

Question A

1. A:  $GOAL = \beta_0 + \beta_1 AGE + \varepsilon_i$   
C:  $GOAL = \beta_0 + \varepsilon_i$
  
2. (In this case we assume that each demographic variable is tested independently, in addition to age)  
Ex. A:  $GOAL = \beta_0 + \beta_1 AGE + \beta_2 DEMOVARIABLE + \varepsilon_i$   
C:  $GOAL = \beta_0 + \beta_1 AGE + \varepsilon_i$   
 $pa - pc = 1$   
 $n - pa = 40$   
  
Large effect:  $\eta^2 = .30$ ; Power is about .98  
Small effect:  $\eta^2 = .03$ ; Power is about .19
  
3. A:  $MANICAFTER = \beta_0 + \beta_1 MANICBEFORE + \beta_2 GOAL + \varepsilon_i$   
C:  $MANICAFTER = \beta_0 + \beta_1 MANICBEFORE + \varepsilon_i$
  
4. A:  $MANICAFTER = \beta_0 + \beta_1 MANICBEFORE + \beta_2 GOAL + \varepsilon_i$   
C:  $MANICAFTER = \beta_0 + 1MANICBEFORE + \beta_2 GOAL + \varepsilon_i$
  
5.  $MCHANGE = MANICAFTER - MANICBEFORE$   
A:  $MCHANGE = \beta_0 + \beta_1 GOAL + \varepsilon_i$   
C:  $MCHANGE = \beta_0 + \varepsilon_i$
  
6.  $GOAL' = GOAL - meanGOAL$   
A:  $MCHANGE = \beta_0 + \beta_1 GOAL' + \varepsilon_i$   
C:  $MCHANGE = 0 + \beta_1 GOAL' + \varepsilon_i$
  
7.  $DCHANGE = DEPRESSAFTER - DEPRESSBEFORE$   
A:  $MCHANGE = \beta_0 + \beta_1 DCHANGE + \varepsilon_i$   
C:  $MCHANGE = \beta_0 + \varepsilon_i$
  
8. A:  $MANICBEFORE = \beta_0 + \beta_1 DEPRESSBEFORE + \varepsilon_i$   
C:  $MANICBEFORE = \beta_0 + \varepsilon_i$   
The predicted sign of the relationship is negative.
  
9. In this case you could use a within-subject regression, using a participant's depression scores to predict his/her mania scores. You would then perform an analysis, using each participant's slope as the dependent variable, to see if across participants the average slope differed from 0:  
A:  $b_1 = \beta_0 + \varepsilon_i$   
C:  $b_1 = 0 + \varepsilon_i$

### Question B

As conservatism increases, individuals are more likely to vote for the republican candidate. Specifically, for each point increase on the conservatism scale, the odds of voting for the republican candidate increase by a factor of 8.82. At average levels of conservatism, the odds of voting for the republican candidate are .82 to 1, which does not differ from chance (1 to 1 odds).

### Question C

1. A:  $MEANLAT = \beta_0 + \beta_1SEX + \beta_2PREJ + \varepsilon_i$   
C:  $MEANLAT = \beta_0 + \quad + \beta_2PREJ + \varepsilon_i$   
PRE = .098  
 $F(1,27) = (1.715)^2 = 2.941$   
pa-pc = 1  
n-pa = 27  
p = .098

Controlling for prejudice, there is a (nonsignificant) trend for women to respond more quickly than men.

2. A:  $PREJ = \beta_0 + \beta_1SEX + \varepsilon_i$   
C:  $PREJ = \beta_0 + \quad + \varepsilon_i$   
PRE =  $(1 - \text{Tolerance}) = (1 - .994) = .006$   
 $F(1,28) = \frac{PRE/(pa-pc)}{(1-PRE)/(n-pa)} = \frac{(.006)/1}{(.994)/28} = .17$   
pa-pc = 1  
n-pa = 28  
p > .05

The evidence does not suggest that men and women differ in terms of prejudice scores.

3. A:  $GUNDIF = \beta_0 + \beta_1SEX + \beta_2PREJ + \varepsilon_i$   
C:  $GUNDIF = 0 + \beta_1SEX + \beta_2PREJ + \varepsilon_i$   
PRE = .576  
 $F(1,27) = (-6.061)^2 = 36.74$   
pa-pc = 1  
n-pa = 27  
p < .01

On average, participants made faster judgments in the case of armed targets than in the case of unarmed targets.

4. A:  $GUNDIF = \beta_0 + \beta_1SEX + \beta_2PREJ + \epsilon_i$   
 C:  $GUNDIF = \beta_0 + \beta_2PREJ + \epsilon_i$   
 PRE = .157  
 $F(1,27) = (-2.241)^2 = 5.022$   
 pa-pc = 1  
 n-pa = 27  
 p = .034

Controlling for prejudice, the interaction between gender and object type was significant. The difference in reaction times for armed and for unarmed targets was greater for men than for women (with both genders responding more quickly to armed targets).

5. A:  $BIAS = \beta_0 + \beta_1SEX + \beta_2PREJ + \epsilon_i$   
 C:  $BIAS = 0 + \beta_1SEX + \beta_2PREJ + \epsilon_i$   
 PRE = .46  
 $F(1,27) = 23.26$   
 pa-pc = 1  
 n-pa = 27  
 p < .01

On average, there is evidence of race bias, such that responses to armed targets are faster if the target is African American, but responses to unarmed targets are faster if the target is White.

6. A:  $BIAS = \beta_0 + \beta_1SEX + \beta_2PREJ + \epsilon_i$   
 C:  $BIAS = \beta_0 + \beta_1SEX + \epsilon_i$   
 PRE = .030  
 $F(1,27) = .834$   
 pa-pc = 1  
 n-pa = 27  
 p = .369

It does not appear that the magnitude of the race bias depends on prejudice score (controlling for gender).

7. If you define the “race effect” as the difference between mean reaction times for White targets and mean reaction times for African American targets, then the value of the coefficient for the SEX variable indicates the magnitude of difference in the race effect for men and for women, holding prejudice level constant. The race effect was stronger in women, whose mean RT was faster for White targets than for African American targets, than in men, who showed similar mean RTs for White and African American targets.

8. In order to examine the effect of race of the target for armed targets only, you would have to create a new  $W$  score for each participant ( $W = \text{WTG} - \text{ATG}$ ; the difference in reaction time for White armed targets and African American armed targets), and perform the following model comparison:

$$\text{A: } W = \beta_0 + \beta_1 \text{SEX} + \beta_2 \text{PREJ} + \varepsilon_i$$

$$\text{C: } W = 0 + \beta_1 \text{SEX} + \beta_2 \text{PREJ} + \varepsilon_i$$

9. Because reaction times cannot be less than 0, you would expect the data to be nonnormal due to positive skew. Thus, the researchers might transform the data (with a log transform or a power transform with  $p < 1$ ) in order to correct for this positive skew.