Random Effect Models

NRES 710

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Review quiz for interactions.

## Review of recent material

We have been learning about **multi-variable models** using a generic model:

In theory, you could have unlimited number of X-variables… but in practice, you might get 8 or 10 before it gets nonsensically complicated.

We can have **interactions** (e.g., ).

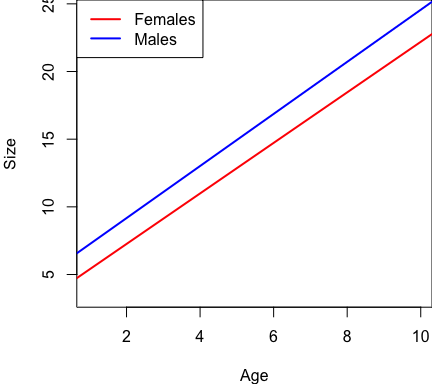
* Note: Sometimes other fields refer to this in other ways (e.g., ‘effect modification’; where one effect modifies another effect).

We have talked about the **advantages** of multi-variable models: eliminates swamping, eliminates bias associated with collinearity (but inflates variance), and allows us to look for interactions.

When we build models with interactions, we should generally include the ‘main effects’ as well (i.e., the individual effects of or ).

## Moving forward

Let’s take a step back and temporarily remove interactions from our brain. Interactions are confusing! Instead, let’s again consider more simple models without interactions.



## Summary

## Truth

################### 'Truth' ####################   
### Lecture 15: code to simulate data for class  
  
# Set the seed for reproducibility  
set.seed(123)  
  
### Dataset 1: age + sex + age\*sex  
# This is similar to the Age, Sex, and Size data we simulated for in Lecture 12.  
# There is no collinearity between Age and Sex, but now there is an interaction  
# between Sex and Age.  
  
# First dataset  
# X variable  
n <- 50  
x1 <- c(rep("Female", n), rep("Male", n))  
x2 <- runif(n \* 2, 1, 10)  
dummy <- data.frame(model.matrix(~ x1 - 1))  
colnames(dummy) <- c("Female", "Male")  
  
# Simulate error  
Error <- rnorm(n \* 2, 0, 0.8)  
  
# Predict Y  
Response <- 4 + 1.5 \* x2 + 2.5 \* dummy$Male + 1 \* x2 \* dummy$Male + Error  
  
# Dataframe  
datum <- data.frame(Age = x2, Sex = x1, Male = dummy$Male, Size = Response)  
  
# Save the data  
write.csv(datum, "lecture\_15\_dataset1.csv", row.names = FALSE)

[–go to next lecture–](lecture_16.html)