking care child more work than pleas, consider the neighborhood safe?, % of childhd in poverty

b. Dependent Variable: Number of hours/day TV on at home

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 10.645 | .594 | | 17.935 | .000 |
| | taking care child more work than pleas | -.487 | .296 | -.037 | -1.646 | .100 |
| | consider the neighborhood safe? | -.681 | .295 | -.052 | -2.306 | .021 |
| | % of childhd in poverty | 1.856 | .306 | .151 | 6.063 | .000 |
| | finedhd | -.363 | .038 | -.232 | -9.456 | .000 |

a. Dependent Variable: Number of hours/day TV on at home

Predictions: (treat p=.10 as significant)

- Someone for whom the parent thinks parenting is work, the neighborhood does not feel safe, 5% of childhood spent in poverty and 15 years of education for the head.
- Someone for whom the parent does not think that parenting is work, the neighborhood feels safe, 0% of childhood spent in poverty and 10 years of education for the head

Model 2

DV = % of childhood spent in poverty (I/R)
IV = Years of education of the head of household (I/R)
IV = Race of head (white) (0/1)
IV = % childhood years head was in poor health (I/R)
IV = Family members hit each other (0/1)
IV = Number of hours the TV is on (I/R)

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .599[a] | .358 | .357 | .24509 |

a. Predictors: (Constant), Number of hours/day TV on at home, family members hit each other, Race of head: White, % childhd yrs head poor health, finedhd

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 61.868 | 5 | 12.374 | 205.984 | .000[a] |
| | Residual | 110.748 | 1844 | .060 | | |
| | Total | 172.616 | 1849 | | | |

a. Predictors: (Constant), Number of hours/day TV on at home, family members hit each other, Race of head: White, % childhd yrs head poor health, finedhd

b. Dependent Variable: % of childhd in poverty

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .820 | .039 | | 20.914 | .000 |
| | finedhd | -.039 | .003 | -.303 | -14.940 | .000 |
| | Race of head: White | -.236 | .015 | -.312 | -15.928 | .000 |
| | % childhd yrs head poor health | .309 | .030 | .201 | 10.230 | .000 |
| | family members hit each other | -.001 | .017 | -.002 | -.087 | .931 |
| | Number of hours/day TV on at home | .005 | .002 | .060 | 3.012 | .003 |

a. Dependent Variable: % of childhd in poverty

Predictions:

- 20 years of education, white head of household, 50% childhood years head spent in poor health, family members hit each other and 7 TV hours
- 9 years of education, non-white head of household, 1% childhood years head spent in poor health, family members do not hit and 0 TV hours

Model 1

1. $R^2$ = 11.2% - 11.2% of the variation in the number of hours the TV is on is explained by the model.
2. p < .001 therefore the model is significant
3. a=10.65 – When all the independent variables have a value of 0, the TV is on for 10.65 hours each day.
4. Taking care of child is more work than pleasure = -.487 – Parents who think that taking care of children is more work than pleasure are predicted to have the TV on for .487 fewer hours than those who do not think that, controlling for all other variable in the model. This is not significant (p=.10) at the .05 level but it is significant at the .10 level.

   Consider neighborhood safe = -.681 – Those who consider their neighborhood safe are predicted to have the TV on for .681 fewer hours than those who do not consider their neighborhood safe, controlling for all other variables in the model. This is significant (p=.021) at the .05 level.

   % of childhood in poverty = 1.86 – For each additional percent of time spent in poverty, the TV is predicted to be on for 1.86 more hours, controlling for all other variables in the model. This is significant (p<.001) at the .05, .01 and .001 levels.

   Years of education of the head = -.363 – For each additional year of education of the head, the TV is predicted to be for .363 fewer hours, controlling for all other variables in the model. This is significant (p<.001) at the .05, .01 and .001 levels.

5. Predictions

   Someone for whom the parent thinks parenting is work, the neighborhood does not feel safe, 5% of childhood spent in poverty and 15 years of education for the head.

   Y′ = 10.65 + (-.487)(1) + (-.681)(0) +1.86(5) + (-.363)(15) = 14.02 hours with TV on

   Someone for whom the parent does not think that parenting is work, the neighborhood feels safe, 0% of childhood spent in poverty and 10 years of education for the head

   Y′ = 10.65 + (-.487)(0) + (-.681)(1) +1.86(0) + (-.363)(10) = 6.34 hours with TV on

Model 2

1. $R^2$ = 35.7% - 35.7% of the variation in the % of childhood spent in poverty is explained by the variables in the model.
2. p < .001 so the model is significant
3. a = .820 – When all the variables in the model are 0, someone is predicted to spend .82% of their childhood in poverty.
4. Education of the head = .-039 – For each additional year of education of the head, the % of childhood spent in poverty is predicted to decrease .039, controlling for all other variables in the model. It is significant (p<.001) at the .05, .01 and .001 level.

   Race of the head = -. 236 – Children in families with white heads of households are predicted to spend .236% less time in poverty than children with non-white heads of households, controlling for all other variables in the model. It is significant (p<.001) at the .05, .01 and .001 level.

   % of childhood years the head was in poor health = .309 – For each additional % increase of childhood years that head was in poor health, % of childhood spent in poverty is predicted to decrease .309, controlling for all other variables in the model. It is significant (p<.001) at the .05, .01 and .001 level.

   Family members hit each other = -.001 – Those who grew up in family where members hit each other are predicted to spend .001% less time in poverty than those who grew up in families that don't hit each other, controlling for all other variables in the model. This is not significant (p=.931).

   Numbers of hours TV is on = .005 – For each additional hour that the TV is on, the percent of childhood spent in poverty is predicted to increase .005. It is significant (p=.003) at the .05 and .01 level.

5. Predictions

20 years of education, white head of household, 50% childhood years head spent in poor health, family members hit each other and 7 TV hours

.820 – (.039)20 - .236(1) + .309(50) - .001(1) + .005(7) = 15.29% of childhood spent in poverty

9 years of education, non-white head of household, 1% childhood years head spent in poor health, family members do not hit and 0 TV hours

.820 – (.039)9 - .236(0) + .309(1) - .001(0) + .005(0) = .778% of childhood spent in poverty