

Relation between Drinking and Smoking to Academic Performance

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Introduction

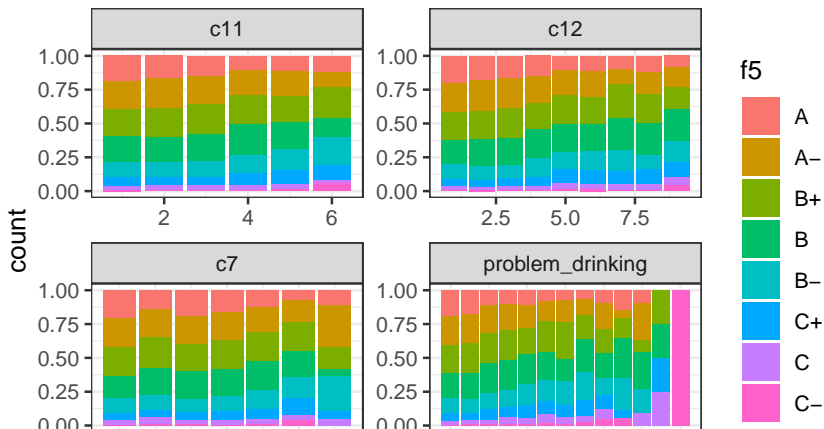
- ▶ Data: 1997 and 2001 College Alcohol Study, 14428 and 10904 observations respectively
- ▶ Goal:
 - ▶ How do drinking and smoking affect academic performance?
 - ▶ Do the effects change from 1997 to 2001?
- ▶ Challenges:
 - ▶ latent construct of drinking behavior and smoking behavior cannot be directly measured by a single observed variable
 - ▶ -> latent factor based model
- ▶ Model:
 - ▶ Structural Equation Model (SEM): studying interrelationships among observed and latent variables
 - ▶ Build SEM for 2001
 - ▶ Build SEM for 1997 using “overlapping” predictors

Pick variables

- ▶ Academic (response variable): f5 (GPA)
- ▶ Drinking:
 - ▶ c7: current use of alcohol (abstainer/former drinker/...)
 - ▶ c11: on how many occasions have a drink (1-2/3-5/...)
 - ▶ c12: how many drinks in these occasions (0/1/2/...)
 - ▶ problem_drinking(c17): how often has your drinking caused you to ...
- ▶ Smocking:
 - ▶ e3: on how many days smoke
 - ▶ e4: how many cigarettes a day
 - ▶ e8: smoke with people/alone/...
 - ▶ e11-13: exposed to smoking
- ▶ Background:
 - ▶ fraternity/sorority: a5,a6,a8d
 - ▶ gender/race/health status/weight/height/mother's and father's alcohol use: a2,g3,g6,g7,g8,g15,g16

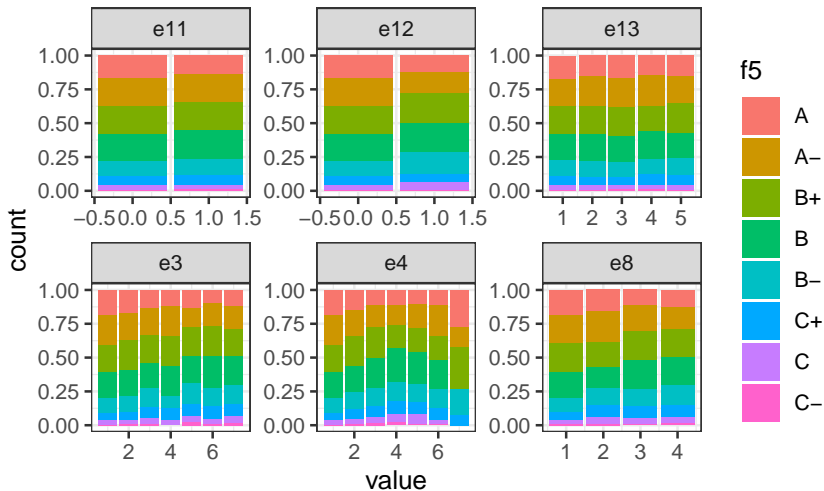
EDA: Relation between drinking behavior and GPA

- ▶ The increasing proportion of higher GPA relate to less alcohol use
- ▶ Students with high GPA tend to “overestimate” the severity (vice versa for students with lower GPA)
- ▶ Students with low GPA tend to be heavy drinker and cause problems



EDA: Relation between smoking behavior and GPA

The increasing proportion of higher GPA relate to - less exposed to smoking environment - the degree of addiction decrease - For the students smoke more than a pack per day, students with high GPA take a large proportion.



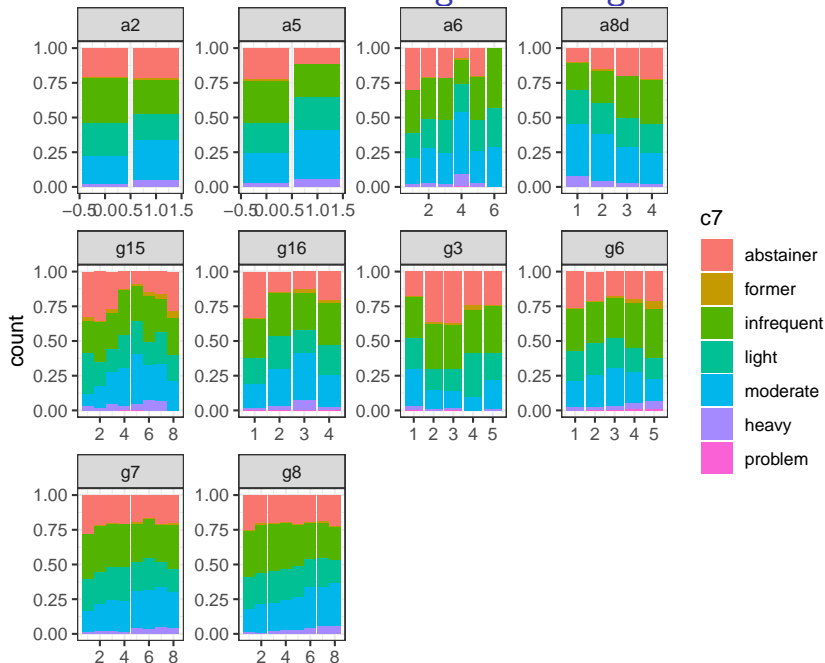
EDA: Relation between drinking and background

heavier use of alcohol/cigaret relate to - member of a fraternity/sorority - live in fraternity/sorority - think fraternity/sorority life is important - mother/father is problem drinker - family accept heavy drinking

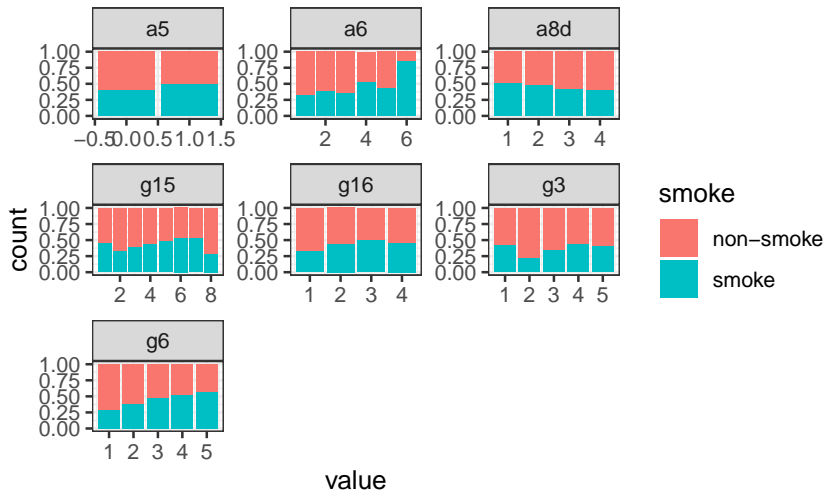
heavier use of alcohol relate to - male - weights/heights

higher proportion of smoker related to - poor health

EDA: Relation between drinking and background

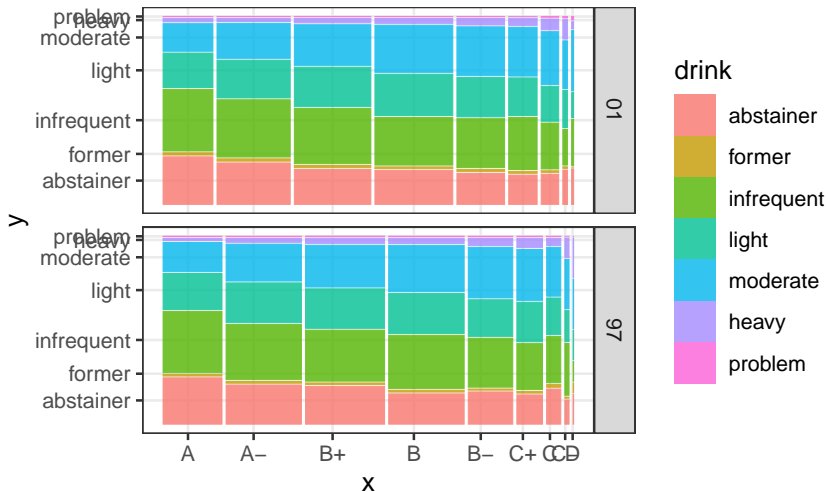


EDA: Relation between smoking and background



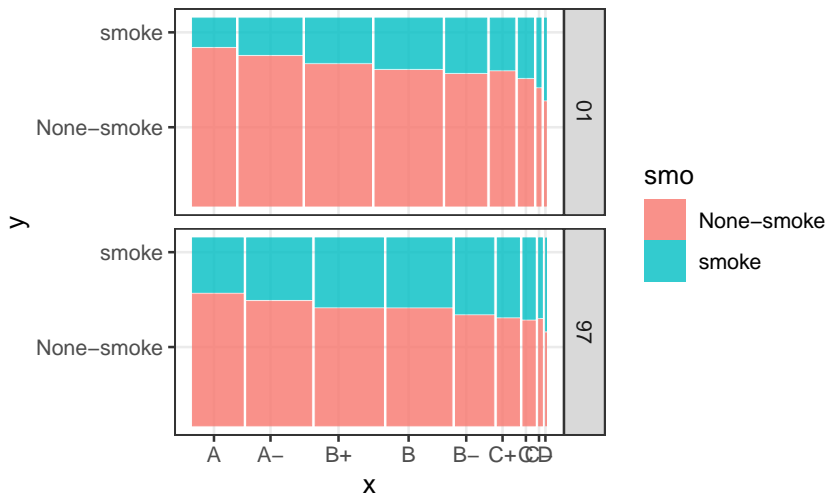
EDA: trend of drinking behavior from 1997 to 2001

► similar relation



EDA: trend of smoking behavior from 1997 to 2001

- more proportion of smokers in 1997, stronger relation to GPA in 2001



Data Preprocessing

- ▶ Impute the NA's based on the relation to other questions
- ▶ Obtain the complete cases (keep 88.5%(2001), 92.4%(1997))

Model

Results

Discussion

- ▶ Data imputation