College Students' Distorted Perceptions of Drug Dangers:Overestimation and Underestimation of Licit and Illicit Drugs

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Abstract

This article presents the results of a survey of one hundred fifty six students enrolled in two major state universities. The survey was based on the model developed by Luce and Merrell (1995). The survey assessed students' perceptions of the level of danger and addictive potential associated with the use of alcohol, cocaine, heroin, marijuana, and tobacco. Students consistently overestimated the danger and addictive potential of illicit drugs, and underestimated the danger and addictive potential of alcohol and tobacco. Student perceptions are compared with realistic assessments of danger levels and addictive potentials of drugs. Implications of these inaccuracies, as well as implications for changes in drug education, are discussed.

Introduction

The message that "drugs kill" is a main theme of communications about drugs in our society. From the classic 1930s movie *Reefer Madness* to televised spots featuring eggs and frying pans, the dominant message the public receives about the currently illicit drugs is one of destruction and death. When Brown and his colleagues (1995) examined the state of drug education in California's public schools they found that most relied upon, "graphic portrayals or presentations of the harmful consequences of substance use" to scare adolescents away from drug use. This reliance on scare tactics continues despite the repeated conclusion that this approach does not deter drug use or abuse (Sherman, et. al., 1998.)

An example of this approach is found in the book *Substance Abuse Prevention Activities* (Gerne, p. 13-C, 1991). This activity states, "You have only $6. A vile (sic) of crack is $10. You are feeling 'ants crawling all over you.' You are getting fearful and agitated. How will you get the money for your drug this time, and the next time? List as many options as you can think of. Next to each, list any consequences that might result from getting the money."

Examining this activity, we notice a graphic description of withdrawal or abstinence syndrome, and the mention of fear and agitation. Even the spelling of the word "vial" is "vile." If the authors were talking about another topic, anyone reading this activity would conclude that it was very biased, and that any information provided might be suspect. However, since they are discussing illicit drug use, this presentation seems more acceptable. In restructuring the message that commercials, education programs and other "Just Say No" programs send, it is important to first see what is already being done, study how this works, its affects on the target audience and their consequent reactions. Is the message being sent to scare, inform, or reduce use? What is the best tactic to use?

The most popular single drug education program in the United States is DARE (Drug Abuse Resistance Education). DARE has been adopted by over 50% of school districts across the nation and the numbers continue to grow (Ringwalt & Greene, 1993). DARE's focus is on teaching students to recognize and resist social pressures to use drugs. The program only marginally includes information about drugs (Ennet, et. al., 1994). Meta-analysis of DARE evaluations shows that when all available studies are examined, DARE's limited influence on adolescent drug use contrasts with the program's popularity and prevalence (Ennet et al., 1994). DARE is well-known and well-funded but the question remains - are their tactics informing young adults about the true dangers of drug use/abuse, or are they over-exaggerating the dangers of drugs because it is socially acceptable.

There are few indications of the extent to which the public is internalizing these messages of danger, and even fewer of how accurate the public's perceptions of the dangers are. Preliminary research suggests that students in college have surprisingly inaccurate perceptions of the dangerousness of various classes of drugs. One such survey was discussed in the *American Journal of Public Health*. A random group of one hundred smokers were polled to see if their perceptions of the health risks from smoking light cigarettes were less than that of "regular" cigarettes. Studies illustrated that 20-40% of smokers of light cigarettes believed that smoking "lights" reduced the risk of health problems. The belief that a behavior may be risk-reduced may be sufficient reason to continue or begin a conduct (Kozlowski, 2000). The fact is that the reduced risks of light-cigarettes are so marginal that they can hardly be considered "a healthier smoke." Furthermore, light-cigarette smokers may be at an even higher risk of health problems because they may be inclined to smoke *more* cigarettes to get the same effect of regular cigarettes.

Adolescents are particularly susceptible to advertisement deception, which can be seen through their increased use of chewing tobacco. Of the estimated 10 million users, 3 million are under the age of 21 (Stafine, Bakdash, 2000). Smokeless tobacco is also associated with cancers of the esophagus, larynx, and stomach, and an increased risk of heart attacks and other cardiovascular diseases. These are hardly less risky health factors as compared with cigarettes. The tobacco industry has targeted male adolescents with its aggressive advertising. Ads associate this drug with rodeos, rock stars, and sports heroes. Smokeless tobacco companies sponsor rock concerts, rodeos, auto racing and tractor pulls. When adolescent boys see these advertisements conjoined with athletes on television chewing bubble gum they associate the two and thus, the behavior becomes acceptable.

While the results of the studies mentioned in this overview are not intended to generalize due to the use of a small, non-representative sample, they are intriguing and worthy of consideration.

Methods

Students enrolled in two major state universities participated in the study under conditions of informed consent. Students completed the survey during class time at the beginning of the semester. The instrument was based on that created by Luce and Merrell (1995).

Instructional Strategies

First, the students were given the blanket statement that there was an average of 550,000 deaths annually attributed to alcohol, tobacco, cocaine, heroin, and marijuana. Then they were asked to estimate specifically how many of these deaths were attributable to *each* of the following drugs: alcohol, tobacco, cocaine, heroin, and marijuana. If students felt that the number of deaths was evenly distributed between these five drugs, then students would simply write 110,000 per drug, per year. However, typically students put more thought into this exercise and disproportionately divided the 550,000 among these five drugs.

This exercise is quite interesting for it provokes students into thinking about societal perceptions of these five drugs and how many deaths are actually attributed to each drug annually. For example, there are many students who estimate that there are 25,000 deaths attributed to marijuana use annually; as many as 100,000 deaths annually attributed to cocaine and heroin, and far fewer deaths attributed to alcohol and tobacco. Once the actual numbers are written on the chalkboard, students are stunned. When students see that there are *no* estimated deaths attributed to marijuana use; 7,000 deaths attributed to heroin use; 8,000 deaths attributed to cocaine use; 110,000 deaths attributed to alcohol use; and 425,000 deaths attributed to tobacco use students are rendered somewhat speechless. A chart outlining the differences of the students' assumptions versus the reality of the statistics is presented in table one. The timing of this newly found realization lends itself well in introducing the subject of misinformation, misguided perceptions, and "real" danger vs. perceived dangers.

Next, they were asked to estimate what percentage of the users of each drug would be medically diagnosed as abusers or dependent. Finally, they were asked to assess the risk associated with using each of the illicit drugs once or twice, occasionally (less than two times a week), or regularly (two or more times a week). The risks associated with the occasional use of cocaine, crack, heroin, and marijuana are illustrated in table two. A total of 156 students, 91 females and 65 males, completed the survey. The median age of the sample was 21 and the sample included 146 undergraduate student's and 10 graduate students.

Results

Respondents gave a reasonably accurate estimate of the number of deaths due to the direct effects of alcohol each year. They underestimated the number of deaths occurring annually attributed to tobacco use (see table

1). This may be because they would not expect something so evidently lethal to be legal. Their estimates of annual mortality due to the three illicit drugs were gross *overestimates* (again, see table one). Respondent estimates of the percent of alcohol users who become alcohol abusers averaged 52.2% compared to a realistic estimate of 20% based on community studies. Reliable estimates hold that 90-95% of tobacco smokers are physically dependent, but our respondents estimated that only 69.3% of smokers became abusers or dependent. Estimates from population data put the percent of illicit drug users who become dependent or abusers at about 20% (Anthony & Helzer, 1991), but our respondents estimated the percentages as being 65.9% for cocaine, 68.1% for heroin, and 52.9% for marijuana.

Table 1. Annual Deaths Due to Five Drugs: Mean Student Estimates Versus Reality (n=156)

	Student Estimate	Vital Statistic
Alcohol	186,500	110,000
Tobacco	95,875	425,000
Cocaine	64,925	8,000
Heroin	60,175	6,500
Marijuana	26,075	0

A majority of respondents regarded the regular use of any of these drugs to be a great risk. Experimental use (once or twice) of heroin or "crack" was considered to be a great risk. Occasional use of heroin or either form of cocaine was seen as being a great risk (table two). For purposes of this section, the risks of cocaine hydrochloride powder and crack cocaine were dealt with separately. This resulted in the interesting finding that experimentation with cocaine powder was regarded as less risky by many respondents than was experimenting with "crack" cocaine. The risk of using cocaine powder once or twice was rated as none by 7 respondents (4.5%), slight by 41 (26.3%), moderate by 49 (31.4%) and great by 59 (37.8%). Using "crack" cocaine once or twice, on the other hand, was rated as no risk by 6 (3.8%), slight risk by 16 (10.3%), moderate by 45 (28.8%), and great by 83 (57.7%).

Given that both forms of cocaine produce identical effects and that the only difference is the route of administration, this result seems illogical. When one further considers that "crack" is typically used in smaller doses and that users can readily control their dose, making overdose very unlikely, it would seem that any difference really should be in the opposite direction.

The consequences of this overestimation of danger are unclear. Perhaps, the difference between cocaine and crack lies within the social stigma attached to crack and its perception as being a "lower" form of drug use. Since the focus of this study is formed around student impressions based partly on education, but more so on media exposure it is relevant to observe how these genres present the use of particular drugs. Stereotypically cocaine use has been associated with politicians, movie stars, and athletes. Whereas, crack, even though having the same chemical components of cocaine, has been linked to degenerate "crack houses" where homeless or destitute individuals obtain just enough drugs to satisfy their immediate need. This may possibly explain why students would think that crack is less risky. It seems to be cheaper and easier to acquire, consequently giving the impression of being less dangerous.

Another consequence of the overstatement of hazard may be that adolescents are less likely to discuss their feelings about drug use, and perhaps their experiences with casual experimentation. If society fostered a more open dialogue about illicit drugs, it might be more likely to promote behavior change in adolescents and pre-adolescents. Another problem with sending a message of exaggerated risk is the potential damage to adult credibility in the eyes of young people.

For example, student substance use decisions are either neutrally or negatively affected by their school-based drug education program (Brown, 1995). In 1991, a California-based Drug, Alcohol, and Tobacco Education (D.A.T.E.) program was initiated for a clearer explanation of what drugs entail and how they effect users. Most schools, which used the D.A.T.E program, found that students believed the perceptions to be biased and therefore undermined the credibility of the school personnel and lead the students to become suspicious of the information provided. With this bias in mind students may be inclined to try drugs with the intention of disproving the suspect information they learned in these programs.

Table 2. Median Estimate of Risks Associated With Use of Four Drugs for Experimental, Occasional and Regular Use

Drug	Risk
Cocaine Powder	
once or twice	moderate risk
occasionally	great risk
regularly	great risk
Crack Cocaine	
once or twice	great risk
occasionally	great risk
regularly	great risk
Heroin	
once or twice	great risk
occasionally	great risk
regularly	great risk
Marijuana	
once or twice	slight risk
occasionally	slight risk
regularly	great risk

This is demonstrated by studies which show an increase in drug use, which has also been illustrated in recent polls. For example it has been found that by the time they finish high school, 9.2% of students have experimented with some form of cocaine at least once (Youth Risk Behavioral Study, 1998). This amounts to almost one in ten students, and considering the relatively few health problems that result from experimental use, they may conclude that the risks associated with experimental use of cocaine are exaggerated.

Equally noteworthy is the respondents' underestimation of the mortality and addiction potential of tobacco. They have been thoroughly indoctrinated concerning the dangerous nature of cocaine, marijuana (which is attributed to less than 1,000 deaths annually) and heroin. Yet the respondents are unaware that tobacco use is the single greatest preventable cause of death in our society. If the overestimation of risk can have adverse consequences, this subsequent underestimation is even more dangerous. Because of the pervasiveness of licit drugs in our society, the social and legal acceptance of their use, and the relatively low cost of purchasing these substances, use by adolescents and pre-adolescents is far greater than any use of illicit drugs. In addition, tobacco use has serious health consequences.

Heart disease and cancer respectively are the number one and two leading causes of death within the U.S. This is disturbing since it has been established that cardiovascular disease and cancer are the significant smoking-related killers, nationally. Some of students' misconceptions might revolve around the adolescent decision of what "light drinking" is defined as. When students hear casual facts associated with light drinking they invent their own parameters that are inclusive for that definition. Light drinking is associated with lowered risk of heart disease and stroke, but chronic heavy drinking is related to a variety of heart disease, cardiac arrhythmias, and cardiovascular problems (Inaba & Cohen, 2000, p.193). Furthermore, smoking injures blood vessels and makes them more prone to arteriosclerosis, which leads to myocardial infarction (heart attack) and strokes. Lung cancer is the number one smoking-related killer among men, and it recently surpassed breast cancer as the number one killer among women (Inaba & Cohen, 2000).

Chronic obstructive pulmonary disease (asthma, acute bronchitis, and emphysema) is the most common smoking-related disabling disease, the number three smoking-related killer among men and women, and the number ten leading cause of death overall. Before a smoker develops mild emphysema, 50% of his or her lung capacity is generally destroyed. Loss of 10% more leads to moderate symptoms, and 10% beyond that to severe symptoms (Breo, 1993).

The EPA (environmental protection agency) has classified "environmental tobacco smoke" as a Class A carcinogen and a cause of lung cancer. Inhaling this smoke puts the nonsmoker at a thirty percent greater risk of lung cancer. The Centers for Disease Control and Prevention have stated that every minute spent smoking decreases lifespan by one minute (Breo, 1993).

These health consequences make especially clear the potential problems with the misperceptions students that have of the dangerousness of various drugs. Many of these misperceptions are likely to stem from drug education that was received during adolescence.

Discussion

Considering the importance of accurate perceptions of the consequences of drug use, our choice of drug education programs as a nation have been somewhat bizarre. A number of sources have suggested that the "zero tolerance" policies that became popular during the 1980's have had no positive effect, and in fact, may contribute to an increase in the casual use of illicit drugs. There are a number of arguments that suggest this. The first relates to the controlled user. A

controlled user is defined as a person who is in sufficient control of his/her drug use such that his or her decisions are made to maximize benefits and minimize costs of use. If a controlled user has decided to consume illicit drugs, and the risk of punishment does not increase with the quantity of possession, what influences the user to purchase less instead of more?

It is argued by Deterrence Theory that a person will engage in any criminal act when the expected utility ($E(U)_c$) exceeds that of the most profitable alternative ($E(U)_a$). Formal statements of modern deterrence theory are variations on the following basic model, in which $E(U)_c$ (expected utility of criminal act) can be derived as follows:

$$\mathbf{E(U)_c = U(G)_c \times P(G)_c + U(L)_c \times P(L)_c}$$

Where $U(G)_c$ is the utility of gains associated with committing the crime, $P(G)_c$ is the probability of obtaining those gains, and $U(L)_c$ is the disutility of legal sanctions occurring as a result of that crime (severity of punishment) (a negative value), and $P(L)_c$ is the probability of experiencing those legal sanctions (probability of punishment.) $E(U)_a$ is derived similarly (MacCoun, 1993).

Through examining the model, we can see that to sufficiently deter any single individual, we must increase the certainty and severity of punishment enough to outweigh the attractiveness of the crime. However, most studies have found that perceived severity of punishment plays almost no part in the likelihood of engaging in criminal behavior (Anderson et al, 1977). This leads us to believe that the most important variable must be the probability of punishment, a variable that as a society, we have placed enormous investments in attempting to control.

In fact, it is arguable that financially and socially, this country has placed a higher investment in the "War on Drugs" than any other nation in the world. It is stated that the U.S spends approximately 19 billion dollars each year on the "war" on drugs (Goldberg, 2000). Moreover, approximately 70% of this money is spent on supply reduction rather than demand reduction or simply reducing the desire of drug use among those who ultimately use drugs. Despite this, the fact remains that our prisons and courts are filled with drug offenders. Drug offenders account for 61% of sentenced inmates in federal prisons as of 1993, and the proportion grows each year (http://www.ojp.usdoj.gov/bjs/pub/pdf/dcfacts.pdf).

The results of this small preliminary survey suggest that college-bound American students have been convinced that illicit drugs are a good deal more dangerous than these drugs really are. The students greatly over-estimated the number of deaths annually attributable to illicit drugs. These students also over-estimated the addictive potential of the illicit drugs. These college bound high-school students regarded any regular use of illicit drugs as involving a great risk, and even experimentation with "crack" cocaine or heroin is identified as a great risk. However, these students also underestimate the danger and addictive potential of the licit drugs common to everyday use in the United States. As educators, policy makers, and researchers we must ask ourselves what the consequences of these misconceptions are and why we seem, as a society, so eager to foster these fallacies.

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