

# Illicit Prescription Stimulant Use Among College Students Living Near the United States–Mexico Border

Grant Benham, PhD

Angelica Huerta

Sandra Salazar

The University of Texas–Pan American

Previous research has suggested that the illicit use of prescription stimulant drugs may be a significant problem on U.S. college campuses. We examined the nonmedical use of prescription stimulants at a large university situated 20 miles from the United States–Mexico border, surveying a predominantly Hispanic population of students that is geographically and culturally distinct from those used in previous studies. Approximately 7% of the students sampled reported having used prescription stimulants during the previous year without a prescription. The majority of students bought the drugs in the United States as opposed to Mexico, and the most frequently cited source for these stimulants was friends. In spite of comparatively easy access to inexpensive prescription stimulants from Mexican pharmacies, illicit usage appears to closely match national averages.

La investigación previa sugiere que el uso ilícito de estimulantes de receta es tal vez un problema importante en las universidades norteamericanas. Examinamos la frecuencia del uso no-médico de estimulantes de receta en una universidad grande situada a 20 millas de la frontera entre los EE.UU y México mediante una encuesta en una muestra predominantemente hispana de estudiantes, geográfica y culturalmente distinta a la utilizada en estudios previos. Aproximadamente 7% de los estudiantes mencionó haber utilizado estimulantes de receta durante el año anterior sin tener una receta. La mayoría de estudiantes compró las drogas en los EE.UU, no en México, y a la fuente normalmente citada para estos estimulantes fueron los amigos. A pesar del acceso relativamente fácil a estimulantes baratos de receta en las farmacias mexicanas, la tasa de uso es semejante a la encontrada en las encuestas nacionales.

**Keywords:** Ritalin; methylphenidate; stimulants; Hispanic; drugs

Prescription stimulants such as methylphenidate are commonly used in the treatment of attention-deficit hyperactivity disorder (ADHD), and various studies have documented increased prescription rates for these drugs in both the United States and abroad (Olfson, Marcus, Weissman, & Jensen, 2002; Robison, Sclar, Skaer, & Galin, 1999; Robison, Skaer, Sclar, & Galin, 2002; Romano, Baillargeon, Wu, Robaey, & Tremblay, 2002; Rushton & Whitmire, 2001; Safer, Zito, & Fine, 1996). Methylphenidate is a schedule II substance and considered to have a high potential for abuse (Drug Enforcement Administration [DEA], n.d.). As a stimulant, the effects of methylphenidate can include appetite suppression, wakefulness, increased focus, and euphoria (National Institute

on Drug Abuse [NIDA], n.d.). Given these effects, misuse has been reported in high schools and colleges, particularly in terms of their use as so-called study drugs. This potential for abuse has led a number of researchers to investigate the prevalence of, and risk factors associated with, nonprescription (illicit) use of stimulants in college students.

In their 2002 article, Graff Low and Gendaszek reported that an alarming 35.3% of the college students surveyed reported having used prescription stimulants (Ritalin, Adderall, or Dexedrine) without a prescription during the previous 12 months. Prior research at a Massachusetts liberal arts college (Babcock & Byrne, 2000) had shown substantially less usage (16.6%), though the results are difficult to compare directly because students were asked

about Ritalin use only and lifetime use was assessed ("Have you ever taken Ritalin for fun ...") rather than usage during the preceding year. Inconsistencies in the specific questions asked and the methods of survey administration have thus created methodological challenges in summarizing the literature on nonmedical use of prescription stimulants (Arria & Wish, 2005), but recent results suggest that the usage rates discovered by Graff Low and Gendaszek may have been uncommonly high.

Ritalin is perhaps the best known brand name of a class of prescription stimulants known as methylphenidate. As a psychopharmacological treatment for ADHD, its production increased by almost 900% from 1990 to 2000 (DEA, 2002). With the associated increases in prescription rates, the potential for illicit use has escalated. Data on non-medical use of Ritalin by high school seniors demonstrates an increase in annual prevalence from 0.1% in 1992 to 2.8% in 1997, with rates ranging from 2.2% to 3.9% for the subsequent 8 years (Johnston, O'Malley, Bachman & Schulenberg, 2006).<sup>1</sup> Three studies have directly assessed the annual prevalence of nonmedical Ritalin use in college students. In a 1997 study of 2,420 students at 10 Texas universities (Kerber & Wallisch, 1999), 1.5% of students reported past-year use (2.0% reported lifetime use). In 2003, an Internet survey of 2,250 students at the University of Michigan revealed that approximately 3% of the students had used Ritalin during the previous year (Teter, McCabe, Boyd, & Guthrie, 2003). A more recent assessment of approximately 420 students (Johnston, O'Malley, Bachman, & Schulenberg, 2004) found a slightly higher past-year use of 4.7%. Because these studies were conducted by separate investigators at different universities, it is not clear whether the variation in reported use is a result of the varying methodologies and samples used or whether the differences reflect increases in prevalence over time.

With the introduction of other brands of methylphenidate (Concerta and Metadate) and with increased availability of alternative types of prescription amphetamine stimulants (Dexedrine and Adderall), researchers have increasingly expanded surveys beyond the exclusive focus on Ritalin. Given that the high percentage reported by Graff Low and Gendaszek (2002) included Adderall and Dexedrine use, it is possible that the lower percentages in other studies were a result of a restriction to Ritalin use. Two lines of evidence suggest that this is not likely to be the case. First, Graff Low's own data show that 31.3% of use was for Ritalin, with only 4% for other stimulants. Second, recent studies, outlined later, show lower rates even when other prescription stimulants are added to the surveys.

Expanding the list of prescription stimulants to include one or more of Ritalin, Concerta, Metadate, Adderall, Dexedrine, or Desoxyn, Hall, Irwin, Bowman, Frankenberger, and Jewett (2005) found that of 381 college students surveyed at a Midwestern university, 13.7% reported having taken stimulants not prescribed to them (lifetime use). The surveys were administered either

via mail or direct administration, and significantly higher usage reports were obtained with direct administration. The authors suggested that the obtained estimate might be slightly low as a result of underreporting on mail surveys. Similar usage was reported by Prudhomme White, Becker-Blease, & Grace-Bishop (2006), who surveyed students from a northwestern U.S. university using both online and paper-and-pencil questionnaires. Of the 1,025 undergraduate and graduate students surveyed, 14.4% of the sample reported using illicit stimulant medication (Ritalin, Adderall, Cylert, Dexedrine, or Concerta) at least two to three times per year.

A large-scale mail survey of 10,904 college students from 119 colleges (McCabe, Knight, Teter, & Wechsler, 2005) found that, overall, 4.1% of students had used either Ritalin, Dexedrine, or Adderall over the previous year (6.9% lifetime). The diverse sample of universities demonstrated just how variable reported rates can be between colleges. Prevalence at different schools ranged from 0%–25%, with 20 schools having a 0% rate and 12 schools having a rate of 10% or higher. McCabe also found similar rates (4.5%) among middle and high school students (McCabe, Teter, & Boyd, 2004), and a Web survey of 9,161 students at the University of Michigan (Teter, McCabe, Cranford, Boyd, & Guthrie, 2005) showed a past-year prevalence rate for Ritalin, Dexedrine, Adderall, or Concerta of 5.4%.

Although a few large-scale studies have provided data about the prevalence of nonmedical use of prescription stimulants, most researchers agree that further research is needed (Arria & Wish, 2005; Graff Low & Gendaszek, 2002; Hall et al., 2005; McCabe, Knight, et al., 2005; Teter et al., 2003; Teter et al., 2005). In particular, researchers have emphasized the need to examine regional differences (Hall et al., 2005; Martyn, Reifsnider, Barry, Treviño, & Murray, 2006), diverse racial backgrounds (Teter et al., 2005), and the issue of accessibility to prescription stimulants (Graff Low & Gendaszek, 2002). It also has been suggested that small-scale studies offer a more practical method of asking in-depth questions about use (Arria & Wish, 2005).

In an attempt to address some of these issues, the current study investigates the nonmedical use of prescription stimulants (including the motivations for use and methods of stimulant acquisition) in a convenience sample of college students at the University of Texas–Pan American, a large university on the United States–Mexico border. The university is situated fewer than 20 miles from the Mexico border, with an enrollment of more than 15,000 students, more than 85% of whom are Hispanic. It is unclear whether ethnicity has an impact on stimulant use. Although there is some evidence for increased prevalence in Hispanics (Centers for Disease Control and Prevention [CDC], 2006), other research suggests that Hispanic ethnicity is not associated with differential use of stimulants (Johnston et al., 2006; McCabe, Knight, et al., 2005; Teter

et al., 2005). Although the impact of ethnicity on illicit use of stimulants remains to be determined, the proximity to the Mexico border and the dominance of this culture in the region sets the current sample apart from previous college samples.

The proximity of Mexican border towns also provides unique access to inexpensive and readily obtainable prescription medications. Under most conditions, U.S. federal law allows U.S. residents to purchase and bring back up to 50 dosage units of a prescription medicine. Border towns have created an industry of prescribing and selling inexpensive medication to U.S. tourists. In one study conducted in 1994–1995, researchers found that an average of 159 Ritalin pills per day (56,706 per year) were declared at the Laredo border crossing, which, as the authors indicate, is likely to be a low estimate of the number of pills actually being transported across the border (McKeithan & Shepherd, 1996). Border towns are lined with *farmacias* (pharmacies), and research has suggested that the acquisition of prescriptions from doctors or dentists is commonly a superficial process (Valdez & Sifaneck, 1997).

Given these factors, the purpose of the current study was to investigate the issue of nonmedical use of prescription stimulants among students in a setting that is both geographically and culturally distinct from previous studies. Our study directly assesses the use of nonprescription stimulants in students at a university less than 20 miles from the Mexico border, a sample of predominantly Hispanic students from a campus and region that is richly influenced by the surrounding Hispanic culture.

## METHODS

### Participants

The Institutional Review Board for the protection of human subjects at the University of Texas–Pan American approved the study. One hundred and fifty students attended one of a number of available scheduled sessions to fill out our survey on drug use. The convenience sample of students was obtained via in-class announcements in psychology, anthropology, English, history, and philosophy classes. Prior to participation, all students read and signed an informed consent document, which was collected and stored separately from the survey itself. The consent document made it clear to students that their responses would be anonymous, and participants were instructed not to include any identifying information on the surveys. Students also were provided with extra credit for participation using a separate sign-in sheet. A total of 146 surveys were completed sufficiently; four of the surveys were returned either blank or without a marked response to the nonprescription stimulant use question and were therefore not included in the subsequent data analysis.

### Procedure and Measures

All participants completed an anonymous survey on drug use, modeled on the survey used by Graff Low and Gendaszek (2002). The survey included demographic questions, questions about stimulant prescription use over the past 12 months, motivations for use, and purchasing of stimulants. Specifically, participants were asked "Regardless of whether or not you have a prescription for any of the following stimulants, select the box that best indicates approximately how many times you have used each in the last 12 months. (These stimulants are usually prescribed for disorders such as ADHD and ADD.)" The stimulants listed were Ritalin, Adderall, Dexedrine, or other, with frequency options of "Never," "1–5 times," "6–11 times," "About once a month," "About once a week," or "About once a day." Participants were classified as using prescription stimulants for nonmedical purposes (illicit users) if they reported use within the last 12 months and did not report having a prescription for the drug.

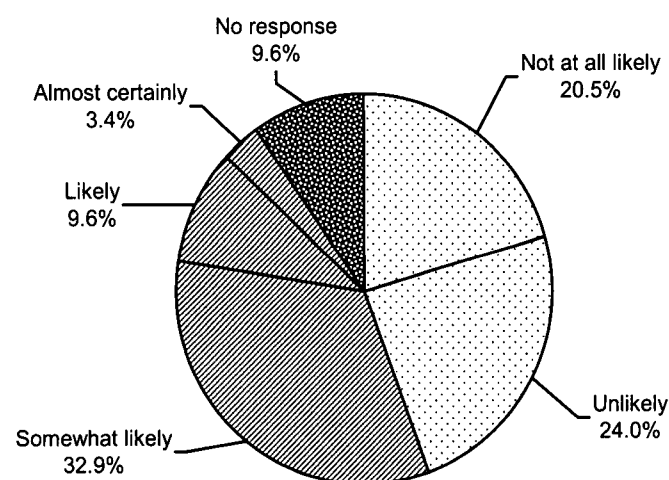
The survey also included questions about over-the-counter stimulant use; stimulants such as caffeine pills, nicotine, and diet pills that can be purchased legally without a prescription. Participants also filled out the Sensation Seeking Scale, Form V, a 40-item forced choice scale designed to test one's tendency toward varied, novel, and intense sensations, sometimes known as thrill seeking or arousal seeking (Zuckerman, 1994). The scale is widely used, provides an overall sensation-seeking score ranging from 0 to 40, and has demonstrated reliability and validity. Completed survey packets were placed in a blank envelope by each participant, sealed, and left on the researcher's table before leaving.

## RESULTS

Students ranged in age from 18 to 35 years (mean 21.9 years), 64% were female, and 87% identified themselves as Hispanic. The majority of participants reported having lived in the surrounding area for 4 or more years. Approximately half of the students (44.5%) felt that prescription stimulants could be easily transported across the border, indicating that getting caught would be either "unlikely" or "not at all likely" (see Figure 1).

### Illicit Use of Stimulants

Out of the 146 students surveyed, 18 (12.3%) reported use of prescription stimulants within the past 12 months. Of those 18, 8 reported having a prescription for stimulants. The remaining 10 students (6.8% of the total sample) reported nonmedical use of prescription stimulants and were classified as illicit users. Only 1.4% of the total sample reported using Ritalin during the previous 12 months. The same percentages (1.4% of the total sample) were reported for Adderall and Dexedrine, with 2.7% of



**Figure 1.** Student opinions about the likelihood of getting caught trying to transport prescription stimulants across the border. Percentages represent responses of a convenience sample of 146 students to the questions, "How easy is it to transport these stimulants across the border?" and "If a person transports the above stimulants, how likely is it that they will get caught?"

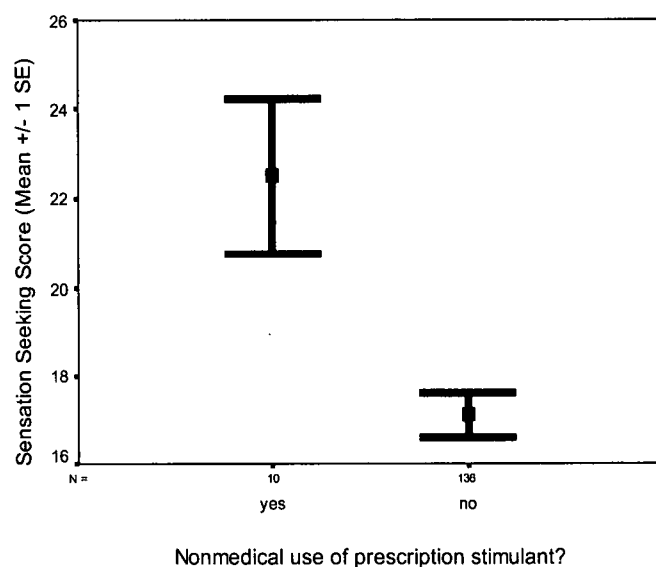
the sample reporting use of other prescription stimulants. All illicit users had lived in the surrounding area for 6 or more years, 8 of the 10 students were Hispanic, and 7 of the 10 were female.

#### Sources of Stimulants and Reasons for Use

In examining the purchasing behavior of illicit users, one student reported buying Adderall "Mostly in Mexico," whereas the majority (six students) purchased the stimulants "Mostly in the United States" (three students left this question blank). Students were asked from whom they purchased their stimulants. One student reported purchasing from street dealers, four students bought from friends, and one student bought from clubs/raves (four students left this question blank). Reasons for stimulant use included the following: to enhance intellectual/academic performance (endorsed by two illicit users), to use in combination with alcohol (one user), to increase sociability (one user), to get high (two users), or for weight/appetite control (one user). None of the illicit users indicated that they used the stimulants to improve athletic performance or because of peer pressure. Interestingly, of the eight students who indicated having prescriptions for stimulants, one indicated using stimulants in combination with alcohol, two indicated using them to get high, and one indicated using them for weight/appetite control.

#### Sensation Seeking and Illicit Use

Nonmedical prescription stimulant users could be differentiated from nonusers based on sensation-seeking scores (see Figure 2). Within the entire sample, sensa-



**Figure 2.** Sensation-seeking scores for nonmedical prescription stimulant users and nonusers. Bars represent mean  $\pm$  one standard error.

tion-seeking scores ranged from a low of 6 to a high of 31 (maximum possible range is 0 to 40). An independent samples *t* test revealed that illicit users scored significantly higher ( $M = 22.5$ ,  $SD = 5.5$ ) than nonusers ( $M = 17.1$ ,  $SD = 5.1$ ) on sensation seeking,  $t(144) = 2.49$ ,  $p = 0.003$ .

#### Nonprescription Stimulant Use

Although the percentage of students reporting illicit use of prescription stimulants was below 7%, our data indicated that almost half of the 146 sampled students (44%) use some sort of herbal stimulant (41% of males, 46% of females). During the preceding year, approximately one-quarter (23%) had used diet pills, 22% had used caffeine pills, and 28% had used nicotine. In all cases, the percentage that used legal nonprescription stimulants was approximately equal for males and females.

## DISCUSSION

Our data show that approximately 7% of the students at the sampled university use prescription stimulants without a prescription. This is substantially lower than the 35.3% reported by Graff Low and Gendaszek (2002) but slightly higher than the usage rates of 4.1% and 5.4% reported by McCabe, Knight, et al. (2005) and Teter et al. (2005), respectively. As mentioned previously, methodological differences make direct comparison of studies difficult. In the McCabe, Knight, et al. study, Ritalin, Dexedrine, or Adderall usage was surveyed. In our study, we included the additional option of "Other stimulants."

If we restrict our data analysis to Ritalin, Dexedrine, or Adderall, however, our usage rate matches the findings of McCabe, Knight, et al. (4.1%). Such specificity in surveys of this behavior may provide a means of more readily comparing data sets.

We defined nonmedical use of prescription stimulants by excluding those who had a prescription for one or more of the stimulants. In our own sample, four of the students who reported having prescriptions for stimulants indicated nonmedical usage behavior such as getting high. In a recent study by Prudhomme White et al. (2006), 14.4% of college students reported illicit stimulant use without a prescription, and an additional 1.8% reported misuse or abuse even though they held a valid prescription for the drug. Thus, though 6.8% reported illicit stimulant use without a prescription in our study, an additional 2.7% admitted to misuse or abuse of his or her own prescription stimulants.

Eighty-seven percent of our participants identified themselves as Hispanic. Research on the relationship of ethnicity to illicit drug use is mixed. The 2004 National Survey on Drug Use and Health (NSDUH; Substance Abuse and Mental Health Services Administration, 2005) indicated no major differences in rates of current illicit drug use between Whites (8.1%) and Hispanics (7.2%), and an earlier NSDUH report (Substance Abuse and Mental Health Services Administration, 2003) indicated lower lifetime nonmedical use of stimulants in Hispanics (5.0%) compared to Whites (10.7%). Although some national studies do suggest higher stimulant usage by Hispanics (CDC, 2006), other research suggests no association between ethnicity and use of stimulants (Johnston et al., 2006; McCabe, Knight, et al., 2005; Teter et al., 2005). Limited research has been conducted on ethnicity as a factor in illicit prescription drug use. McCabe, Teter, Boyd, Knight, and Wechsler (2005) found Hispanic students were two times less likely to report nonmedical use of prescription opioid analgesics; however, there is little data regarding the differences in illicit prescription stimulant use between Hispanics and non-Hispanics.

In attempting to determine the source of illicit prescription stimulants, we were somewhat surprised to find that only one student reported purchasing stimulants from across the border. Despite the fact that there is ready access to cheap prescriptions in nearby Mexico and that almost half the students felt that there was little risk getting caught with such drugs at the border crossings, the most commonly endorsed method for purchasing stimulants was from friends in the United States. This purchasing behavior is consistent with prior research with college students regarding the primary source for illicit prescription drugs (e.g., McCabe & Boyd, 2005; McCabe, Teter, & Boyd, 2006; Prudhomme White et al., 2006). The notion that individuals with valid prescriptions may be distributing their stimulants to others is

supported by a recent study of adolescents and young adults with ADHD in which 11% of the sampled patients reported selling their medications (Wilens, Gignac, Swezey, Mounteaux, & Biederman, 2006). Thus, though it is still possible that the suppliers of these stimulants are purchasing the drugs from Mexico, access to *farmacias* does not appear to increase usage above the national college norms or influence where illicit users purchase their drugs.

Although prescription rates for stimulant medication in the United States have risen over the past two decades, it is interesting to note that stimulant prescription rates for children are lower in Hispanics versus non-Hispanics (CDC, 2005). The cause of this difference is not clear. It could be based on a number of different factors, including unequal levels of medical insurance or differing cultural attitudes toward stimulant medications. For example, Hispanics are more likely to see prescription drugs as dangerous (Hadjicostandi & Cheurprakobkit, 2002). Additionally, many of the students in our sample had a strong sense of family connection and loyalty (*familismo*), which may be an important factor in reducing the likelihood of illicit use. Hispanic children and adolescents are less likely to use drugs when living with both parents (Delva et al., 2005), and it has been suggested that mentoring relationships with uncles or aunts or grandparents may be a protective process against risk behavior (Martyn et al., 2006). High levels of *familismo* have been shown to be negatively related to alcohol use in adolescents (Gil, Wagner, & Vega, 2000) and to less marijuana use in adolescents knowledgeable about drugs (Ramirez et al., 2004). Recognition of the importance of culturally relevant interventions is exemplified by programs such as the Substance Abuse and Mental Health Services Administration's "Keepin' it REAL" (Schinke, Brounstein, & Gardner, 2002), which presents material using culturally based narratives.

In spite of the potentially protective factors of Hispanic attitudes to prescription drugs and the influence of *familismo*, a number of the students sampled still chose to use stimulant drugs illicitly. As with the earlier study by Graff Low and Gendaszek (2002), illicit users in our study scored significantly higher on a measure of sensation seeking. Thus, our research suggests that the sensation-seeking trait may be a risk factor in stimulant use, a notion in keeping with a substantial amount of prior research on personality factors related to drug use. Sensation seeking has been frequently linked to risky behavior and drug use (e.g., Arnett, 1996; Hittner & Swickert, 2006; Simons, Gaher, Correia, & Bush, 2005; Wagner, 2001; Wood, Cochran, Pfefferbaum, & Arneklev, 1995), and it is clear that such personality traits must be considered when examining the causes of, and solutions to, drug abuse.

Although the nonmedical use of prescription stimulants in our sample cannot be considered widespread, it is important to note that many students in our study reported using legal stimulants. *Herberias* (herb shops) are commonplace in the community, and folk medicines are widely used. Thus, it is not too surprising to see almost half of the students sampled reporting the use of herbal stimulants over the past year. It is unclear what health implications such behavior might have, but it is important for medical professionals to be aware of such usage, particularly in terms of how it might interact with prescription medications.

Our study suffered from a number of methodological limitations, including the use of a convenience sample of limited size. The sampling method and small sample size limit the generalizability of our results. Future research on Hispanics living at the border would benefit from random sampling methods and the casting of a wider net to include individuals of varying socioeconomic status and educational background. Although our demographic confers some advantage over previous studies using largely non-Hispanic White samples, its homogeneity (87% Hispanic) also hampers the examination of local differences between Hispanics and non-Hispanics. Our study also makes no attempt to examine within-ethnicity diversity, such as whether differences exist between Mexican and U.S. nationals or whether varying levels of acculturation impact illicit stimulant use. Given the ease of obtaining Mexican prescriptions from border doctors or dentists, future research also should consider assessing the source or legitimacy of prescriptions. Our data did not differentiate between U.S. and Mexican prescriptions for those that were using prescription stimulants legally.

In conclusion, our study demonstrated that the illicit use of prescription stimulants among predominantly Hispanic college students near the United States–Mexico border is similar to national averages obtained from recent large-scale studies. It is important for medical practitioners, however, to recognize that even students with valid stimulant prescriptions may not be using the medications appropriately. Our research, and the research of others (e.g., Prudhomme White et al., 2006; Wilens et al., 2006), indicates that individuals with prescriptions may be using the drugs for nonmedical reasons (such as to get high). Our study also shows that, aside from illicit prescription stimulant use, almost 50% of students use herbal stimulants. Thus, medical practitioners should be aware of the potential for inappropriate use of stimulants by both individuals with prescriptions and those without. Additionally, although prevalence rates may appear similar across disparate samples, the reasons underlying the usage rates may differ. In order for health professionals to develop effective education programs and intervention strategies, knowledge of specific risk factors and culturally relevant protective processes are imperative.

## NOTE

1. A newer question format on the same survey suggests that actual prevalence rates may be higher. The new question format, added in 2001, indicates prevalence rates ranging from 4.0% to 5.1%. It is suggested that these prevalence rates may be more accurate, but the previously demonstrated trend for increased prevalence is still likely to be valid.

## REFERENCES

- Arnett, J. J. (1996). Sensation seeking, aggressiveness, and adolescent reckless behavior. *Personality and Individual Differences*, 20(6), 693–702.
- Arria, A. M., & Wish, E. D. (2005). Nonmedical use of prescription stimulants among students. *Psychiatric Annals*, 35(3), 228–235.
- Babcock, Q., & Byrne, T. (2000). Student perceptions of methylphenidate abuse at a public liberal arts college. *Journal of American College Health*, 49(3), 143–145.
- Centers for Disease Control and Prevention (CDC). (2005). Prevalence of diagnosis and medication treatment for attention-deficit/hyperactivity disorder—United States, 2003. *Morbidity and Mortality Weekly Report*, 54(34), 842–847.
- Centers for Disease Control and Prevention (CDC). (2006). Youth risk behavior surveillance—United States, 2005. Surveillance summaries. *Morbidity and Mortality Weekly Report*, 55(SS-5). Retrieved August 28, 2006, from <http://www.cdc.gov/mmwr/PDF/SS/SS5505.pdf>
- Delva, J., Wallace, J. M. Jr., O'Malley, P. M., Bachman, J. G., Johnston, L. D., & Schulenberg, J. E. (2005). The epidemiology of alcohol, marijuana, and cocaine use among Mexican American, Puerto Rican, Cuban American, and other Latin American eighth-grade students in the United States: 1991–2002. *American Journal of Public Health*, 95(4), 696–702.
- Drug Enforcement Administration (DEA). (2002). *Yearly aggregate production quotas (1990–2000)*. Washington, DC: Office of Public Affairs, Drug Enforcement Administration.
- Drug Enforcement Administration (DEA). (n.d.). *Methylphenidate*. Retrieved August 30, 2006, from <http://www.usdoj.gov/dea/concern/methylphenidate.html>
- Gil, A. G., Wagner, E. F., & Vega, W. A. (2000). Acculturation, familism and alcohol use among Latino adolescent males: Longitudinal relations. *Journal of Community Psychology*, 28(4), 443–458.
- Graff Low, K., & Gendaszek, A. E. (2002). Illicit use of psychostimulants among college students: A preliminary study. *Psychology, Health and Medicine*, 7(3), 283–287.
- Hadjicostandi, J., & Cheurprakobkit, S. (2002). Drugs and substances: Views from a Latino community. *American Journal of Drug and Alcohol Abuse*, 28(4), 693.
- Hall, K. M., Irwin, M. M., Bowman, K. A., Frankenberger, W., & Jewett, D. C. (2005). Illicit use of prescribed stimulant medication among college students. *Journal of American College Health*, 53(4), 167–174.
- Hittner, J. B., & Swickert, R. (2006). Sensation seeking and alcohol use: A meta-analytic review. *Addictive Behaviors*, 31(8), 1383–1401.

- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2004). *Monitoring the future national survey results on drug use, 1975-2003: Vol. 2. College students and adults ages 19-45* (NIH Publication No. 04-5508). Bethesda, MD: National Institute on Drug Abuse. Retrieved June 7, 2005, from [http://www.monitoringthefuture.org/pubs/monographs/vol2\\_2003.pdf](http://www.monitoringthefuture.org/pubs/monographs/vol2_2003.pdf)
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2006). *Monitoring the future national survey results on drug use, 1975-2005: Vol. 1. Secondary school students* (NIH Publication No. 06-5883). Bethesda, MD: National Institute on Drug Abuse. Retrieved August 28, 2006, from [http://www.monitoringthefuture.org/pubs/monographs/vol1\\_2005.pdf](http://www.monitoringthefuture.org/pubs/monographs/vol1_2005.pdf)
- Kerber, L., & Wallisch, L. (1999). *1997 Texas survey of substance use among university students*. Austin: Texas Commission on Alcohol and Drug Abuse.
- Martyn, K. K., Reifsnider, E., Barry, M. G., Treviño, M. B., & Murray, A. (2006). Protective processes of Latina adolescents. *Hispanic Health Care International, 4*(2), 111-124.
- McCabe, S. E., & Boyd, C. J. (2005). Sources of prescription drugs for illicit use. *Addictive Behaviors, 30*(7), 1342-1350.
- McCabe, S. E., Knight, J. R., Teter, C. J., & Wechsler, H. (2005). Non-medical use of prescription stimulants among U.S. college students: Prevalence and correlates from a national survey. *Addiction, 100*(1), 96-106.
- McCabe, S. E., Teter, C. J., & Boyd, C. J. (2004). The use, misuse and diversion of prescription stimulants among middle and high school students. *Substance Use and Misuse, 39*(7), 1095-1116.
- McCabe, S. E., Teter, C. J., & Boyd, C. J. (2006). Medical use, illicit use and diversion of prescription stimulant medication. *Journal of Psychoactive Drugs, 38*(1), 43-56.
- McCabe, S. E., Teter, C. J., Boyd, C. J., Knight, J. R., & Wechsler, H. (2005). Nonmedical use of prescription opioids among U.S. college students: Prevalence and correlates from a national survey. *Addictive Behaviors, 30*(4), 789-805.
- McKeithan, E. K., & Shepherd, M. D. (1996). Pharmaceutical products declared by U.S. residents on returning to the United States from Mexico. *Clinical Therapeutics, 18*(6), 1242-1251.
- National Institute on Drug Abuse (NIDA). (n.d.). *InfoFacts: Methylphenidate (Ritalin)*. Retrieved August 30, 2006, from <http://www.drugabuse.gov/infofacts/ritalin.html>
- Olfson, M., Marcus, S. C., Weissman, M. M., & Jensen, P. S. (2002). National trends in the use of psychotropic medications by children. *Journal of the American Academy of Child and Adolescent Psychiatry, 41*(5), 514-521.
- Prudhomme White, B., Becker-Blease, K. A., & Grace-Bishop, K. (2006). Stimulant medication use, misuse, and abuse in an undergraduate and graduate student sample. *Journal of American College Health, 54*(5), 261-268.
- Ramirez, J. R., Crano, W. D., Quist, R., Burgoon, M., Alvaro, E. M., & Grandpre, J. (2004). Acculturation, familism, parental monitoring, and knowledge as predictors of marijuana and inhalant use in adolescents. *Psychology of Addictive Behaviors, 18*(1), 3-11.
- Robison, L. M., Sclar, D. A., Skaer, T. L., & Galin, R. S. (1999). National trends in the prevalence of attention-deficit/hyperactivity disorder and the prescribing of methylphenidate among school-age children: 1990-1995. *Clinical Pediatrics, 38*(4), 209-217.
- Robison, L. M., Skaer, T. L., Sclar, D. A., & Galin, R. S. (2002). Is attention deficit hyperactivity disorder increasing among girls in the U.S.? Trends in diagnosis and the prescribing of stimulants. *CNS Drugs, 16*(2), 129-137.
- Romano, E., Baillargeon, R. H., Wu, H.-X., Robaey, P., & Tremblay, R. E. (2002). Prevalence of methylphenidate use and change over a two-year period: A nationwide study of 2- to 11-year-old Canadian children. *Journal of Pediatrics, 141*(1), 71-75.
- Rushton, J. L., & Whitmire, J. T. (2001). Pediatric stimulant and selective serotonin reuptake inhibitor prescription trends: 1992 to 1998. *Archives of Pediatrics and Adolescent Medicine, 155*(8), 560-565.
- Safer, D. J., Zito, J. M., & Fine, E. M. (1996). Increased methylphenidate usage for attention deficit disorder in the 1990s. *Pediatrics, 98*(6), 1084-1088.
- Schinke, S., Brounstein, P., and Gardner, S. (2002). *Science-based prevention programs and principles, 2002*. DHHS Pub. No. (SMA) 03-3764. Rockville, MD: Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration. Retrieved August 8, 2006, from <http://www.modelprograms.samhsa.gov/pdfs/ScienceReportFINAL.pdf>
- Simons, J. S., Gaher, R. M., Correia, C. J., & Bush, J. A. (2005). Club drug use among college students. *Addictive Behaviors, 30*(8), 1619-1624.
- Substance Abuse and Mental Health Services Administration. (2003). *Results from the 2002 National Survey on Drug Use and Health: National findings*. DHHS Publication No. SMA 04-3964, NSDUH Series H-25. Rockville, MD: Author. Retrieved August 28, 2006, from <http://oas.samhsa.gov/2k5/stimulants/stimulants.cfm>
- Substance Abuse and Mental Health Services Administration. (2005). *Results from the 2004 National Survey on Drug Use and Health: National findings*. Office of Applied Studies, NSDUH Series H-28, DHHS Publication No. SMA 05-4062. Rockville, MD: Author. Retrieved August 28, 2006, from <http://oas.samhsa.gov/NSDUH/2k4NSDUH/2k4results/2k4results.htm#ch2>
- Teter, C. J., McCabe, S. E., Boyd, C. J., & Guthrie, S. K. (2003). Illicit methylphenidate use in an undergraduate student sample: Prevalence and risk factors. *Pharmacotherapy, 23*(5), 609-617.
- Teter, C. J., McCabe, S. E., Cranford, J. A., Boyd, C. J., & Guthrie, S. K. (2005). Prevalence and motives for illicit use of prescription stimulants in an undergraduate student sample. *Journal of American College Health, 53*(6), 253-262.
- Valdez, A., & Sifanek, S. J. (1997). Drug tourists and drug policy on the U.S.-Mexican border: An ethnographic investigation of the acquisition of prescription drugs. *Journal of Drug Issues, 27*(4), 879-897.
- Wagner, M. K. (2001). Behavioral characteristics related to substance abuse and risk-taking, sensation-seeking, anxiety sensitivity, and self reinforcement. *Addictive Behaviors, 26*(1), 115-120.
- Wilens, T. E., Gignac, M., Swezey, A., Mounetaux, M. C., & Biederman, J. (2006). Characteristics of adolescents and young adults with ADHD who divert or misuse their prescribed medications. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*(4), 408-414.

Wood, P. B., Cochran, J. K., Pfefferbaum, B., & Arneklev, B. J. (1995). Sensation-seeking and delinquent substance use: An extension of learning theory. *Journal of Drug Issues*, 25(1), 173-193.

Zuckerman, M. (1994). Appendix A-D: Sensation seeking scale-form V. In *Behavioral expressions and biosocial bases of sensation seeking* (pp. 389-395). Cambridge: Cambridge University Press.

**ACKNOWLEDGMENT.** *The authors wish to thank Etzel Cardeña and Christine Gutierrez for providing a Spanish abstract translation and Stina Garibay for her assistance with administration of surveys and data entry.*

**OFFPRINTS.** *Requests for offprints should be directed to Grant Benham, PhD, Assistant Professor, Department of Psychology and Anthropology, The University of Texas-Pan American, 1201 W. University Drive, Edinburg, TX 78541. E-Mail: gbenham@utpa.edu*



Copyright of Hispanic Health Care International is the property of Springer Publishing Company, Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.