

BIO A 423:

Paper

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Introduction

In this paper, I investigate the link between COVID-19, student living situation, and contraception use. I am interested in understanding the association between network characteristics and risky sexual behavior. For example, I am interested in understanding how the number and presence of peers who engage in risky sexual behavior (one night stands, lack of contraception by type, and multiple partners) is associated with different ego outcomes. In addition to that, I want to know about behaviors related to student groups which have been associated with these behaviors (i.e. the greek community). I seek to investigate how the covid safety of a social network and one's own perceived covid safety correlates with the outcome of contraception use and type of contraception use.

In this report, I create and administer a survey to a sample of college students between the ages of 18-30, collecting demographic, age, and gender covariates. In the survey, I ask questions about the structure and characteristics of the ego's network as well as certain behaviors that are related to risky sexual behavior like alcohol use.

Literature review

<< add in the information on each of these sources to the bibtex and cite >>

In this short literature review I provide three sources looking at network characteristics and risky sexual behavior, STDs, and STIs. To recall, I am interested in the network characteristic effects (perceived peer group use of contraception, and perceived covid safety) on individual sexual behavior and contraception use. One issue in doing this literature review is that there is not much information about COVID and STDs at this moment, so there is some speculation on my part. With these three sources, I tried to focus on social network studies of youth and adolescent sexual behavior to provide context about my survey.

(???) uses nationally representative survey data (Add Health) to estimate the role of peer networks in influencing adolescent sexual behavior. The authors use measures not only from individual perception but from peers as well. They are particularly interested in whether there might be a social-acceptability effect that drives the likelihood of engaging or not engaging in risky sexual behavior. They estimate a mixed effects model that controls for environmental and school level factors influencing a causal interpretation as well as utilizing two-stage least squares to deal with bias and peer selection. They specifically look at a binary variable of sexual behavior and then a count variable that measures the number of sexual partners and include demographic and school level covariates. They find a positive and statistically significant relationship between having sex and peer group effects in grade level and upper level students. Overall their major finding is that the association between peer behavior and individual sexual behavior is important. They suggest that further study should use differently worded dependent variables and or look at more granular age groups than grades. Note: They use a linear probability model, which they argue with a large sample size converges to normal. This could be debated in light of a logistic model. Also, it is odd that when dealing with the count variable for the number of sexual partners that they did not consider a poisson regression outcome. Since college students are on average still

young, I think that the behaviors and information presented in this paper is still relevant.

Bearman, Moody, and Stovel (2004) looks at the characteristics of adolescent romantic networks. They look at the ties and distributions in the network as well as attempt to develop an empirical understanding of what these networks look like as well as a theoretical understanding of how they may influence behavior. They find in their broad scope study that the methods and models that disease epidemiologists are using might not be appropriate for describing how disease diffuses through a network of youths. They reference earlier work (Moody 2003) which suggests that networks that have low average degrees can have clusters of higher prevalence STD infection. They conclude suggesting that policy approaches to intervening focusing on high-risk individuals is not productive because the number of partners does not empirically matter for disease distribution as previously thought. Rather comprehensive sex education would be more important in the author's view. This article is useful for providing background and theory for how STDs diffuse in a network of youth as well as information on how to inform questions for my survey.

Scott-Sheldon, Carey, and Carey (2008) offers a comparative study of Greek and non Greek students's health behaviors. They assess drug and alcohol use, sexual behavior, and membership to Greek life to understand if there are differences in risky health behaviors. They find that broadly, Greeks and non-Greeks are the same, however in the presence of alcohol, Greeks are more likely to engage in risky behavior. This is important for my survey because I could ask about alcohol usage as a potential moderating variable. I could also formulate and test interactions between drinking and non drinking and different memberships as well to test if this alcohol effect is represented in the data I collect too.

Hypotheses.

Drawing on social influence and peer pressure theories of social network behavior, I predict that those who have a peer group that is more comfortable with risky behavior relative to peers will be associated with an increase in risky sexual behavior (Alexander et al. 2001).

I also predict that those who do not take covid precautions seriously will be associated positively with risky sexual behavior.

In addition to this, I will also investigate the types of contraception used by these groups to understand whether there are gaps in usage by different living situations.

Methods

To investigate the questions from this study I ran a survey for a period of two weeks, which asked undergraduate and graduate students about their social network and their own covid behavior, their numbers of friends, and their and their friends practices regarding both safe and unsafe sexual practices. The inclusion criteria were being a student and being sexually active which in the end comprised a sample size of ($N = 55$).

To answer my study questions empirically, I estimate both multinomial and logistic regression, to understand peer effects and social network impacts on one's engagement in safe or unsafe sex and the type of contraception that they use. I use the "Effects" package to visualize these results and present descriptive and inferential results in the following section.

The first model, which is a multinomial regression where the outcome variable is the whether the respondent uses Y_i type of contraception and the second model, is a logistic regression looking at the decision to use 1 or less or two or more types of contraception.

The logistic model equation is given by:

$$\ln\left(\frac{Y_i}{1 - Y_i}\right) = \alpha + X\beta + \epsilon$$

$$\epsilon \sim \text{Bin}(n, p)$$

Where we model the log odds of the outcome 2 or more types of contraception, in comparison to the reference category 1 type or none at all, as a linear combination of the predictors contained in X, which are, age, race, living situation, peer and personal covid safety, and

the ego's peer's sexual health. Epsilon is the error distribution as this is estimated with maximum likelihood which is binomially distributed to account for the binary nature.

Below is the equation for the multinomial regression model:

$$\ln\left(\frac{\pi_j}{\pi_i}\right) = \alpha_j + X\beta + \epsilon$$

$$\epsilon \sim \text{Multinom}(x_i, n, p_i)$$

Where we model the log odds of a category j of the multinomial outcome, with a given reference category (both represented by π_i), which are then both modeled by the same linear predictors in the first equation. In this case, the error distribution has been generalized to accomodate x_i outcomes with p_i probabilities out of n trials.

For both models, I present full models and restricted (only the focal predictor) to provide a check on the robustness of these trends with and without covariates. In the following section, I present descriptive and statistical results from my sample, and discuss the results of both.

Results

Discussion and conclusion

Bibliography

- Alexander, Cheryl, Marina Piazza, Debra Mekos, and Thomas Valente. 2001. "Peers, Schools, and Adolescent Cigarette Smoking." *Journal of Adolescent Health* 29 (1). Elsevier: 22–30.
- Bearman, Peter S, James Moody, and Katherine Stovel. 2004. "Chains of Affection: The Structure of Adolescent Romantic and Sexual Networks." *American Journal of Sociology* 110 (1). The University of Chicago Press: 44–91.

Scott-Sheldon, Lori AJ, Kate B Carey, and Michael P Carey. 2008. "Health Behavior and College Students: Does Greek Affiliation Matter?" *Journal of Behavioral Medicine* 31 (1). Springer: 61–70.

Appendix

This survey asks about social network characteristics and sexual behavior. Due to the sensitive nature of this survey the information is completely anonymous and no identifying information will be collected about you, your friends, or your university. This survey is only used for educational purposes and will not be linked back to you in any way whatsoever. You do not have to answer all of the questions and may skip some if you do not wish to answer them and you are free to stop at any time. Though the nature of this survey is sensitive, the researchers interested in this information ask participants to answer as honestly and truthfully as possible. Some of the questions may ask about continuous behaviors or those that you do infrequently. When answering these questions, please choose the answer that represents your overall behavior best.

PT1.

Are you a current undergraduate college student? (Y/N)

Are you sexually active? (Y/N)

Please select one of the following about your living situation:

- On-campus
- Off-campus
- Greek

What is your Gender?

- Male
- Female

- Non-Binary
- Transgender-Male
- Transgender-Female
- Prefer to self-describe

What is your Race/Ethnicity? (select all that apply)

- White/caucasian
- Asian/Pacific Islander
- Black or African American
- Two or more races
- Other (please specify

Are you Hispanic of Latinx Y/N.

What year were you born? (YYYY)

How many close friends do you have that you see or talk to regularly? Numeric [write in]

On a scale of 1-5, with 3 being neutral, how would you rate your close friends' behavior at following COVID-19 safety precautions compared to others? 1 = not at all, 2 = A few precautions, 3 = neutral, 4 = most precautions , 5 = all precautions.

On a scale of 1-5, with 3 being neutral, how would you rate your behavior at following COVID-19 safety precautions, relative to your friends? 1 = not at all, 2 = A few precautions, 3 = neutral, 4 = most precautions , 5 = all precautions.

Are you currently in a relationship with another person(s)? (Y/N)?

On a regular basis, how many sexual partners do you have (please count anyone you regularly have sex with)?

[numeric write in]

On a regular basis, how many drinks per week do you have? [Numeric write in]

PT 2.

Now, thinking about your friend group, how many of your friends are sexually active?

- A few
- Some of them
- Most of them
- All of them

How many of your friends to the best of your knowledge would you say engage in safe sex practices, eg. using condoms, dental dams, IUD/Birth control, or getting tested for STDs/STIs?

A few Some of them Most of them All of them

How many of your friends would you say DO NOT engage in safe sex practices?

A few Some of them Most of them All of them

Can you describe the types of protection that you use in your sexual encounters on a regular basis?

- 1 = No protection at all.
- 2 = 1 type of sexual protection (such as condoms, dental dams, and IUD/Birth control, or getting tested for STDs/STIs).
- 3 = 2 or more methods of protection.

Please describe the protection that you use:

- My partner(s) and I use condoms.
- My partner(s) and I use an IUD/Birth control.
- My partner(s) and I use a dental dam.
- I use some other type of protection.
- My partner(s) and I get tested for STDs/STIs.

- My partner and I use 2 or more of the above protection methods.