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Substance use in college students in relation to adolescent invulnerability and distress tolerance

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Substance Use in College Students in Relation to Adolescent Invulnerability and Distress
Tolerance

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Substance Use in College Students in Relation to Adolescent Invulnerability and Distress Tolerance

Life is full of transitions, and for some people, one of those large adjustments is the college experience. Almost overnight, teenagers transition from being under their parents' rules, to being able to make their own decisions and setting their own guidelines. College is also an “experimental” time for young adults, with one of the biggest exploratory factors being the use of drugs and alcohol (Haardörfer, Berg, Lewis, Payne, Pillai, & McDonald et al., 2016). College campuses are rich with opportunities for students to try alcohol, marijuana and tobacco for the first time, or to continue a habit they already have.

The main focus of this study is to examine factors associated with young adults' substance use in college, especially if these behaviors were not something they engaged in during high school. One reason for substance use is that people simply want to fit in and make friends, and they believe that if they exhibit the “cool” behavior, they in turn will be accepted into college society (Cadigan, Martens, & Herman, 2015). However, there are other reasons students choose to drink aside from social reinforcement. While studies have found that goading or encouragement from peers is the leading reason college students will try illegal or dangerous behaviors, the current study seeks to look at other variables related to substance use and risk behaviors in college students (Mason, Zaharakis, & Benotsch, 2014; Noland, Ickes, Rayens, Butler, Wiggins, & Hahn, 2015). This study focuses on adolescent invulnerability and distress tolerance. Adolescent invulnerability is the belief that one can participate in dangerous activities without negative consequences (Duggan, Lapsley, and Norman, 2001) and distress tolerance is the ability of a person to work through hardships (Simons & Gaher, 2005). This study will

examine the relationship between the aforementioned variables, and college students' engagement in substance use and risk behavior.

Substance Use

Alcohol

Alcohol consistently ranks as the most common substance that college-aged students use, and is associated with positive attitudes towards drinking, as well as increased belief that it leads to acceptance within ones' social group (Haardörfer et al., 2016). Students participate in heavy drinking for positive reasons (e.g., social acceptance, makes you feel good) and negative reasons (e.g., forget about problems, peer pressure). In 2009, Dillard, Midboe & Klein reported that in the United States alone, the majority of college students consume alcohol, with nearly 50% admitting to heavy drinking. Researchers continue to find that students with the highest levels of positive motives are the individuals that drink the most heavily (Cadigan et al., 2015; Cooper, 1994; White, Anderson, Ray, & Mun, 2016).

When asked about the norms of campus culture, many college students told researchers that they drank because it was part of "the college experience" (Russell & Arthur, 2015). Whether it is from television shows, movies, social media, or having older friends or siblings, the stereotypical college experience is full of partying and a lot of drinking (Russell & Arthur, 2015). This schema leads people to believe that drinking, getting drunk, and experimenting with different substances is a vital part of college culture that should not be missed out on because college only happens once. This need for inclusion and approval can lead students to drink potentially toxic amounts of alcohol (Mason et al., 2014). One of the biggest concerns surrounding alcohol consumption in college students is that they are at a higher risk for engaging in risky behaviors with negative consequences (Weybright, Cooper, Beckmeyer, Bumpus, Hill,

& Agle, 2016). Some of these dangerous behaviors include, but are not limited to, driving under the influence, binge drinking, injury, and unprotected sexual activity, as well as waning mental and psychological well-being (Weybright et al., 2016).

Coping motives are another reason that many college students drink, and they have been found to be associated with increased binge drinking during the progression towards young adulthood (White et al., 2016). A moderate, positive correlation was found between students reporting depressed moods and the use of alcohol as a coping mechanism, but there was no such association between depressive symptoms and social or enhancement drinking motives (Cadigan et al., 2015). This information suggests that people have an innate desire to get rid of uncomfortable and negative thoughts or feelings, and may turn to substances such as alcohol to help alleviate distress when constructive coping mechanisms are not available (Kenney, Jones, & Barnett, 2015). College undergraduates that reported using alcohol as a coping device also reported higher instances of alcohol related problems, such as drinking until intoxication or heavy episodic drinking (Park & Levenson, 2002). In 1998, Tyssen, Vaglum, Aasland, Grønvold & Ekeberg surveyed 931 medical students in Norway about their drinking habits. They wanted to measure hazardous drinking, and chose to do so by surveying how often the participants drank until they were intoxicated. The results of Tyssen et al.'s (1998) study reported that 50% of the male participants and 39% of the female participants were binge drinking at least once within the past 2 weeks. Although drinking to cope was observed less frequently than in other studies, Tyssen et al., (2012) speculate that using alcohol to cope may be an important predictor of alcohol abuse later in life, particularly in women. In comparison, studies with students from the United States have found that binge drinkers tend to report higher coping motivations (Cadigan et al., 2015; White et al., 2016).

Patrick & Schulenberg (2011) surveyed adolescents and young adults about their drinking motives and found that drinking to get high or to relieve boredom were the most popular reasons individuals cited for their binge drinking. It was noted though, that students who were heavy drinkers in college tended to decrease this behavior once they had graduated and moved on from the college atmosphere (Patrick & Schulenberg, 2011). For example, the frequency of drinking to cope with and escape from problems is around 20% at 18 years old, but declines to about 10% by the time one is 30 (Patrick & Schulenberg, 2011). However, the participants in Patrick & Schulenberg's (2011) study reported their binge drinking behavior continued post-college, instead of declining, per the normal, in young adulthood. These findings continue to indicate that adolescents who drink for negative coping reasons were more likely to develop binge drinking behaviors that will continue through adulthood. Although alcohol is the most popular drug of choice among college populations, marijuana use, especially as a means of coping, is steadily increasing in young adults.

Marijuana

Studies indicate that the use of marijuana is rising in the college population, with 21.4% of students reporting smoking marijuana in the past month (Mason et al., 2014). Marijuana is now more socially acceptable than ever, and is increasingly becoming legalized across the country, leading more people to engage in casual use of it (Haardörfer et al., 2016). One reason young adults may be willing to smoke marijuana is because they want to fit in and be part of the group. When it comes to trying to fit in with friends, students that associate with smokers are more heavily influenced to smoke, and this is likely because peer closeness has a large influence on the substance use behaviors of college students (Mason et al.,

2014). The chances of drinking and/or smoking increase when one is surrounded by peers that are engaging in the substance use. When comparing alcohol, marijuana, and tobacco, marijuana is found to be the substance that is most influential in peer groups (Mason et al., 2014). Mason et al., (2014) hypothesized that close peer relationships, in regards to marijuana use, may stem from the fact that marijuana is currently an illegal substance in most states. This high-risk aspect may strengthen the bond between peers as they rely on each other to keep their drug behavior secret. Along with being an influential drug, marijuana is also commonly used as a complementary substance. Marijuana is frequently used alongside other substances such as alcohol, and sometimes, more dangerous substances, such as cocaine (Keith, Hart, McNeil, Silver, & Goodwin, 2015). The results of Keith et al. (2015) found that almost half of the participants that admitted to using marijuana frequently also reported cocaine use.

While a popular recreational substance, marijuana may also be used as a coping device for stressful events. Keith et al., (2015) examined the relationship between the use of marijuana and self-treatment for mental health problems, including anxiety disorder, major depressive disorder and substance use disorders. In a college student population, participants were asked to answer questions about their substance use behaviors and mental health. Keith et al., (2015) found a strong, significant positive correlation between participants' marijuana use, and reported negative mental health diagnoses. Interestingly, Keith et al., (2015) did not find a significant relationship between stress and marijuana use. However, a drug that is known to have an association with stress is tobacco. Tobacco is widely known as an addictive drug often used during stressful situations to help alleviate anxiety. This fact alone may be a reason that tobacco use is popular among college students.

Tobacco

The prevalence of tobacco use among college is well documented, however, recent studies have begun to find that cigarettes are giving way to alternative forms of tobacco (Evans-Polce, Lanza, & Maggs, 2015). These include, but are not limited to, cigars and cigarillos, smokeless tobacco, e-cigarettes, and hookah. Hookah use has been on the rise for about a decade and is a popular option for college students that want to experiment with substance use, possibly because hookah is easy to use, has a variety of flavors and scents, and is relatively inexpensive (Shepardson & Hustad, 2015). Recent studies of hookah use among college students reported prevalence rates of 30% lifetime use, and that lifetime hookah use was as high as, if not higher than, cigarette use (Shepardson & Hustad, 2015). Many students begin smoking hookah in the early years of college because it is a socially-acceptable behavior in college communities, they are away from parental supervision, many hookah bars or lounges are not restricted to 21 and older, and it is a chance to socialize and fit in with ones' peers (Shepardson & Hustand, 2015). E-cigarettes are also increasingly popular with young adults, likely because they appear to be more accepted by college students, including those that are not tobacco users, and because they are often claimed to be safer than traditional cigarettes (Noland et al., 2015).

In 2016, Bandiera, Loukas, Wilkinson, & Perry studied the relationship between e-cigarettes and depression in college students. They surveyed almost 5,500 college students in Texas between the ages of 18-29 regarding their mental health, and the frequency of their tobacco use (Bandiera et al., 2016). Based on their results, the authors of the study speculate that e-cigarette usage may be a precursor to depressive symptoms, as well as possibly a temporary reliever of distress symptoms (Bandiera et al., 2016). Not enough research has been done to make accurate associations between mental health and e-cigarettes, but the current study expands

the literature in this area. There is, however, plenty of research on the relationship between mental health and traditional cigarettes. Major depression is associated with tobacco use, and may play a role in the delay of quitting (Floyd, Westmaas, Targhetta, & Moyer, 2009). Floyd et al., (2009) reported that heavy smokers were more likely to have problems trying to quit smoking because they associate smoking with lower feelings of negative affect and stress, thus, stopping tobacco use would resurface these problems. College smokers are also less likely to simply stop smoking, due to the likelihood of believing that their tobacco use is just a phase, and that when they decide to quit, they will be able to do so before negative consequences occur (i.e., lung cancer, emphysema, heart disease, etc.) (Weinstein, Slovic, & Gibson, 2004). This confidence in relation to avoiding negative consequences may manifest itself in younger adults in a concept known as adolescent invulnerability.

Adolescent Invulnerability

Adolescent invulnerability is conceptualized by Duggan et al., (2001) as an intensified belief in ones' ability to engage in risk behaviors and not suffer the consequences others do. Two factors that fall under adolescent invulnerability are danger invulnerability and psychological invulnerability. Danger invulnerability is a factor that represents an invulnerability to external danger, whereas psychological invulnerability represents an invulnerability to psychological distress (Duggan et al., 2001). Adolescent invulnerability is similar to the idea of adolescents having a personal fable (Levin & Munsch, 2014). This term, coined by psychologist David Elkind, is when a teenager believes that they are special or the center of attention. These beliefs can lead to feelings of invulnerability, in which the adolescent or young adult is under the impression that, because of their specialness, they are exempt from the consequences others face when engaging in certain behaviors (Levin & Munsch, 2014). For example, a study done by

Sjöberg (1998) revealed that while college students are aware of the health risks that come with heavy alcohol consumption, they have a tendency to deny this risk to themselves. This optimistic viewpoint is dangerous because it may provide a mental barrier of protection against the student while they are drinking. There is also a certain expectation of positive outcomes an individual has when drinking. The mental pressure to meet these expectations may entice increased consumption of alcohol (Dillard, Midboe, & Klein 2009). In 2007, Klein, Geaghan, and MacDonald surveyed almost 10,000 college students on their substance use behaviors and sexual activities post-substance use. Their results indicated that about 38% of their participants acknowledge having unplanned sex after drinking or using other drugs (Klein et al., 2007). Morrell, Lapsley, & Halpern-Felsher (2016) surveyed almost 230 ninth grade students every 6 months until the end of tenth grade, on their beliefs and habits regarding cigarette smoking. The teenagers completed a questionnaire at each 6 month meet up. Results of the study indicated that there was a positive association between danger invulnerability and increased use of cigarettes 6 months later (Morrell et al., 2016).

Although information about adolescent invulnerability continued to appear in research, there was yet to be a good measure for it. In 2001, Duggan et al., created the Adolescent Invulnerability Scale (AIS) to measure how adolescents reported their likelihood of injury or harm when participating in dangerous activities. The AIS reports significant positive correlations with risk behaviors, danger invulnerability, and psychological invulnerability. These correlations support the idea that there is a correlation between engaging in risk behaviors and feeling a sense of invulnerability (Duggan et al., 2001). Based on these results, Duggan et al., (2001) speculated that teenagers see themselves as invincible in not only physical, but also mental and psychological situations in which they could be hurt. Lapsley & Hill (2010) have done further

research on danger invulnerability and substance use and have consistently found strong, positive correlations between the two variables. Danger invulnerability is the only factor in Lapsley & Hill's (2010) study that had a significant prediction for risk taking, drinking, and or smoking any drugs. Lapsley & Hill (2010) suggest that college-age students may be more willing to drink or smoke because they believe that they are not going to experience the negative effects that could come with substance use. Although students may believe they are exempt from negative consequences post-substance use, one of the reasons they might be turning to drugs and alcohol is because they cannot manage their day to day troubles. Those students that choose not turn to drugs as a problem solver may be described as having high distress tolerance.

Distress Tolerance

Simons & Gaher (2005) describe distress tolerance as a persons' adaptive ability to endure negative emotional and mental hardships. Distress tolerance is a relatively new concept that is designed to measure how a person might rate and describe their tolerance in regards to negative psychological events. These negative psychological events can be grouped into four main factors: tolerance, appraisal, absorption, and regulation (Simons & Gaher, 2005). 1. Tolerance is the idea that being distressed is so upsetting, a person just cannot handle it because they desperately want to avoid the negative emotions that come with being distressed (Simons & Gaher, 2005). 2. Appraisal is when a person refuses to accept distress and they compare themselves as worse than others for not being able to accept the problem (Simons & Gaher, 2005). 3. Absorption happens when a person is unable to control the negative emotions they feel, those that have low levels of distress tolerance will claim that they are completely overtaken by this distress that is so bad, it impairs functioning in day to day life (Simons & Gaher, 2005). 4. Regulation occurs when an individual goes to great lengths to evade negative emotions, and are

very quick to try and regulate their negative emotions before they become distressing (Simons & Gaher, 2005). When a participant takes the Distress Tolerance measure the questions they answer are based on these four factors and can then be compiled to give an overall rating of high or low distress tolerance. Low distress tolerance can be defined, as a person's belief that distress is so intolerable, something must be done to fix it. On the other hand, high distress tolerance is the capacity a person has to work through distressing events (Simons & Gaher, 2005).

Wray, Simons, Dvorak & Gaher (2012) recruited 621 college students to complete an online questionnaire in regards to trait affect, distress tolerance, positive and negative urgency, risk behavior, and dangerous drinking. The responses of the participants suggested associations between low distress tolerance and substance/alcohol use, inadequate positive affect, and depressive symptoms (Wray et al., 2012). The results of the study done by Wray et al., (2012) support the idea that a low tolerance for distress may increase a person's desire to seek out unhealthy coping methods such as excessive drinking.

In 2016, Semcho, Bilsky, Lewis & Leen-Feldner studied marijuana use in young adults undergoing treatment for substance use disorders. They found a connection between low distress tolerance and marijuana use as a coping mechanism, such that individuals with low distress tolerance reported an increased likelihood of smoking marijuana to forget their problems. Because this study was done on adults seeking treatment for their marijuana use, the researchers suggested that one way to help users is by teaching them strategies to endure negative emotions may help their abstinence efforts (Semcho et al., 2016).

Current Study

The aim of this study was to investigate the relations between substance use and risk behaviors in college students in regards to adolescent invulnerability and distress tolerance. This study was administered via an online survey sent out through the campus's mass email system. Since there has yet to be a study that considers all of these factors together in college students, the results are important for future research.

Based on previous research, I expect a positive correlation between adolescent invulnerability and substance use, such that individuals with high adolescent invulnerability are more likely to engage in risk behaviors and substance use. Distress tolerance is expected to have a negative correlation with substance use, such that individuals with low levels of distress tolerance are more likely to report substance use. In regards to previous literature, I expect similar patterns for alcohol, marijuana and tobacco behaviors. However, there have been changes in substance use behaviors, such as the creation of e-cigarettes and the more open culture around marijuana, that date previous studies and render them less applicable to modern society. This study will examine substance use behaviors together and separately, as well as adolescent invulnerability and distress tolerance alone. I am expecting a negative correlation between adolescent invulnerability and distress tolerance.

Methods

Participants

This study consisted of 118 undergraduate students from a public university in Virginia. A convenience sample via online survey was sent out through the schools' mass email. Females comprised 80% of the sample. The ages of participants ranged from 18-25 years ($M = 20$, $SD = 1.73$). 88% of the sample reported their ethnicity as White, 4% Black/African American, 3% Hispanic/Latino, 3% multiracial, 2% other or prefer not to answer, and 1% Asian/Pacific Islander. Of the participants, 31% were seniors, 27% juniors, 24% freshman, and 19% sophomores.

Instruments

Adolescent Invulnerability

To assess adolescent invulnerability, I used the Adolescent Invulnerability Scale (AIS). The AIS is a 20-item measure that assesses two factors: "danger invulnerability" and "psychological invulnerability". The AIS is rated on a 5-point scale ranging from (1) Strongly disagree to (5) Strongly agree. High scores indicate a greater tendency for delinquent behavior. The Adolescent Invulnerability Scale presented statements about risk behaviors (e.g. "The problems that happen to people my age are unlikely to happen to me") and feelings the participants have regarding others' opinions of them (e.g. "I feel very badly when I know there is gossip about me"). The AIS demonstrates strong internal consistency ($\alpha = .87$) (Duggan, Lapsley & Norman, 2000). For the current study, the reliability of the AIS was $\alpha = .88$. The reliability for the two subscales, danger invulnerability ($\alpha = .80$), and psychological invulnerability ($\alpha = .90$) was also computed.

Distress Tolerance

I used the Distress Tolerance Scale (DTS) (Simons & Gaher, 2005) to measure distress tolerance. The DTS is a 14-item measure with a four-factor structure. Items were scored on a 5-point scale from (1) strongly agree to (5) strongly disagree, with high scores representing high distress tolerance. The Distress Tolerance Scale asked participants how they feel when dealing with distress (e.g. “My feelings of distress are so intense that they completely take over”), as well as how well they can tolerate distress in comparison to others (e.g. “I can tolerate being distressed or upset as well as most people” reverse code) (Simons & Gaher, 2005). The DTS displays good internal consistency ($\alpha = .95$) and stability after 1 month ($r = .83$) (Simons & Gaher, 2005). For the current study, the reliability of the DTS was $\alpha = .93$. The 4 subscales of the DTS also displayed good reliability in the current study. The tolerance subscale’s reliability was $\alpha = .76$, the absorption subscale was $\alpha = .86$, the appraisal subscale was $\alpha = .87$, and the regulation subscale was $\alpha = .73$.

Drinking Frequency

A series of questions regarding the typical use of alcohol among participants when they were in high school, and while they are currently in college measured drinking frequency. Questions asked participants about their drinking habits (i.e. “How many drinks on average do you consume *each time you drink?*”; “What is the maximum number of drinks you have consume at one time in the past month?”) as well as the history of a participants’ use (i.e. “Did you drink in high school?”).

Drinking Consequences

The Young Adult Alcohol Consequences Questionnaire (YAACQ) measured consequences of engaging in alcohol consumption. This is a 48-item scale regarding alcohol use consequences. The YAACQ is scored with yes/no answers, with no = 0 points and 1 = 1 point. Higher scores suggest more consequences from alcohol.

Marijuana Frequency

A series of questions regarding typical marijuana use among participants when they were in high school, and while they are currently in college measured marijuana frequency. Questions asked participants about their marijuana habits (i.e., “What is your preferred method of marijuana intake?”; How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?”) as well as marijuana use history (i.e., “How many times in your life have you smoked marijuana?”).

Marijuana Consequences (Modified)

To measure marijuana consequences, I used the Brief Marijuana Consequences Questionnaire (B-MACQ), which is an altered version of the YAACQ to fit marijuana use. The B-MACQ is a 21-item measure regarding consequences from marijuana use. For the purposes of this study, I modified the time frame of marijuana use from 6 months to 3 months. The B-MACQ is scored with yes/no answers, with no = 0 points and yes = 1 point. Higher scores suggest more consequences from marijuana.

Tobacco Behavior

To measure the use of tobacco, I used the Electronic Cigarette Dependence Index (ECDI). The ECDI is a 10-item survey designed to measure a user's dependence on e-cigarettes, but underwent modifications for this study to include all types of tobacco. The ECDI is scored by points. Points are calculated based on the answer to a question (either yes/no or choosing a time related answer choice). Higher scores suggest high dependence.

Tobacco Consequences

The Short Form Smoking Consequences Questionnaire (S-SCQ) measured tobacco consequences. The S-SCQ is a 21-item questionnaire designed to measure a user's beliefs of the consequences of using tobacco. The S-SCQ ranks choices on a 10-point Likert scale where 0 = completely unlikely and 9 = completely likely. The S-SCQ is then scored by adding the raw scores from the items across the scale, with higher scores indicating stronger affirmation of the consequence.

Results

The two variables of interest in this study were adolescent invulnerability and distress tolerance. These variables have not been looked at together before, so these results are especially speculative (see Table 1 for means and standard deviations for overall and subscales). However, I predicted that adolescent invulnerability and distress tolerance would be negatively correlated. However, adolescent invulnerability and distress tolerance were found to be positively associated, $r = .46, p < .01$ (see Table 2 for correlations with subscales), such that individuals that score high in invulnerability also score high in their ability to work through distressing situations.

My first hypothesis stated that adolescent invulnerability would have a positive correlation with substance use. The second hypothesis I made stated that distress tolerance would have a negative correlation with substance use. The relationships of adolescent invulnerability and distress tolerance with the following behaviors, alcohol, marijuana and tobacco use, are presented below. Ninety-seven participants drank alcohol, 45 participants smoked marijuana and 10 participants smoked tobacco. (See Table 3 for means and standard deviations for alcohol, marijuana and tobacco behaviors)

Alcohol

Adolescent Invulnerability

Overall adolescent invulnerability had a significant positive correlation with drinking frequency, $r = .20, p < 0.05$, as well as danger invulnerability, $r = .24, p \leq .01$, such that higher drinking frequency was associated with feelings of invulnerability overall, and invulnerability to danger. The average number of drinks consumed in a typical week was 3-5. Number of drinks

consumed in a typical week had a positive correlation with overall adolescent invulnerability, $r = .21, p < .05$, such that more number of drinks consumed was associated with feelings of invulnerability. Binge drinking was positively correlation with danger invulnerability, $r = .22, p < .05$, such that higher perceptions of danger invulnerability are related to higher instances of binge drinking. The consequences associated with drinking were also positively related to danger invulnerability, $r = .30, p < .01$, such that individuals reporting more alcohol consequences also reported more invulnerability to danger.

Distress Tolerance

Alcohol use behaviors had no significant correlations with distress tolerance. The consequences associated with drinking were negatively related to overall distress tolerance, $r = -.28, p < .05$, such that individuals reporting more alcohol consequences also reported less ability to handle distress. The consequences correlated with drinking also had a negative association with the subscales tolerance ($r = -.22, p < .05$) and appraisal ($r = -.31, p < .01$). Students reporting more alcohol consequences reported lower ability to tolerate distress and appraisal of being ashamed and less able to cope. (See Table 4 for all correlations with alcohol)

Marijuana

Adolescent Invulnerability

The average number of times participants claimed they had smoked marijuana over their life was 6-9 times. Lifetime usage did not have a significant relationship with adolescent invulnerability. Consequences associated with smoking marijuana had no significant relationship with adolescent invulnerability.

Distress Tolerance

Lifetime frequency was not significantly correlated with distress tolerance, however, current frequency was. Current frequency displayed a negative correlation with overall distress tolerance, $r = -.34, p < .05$, the tolerance subscale, $r = -.29, p \leq .05$, the absorption subscale, $r = -.35, p < .05$, and the appraisal subscale, $r = -.32, p < .05$, such that more marijuana use was associated with lower scores on the distress tolerance scale indicating an inability to handle distressing situations. Of the current marijuana users, the average time spent “stoned” was 1-2 hours. Hours spent “stoned” had a negative correlation with the distress tolerance appraisal subscale, $r = -.30, p \leq .05$, such that more hours stoned was associated with the appraisal of being unable to cope. lower. Consequences associated with smoking marijuana had no significant relation with distress tolerance or the subscales. (See Table 5 for all correlations with marijuana)

Tobacco

Adolescent Invulnerability & Distress Tolerance

The average frequency of tobacco use in high school suggested that most of the participants never smoked tobacco while in high school. Current frequency of tobacco use suggests almost 90% of participants were not smokers. Frequency of current tobacco use had a negative correlation with overall adolescent invulnerability, $r = -.21, p < .05$, and danger invulnerability, $r = -.19, p < .05$, such that lower scores indicated a likelihood of not engaging in tobacco use. The strength of tobacco cravings within the past week averaged at none or slight, and did not have any significant correlations with adolescent invulnerability. The sample size of students reporting consequences of tobacco use was too small and skewed to analyze. Tobacco

use had no significant correlations with distress tolerance in this study. (See Table 6 for all correlations with tobacco)

Discussion

The general findings of the present study indicate a positive relationship between substance use and adolescent invulnerability, a negative relationship between substance use and distress tolerance, and a positive association between adolescent invulnerability and distress tolerance. Because I expected a positive correlation for adolescent invulnerability and substance use and a negative correlation between distress tolerance and substance use, it was anticipated that there would be a negative association between adolescent invulnerability and distress tolerance. However, data revealed a positive relationship between these two variables. This relationship may be important, because it might indicate that those young adults who believe they are invincible may also believe they can easily handle distressing situations, or that they do not care about being distressed.

Overall invulnerability was significantly correlated with some drinking behaviors, but it was the danger subscale that displayed the most interesting results. Danger invulnerability was significantly correlated with drinking frequency, number of drinks consumed per week, and consequences associated with alcohol consumption. I believe this variable had the strongest relationship with alcohol behaviors and consequences due to the higher risks that can be associated with drinking.

Frequency of marijuana use displayed a significant correlation with overall distress tolerance, as well as the tolerance, absorption and appraisal subscales. My speculation for this relationship is the desire college students have to feel relaxed and calm, particularly during a stressful situation, and calmness is a known side effect of marijuana use. These results are similar to those found by Semcho et al., (2016), which is interesting due to the difference in populations. This study sampled only undergraduate students, whereas the research done by

Semcho et al., (2016) focused on young adults in treatment for their marijuana use. Further research on the correlation between distress tolerance and marijuana use in college students should be conducted in an effort to learn more about the reasons those low in distress tolerance are more frequent marijuana users.

Implications

The results of this study provide useful information for college campuses to take into account when attending to students. College counseling centers should be made aware of the relationship between low distress tolerance and frequency of marijuana use. Counselors should not consider lifetime marijuana use, but instead the frequency of use during college. Students reporting low levels of distress tolerance are also more likely to report more frequent marijuana use. If college counselors are cognizant of this behavioral pattern, they may be able to offer healthier coping strategies for college students.

Another implication this study makes is that alcohol programs being offered to college students should recognize the correlation between danger invulnerability and frequency of excessive drinking. The students that are prone to risky behaviors and have a belief that they will not get hurt when engaging in dangerous activities are more likely to engage in binge drinking. If alcohol programs know of this correlation, they may be able to offer better resources for the students that are binge drinkers. Likewise, campus police would also benefit from understanding the relationships between adolescent invulnerability and substance use. If campus police were more aware of these associations, they might be able to circumvent other behaviors associated with drinking alcohol and danger invulnerability, such as fighting or vandalism.

Limitations

This study presented a few limitations. The participants are not representative of all college students as the majority were white females, with the mean age being 20 years old. The study was also limited by the fact that it used a convenience sample via email instead of a random selection. Because the sample is small and participants could elect to quit the survey whenever they wanted, those that answered may be biased in one way or another (i.e., have smoked marijuana before, but are not avid users of the drug; are not college students that frequently engage in substance use). Additionally, participants may have falsified some answers based on the personal nature of some questions, or because they may not be legally using the substances mentioned. Due to time constraints, the survey was only available for a few days, giving participants only a small window of time to respond. Potential further research could employ tactics such as better sample recruitment, time during the semester in which the study takes place, and an incentive offered to the participants that complete the study.

Conclusions

College students are surrounded by opportunities to participate in substance use and risk behaviors on a frequent basis. The present study focused on two of these factors in depth in an effort to understand how often substance use is occurring among students, and the behaviors and choices that are made during or after substance use. From this study we can speculate that strong beliefs in ones' invulnerability, as well as a lack of ability to handle distress, may be predictors of a college students' choice to take part in substance use and the consequences they experience. However, more research is necessary for us to gain a better understanding of the influence distress tolerance and adolescent invulnerability have on college students' decisions to partake in substance use. Continued research may also consider different drugs, as well as other aspects of

the lives of college students that may be influenced by their levels of adolescent invulnerability and distress tolerance.

Tables

Table 1.

Adolescent Invulnerability and Distress Tolerance Means and Standard Deviations

	<i>M</i>	<i>SD</i>
Adolescent Invulnerability	2.30	0.55
- Danger	2.17	0.54
- Psychological	2.49	0.78
Distress Tolerance	3.37	0.86
- Tolerance	3.49	0.96
- Absorption	3.22	1.10
- Appraisal	3.38	0.94
- Regulation	3.34	1.12

Table 2.*Adolescent Invulnerability and Distress Tolerance Correlations*

	Adolescent Invulnerability	Danger	Psychological
Distress Tolerance	0.46*	0.26*	0.55*
- Tolerance	0.44*	0.24*	0.56*
- Absorption	0.44*	0.24*	0.53*
- Appraisal	0.46*	0.25*	0.53*
- Regulation	0.13	0.05	0.17

Note: * denotes $p \leq .05$, $N = 116$

Table 3.*Alcohol, Marijuana and Tobacco Means and Standard Deviations*

	<i>M</i>	<i>SD</i>
Alcohol frequency	2.74	1.07
Number of drinks	2.76	1.54
Binge drinking	1.81	1.41
Lifetime marijuana use	2.81	2.23
Marijuana frequency	2.61	1.24
Hours “stoned”	2.17	1.02
Current tobacco use	1.90	0.30
Tobacco craving strength	1.50	0.85

Table 4.*Adolescent Invulnerability, Distress Tolerance, Subscales and Alcohol Correlations*

	Frequency	Number of drinks	Binge drinking	Consequences
Adolescent	0.20*	0.21*	0.19	0.20
Invulnerability				
- Danger	0.24*	0.19	0.22*	0.30*
- Psychological	0.12	0.17	0.11	0.03
Distress Tolerance	0.15	0.07	0.04	-0.28
- Tolerance	0.13	0.02	0.10	-0.22*
- Absorption	0.14	0.08	0.10	-0.21
- Appraisal	0.16	0.11	-0.01	-0.31
- Regulation	0.08	0.03	-0.03	-0.12

Note: * denotes $p \leq .05$, $N = 97$

Table 5.*Adolescent Invulnerability, Distress Tolerance, Subscales and Marijuana Correlations*

	Lifetime use	Frequency	Hours “stoned”	Consequences
Adolescent Invulnerability	0.13	-0.05	0.06	0.08
- Danger	0.14	-0.06	0.03	0.00
- Psychological	0.08	-0.03	0.08	0.13
Distress Tolerance	0.02	-0.34*	-0.13	-0.14
- Tolerance	0.03	-0.30*	-0.17	-0.02
- Absorption	-0.05	-0.35*	-0.30*	-0.22
- Appraisal	0.02	-0.31*	-0.30	-0.18
- Regulation	0.02	-0.13	-0.17	0.07

*Note: * denotes $p \leq .05$, $N = 45$*

Table 6.*Adolescent Invulnerability, Distress Tolerance, Subscales and Tobacco Correlations*

	Current smoker	Craving strength
Adolescent Invulnerability	-0.21*	0.32
- Danger	-0.19*	0.26
- Psychological	-0.17	0.27
Distress Tolerance	0.00	0.28
- Tolerance	0.33	0.31
- Absorption	0.05	0.17
- Appraisal	-0.01	0.27
- Regulation	-0.07	0.32

*Note: * denotes $p \leq .05$, $N = \text{current} = 118$, $N = \text{craving} = 10$*

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