Multiple Approaches to Causal Modeling Using Black Spruce Data

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# Background

[@Chihara2018] provide a data set concerning the growth of Black Spruce Trees. According to these authors:

“Black spruce (Picea mariana) is a species of a slow-growing coniferous tree found across the northern part of North America. It is commonly found on wet organic soils. In a study conducted in the 1990s, a biologist interested in factors affecting the growth of the black spruce planted its seedlings on sites located in boreal peatlands in northern Manitoba, Canada (Camil et al. (2010)). The data set Spruce contains a part of the data from the study (Table 1.8). Seventy-two black spruce seedlings were planted in four plots under varying conditions (fertilizer–no fertilizer, competition–no competition), and their heights and diameters were measured over the course of 5 years. The researcher wanted to see whether the addition of fertilizer or the removal of competition from other plants (by weeding) affected the growth of these seedlings.”

# Setup

.   
. clear all  
  
.   
. cd "/Users/agrogan/Desktop/newstuff/spruce"  
/Users/agrogan/Desktop/newstuff/spruce  
  
.   
. use spruce.dta, clear  
  
.

.   
. describe  
  
Contains data from spruce.dta  
 obs: 72   
 vars: 9 26 Apr 2020 12:18  
 size: 4,320   
───────────────────────────────────────────────────────────────────────────────────────────────  
 storage display value  
variable name type format label variable label  
───────────────────────────────────────────────────────────────────────────────────────────────  
Tree long %12.0g Tree number  
Competition long %12.0g Competition  
 C (competition), CR (competition removed)  
Fertilizer long %12.0g Fertilizer  
 F (fertilized), NF (not fertilized)  
Height0 double %10.0g Height (cm) of seedling at planting  
Height5 double %10.0g Height (cm) of seedling at year 5  
Diameter0 double %10.0g Diameter (cm) of seedling at planting  
Diameter5 double %10.0g Diameter (cm) of seedling at year 5  
Ht\_change double %10.0g Change (cm) in height  
Di\_change double %10.0g Change (cm) in diameter  
───────────────────────────────────────────────────────────────────────────────────────────────  
Sorted by:   
  
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