

Modeling Relationship between Alcohol Policy  
Perception and Alcohol Consumption in '01  
Harvard College Alcohol Survey (CAS)

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# Objective

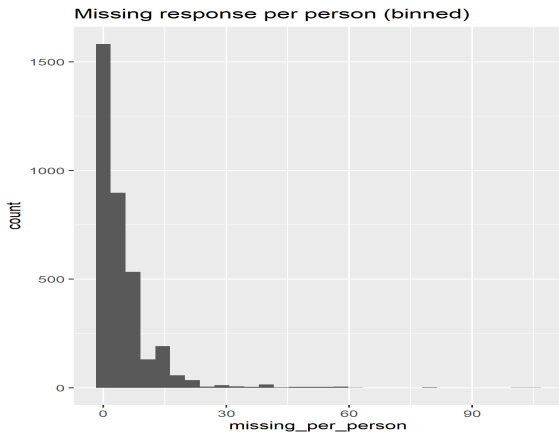
- ▶ Data: 2001 Harvard College Alcohol Study (CAS)
- ▶ 10904 participants (unknown response rate)
- ▶ Investigate the correlation structure between **subjective beliefs about campus alcohol policy** and **objective measures of alcohol consumption**
- ▶ *Section B* for subjective questions, *Section C* for objective questions
- ▶ Standard survey modeling techniques: factor analysis, structural equations model, item response theory

# Data Processing

- ▶ Consistent ordering of responses
- ▶ More stringent alcohol policy beliefs (1) -> Less stringent
- ▶ Less alcohol consumption (1) -> More consumption
- ▶ Aggressive pruning of the variables before modeling
- ▶ Unreliable responses classified based on
- ▶ Response to A7: A (alone) is not allowed with other responses (family/partner/roommate)
- ▶ Response in Section C: participants who chose 1 in C10 and answered C11–C15, etc.
- ▶ WEIGHT01 used as sampling weights (intended for cross-sectional studies)

# Missing Responses

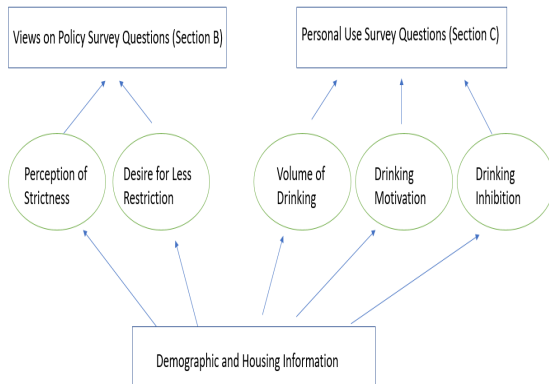
- ▶ Missing response rate adjusted for questions that only target certain demographic subgroups



# Missing Responses for Each Section

<<<<<<< HEAD ## What A Structural Model Looks Like

... Graphic plot here (believe will be better to include it soon to give



the big picture)...

===== >>>>>>>

1242f462d3b86806b4f07d6cc047dc52c9558fea ## Structural Equations Modeling (SEM)

# Graphical Representation of the Model

...PLOT...

# Modeling Challenges

- ▶ The model is clearly misspecified: Gaussian error assumption is made on ordered response
  - ▶ Asymptotic standard errors of factor loading estimators are valid for nonnormal factor analyses (Anderson and Amemiya, 1988)
  - ▶ In practice can cause lower goodness-of-fit
- ▶ Complete case analysis due to excessive computation in maximizing the full likelihood
- ▶ (ANYTHING ELSE??)

# Main Results

We define two factors corresponding to Section B of the survey, which we characterize as:

B1: Perception of strictness in school's alcohol policy, and B2: Desire for less restrictive alcohol policies

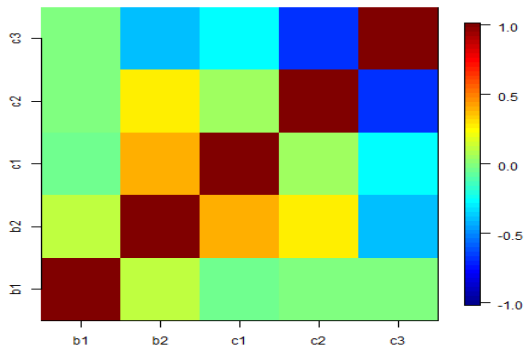
We also define three factors corresponding to Section C of the survey, which we characterize as:

C1: Volume of Drinking C2: Motivation for Drinking C3: Inhibition towards Drinking



# Main Results

Correlation between latent factors:

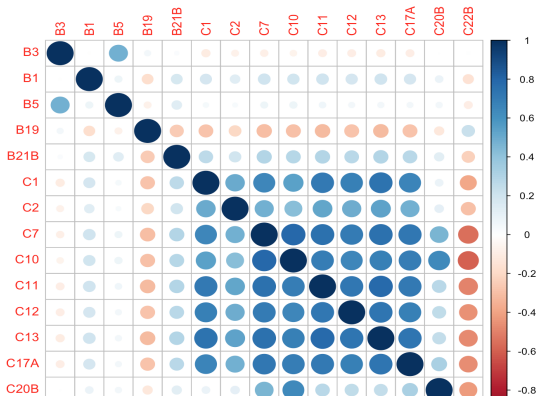


# Model Diagnostics

- ▶ Various statistics to evaluate model fit in practice (and suggested threshold indicating good fit): CFI ( $> .95$ ), RMSEA ( $< .08$ ), SRMR ( $< .06$ ) (See Hu and Bentler, 1999)
- ▶ Goodness of fit statistics for our model:  
CFI: 0.866, RMSEA: 0.041, SRMR: 0.027

# Interpretation

B5 and B3: current policy is lenient, and students want even more lenient policy; B19: minimal drinking age, Better knowledge of drinking, less alcohol use, more against drinking (C22); B3 and C's: stronger enforcement of policy does correlate with less consumption; B1, B5 and C's: however wanting more lenient policy correlate with more consumption



# Conclusion

- ▶ ...
- ▶ Limitations
- ▶ Alternative approaches to account for ordered response
- ▶ Theory-driven priors may improve fit of more complex models
- ▶ Need information to correct for estimate biases

# Reference

- ▶ “Asymptotic Chi-Square Tests for a Large Class of Factor Analysis Models,” Anderson, T. W. and Amemiya, Y. *The Annals of Statistics*, 16(2), 1988.
- ▶ “Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives,” Hu, L.-T. and Bentler, P. M. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1999.