Segment 12:
Extension of Multiple Regression Analysis

Prof. Sharyn O’Halloran
Key Points

- Dummy Variables
  - Shift in the intercept

- Difference of Means Test
  - Are two groups significantly different

- Interactive Terms
  - Shift in the Slope
I. Introduction to Dummy Variables

A. Definition:

Any dichotomous variable that is coded zero-one

Examples:

- Gender: 1 for female
  0 for male

- Employment: 1 if employed
  0 if unemployed

- Religion: 1 if Catholic
  0 otherwise
I. Introduction to Dummy Variables

B. Example

- Suppose that a certain drug is suspected of raising blood pressure.

- One way to test this hypothesis is to conduct a controlled experiment.

- For example, suppose we randomly sample 10 women, 6 take the drug, 4 do not take the drug.
I. Introduction to Dummy Variables (cont.)

B. Example

1. Variables

We represent this information by a dummy variable.

- \( Y = \) Level of Blood Pressure
- \( D = \) number of doses of this drug daily
  - \( D = 1 \) if she took the drug
  - \( D = 0 \) if she did not (i.e., was a control)
I. Introduction to Dummy Variables (cont.)

B. Example
   2. Data

<table>
<thead>
<tr>
<th>OBS</th>
<th>PRESSURE</th>
<th>DRUG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>85</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>90</td>
<td>1</td>
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<td>4</td>
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<td>5</td>
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<td>100</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>85</td>
<td>1</td>
</tr>
</tbody>
</table>
I. Introduction to Dummy Variables (cont.)

B. Example

3. Graph

\[ Y = 85 + 8.3 \ D \]
I. Introduction to Dummy Variables (cont.)

B. Example

4. Results

- There are four observations when $D = 0$. The mean of these observations is 85.

- There are six observations when $D = 1$. The mean of these observations is 93.3.
I. Introduction to Dummy Variables (cont.)

B. Example

4. Results (cont.)

- So how do we get a regression line from these data?
  - To draw the regression line, we just connect the means of each group!
  - This minimizes the sum of the squared distances from the data points to the line.
I. Introduction to Dummy Variables (cont.)

B. Example

4. Results (cont.)

The equation would be:

\[ Y = 85 + 8.3 \text{ Drug.} \]

(3.22) (4.16)
I. Introduction to Dummy Variables (cont.)

B. Example

5. Interpretation

- The intercept is the average blood pressure level for those who did not take the drug.

- The group of all people who did not take the drug is called the reference group, or the control group.
- The intercept is the average of the dependent variable when the dummy variable is 0.
I. Introduction to Dummy Variables (cont.)

B. Example

5. Interpretation (cont.)

- The coefficient on the Dummy variable states by how much an individual’s blood pressure increases, on average, when given the drug.
I. Introduction to Dummy Variables (cont.)

C. Difference of Means Test

1. Slope

- What is the difference between the means when the sample is divided into those who took the drug and those who did not?
  - As the dummy variable goes from 0 to 1, the value of Y rises by 8.33 points.
  - The difference between the means is 8.33.
I. Introduction to Dummy Variables (cont.)

- C. Difference of Means Test
  - 2. Significant Difference

  Now, how can we tell if this slope is significantly different from zero?

  - a. Hypothesis

    \[ H_0: \beta = 0 \]
    \[ H_a: \beta > 0 \]
I. Introduction to Dummy Variables (cont.)

- C. Difference of Means Test
  - 2. Significant Difference (cont.)
    - b. t-statistic
      - c. Accept of Reject
        - the variable is significant at the 5% level.

\[ n = 10; \ d.f. = 8; \ \alpha = .05 \]

\[ t = \frac{8.3}{4.16} = 2.00 \]
I. Introduction to Dummy Variables (cont.)

- C. Difference of Means Test
  - 3. Interpretation

  - What does it mean that the slope is significant?

  - People who took the drug did have a significantly higher blood pressure than those who didn't.
D. SPSS Example 1:

- Does education vary according to a respondent's religion?

- I investigated whether Catholics had more or less education than the general population.

1. Hypothesis

\[ H_0: \beta = 0; \quad H_a: \beta \neq 0 \]
D. SPSS Example 1:

1. Hypothesis (cont.)

1. Commands

- I made my own variable called Catholic.

- I recoded it and gave it value labels, so that all Catholics were coded 1 and all others got a 0.

- I then made a variable for education, called Smarts.

- Finally, I specified my regression.
I. Introduction to Dummy Variables (cont.)

- D. SPSS Example 1:
  - 1. Hypothesis
  - 2. Regression Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATHOLIC</td>
<td>.314567</td>
<td>.178289</td>
<td>.047002</td>
<td>1.764</td>
<td>.0779</td>
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<tr>
<td>(Constant)</td>
<td>12.755382</td>
<td>.093351</td>
<td></td>
<td>136.639</td>
<td>.0000</td>
</tr>
</tbody>
</table>
D. SPSS Example 1:
   1. Hypothesis
      2. Regression Results (cont.)

   - What was the average education level of non-Catholics in the population?
   - What's the average education level of Catholics?
I. Introduction to Dummy Variables (cont.)

D. SPSS Example 1:
  1. Hypothesis
  3. Significance
    Is the coefficient significant at the 5% level?

\[
\frac{3.145}{0.178} = 1.764
\]
D. SPSS Example 1:
  1. Hypothesis
  4. Difference of Means Results

For comparison, I did a difference of means test on the same data.

Is There A Significant Difference Between Catholics
And The Rest Of The Population?
D. SPSS Example 1:

1. Hypothesis

4. Difference of Means Results (cont.)

* T-TEST / GROUPS CATHOLIC (0,1) / VARIABLES SMARTS.

-----------------------------

- Independent samples of CATHOLIC
- Group 1: CATHOLIC EQ .00     Group 2: CATHOLIC EQ 1.00

- t-test for: SMARTS
D. SPSS Example 1:

1. Hypothesis

4. Difference of Means Results (cont.)

<table>
<thead>
<tr>
<th>Number of Cases</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
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</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>1022</td>
<td>12.7554</td>
<td>3.031</td>
</tr>
<tr>
<td>Group 2</td>
<td>386</td>
<td>13.0699</td>
<td>2.855</td>
</tr>
</tbody>
</table>
D. SPSS Example 1:
   1. Hypothesis
      4. Difference of Means Results (cont.)

<table>
<thead>
<tr>
<th>Pooled Variance Estimate</th>
<th>Separate Variance Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>F Value 2-Tail Prob.</td>
<td>t Value Degrees of Freedom 2-Tail Prob</td>
</tr>
<tr>
<td>1.13 .165 -1.76 1406 .078</td>
<td>-1.81 732.50 .070</td>
</tr>
</tbody>
</table>
D. SPSS Example 1:

1. Hypothesis

5. Interpretation

The results suggest that there is no significant difference between Catholics and the rest of the population.
II. More than One Dummy Variable

A. Sample Equation

- If we had many different drugs that we thought might cause high blood pressure, then we could write:

\[ Y = b_0 + b_1 D_1 + b_2 D_2 + b_3 D_3 + \ldots \]

- Then \( b_1, b_2, b_3 \), the slope coefficient on the dummy variables, are the difference between the blood pressure of someone taking that drug and a control group which takes none of the drugs.
II. More than One Dummy Variable (cont.)

B. 1. Example: More than One Dummy Variable

- Say that we rerun the regression from before, but we allow religion to be either Protestant, Catholic, Jewish, or Other.

- We create separate variables for each category.
B. 1. Example: More than One Dummy Variable (cont.)

Variables:

Catholic 1 if yes
0 otherwise

Protestant 1 if yes
0 otherwise

Jewish 1 if yes
0 otherwise

Other 1 if other than catholic, Protestant, etc.
0 otherwise
II. More than One Dummy Variable (cont.)

- 2. Question:

  - Can we run a regression that looks like this:

    \[ Y = b_0 + b_1 \text{ Catholic} + b_2 \text{ Protestant}, + b_3 \text{ Jewish} + b_4 \text{ Other} \]
II. More than One Dummy Variable (cont.)

3. Model Specification

- Let's have Catholic be our base group.

- Then the correct equation is:

\[ Y = b_0 + b_1 \text{Protestant} + b_2 \text{Jewish} + b_3 \text{Other}. \]
II. More than One Dummy Variable (cont.)

- C. Difference of Means

  1. Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTHER</td>
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<td>.078695</td>
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<td>.0035</td>
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<td></td>
<td>87.546</td>
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</table>
II. More than One Dummy Variable (cont.)

- C. Difference of Means
  - 2. Interpretation
    - The intercept is the average education of the reference group.
      - It is 13.06. This agrees with our earlier results when we just did Catholic as our single category.
    - Slopes is the difference in years of education from the base case.
II. More than One Dummy Variable (cont.)

C. Difference of Means

3. Differences between other groups

- We can also use these results to tell the difference between any two groups.

- For instance, the education difference between *Jewish* and *Other* is:

  \[ 2.77 - 1.64 = 1.13. \]
II. More than One Dummy Variable (cont.)

- C. Difference of Means
  - 3. Differences between other groups (cont.)

  However, to tell if this difference is significant, we'd have to re-run the regression, using either Jewish or Other as the reference group.
III. Dummy Variables and Confounding Variables

- We may think that our results are confounded by other factors.

A. Parallel Lines for Two Categories

1. Blood Pressure Example

- What we want to do is compare the blood pressure of those women who take the drug against those who do not.

- In testing the effect of the drug, however, we will also want to control for age.
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories
   2. Path Diagram

   Drug-----------------------> High Blood pressure

   Age

   3. Data
III. Dummy Variables and Confounding Variables (cont.)

- A. Parallel Lines for Two Categories
  - 3. Data

<table>
<thead>
<tr>
<th>OBS</th>
<th>PRESSURE</th>
<th>AGE</th>
<th>DRUG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>85</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>95</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>90</td>
<td>40</td>
<td>1</td>
</tr>
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<tr>
<td>5</td>
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<td>1</td>
</tr>
<tr>
<td>10</td>
<td>85</td>
<td>30</td>
<td>1</td>
</tr>
</tbody>
</table>
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

4. Results

a. Regression

- Suppose after we run a regression line then the results look like this

- Blood Pressure = $b_0 + b_1$AGE + $b_2$DRUG

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>ST. DEV.</th>
<th>T-STATISTIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td>69.535</td>
<td>2.905</td>
<td>23.93</td>
</tr>
<tr>
<td>AGE</td>
<td>0.44186</td>
<td>0.07301</td>
<td>6.05</td>
</tr>
<tr>
<td>DRUG</td>
<td>4.651</td>
<td>1.885</td>
<td>2.47</td>
</tr>
</tbody>
</table>
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

4. Results

a. Regression (cont.)

Our regression equation is

\[ Y = 69.5 + 0.442 \text{ (Age)} + 4.65 \text{(Drugs)} \]
\[ Y = 69.5 + 0.442 \text{ (AGE)} \quad D=0 \]
\[ Y=69.5 + 0.442\text{(AGE)} + 4.65 \quad D=1 \]
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

4. Results

b. Graph

What is the regression line then, for those women who take the drug?

\[ Y = 70 + 0.44X \] (control: \( D = 0 \))

\[ Y = 75 + 0.44X \] (Drug = 1)
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

4. Results

c. Interpretation

- How do we interpret the coefficient?
  - The coefficient on Drugs is the change in Blood pressure that accompanies a unit change in Drugs, while age remains constant.
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

4. Results

c. Interpretation

- How do we interpret the coefficient? (cont.)
  - There is an increase in blood pressure of 5 units as we go from a woman without the drug (D=0) to a woman of the same age with the drug (D=1).
III. Dummy Variables and Confounding Variables (cont.)

- A. Parallel Lines for Two Categories
  - 5. Construct a 95% confidence interval
    - a. State hypothesis

\[ H_o: \beta = 0 \]
\[ H_a: \beta \neq 0 \]
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

5. **Construct a 95% confidence interval**

b. Confidence Interval

\[ \beta = b - t_{.025} \frac{s}{x^2} \]

\[ \beta = b - t_{.025} \times SE \]

d.f. = n-k-1 = 10 - 2 - 1 = 7

\[ \beta = 4.7 - 2.36 \times (1.88) \]

\[ 4.7 - 4.4 \]
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

5. Construct a 95% confidence interval
   c. Accept or Reject

   So can we reject the null hypothesis that the difference is 0?
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

5. Construct a 95% confidence interval

   d. Interpretation

   This suggests that on average women taking the drug have significantly higher blood pressure than those who do not.
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

5. Construct a 95% confidence interval

  e. Note

  We should note, however, that this does not suggest that the drug causes high blood pressure.
III. Dummy Variables and Confounding Variables (cont.)

A. Parallel Lines for Two Categories

5. Construct a 95% confidence interval

e. Note (cont.)

- Other confounding factors, such as stress levels, eating and exercise habits, may also influence blood pressure.
B. Parallel Lines for Several Categories

1. Data

- What if we are now testing two drugs, A and B, against a control C, with a sample of 30 patients.

- In measuring drugs, we use two dummy variables.

  - $D_A = 1$ if drug A given; 0 otherwise
  - $D_B = 1$ if drug B given; 0 otherwise
III. Dummy Variables and Confounding Variables (cont.)

- B. Parallel Lines for Several Categories
  - 2. Estimates

  - Suppose the regression line turned out to be:
    - \( Y = 70 + 5D_A + 8D_B + .44 \text{AGE} + ...... \)
  - From this regression, we can easily write down three separate equations for the three groups:
    - For the control group, set \( D_A = 0, D_B = 0 \): \( Y = 70 + .44(\text{AGE}) \)
    - For the group on Drug A, set \( D_A = 1, D_B = 0 \): \( Y = 75 + .44(\text{AGE}) \)
    - For the group on Drug B, set \( D_A = 0, D_B = 1 \): \( Y = 78 + .44(\text{AGE}) \)
III. Dummy Variables and Confounding Variables (cont.)

B. Parallel Lines for Several Categories

3. Graph

- The easiest way to interpret these results by a graph.

![Graph showing parallel lines for blood pressure and age with equations:]

- $Y = 70 + .44X$ (control: $D=0$)
- $Y = 75 + .44X$ (with $D_a=1$; $D_b=0$)
- $Y = 78 + .44X$ (with $D_a=0$; $D_b=1$)

AGE

BLOOD PRESSURE
III. Dummy Variables and Confounding Variables (cont.)

B. Parallel Lines for Several Categories

4. Interpretation

- The results show that the group on drug A exceeds the controls by 5 units-- the coefficient on $D_A$.

- Similarly, the group on Drug B exceeds the controls by 8 units-- the coefficient of $D_B$. 
III. Dummy Variables and Confounding Variables (cont.)

- B. Parallel Lines for Several Categories

- NOTE

- Again, in designing our models we need to make sure that we identify our equation. That is, we need to have a least one category left as a reference group.
IV. Different Slopes as Well as Intercepts: Interactive Terms

A. Interactive Terms

- What if the relation between age and the drug is not additive but multiplicative?
  - That is, not only does the intercept change, but so does the slope of the regression line.
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

A. Interactive Terms

1. Definition

- What if the drug had a greater impact on your blood pressure as a person gets older.
  - We can investigate this possibility by adding a multiplicative term to the regression.
    - \( Y = c + \text{Drug} + \text{Age} + \text{Age*Drug} \ldots \)

- The term \( \text{Age*Drug} \) is called an interactive term.
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

A. Interactive Terms
   1. Definition (cont.)
      - Interactive terms captures the possibility that the effect of one independent variable might vary with the level of another independent variable.
      - In this case, the effect of the drug on your blood pressure depends on your age.
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

A. Interactive Terms
   1. Definition (cont.)

Path Diagram of Interactive Effects

Drug --- > High Blood pressure

Age
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

A. Interactive Terms

1. Definition (cont.)

2. Data

<table>
<thead>
<tr>
<th>OBS</th>
<th>PRESSURE</th>
<th>AGE</th>
<th>DRUG</th>
<th>Age*Drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>85</td>
<td>30</td>
<td>0</td>
<td>0</td>
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<td>85</td>
<td>30</td>
<td>1</td>
<td>30</td>
</tr>
</tbody>
</table>
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

A. Interactive Terms

2. Results

- Suppose that when we run a regression, we get the following results:

- Again we set $D = 0$ for the control group and $D = 1$ for those taking the drug.
  \[ Y = 70 + 5(Drug) + .44(Age) + .21(Drug*Age) \]

- We obtain two separate equations for the two groups:

  - Set $D = 0$: $Y = 70 + .44Age$
  - Set $D = 1$: $Y = 75 + .65Age$
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

A. Interactive Terms

3. Graph

\[ Y = 75 + 0.65 \text{Age} \]

\[ Y = 70 + 0.44 \text{Age} \]
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

A. Interactive Terms

4. Interpretation

- Note that for those taking the drug not only does the intercept increase (that is, the average level of blood pressure), but so does the slope.

- Interpretation of an interactive term -- The effect of one independent variable (DRUG) depends on the level of another independent variable (AGE).
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

A. Interactive Terms

1. Definition
2. Results
3. Graph
4. Interpretation (cont.)

- The results here suggest that for people not taking the drug, each additional year adds .44 units to blood pressure.
- For people taking the drug, each additional year increases blood pressure by .65 units.
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

B. Example 3:

1. Setup

\[ \text{PARTYID} = C + \text{MONEY} + \text{MALE} + \text{MONEY*MALE (MANBUCKS)} \]

What is the interpretation of this interactive variable between Money and Gender?

As a male’s income increases are they more likely to identify themselves as a Republican than are women?
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

B. Example 3:

2. Commands

- The next two pages of your handout give the results.

- First, I made variables for everything that I want to analyze.

- MYPARTY is party ID.

- MONEY is income.
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

B. Example 3:

2. Commands (cont.)

- MALE is whether or not you're a male.
- And MANBUCKS is the interactive term for MALE and MONEY.
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

B. Example 3:

3. Results

1. No Interactive Effect
   - Notice that both MALE and MONEY are significant determinants of Party ID.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
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<td>MONEY</td>
<td>.046016</td>
<td>.010763</td>
<td>.116615</td>
<td>4.275</td>
<td>.0000</td>
</tr>
<tr>
<td>(Constant)</td>
<td>2.112151</td>
<td>.155388</td>
<td></td>
<td>13.593</td>
<td>.0000</td>
</tr>
</tbody>
</table>
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

B. Example 3:

3. Results

2. Interactive Effect

Now we put in the interactive term. Is it significant?

Equation Number 2  Dependent Variable.. MYPARTY

------------------- Variables in the Equation -------------------

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANBUCKS</td>
<td>5.009256E-04</td>
<td>.022138</td>
<td>.001915</td>
<td>.023</td>
<td>.9820</td>
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<tr>
<td>MONEY</td>
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<td>.013720</td>
<td>.116128</td>
<td>3.340</td>
<td>.0009</td>
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<tr>
<td>MALE</td>
<td>.384671</td>
<td>.327505</td>
<td>.092209</td>
<td>1.175</td>
<td>.2404</td>
</tr>
<tr>
<td>(Constant)</td>
<td>2.114600</td>
<td>.189432</td>
<td></td>
<td>11.163</td>
<td>.0000</td>
</tr>
</tbody>
</table>
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

B. Example 3:

3. Results

3. Presentation of Results

<table>
<thead>
<tr>
<th>Model Variables</th>
<th>Model I</th>
<th>Model II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.11** (0.15)</td>
<td>2.11 (0.19)**</td>
</tr>
<tr>
<td>MALE</td>
<td>0.39** (0.11)</td>
<td>0.38 (0.33)**</td>
</tr>
<tr>
<td>MONEY</td>
<td>0.046** (0.01)</td>
<td>0.046 (0.014)</td>
</tr>
<tr>
<td>MANBUCKS</td>
<td>0.0005 (0.02)</td>
<td></td>
</tr>
</tbody>
</table>

Standard errors in parentheses; Significant at $\alpha<.05$
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

B. Example 3:

3. Results

4. Interpretation

- So we conclude that as men and women’s income increases, they become Republican at the same rate.

- Men and women are equally as likely to become Democrats as they get poor.
IV. Different Slopes as Well as Intercepts: Interactive Terms (cont.)

B. Example 3:

3. Results

5. Notice

- Notice that the t-statistics for the other two variables went haywire when we added the interactive term into the equation.
- This is an important general point; you can use the t-value for the interactive term, but the other t-values become meaningless.
VII. Term Paper

1. Clearly state your hypothesis.
   - Use a path diagram to present the causal relation.
   - Use the correlations to help you determine what causes what.
   - State the alternative hypothesis.

2. Present descriptive statistics.
VII. Term Paper (cont.)

- 3. Estimate your model.
  - You can do simple regression, or include interactive terms, or do path analysis, or use dummy variables; whatever is appropriate to your hypothesis.

- 4. Present your results.

- 5. Interpret your results.
6. Draw out the policy implications of your analysis.

7. The paper should begin with a brief which states the basic project and your main findings.