

Factors That Influence College Students' Risk Perceptions of Marijuana

Alayna B Sheffield and Judy O. Grissett

Georgia Southwestern State University

Abstract

The current study examines factors that affect college students' risk perceptions and opinions on the legality of marijuana use ("risk perceptions"). A 22-question survey was administered to college students regarding background demographics, experiences with alcohol and cigarettes, experiences with anxiety and depression, and the number of people they knew to smoke marijuana. Although no relationship was found between demographics, cigarette use, or anxiety and depression and risk perceptions, a negative correlation existed between alcohol use and risk perceptions, meaning that higher alcohol consumption was associated with lower risk perceptions of marijuana. A positive relationship was also found between the number of marijuana users students knew and their risk perceptions, showing that the risk of using marijuana was viewed as having lower risk as the number of known marijuana smokers increased.

Key Words:

substance use, marijuana, college students, risk perception

Substance use, including the use of marijuana, has been an issue of concern for decades. Two driving forces behind this issue are people's perceptions of the safety and legality of marijuana (referred to as "risk perceptions of marijuana" throughout this paper). The debate over whether or not to legalize marijuana use has become a main topic of discussion in recent years, with marijuana recently becoming legal in several states across the country. Those who agree with the legalization of marijuana and believe it is safe to use are fighting against those who oppose its legalization as they believe the drug is harmful and should remain illegal.

Because states such as Colorado and Washington have legalized marijuana use, the federal government must now change their debate from 'if' they will legalize marijuana, to 'how' they will legalize it (Kreit, 2015). According to Barcott and Scherer (2015) the government's negative stance on marijuana use and lack of research and evidence to support their claims concerning the dangers marijuana poses has led many Americans to become skeptical of any negative information presented

about the substance. Marijuana remains classified as a Schedule I drug, which makes it difficult to gain approval for research, even though the scant existing research shows that there are numerous benefits to be gained from the substance, including treating the symptoms of cancer and possibly even fighting the cancer cells themselves, and treating pain, glaucoma, and epilepsy (Barcott & Scherer, 2015).

For the purposes of this paper, adolescents and young adults were the main focus of the study. One reason for this is because college provides this population with new insights on other ways of life and students are often exposed to things they never experienced as a youth. Another reason for choosing this population is because an individual's brain is still developing into their twenties, so it is important to understand the effects and consequences of exposure to marijuana before and during this time. This relates back to the issue of legalization because if marijuana is legalized it could potentially lead to even more exposure among adolescents and young adults. In terms of risk perceptions, a recent study found an increase in the percentage of young Americans

who believe marijuana use to be safe and harmless, as well as an increase in marijuana use among this population (Merrill, 2015). The study measured risk perceptions and marijuana use in 6th through 12th graders from 2009 to 2013 and found a 23% increase in 6th graders' perceptions that marijuana posed no risk, a 64% increase in 8th graders' perceptions, an 81% increase in 10th graders' perceptions, and a 105% increase in 12th graders' perceptions (Merrill, 2015). The researchers also found that from 2009 to 2013, marijuana use in the last 30 days increased by 52% and there was a 37% increase in lifetime marijuana use (Merrill, 2015). The authors concluded that the increases in marijuana use was due to the more positive views on the effects of marijuana use, but it could also be due to increased exposure and access.

The lack of widely known research available on the substance suggests people are unaware of the full effects of marijuana, which can affect their perceptions on the substance. Providing easy access to information regarding the psychological and biological effects of marijuana use to adolescents and young adults could change risk perceptions. About 30% of students entering college reported having tried marijuana at some point and 8.5% began using marijuana during their freshman year of college (Suerken et al., 2014). Considering the prevalence of marijuana use among college students, we believe the perceptions of this population regarding marijuana use and safety should be better understood. It is considered common knowledge that the amount of alcohol consumption is high among college students, therefore we can assume marijuana use would also increase among this population if it was legalized. In this study, we examine college students' perceptions of the safety and legal status of marijuana and the background factors that influence those perceptions.

Specifically, the study examines students' demographics, including students' age, gender, year in school, grade point average, and parents' income to determine whether there is a correlation between the students' backgrounds and school standing and their perceptions of marijuana. These factors are focal points

because each one has been shown to influence drug and alcohol use. Second, the study examines students' experiences with alcohol and cigarettes and prior experiences with anxiety and depression to determine if there is a correlation between these factors and perceptions of marijuana. Finally, we take the number of known marijuana users into account, meaning we asked how many people the participants knew in their lives who smoked marijuana. We also asked what the relationship of the known smokers was to the participant. Essentially, this study aims to create a profile of the factors that could affect students' perceptions of the safety and legality of marijuana. The factors that may influence marijuana risk perceptions are reviewed in the following section.

Literature Review

A number of factors can influence risk perceptions of licit and illicit substances. Some factors are demographic, including age, gender, socioeconomic status, and school classification, whereas others are experiential, such as prior substance use, or psychological, such as anxiety and depression. In this section, we outline prior literature that posits demographic background, prior substance use, and anxiety and depression can influence perceptions of substance use risk.

Demographics and Substance Use

Asking questions that pertain to individuals' backgrounds along with questions about their experiences with substance use can shed light on the relationship between certain aspects of individuals' background and their potential for substance use. Novak, Reardon, and Buka (2002) looked at neighborhood influences on adolescents' perceived risks of a number of different substances, including both licit and illicit substances. Looking at gender differences, family socio-economic status, and age, Novak, Reardon, and Buka (2002) found that males considered the light/experimental use of alcohol to be less harmful than females did. Family socio-economic status did not have much effect

on risk perceptions except when determining the harmfulness of heavy/regular use, in which case those of a higher socio-economic status viewed it as more harmful than those of a lower socio-economic status. Older participants viewed alcohol use as less harmful, but hard drugs such as cocaine, crack, or heroine as more harmful than younger participants. These findings suggest that gender, socioeconomic status, and age play an important role in perceptions of substance use risk.

Prior substance use, including alcohol and cigarette use, can also have an effect on the risk perceptions of other substances, including illegal substances (e.g., marijuana). If an individual drinks alcohol or smokes cigarettes, that might affect their attitudes towards other substances like marijuana. Novak, Reardon, and Buka (2002) looked at the level of involvement in substance use of the individuals participating in the study and found that the older individuals who had more experience with different substances rated alcohol and marijuana use as less harmful than those individuals who were younger and had less experience.

Early risk perceptions are also important in shaping later risk perceptions and can have the potential to affect the likelihood of substance use later in life. Yan and Brocksen (2013) conducted a study that looked at adolescent risk perceptions and if that affected their later substance use at an older age. They studied early adolescents' perceptions of the risk involved in binge drinking and smoking cigarettes and if that impacted their chances of binge drinking and smoking cigarettes in later adolescence, which was defined as senior year of high school. The study found that higher risk perceptions in early adolescence led to lower substance use during their senior year.

In a similar study that examined the relationship between risk perception and substance use, Mason, Mennis, Linker, Bares, and Zaharakis (2014) looked at adolescents' perceptions of substance use and the effect it had on their friends' substance use and their own substance use. They primarily looked at alcohol, cigarette, and marijuana use. Mason and colleagues also looked at the differences

between males and females, and the differences between races, finding that females were more greatly influenced by their peers than males and whites were influenced more by their peers than non-whites. The study used data provided by the 2010 National Survey on Drug Use and Health (NSDUH), which uses in-person interviews, to obtain a probability sample and then adjusted that for subsampling. Findings showed that white females were more heavily influenced by their peers to partake in substance use than others. They also found that close friends' risk perceptions greatly influenced substance use among adolescents. Adolescents were most influenced to use marijuana, while alcohol was the least influential substance (Mason et al., 2014).

While Mason et al. (2014) provides information and insight into risk perceptions and substance use, the researchers focused on gender and racial differences among younger adolescents. The the study did not target an older population (i.e., college students older than 18). As college is a particular time of transition it is important to investigate risk perceptions and marijuana use in this population, a gap that the present study hopes to address. Another important factor that is relatively understudied with respect to marijuana use and risk perceptions is the impact of anxiety and depression on marijuana risk perception among college students.

Anxiety and Depression

At least 25 percent of college students experience symptoms of anxiety, depression, and stress (Mahmoud, Staten, Hall, & Lennie, 2012). Research has shown that there is a high comorbidity between substance use (i.e., alcohol, nicotine, and illicit substances) and anxiety and depression (Fergusson, Boden, & Horwood, 2011). Because of this, it is necessary to look into individuals' experiences with anxiety and depression as it relates to substance use.

Gage et al. (2015) looked at substance use and its relation to mental illness, specifically, the influence of substance use on anxiety and depression. They found that the use of

marijuana at age 16 was related to increased instances of depression at age 18. Cigarette use at age 16 also was related to increased instances of depression at age 18. However, there was only a small relationship found between anxiety and the use of marijuana and cigarettes (Gage et al., 2015).

Fergusson, Boden, and Horwood (2011) found more conclusive evidence to support the claim of a significant comorbidity between anxiety and depression and substance use. A longitudinal study was conducted looking at children at birth, 4 months, 1 year, and then annually up through the age of 16. They then looked at the same participants again at ages 18, 21, and 25. They found a relationship between depression and substance use disorders that confirmed prior research on the subject. This relationship revealed that when an individual had depression, there was a higher chance that they would also have a substance use disorder and vice versa. They also found a significant comorbidity between anxiety and substance use disorders that also supported previous research. Other studies reiterate the claim that there is an important relationship between psychological well-being and substance use (Gage et al., 2015; Malmberg et al., 2010; Mee, 2014). These studies show correlational evidence to support the claim that anxiety and depression are related to substance use. What is not always clear, though, is which one causes the other or if they are separate issues altogether. It is possible that this is dependent on the individual, rather than a generalized rule. In either case, looking into past experiences with psychological issues could provide an insight into some of the aspects that might influence an individual's perception of the risk of substance use.

The Present Study

Many previous studies focus more on adolescents and those younger than 18 (e.g., Mason et al.), while the current study focuses on college students older than 18 years of age. Previous research has typically looked into the relationship between risk perceptions and substance use (e.g., Novak, Reardon, and Buka,

2002), substance use and psychological disorders (e.g., Fergusson, Boden, & Horwood, 2011), or demographics and one of the topics listed among adolescents and older adults (e.g., Mason et al., 2014). The present study, however, is the first attempt to our knowledge to assess the relationship between all of these factors simultaneously. The current study incorporates all of these factors—demographics, substance use, anxiety and depression—together, in addition to number of known marijuana-smokers, in an effort to fill in the gap in the literature regarding factors that might influence risk perceptions.

In the current study participants were asked questions pertaining to age, gender, year in school, grade point average, and parents' income, whether they have any experience with alcohol and cigarettes, and if so how much, if they have had any prior experiences with anxiety and depression in the past year, and number of marijuana users they know. For our dependent measure--risk perceptions of marijuana--participants were asked their opinion about the risk of marijuana and its legal status.

Method

Participants

Participants were college students from Georgia Southwestern State University, a regional public university with a population of approximately 2700 students. Eighty-seven students were recruited from Introductory and Experimental Psychology courses to participate in the study. One participant was excluded from the data due to being younger than 18, leaving a total of 86 participants.

Participants ranged in age from 18 years old and older, with the majority (65%) of participants being between 18 and 20 years old. They included 32 males and 54 females from various socioeconomic backgrounds. Race and ethnicity were not variables acknowledged in this study. Participants were ineligible to participate if they were under the age of 18.

Materials and Procedure

Participants were informed about the study by the instructor and were asked to participate during class time. They were given the option to complete an alternate assignment if they did not wish to participate in the study. If they chose to participate, they were given paper copies of the survey and asked to complete it in class. The researchers explained the purpose and procedures of the study, obtained informed consent, and debriefed all participants after the survey was completed. The entire process took approximately thirty minutes. All participants received a modest amount of extra course credit for completing the study.

Survey. The survey consisted of 22 questions, including demographic questions (i.e., gender, age, year in school, grade point average, and parents' income); personal substance use questions, (i.e., how often they drink alcohol and smoke cigarettes); questions concerning their experiences with anxiety and depression in the past year and the severity of those experiences; and questions concerning how many people they know who smoke marijuana and their relationship with those people. The last survey question focused on participants' risk perceptions of marijuana and if it should be legal or illegal ("What is your overall perception of marijuana use?"). For the last question participants selected one of the following responses: "It is safe and should be legal," "It is safe but should be illegal," "It is unsafe but should be legal," "It is unsafe and should be illegal," or "No opinion." The first four responses were scored on a scale of 1-4 respectively. The last response, "No opinion," was given the score of zero. Responses showing no opinion were included in the descriptive statistics of demographic questions and the regression results, but were excluded from t-test analyses and Spearman's Rho correlations. Survey questions are listed in Appendix A. No

previously established questionnaires were used in this study.

Results

First, we examined the relationship between participants' demographic background and their risk perceptions of marijuana using descriptive statistics with continuous variables. Complete descriptive data, including percentages of demographic background and risk perceptions of marijuana, are shown in Table 1.

Second, we examined the relationship between participants' experiences with anxiety and depression and their risk perceptions of marijuana. Independent *t*-tests revealed there were no relationships between experiencing anxiety or depression and risk perceptions of marijuana (Table 2).

Third, we examined the relationship between risk perceptions of marijuana and anxiety, depression, alcohol use, cigarette use, and number of known marijuana-smokers. Spearman's rho correlations were conducted to measure the relationship between frequency and severity of anxiety and depression and risk perceptions of marijuana. A two-tailed test of significance showed no relationship between anxiety and depression frequency or severity and risk perception of marijuana (Table 3). Spearman's rho results showed a significant negative correlation between alcohol use and risk perceptions, $r = -.360$, $p = .006$, meaning the less people drink, the riskier they view marijuana and less likely they thought it should be legal. No such relationship was found between cigarette use and risk perceptions, $r = -.115$, $p = .390$ (Table 3). A significant negative relationship was found between the number of people participants known to smoke marijuana and their risk perceptions of marijuana, $r = -.521$, $p = .000$. The more people that they knew who smoked marijuana, the less likely they were to think marijuana was unsafe and should be illegal (Table 3).

Table 1

Percentages showing descriptive statistics of demographic questions

	Risk Perception of Marijuana											
	Safe & Legal		Safe but Illegal		Unsafe but Legal		Unsafe & Illegal		No Opinion		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Gender												
Male	13	15.1%	3	3.5%	1	1.2%	9	10.5%	6	7.0%	32	37.2%
Female	14	16.3%	5	5.8%	3	3.5%	10	11.6%	22	25.6%	54	62.8%
Total	27	31.4%	8	9.3%	4	4.7%	19	22.1%	28	32.6%	86	100.0%
Class												
Freshman	12	14.0%	7	8.1%	2	2.3%	9	10.5%	16	18.6%	46	53.5%
Sophomore	3	3.5%	1	1.2%	1	1.2%	1	1.2%	5	5.8%	11	12.8%
Junior	3	3.5%	0	0.0%	0	0.0%	3	3.5%	2	2.3%	8	9.3%
Senior	8	9.3%	0	0.0%	1	1.2%	6	7.0%	5	5.8%	20	23.3%
Did Not Answer	1	1.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.2%
Total	27	31.4%	8	9.3%	4	4.7%	19	22.1%	28	32.6%	86	100.0%
Age groups												
18-20	14	16.3%	7	8.1%	3	3.5%	11	12.8%	21	24.4%	56	65.1%
21-22	8	9.3%	0	0.0%	1	1.2%	6	7.0%	3	3.5%	18	20.9%
24-27	3	3.5%	0	0.0%	0	0.0%	0	0.0%	2	2.3%	5	5.8%
28+	2	2.3%	0	0.0%	0	0.0%	2	2.3%	2	2.3%	6	7.0%
Did Not Answer	0	0.0%	1	1.2%	0	0.0%	0	0.0%	0	0.0%	1	1.2%
Total	27	31.4%	8	9.3%	4	4.7%	19	22.1%	28	32.6%	86	100.0%
GPA												
4.0	1	1.2%	0	0.0%	1	1.2%	0	0.0%	1	1.2%	3	3.50%
3.0-3.9	13	15.1%	6	7.0%	2	2.3%	13	15.1%	17	19.8%	51	59.3%
2.0-2.9	12	14.0%	2	2.3%	1	1.2%	6	7.0%	9	10.5%	30	34.9%
1.0-1.9	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.2%	1	1.2%
Did Not Answer	1	1.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.2%
Total	27	31.4%	8	9.3%	4	4.7%	19	22.1%	28	32.6%	86	100.0%
Parents' Income												
-\$20,000	4	4.7%	1	1.2%	0	0.0%	2	2.3%	2	2.3%	9	10.5%
\$20,000-\$39,000	6	7.0%	3	3.5%	1	1.2%	1	1.2%	6	7.0%	17	19.8%
\$40,000-\$59,000	3	3.5%	1	1.2%	1	1.2%	1	1.2%	3	3.5%	9	10.5%
\$60,000-\$79,000	6	7.0%	1	1.2%	0	0.0%	3	3.5%	6	7.0%	16	18.6%
\$80,000+	2	2.3%	0	0.0%	2	2.3%	2	2.3%	3	3.5%	9	10.5%
I don't know	6	7.0%	2	2.3%	0	0.0%	9	10.5%	8	9.3%	25	29.1%
Did Not Answer	0	0.0%	0	0.0%	0	0.0%	1	1.2%	0	0.0%	1	1.2%
Total	27	31.4%	8	9.3%	4	4.7%	19	22.1%	28	32.6%	86	100.0%

Note. *N* = Number of participants that answered that choice in the risk perception question. % = Percentage of total participants that chose that answer choice in the perception of marijuana question.

Table 2

T-test analyses comparing each question with risk perception.

	Risk Perception of Marijuana					
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>F</i>	<i>p</i>
Anxiety						
Yes	2.310	1.3523	.268	55	.157	.693
No	2.200	1.3732				
Depression						
Yes	2.074	1.2987	-.771	53	2.192	.145
No	2.357	1.4198				

Note. Risk perceptions scored on a scale of 1 – 4; Response “No opinion” was omitted from analyses.

In order to better understand how these different factors together affected college students' risk perceptions of marijuana, regression analyses were run in IBM SPSS Statistics 23. Using the Enter Method, we analyzed several of the questions from the survey, in particular the questions that showed the strongest results in prior analyses. These included demographic factors (gender, year of school, age, GPA, and parents' income level), how often they drank alcohol, and how many people they knew who smoked marijuana. The last two factors--alcohol use and number of known marijuana-smokers--showed the strongest correlations with the dependent variable in previous analyses, so we wanted to look further into those relationships.

In the first model we entered background demographic factors coded as continuous variables. No factors in the model significantly predicted risk perceptions of marijuana. Next, using the Enter method, we added alcohol use into Model 2. Cigarette use was not included because of the small number of people who reported they smoked cigarettes. Alcohol use explained a significant amount of variance in risk perceptions of marijuana, $F(6,51) = 2.316$, $p = .003$, $R^2 = .214$, $\Delta R^2 = .152$. Finally, we added number of known marijuana-smokers into Model 3. Number of known marijuana-smokers

explained a significant amount of variance in risk perceptions of marijuana, $F(6,51) = 3.605$, $p = .004$, $R^2 = .335$, $\Delta R^2 = .121$. The significant relationship between alcohol use and risk perceptions was eliminated once number of known marijuana-smokers was taken into account, suggesting the latter has a stronger effect on risk perceptions of marijuana. Complete regression results are found in Table 4.

Discussion

The purpose of the present study was to examine the relationship between background demographics, alcohol and cigarette use, anxiety and depression, and the number of people students knew to smoke marijuana with college students' risk perceptions of marijuana. Although we did not find a significant relationship between background demographics and risk perceptions or anxiety and depression and risk perceptions, there were two noteworthy findings. First, the results showed a significant negative relationship between alcohol use and risk perception--college students who drank alcohol more often rated marijuana use as less harmful and that it should be legal.

Table 3

Spearman's rho correlation results between anxiety, depression, alcohol use, cigarette use, and number of known marijuana-smokers as compared with risk perception. Participants with no opinion were excluded from analyses.

	Risk Perception of Marijuana Use	
	<i>r</i>	<i>p</i>
Frequency of Anxiety	.064	.631
Severity of Anxiety	-.039	.771
Frequency of Depression	-.089	.514
Severity of Depression	-.115	.398
Alcohol Use	-.360**	.006
Cigarette Use	-.115	.390
Number of Known Smokers	-.521**	.000

Note. * = $p \leq .05$; ** = $p \leq .01$; *** = $p \leq .001$

This supports prior research conducted concerning substance use and risk perceptions of alcohol and marijuana that found that older individuals who had more experience with alcohol and marijuana rated the substances as less harmful than individuals who were younger and had less personal experience with the substances (Novak, Reardon, & Buka, 2002). Increased substance use and positive views on the risk of substance use could be caused by the desensitization of college students to substance use. They see many other students on or near campus drinking and possibly even smoking marijuana, and so they become curious and less afraid of the substances. College students often experiment with alcohol, and could possibly determine that since their alcohol use has not hurt them then marijuana use would not either.

Second, our findings showed a significant relationship between the number of people that college students knew to smoke marijuana and their risk perceptions of marijuana. Negative ratings of marijuana use (that it is unsafe and should be illegal) decreased as the number of known marijuana smokers increased. Furthermore, our regression analysis revealed this factor was a stronger predictor than the relationship between alcohol use and risk perceptions of marijuana, suggesting that number of known smokers has a bigger impact on marijuana risk perceptions than alcohol use.

The results demonstrating a strong correlation between the number of known marijuana smokers and risk perceptions of marijuana use are possibly due to students being desensitized to the substance. This relates back

Table 4

Regression Results between Demographics, Alcohol Use, Number of Known Marijuana Smokers, and Risk Perception of Marijuana

		Unstandardized		Standardized	<i>t</i>	<i>F</i>	<i>R</i>	<i>R</i> ²	ΔR^2
		B	SE	Beta					
Model 1	(Constant)	1.326	1.017		1.304	.691	.250	.062	.062
	Gender	.230	.389	.086	.591				
	YoS	.126	.163	.124	.775				
	Age	-.071	.246	-.048	-.290				
	GPA	-.102	.306	-.047	-.335				
	PIL	.175	.105	.244	1.665				
Model 2	(Constant)	1.676	.947		1.770	2.316	.463	.214	.152
	Gender	.380	.363	.142	1.047				
	YoS	.202	.152	.198	1.325				
	Age	-.138	.229	-.093	-.604				
	GPA	.005	.285	.002	.016				
	PIL	.174	.097	.242	1.793				
	AU	-.267	.085	-.404	-3.139**				
Model 3	(Constant)	3.559	1.078		3.301	3.605	.579	.335	.121
	Gender	.246	.340	.092	.723				
	YoS	.190	.141	.187	1.341				
	Age	-.238	.215	-.160	-1.109				
	GPA	.018	.265	.008	.067				
	PIL	.023	.103	.032	.223				
	AU	-.165	.086	-.250	-1.926				
	NoKS	-.322	.107	-.428	-3.021**				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; YoS = Year of School; GPA = Grade Point Average; PIL = Parents' Income Level; NoKS = Number of Known Smokers; AU = Alcohol Use; Dependent Variable = Risk Perceptions of Marijuana

to the study conducted by Mason et al. (2014) that found that adolescent substance use was most influenced by peer attitudes. When close peers believe a substance is safe to use, those around them will sometimes change their perceptions to go along with their peers. When students know 15 or more people who smoke marijuana, it could become simply another part of their life. There would be an expectation for them to join in and participate at that point. When an individual is exposed to multiple people doing something, over time it will become less surprising to see that action being performed. In addition, if the students see multiple people smoking marijuana and the substance is not negatively affecting their lives, then the students might come to believe the substance is safe and not something to be concerned about.

Our findings revealed that individuals who are exposed to alcohol and marijuana already are more likely to believe that marijuana use is safe and acceptable. Other factors not related to high levels of exposure to alcohol and marijuana (age, GPA, parents' income, etc.) did not pose a connection to positive views on the risk perceptions of marijuana use. Because of this finding, it can be argued that legalizing marijuana would have the most impact on those already exposed to it now and very little effect on those individuals who already avoid alcohol and marijuana. If this is the case, then legalizing marijuana would not be detrimental to the adolescents and young adults of our society.

Limitations

It is possible that the small sample size (86 participants) affected the results and that a larger sample would yield more statistically significant results. Also, a large portion of the participants reported that they did not smoke cigarettes, which may have affected the correlational analyses on this factor. The same occurred with questions concerning anxiety and depression, where many of the participants answered that they have not experienced anxiety and depression and so data regarding the frequency and severity of their anxiety and depression could not be collected. Because several of the questions did not yield any data, it

was difficult to obtain significant results on those questions.

Another possible limitation to the study is that the questions pertained to what could be considered sensitive topics, and so many students might have felt they could not provide true information on their personal substance use or experiences with anxiety and depression. The majority of the participants were under the age of 21 and they might have felt unsure of whether they should report their drinking habits or not. Some participants also may have been unwilling to discuss their experiences with anxiety and depression. On a related note, some individuals might not recognize that they are experiencing anxiety or depression, or they might not have noticed if the conditions were affected by cigarette and alcohol use. Finally, participants were not asked about their personal marijuana use. This was due to the illegal status of marijuana in the state where the research was being conducted and we did not want to ask the participants about their illegal behavior. Had this data been collected, we may more accurately examine the relationship between marijuana use and risk perceptions of marijuana. Another limitation is that we did not use established measures for assessing depression, anxiety, and risk perceptions. Established and published methods of assessing depression and anxiety might have provided a better view into the possible connection between depression, anxiety, and risk perceptions.

Despite the study's limitations, our results are an important step toward better understanding the factors that influence college students' risk perceptions of marijuana. Our findings suggest a strong relationship between higher levels of alcohol consumption and positive views on the risk perception of marijuana use. The findings also suggest a strong relationship between having a large number of peers who smoke marijuana and positive risk perception views. By further examining the factors that influence risk perceptions among college students, our research supports and expands upon prior research on this topic and further informs those working with college students, including

educators and staff (e.g., counselors) in higher education.

Acknowledgments

This research was made possible by the support of the Department of Psychology and Sociology at Georgia Southwestern State University.

References

- Barcott, B., & Scherer, M. (2015). The great pot experiment. (Cover story). *Time*, *185*(19), 38-45.
- Fergusson, D., Boden, J., & Horwood, L. (2011). Structural models of the comorbidity of internalizing disorders and substance use disorders in a longitudinal birth cohort. *Social Psychiatry & Psychiatric Epidemiology*, *46*(10), 933-942. doi:10.1007/s00127-010-0268-1
- Gage, S. H., Hickman, M., Heron, J., Munafò, M. R., Lewis, G., Macleod, J., & Zammit, S. (2015). Associations of cannabis and cigarette use with depression and anxiety at age 18: Findings from the Avon Longitudinal Study of Parents and Children. *Plos ONE*, *10*(4), 1-13. doi:10.1371/journal.pone.0122896
- Kreit, A. (2015). What will federal marijuana reform look like? *Case Western Reserve Law Review*, *65*(3), 689-718.
- Mahmoud, J. R., Staten, R. 'T., Hall, L. A., & Lennie, T. A. (2012). The Relationship among Young Adult College Students' Depression, Anxiety, Stress, Demographics, Life Satisfaction, and Coping Styles. *Issues in Mental Health Nursing*, *33*(3), 149-156 8p. doi:10.3109/01612840.2011.632708
- Malmberg, M., Overbeek, G., Monshouwer, K., Lammers, J., Vollebergh, W. M., & Engels, R. E. (2010). Substance use risk profiles and associations with early substance use in adolescence. *Journal of Behavioral Medicine*, *33*(6), 474-485. doi:10.1007/s10865-010-9278-4
- Mason, M. J., Mennis, J., Linker, J., Bares, C., & Zaharakis, N. (2014). Peer attitudes effects on adolescent substance use: The moderating role of race and gender. *Prevention Science*, *15*(1), 56-64. doi:10.1007/s11121-012-0353-7
- Mee, S. (2014). Self-efficacy: A mediator of smoking behavior and depression among college students. *Pediatric Nursing*, *40*(1), 9-37.
- Merrill, R. M. (2015). Use of marijuana and changing risk perceptions. *American Journal Of Health Behavior*, *39*(3), 308-317. doi:10.5993/AJHB.39.3.3
- Novak, S. P., Reardon, S. F., & Buka, S. L. (2002). How beliefs about substance use differ by socio-demographic characteristics, individual experiences, and neighborhood environments among urban adolescents. *Journal of Drug Education*, *32*(4), 319-342. doi:10.2190/GJ7D-NOKF-NW64-KLW0
- Suerken, C. K., Reboussin, B. A., Sutfin, E. L., Wagoner, K. G., Spangler, J., & Wolfson, M. (2014). Prevalence of marijuana use at college entry and risk factors for initiation during freshman year. *Addictive Behaviors*, *39*(1), 302-307. doi:10.1016/j.addbeh.2013.10.018
- Yan, J., & Brocksen, S. (2013). Adolescent risk perception, substance use, and educational attainment. *Journal of Risk Research*, *16*(8), 1037-1055. doi:10.1080/13669877.2013.788545