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**The Relationship between Perceived High Levels of Stress
and Non-Condom Usage among College Students at the University of Kentucky**

A paper submitted in partial fulfillment of the requirements for the degree of
Master of Public Health in the University of Kentucky College of Public Health

By

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April 24, 2014

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Abstract:

Introduction: Due to the paucity of research that specifically examines the non-use of condoms, during sexual encounters, as a maladaptive coping strategy for stress among college students; the purpose of my study, is to determine if there is an association between perceived high levels of stress and the decreased likelihood of condom use during sex among students at the University of Kentucky.

Method: The cross-sectional descriptive study investigated health behaviors and attitudes towards health behaviors in a sample of 7,000 University of Kentucky students enrolled in courses for fall 2013. Participants were randomly selected to partake in an anonymous online health survey. The study is geared toward gaining an understanding between high levels of stress and non-condom use during vaginal, oral, and anal sex among those students at the University of Kentucky. The variables measured in the study were all contributing factors towards perceptions of overall health. The variables of interest were stress, sex, and non-condom use; stress being the correlate variable, and non-condom use being the outcome variable. I am focusing my attention only on those respondents who have been sexually active within the last 30 days, excluding responses from sexually naïve respondents.

Results: While the chi-square analysis reported certain variables were significantly associated with non-condom use for vaginal and anal sex, logistic regressions run for vaginal, oral, and anal sex reported that high stress levels did not appear to predict not using condoms during vaginal, oral, and anal sex.

Conclusions: Public health practitioners should create targeted condom promotion campaigns to normalize condom use on college campuses and increase condom use regardless of the sexual act.

Introduction:

College culture is one that fosters casual sex as socially accepted behavior.¹ The Centers for Disease Control and Prevention (CDC) define risky sexual behaviors as non-use of condoms, having multiple partners, and engaging in sex in an altered state of consciousness after consuming drugs or alcohol.² Although non-condom use is typically associated with casual sex at the college level,³ it is also possible that it is associated with stress. Many college students experience stress and depression as a result of time management, academic success, and financial and health concerns.⁴ According to a national survey of students entering 4-year colleges and universities administered by the Higher Education Research Institute, self-reported emotional health of first year students dropped to record lows in 2010.⁵ The National Alliance on Mental Health's 2012 survey reported that 73% of respondents experienced a mental health crisis—listing stress as a trigger—during their time at college.⁶ Ultimately, experiencing a poorer mental health status may place someone into a state in which they are less likely to engage in condom use during sexual encounters.⁷

Coping methods for perceived levels of stress and anxiety are often affected by decreased self-efficacy and self-esteem which may result in alcohol use, drug abuse, and/or sex as a means of dealing with situational distress.⁸ Stress may lead to alcohol consumption, which could potentially increase someone's vulnerability of engaging in other harmful health choices.⁹ Noting that, college life is commonly associated with increased alcohol consumption and alcohol abuse among undergraduate and graduate students.¹⁰ In *The College Life Study*, a longitudinal prospective study of college females who had ever had vaginal sex, investigators sought to better understand and predict their health behaviors. It was determined that sexual encounters occurring

under the influence of alcohol were independent predictors of unsafe sex (no condom usage) as well as having multiple sex partners.¹⁰

Indeed, UK University Health Service (UKUHS) considers alcohol consumption and sex as maladaptive coping methods for perceived levels of stress among college students. Risky behaviors may become a coping mechanism when appropriate resources are lacking to help students cope with stress, as suggested by UKUHS (Brandy Reeves, e-mail communication, November 2013). The past literature by Lam and Lefkowitz focused on condom usage, perceived levels of stress, and maladaptive coping methods in college students, which reinforces the idea that college is frequently a time for students to engage in risky sexual behavior as well as undergo a general increase in any already risky sexual behaviors. Their findings also noted that risky sexual behaviors, specifically inconsistent condom use, increased and eventually leveled out over time.¹¹

Inconsistent condom use places college students at an increased risk for sexually transmitted infections (STI), unintended pregnancies, and other negative social consequences.¹ The likelihood of a university student contracting an STI during their time attending college is one in four.¹² A targeted intervention strategy for students suffering from stress would be to highlight the negative health impacts resulting from maladaptive coping behaviors and promote adaptive strategies. Students adopt coping behaviors to handle their stress levels, some of which are maladaptive and have a negative impact such as alcohol and drug consumption as well as risky sexual behaviors.⁴

In a fall 2013 survey, the UHS utilized the Transactional Model of Coping in order to categorize students' coping strategies. The Transactional Model of Coping identifies two categories of coping: adaptive strategies, which facilitate positive health outcomes like strong

social support and planning; and maladaptive strategies, which are often associated with negative health outcomes, such as denial, substance abuse, and venting (manuscript in preparation).

Although no firm reason was given for the decision, UHS now categorizes sex as a maladaptive coping strategy. If all sex can be seen as a maladaptive coping strategy, then certainly risky sex—already defined as non-condom use, having many partners, and engaging in sex after the consumption of drugs or alcohol—can be seen as maladaptive.

Due to the paucity of research that explicitly examines the relationship between stress and non-condom use during sexual encounters among college students, the purpose of my study was to determine if there is an association between perceived high levels of stress and the decreased likelihood of condom use during sex among students at UK who have had sex within the last 30 days. Evaluating if non-condom use of students, who had engaged in sex within the last 30 days, had a relationship with their stress levels may serve to aid future research geared toward unequivocally categorizing sex as a maladaptive coping behavior for stress.

Methods:

The UK Institutional Review Board waived review of this study because of the use of de-identified secondary data used with permission of UHS.

Study Design and Sample:

This cross-sectional descriptive study investigated health behaviors and attitudes towards health behaviors in a sample of 7,000 UK students enrolled in courses for fall 2013. The participants were randomly selected from the student roster provided by UK's Office of the Registrar and offered to UHS in order to properly provide a diverse representation of the 25,000 students at UK. It is important to note that in past studies, which took samples from underclassmen, there were typically lower response rates from freshman and sophomore students. Therefore, for the purpose of this study, students were stratified by academic class,

allowing for an oversampling of freshmen and sophomores. To be eligible to participate in the study, a student must have been registered for courses for the fall 2013 semester and at least 18 years of age. For the purpose of my study, participants were only included if they had engaged in vaginal, oral, or anal sex within the past 30 days. Participants were excluded who reported to have not ever engaged in sex at all or the sexual behavior within the last 30 days.

Recruitment and Data Collection:

Participants were invited to participate in an anonymous online health survey administered via Qualtrics. Recruitment e-mails were sent to prospective participants from UHS study staff outlining the nature of the study, the significance of their participation in the study, and an explanation that by completing and submitting the on-line survey, students would be providing their implied consent to participate. The official university e-mail account of prospective participants was utilized by UHS to invite them to click on a link to the survey. Reminder e-mails were used for 10 days and sent every other day to those participants who had not completed and submitted their survey. There were no participant incentives offered for study participation.

The sample of participants was randomly divided into two survey recipient groups by the survey software. Participants received either Version A or Version B of the survey. Each survey contained core questions that were present in both survey versions.

Measures:

The variables measured in the study were all contributing factors towards perceptions of overall health: academic performance, alcohol and drug use, stress level, coping methods for stress, depression and anxiety, sleep habits, nutrition and exercise, sex, and contraception use. This study investigated the relationship between stress and not using a condom for participants

who reported engaging in various sexual acts within the past 30 days. Therefore, the variables of interest for this use of data are: stress, sexual acts, and non-condom use.

The correlate variable, stress level, was measured with the following question, “Please select the answer that best represents your stress level in the past 30 days.” The response options provided were ordinal and are as follows: “No stress, Some stress, Moderate amount of stress, Much stress, or a Great deal of stress.” The variable was dichotomized into those who listed a great deal of stress and much stress (high stress) versus those who responded no stress, some stress and moderate amount of stress (low stress).

The outcome variable, non-condom use, was measured with the following question, “How frequently did you or your partner use a condom or dental dam during anal, oral and/or vaginal sex?” The response options provided were ordinal and are as follows: “None have never done this activity, None have done but not in past 30 days, Never, Rarely, Sometimes, Most of the time, Always.” The variable was dichotomized into those who listed Never or Rarely Use versus those who responded as Sometimes, Most of the time and Always for each oral, anal, and vaginal sex category. Responses were excluded that fell under none have never done this activity, and those who also responded as none have done but not in the past 30 days. I focused my attention only on those respondents who had reported themselves as being sexually active within the last 30 days.

Demographics:

The moderating covariates were gender and sexual orientation. Gender was measured with the following question, “What is your gender?” The response options provided were categorical and are as follows, “Male, Female, Transgender.” Sexual orientation was measured with the following question, “What is your sexual orientation?” The response options provided

were categorical and are as follows, “Bisexual, Gay/Lesbian, Heterosexual/Straight, Questioning, and Self defined (with a space left for the participant to write in their own response).”

Analytic Plan:

This study examined the relationship between stress and non-condom use during sexual acts. Bivariate analysis were used to determine the association between the non-use of condoms during vaginal, oral, and anal sex in the past 30 days and stress, age, class level, race, gender, relationship status, and sexual orientation. Logistic regression was performed to assess the impact of a number of factors—stress, age, class level, race, gender, relationship status, and sexual orientation—on the likelihood that respondents would report non-condom use during vaginal, oral, and anal sex in the past 30 days, adjusting for confounding variables. Statistical analysis was performed using IBM SPSS Statistics 21.

Results:

The total survey respondents were predominantly White non-Hispanic (82.2%), female (67.9%), between the ages of 18-24 (82.9%), were an undergraduate class level (78.9%), were not in a relationship (56.9%), and self-identified as heterosexual (94.6%). Over half (58.4%) of the total 837 survey respondents rated themselves as having low stress, while 41.6% rated themselves as having high stress (Table 1).

A bivariate analysis for oral sex showed that high levels of stress were significantly associated with the outcome of non-condom use during oral sex ($X^2 = 4.65$, $p = .031$) (Table 2b). Additionally, a bivariate analysis for anal sex also showed that the relationship status of participants were significantly associated with the outcome of non-condom use during anal sex ($X^2 = 9.53$, $p = .002$) (Table 2c). Furthermore, a bivariate analysis for vaginal sex showed that age, was also significantly associated with the outcome of non-condom use during vaginal sex

($X^2 = 29.3$, $p < .001$) (Table 2a). The bivariate analysis for vaginal sex, also showed that relationship status, was also significantly associated with the outcome of non-condom use during vaginal sex, ($X^2 = 8.100$, $p = .004$) (Table 2a). The same, bivariate analysis for vaginal sex showed that participants class level were significantly associated with the outcome of non-condom use ($X^2 = 9.44$, $p = .002$) (Table 2a).

Binary logistic regression was performed to assess the impact of all variables to simultaneously predict non-condom use, the results showed that there was no significant relationship between stress and condom use during vaginal sex (Table 3a). The model contained seven independent variables (stress, gender, race, class level, age, relationship status, and sexual orientation). The full model containing all predictors for non-condom use during vaginal sex was statistically significant $X^2 (7, N = 330) = 31.58$, $p < .001$, indicating that the model was able to distinguish between respondents who did and did not use a condom during vaginal sex. The model as a whole explained between 9.1% and 12.3% of the variance in non-condom use and correctly classified 67% of the cases (Table 3a). The variable age, made a statistically significant contribution to the model of predicting non-condom use during vaginal sex. Participants who were age 25+ had a 3.823 times higher odds (95% CI 1.980-7.380) of not using condoms during vaginal sex compared to the reference category of participants ages 18-24 when controlling for confounding variables (Table 3a).

Additionally, a binary logistic regression was performed to assess the impact of all variables to simultaneously predict non-condom use, the results showed that there was no significant relationship between stress and condom use during oral sex (Table 3b). The model contained seven independent variables (stress, gender, race, class level, age, relationship status, and sexual orientation). The full model containing all predictors for non-condom use during oral

sex was statistically significant $X^2 (7, N = 307) = 16.89, p < .05$, indicating that the model was able to distinguish between respondents who did and did not use a condom during oral sex. The model as a whole explained between 5.4% and 20.1% of the variance in non-condom use and correctly classified 96.4% of the cases (Table 3b). The variable race, made a statistically significant contribution to the model of predicting non-condom use during oral sex. Participants who were age White Non-Hispanic had a 4.75 times higher odds (95% CI 1.27-17.69) of not using condoms during oral sex compared to the reference category of participants who were Non-White when controlling for confounding variables (Table 3b).

Lastly, a binary logistic regression was performed to assess the impact of all variables to simultaneously predict non-condom use, the results showed that there was no significant relationship between stress and condom use during anal sex (Table 3c). The model contained seven independent variables (stress, gender, race, class level, age, relationship status, and sexual orientation). The full model containing all predictors for non-condom use during anal sex was statistically significant $X^2 (7, N = 71) = 6.97, p < .05$, indicating that the model was able to distinguish between respondents who did and did not use a condom during anal sex. The model as a whole explained between 9.4% and 13.1% of the variance in non-condom use and correctly classified 66.2% of the cases (Table 3c).

Discussion:

The data suggest that stress does not impact non-condom use among this sample of college students who have engaged in sexual acts within the past 30 days. These results can be made useful for future research efforts tailored towards the examination of non-condom use among college students, by potentially eliminating a possible contributing variable, stress level.

If stress does not impact condom use, then perhaps sex alone should not be categorized as a maladaptive behavior. However, it is important to consider that sex without a condom appears to

be just as likely for non-stressed students as it is for students with high levels of perceived stress. Therefore, future surveys may want to classify sex as protected and safe versus unprotected and risky. Though the research does not show a direct contribution of stress on non-condom use, future researchers may want to investigate the relationship between stress and alcohol use; then, the combination of alcohol use and not using a condom may yield an indirect relationship. Prior research reports that, if the sex act includes unprotected sex, it is ultimately a maladaptive coping behavior because of the individual and their partners' potential risk for HIV transmission.¹³ Practitioners should target messages that engage the college population in recognizing their likelihood of a health threat when they avoid using condoms. While the results did not show a relationship between stress and non-condom use, they instead suggest that relationship status plays a significant role in determining condom use during sexual acts. The information obtained from the study can be made useful in promoting healthy sexual interactions and condom negotiations specifically tailored to relationship status.

A limitation of my study was the use of secondary data in which we were limited to using only the questions and responses available on the survey. The sample of students taken from UK is limited and may not be representative of the population of students nationwide. While results from this study may not be applicable nationwide perhaps universities in neighboring states may also find that stress does not impact the non-condom use of condoms among their students. The questionnaire dealt with health behaviors, some of which may make a student feel uncomfortable (i.e. sexual behaviors, drinking, drugs, depression, and anxiety) and thus may inhibit them from starting or completing the survey. Furthermore, the survey utilized self-reported data, which often has response biases such as recall bias and social desirability bias.

Additionally, the survey design did not incorporate a health belief theory into its implementation. Future surveys executed through UHS would be more reliable if a theory was used in their design and implementation. Prior findings do highlight a possible explanation for the higher likelihood of engaging in condom use: to primarily prevent pregnancy rather than to prevent the spread of disease, regardless of relationship status.¹⁴ My findings possibly support this idea because more than half of respondents—who were sexually active within the last 30 days—reported not using a condom for both oral and anal sex. An intervention strategy targeting the perception of risk should take place to facilitate an overall environmental behavior change wherein condom use is a normalized practice, supported and encouraged through various levels within the institutional framework.

My findings were supported by a prior study within gay and bisexual non-monogamous males in San Francisco that showed there was no relationship between stress and non-condom use during anal sex.¹³ Unprotected sex could be addressed through innovative risk reduction programs promoting effective condom use and sexual boundary communication, as well as supporting the endorsement that sexual pleasure can still be achieved when condoms are used. Additionally, even when prior findings did report an association between high levels of stress and high risk sexual behaviors, no significant relationships were found between the psychosocial variables and current STIs.¹⁵ Intervention efforts focused on promoting condom negotiation and sexual communication competency may begin normalizing condom use at the collegiate level, and potentially create a positive shift in behavior. However, as long as condom use remains inconsistent, students are still at risk for unplanned pregnancy as well as contracting or spreading STIs.

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Biographical Sketch

This capstone has been prepared by Samantha Bearman. In preparation for graduate school, Samantha attended San Diego State University where she received her Bachelors of Science in Psychology with a double minor in Spanish and Women's Studies. She just recently joined APHA and is pursuing certification in Health Education. Samantha was also the program assistant for the Kentucky Aids Education Training Center for 2013-2014. If you would like to contact her please use the following information.

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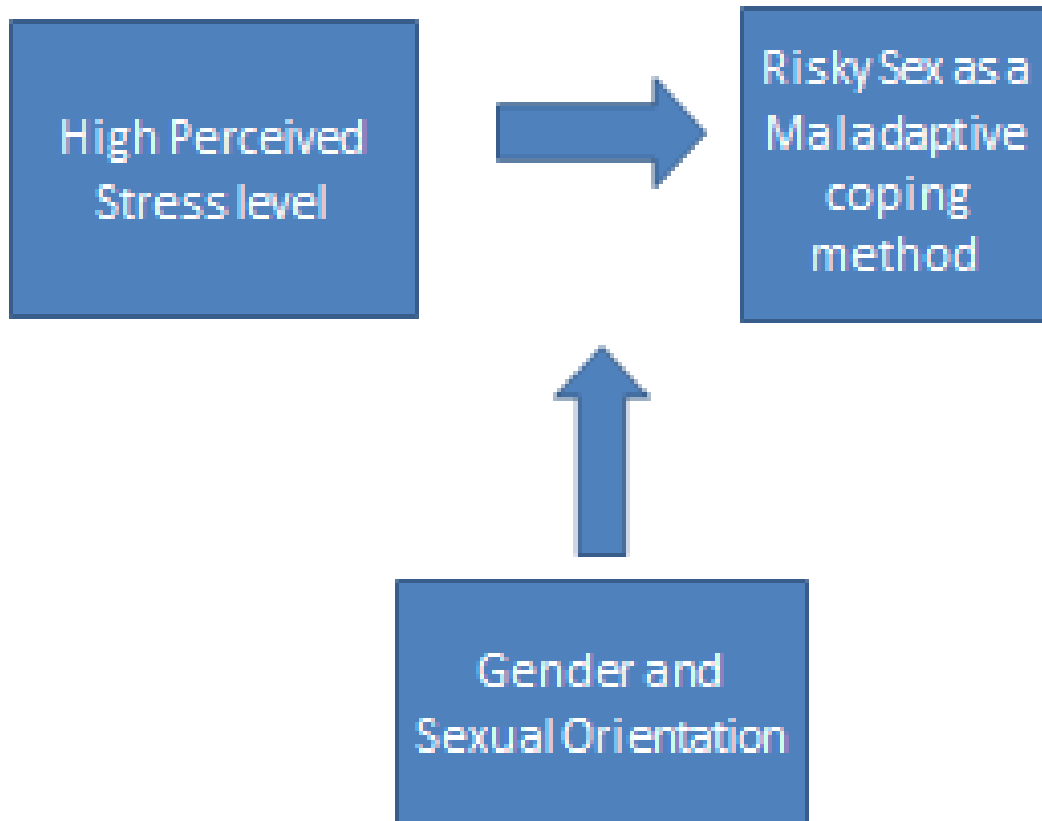
Conceptual Model:

Table 1: Descriptive characteristics of the total 837 survey respondents

Variables	N	(%)
Stress (N = 774)		
Low	452	58.4%
High	322	41.6%
Gender (N = 812)		
Male	261	32.1%
Female	551	67.9%
Race (N = 815)		
White Not Hispanic	670	82.2%
Non-White	145	17.8%
Class Level (N = 806)		
Undergraduate	636	78.9%
Graduate	170	21.1%
Age (N = 800)		
18-24	663	82.9%
25+	137	17.1%
Relationship Status (N = 816)		
In a relationship	352	43.1%
Not in a relationship	464	56.9%
Sexual Orientation (N = 698)		
Heterosexual	660	94.6%
Bisexual/Gay	38	5.4%

Table 2a: Relationship between stress level, gender, race, class level, age, relationship status, sexual orientation and no-condom use using Chi square analysis among 367 participants who engaged in Vaginal Sex in the past 30 days

Variables	No Condom Use N (%)	Chi - Square	P-Value
Stress Level (N = 366)			
Low	75 (36.6%)	2.871	.090
High	73 (45.3%)		
Gender (N = 365)			
Male	41 (38.3%)	.241	.624
Female	106 (41.1%)		
Race (N = 367)			
White, Non-Hispanic	126 (40.8%)	.025	.873
Non-White	23 (39.7%)		
Class Level (N = 363)			
Undergraduate	95 (35.7%)	9.445	.002
Graduate	52 (53.6%)		
Age (N =359)			
18-24	93 (33.6%)	29.303	<.001
25+	55 (67.1%)		
Relationship Status (N =367)			
In a relationship	104 (46.4%)	8.100	.004
Not in a relationship	45 (31.5%)		
Sexual Orientation (N = 365)			
Heterosexual	106 (41.1%)	.241	.624
Bisexual/Gay	41 (38.3%)		

Table 2b: Relationship between stress level, gender, race, class level, age, relationship status, sexual orientation and no-condom use using Chi square analysis among 340 participants who engaged in Oral Sex in the past 30 days

Variables	No Condom Use N (%)	Chi – Square	P-Value
Stress Level (N = 339)			
Low	167 (93.3%)	4.658	.031
High	157 (98.1%)		
Gender (N = 337)			
Male	100 (92.6%)	3.266	.071
Female	222 (96.9%)		
Race (N = 340)			
White, Non-Hispanic	277 (96.5%)	3.755	.053
Non-White	48 (90.6%)		
Class Level (N = 337)			
Undergraduate	242 (95.3%)	.181	.670
Graduate	80 (96.4%)		
Age (N = 336)			
18-24	252 (95.5%)	.417	.518
25+	69 (97.2%)		
Relationship Status (N = 340)			
In a relationship	209 (96.8%)	1.926	.165
Not in a relationship	116 (93.5%)		
Sexual Orientation (N = 317)			
Heterosexual	283 (96.9%)	1.663	.197
Bisexual/Gay	25 (100%)		

Table 2c: Relationship between stress level, gender, race, class level, age, relationship status, sexual orientation and no-condom use using Chi square analysis among 77 participants who engaged in Anal Sex in the past 30 days

Variables	No Condom Use N (%)	Chi – Square	P-Value
Stress Level (N = 77)			
Low	27 (64.3%)	.157	.692
High	24 (68.6%)		
Gender (N = 76)			
Male	15 (55.6%)	1.949	.163
Female	35 (71.4%)		
Race (N = 77)			
White Not Hispanic	45 (70.3%)	2.820	.093
Non-White	6 (46.2%)		
Class Level (N = 77)			
Undergraduate	44(66.7%)	.039	.844
Graduate	7 (63.6%)		
Age (N =77)			
18-24	40 (64.5%)	.420	.517
25+	11 (73.3%)		
Relationship Status (N = 77)			
In a relationship	38 (79.2%)	9.532	.002
Not in a relationship	13 (44.8%)		
Sexual Orientation (N = 71)			
Heterosexual	38 (69.1%)	.246	.620
Bisexual/Gay	10 (62.5%)		

Table 3a: Logistic regression predicting non-condom use for vaginal sex

Variables	Odds Ratio	95% CI
Stress		
Low	Reference	
High	1.311	.820-2.097
Gender		
Male	.920	.545-1.552
Female	Reference	
Race		
White Non- Hispanic	1.239	.640-2.398
Non-White	Reference	
Class Level		
Undergraduate	1.034	.558-1.918
Graduate	Reference	
Age		
18-24	Reference	
25+	3.823	1.980-7.380
Relationship Status		
In a relationship	Reference	
Not in a relationship	.637	.389-1.041
Sexual Orientation		
Heterosexual	Reference	
Bisexual/Gay	1.569	.560-4.398
Constant		
Constant	.427	.095
R ² =.123		

Table 3b: Logistic regression predicting non-condom use for oral sex

Variables	Odds Ratio	95% CI
Stress		
Low	Reference	
High	5.789	.929-36.079
Gender		
Male	.368	.097-1.395
Female	Reference	
Race		
White Non- Hispanic	4.754	1.277-17.690
Non-White	Reference	
Class Level		
Undergraduate	2.289	.428-12.235
Graduate	Reference	
Age		
18-24	Reference	
25+	6.194	.529-72.527
Relationship Status		
In a relationship	Reference	
Not in a relationship	1.233	.310-4.899
Sexual Orientation		
Heterosexual	Reference	
Bisexual/Gay	.296	.051-1.715
Constant		
Constant R ² = .201	3.673	.095

Table 3c: Logistic Regression Predicting Non-condom Use for Anal Sex

Variables	Odds Ratio	95% CI
Stress		
Low	Reference	
High	.882	.282-2.762
Gender		
Male	.986	.296-3.280
Female	Reference	
Race		
White Non- Hispanic	2.656	.661-10.671
Non-White	Reference	
Class Level		
Undergraduate	1.284	.269-6.126
Graduate	Reference	
Age		
18-24	Reference	
25+	2.318	.494-10.874
Relationship Status		
In a relationship	Reference	
Not in a relationship	.285	.080-1.015
Sexual Orientation		
Heterosexual	Reference	
Bisexual/Gay	.830	.214-3.218
Constant		
Constant R ² = .131	1.671	.095

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This capstone was created in partial fulfillment of the requirements for the degree of Master of Public Health in the University of Kentucky College of Public Health in an effort to examine the relationship between perceived high levels of stress and non-condom usage among college students at the University of Kentucky. It would have been impossible to present a final version without the dedication and teaching of faculty and staff members who mentored me throughout the process, my parents who championed me through each struggle, and the support of my friends.

This is a page of thanks dedicated to:

Dr. Richard Crosby

Dr. Robin Vanderpool

Dr. Katherine Eddens

Brandy Reeves

Mom

Dad

Sincerely,

Samantha Bearman