## IDS 702 Interaction terms

#### Interaction terms

- Sometimes we may be interested in how the relationship between a predictor and Y changes based on another (typically categorical) predictor
- Example: We want to know the relationship between a certain drug dosage and anxiety level for those <65 yrs vs. ≥65 yrs</li>

#### scenarios

#### **Representation in the model**

#### $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2$

### Interaction terms

- If significant, the effect of one predictor on the outcome depends on the value of another predictor
- General practice is to include **main effects** (each variable without interaction, e.g.,  $X_1$  and  $X_2$ ) when including interactions:  $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2$
- However, interpreting main effects can be difficult when interaction is significant
- Can have higher order interactions  $(X_1X_2X_3)$  or continuous variable interactions but these are difficult to interpret



# When should I include an interaction term?

- If the research question/domain calls for it
- If you see a difference during EDA