A Summary and Synthesis of Contemporary Empirical Evidence Regarding the Effects of the Drug Abuse Resistance Education Program (D.A.R.E.)

Renee D. Singh, Shane R. Jimerson, Tyler Renshaw, Elina Saeki,
Shelley R. Hart, James Earhart, & Kaitlyn Stewart,
University of California, Santa Barbara

The prevention of drug abuse is an especially salient topic for school psychologists and other educational professionals. Schools are the primary setting for providing education and information aimed at the prevention of drug abuse. Previous meta-analyses (Ennett, et al., 1994; West & O'Neal, 2004) indicate that one of the nation's most popular drug prevention programs, the Drug Abuse Resistance Education program (D.A.R.E.), was not effective in reducing illicit drug use among youths. In 2003, D.A.R.E. was modified in an attempt to make it more effective. The purpose of this review is to summarize and synthesize the contemporary empirical evidence, which includes six studies focusing on the old D.A.R.E. and one study focusing on the new D.A.R.E., regarding outcomes associated with the modified D.A.R.E. program. Recent studies offer mixed evidence regarding the effectiveness of the new D.A.R.E curriculum, thus, further systematic investigation is warranted to better understand student outcomes associated with the new D.A.R.E curriculum. This information is particularly valuable for school psychologists, administrators, and other education professionals responsible for identifying empirically supported programs for use in schools.

Through the Drug Abuse Resistance Education (D.A.R.E.) program, law enforcement personnel contribute their expertise to help teach America's youth to resist peer pressure, and to abstain from drugs, gangs, and violence. We all have a responsibility to join these professionals in enabling youth to choose alternatives to violence and dangerous behavior and to lead the next generation of Americans toward a brighter future. NOW, THEREFORE, I, BARACK OBAMA, President of the United States of America, by virtue of the authority vested in me by the Constitution and the laws of the United States, do hereby proclaim April 8, 2010, as National D.A.R.E. Day. (http://www.dare.com/home/tertiary/default1b34.asp)

We find ourselves amidst a socio-political zeitgeist emphasizing "evidence-based" and "empirically supported" prevention and intervention efforts in our nation's schools. Given the above, and the preceding proclamation by President Barack Obama declaring a National D.A.R.E. Day, it begs the question: What does the research reveal regarding student outcomes associated with D.A.R.E.? The following begins with a brief discussion of the importance of prevention programs to address deleterious outcomes associated with drug use, then provides a summary of one of the nation's most popular prevention programs, D.A.R.E. The results of recent meta-analyses are subsequently discussed and recent studies are reviewed. In the final sections, we explore the widespread popularity of D.A.R.E. and the importance of empirical evidence and data-based decision making in choosing school-wide prevention programs.

DELETERIOUS OUTCOMES OF DRUG USE

The harmful effects of drug abuse can be widespread and irreversible. According to the National Institute on Drug Abuse (NIDA), even short-term drug use may lead to detrimental conditions such as cardiovascular disease, stroke, cancer, HIV/AIDS, hepatitis, and lung disease (NIDA, 2008). Moreover, long-term drug use may lead to debilitating psychiatric conditions such as paranoia, depression, exces-

Correspondence may be sent to Renee D. Singh, UCSB, GGSE, CCSP, Santa Barbara, CA 93106-9490 or e-mail: rsingh@education.ucsb.edu or jimerson@education.ucsb.edu

sive aggression, and hallucinations. In addition, drug use is associated with deleterious academic, social, emotional, behavioral, and mental health indicators among adolescents (Hussong, Curran, Moffitt, Caspi, & Carrig, 2004; Martins & Alexandre, 2009). Finally, both short- and long-term drug use may lead to temporary or permanent neurological damage that impairs various aspects of memory and executive functioning, including emotional and behavioral inhibition (NIDA, 2008). Unfortunately, despite these deleterious consequences, many school-aged youth continue to both use and abuse drugs of many kinds.

DRUG USE AMONG YOUTH IN THE UNITED STATES

The recent National Survey on Drug Use and Health (NSDUH) revealed that, between 2002 and 2009, overall rates of drug use among youths ages 12 through 17 were down (from 11.6% to 9.5%) (Substance Abuse and Mental Health Services Administration, 2009). Although there may be several plausible hypotheses for explaining this observed decline in drug use, Kuehn (2006) suggested that it is due, at least in part, to drug prevention programs, which have proliferated in communities and schools during the last few decades. Currently, some of the most popular drug use and abuse prevention programs targeting youth include the Boys and Girls Club of America community prevention efforts, various Substance Abuse and Mental Health Service Administration (SAMHSA) Model Programs, the Drug Free Communities and Supports Program, the Coaches Playbook Against Drugs, the Weed and Seed program, and the Drug Abuse Resistance Education (D.A.R.E.) program (Office of National Drug Control Policy, 2010; http://www.whitehousedrugpolicy.gov/prevent/programs.html).

Despite the importance of such prevention programming, communities and educational agencies have limited economic resources and are therefore faced with the difficult task of discerning which programs — including those focused on drug prevention — are essential and effective and thus deserve to be adopted, as opposed to which programs are superfluous or ineffective and are thus likely to be a waste of valuable resources. For schools especially, this situation is further compounded by current educational policy, which demands that data-based decisions be made and, ultimately, that empirically supported programs be employed. Given this present context, educational professionals involved in decision-making processes regarding the selection of school programming may substantially benefit from a summary and synthesis of contemporary empirical evidence regarding various popular prevention programs. The intent of this work is to aid educational professionals in their decision-making processes by providing such a summary and synthesis for one of the most popular drug prevention programs: D.A.R.E.

THE D.A.R.E. PROGRAM

Original D.A.R.E. Program

The original D.A.R.E. program was developed in 1983 as part of a joint effort between the Los Angeles Police Department and Los Angeles Unified School District to encourage students to resist both drugs and violence (Hansen & McNeal, 1997). The original curriculum consisted of core elements (e.g., resistance, skill training, self-esteem building) from two prototype versions of Project SMART (Self-Management and Resistance Training), supplemented with additional information on gang-related issues as well as legal issues related to drug use. During its first year of implementation, the program was delivered to approximately 6 million students at a cost of $750 million (costs of approximately $125 per child). Following the initial implementation, with the help of funding from the 1994 Safe and Drug-Free Schools and Communities Act, D.A.R.E. reached approximately 26 million students across the globe. Within the last decade at least 75% of school districts in the United States participated in D.A.R.E. (Griffith, 1999). Outside the U.S., D.A.R.E. has been implemented in 44 countries, including New Zealand, Belgium, Mexico, Canada, Sweden, Brazil, and Colombia. Thus, with approximately 33 million youth participating in the program since its inception, D.A.R.E. is often referred to as one of the most popular drug prevention programs in the world (Griffith, 1999). Further evidence of the program's popularity is found in President Barack Obama's recent declaration of a "National D.A.R.E. Day" (April

8, 2010) to honor D.A.R.E. officers' efforts to reduce drug use, gang participation, and violence among the nation's youth.

Currently, D.A.R.E. curricula are available for elementary-, middle-, and high school- aged students. The original curriculum was designed for use with elementary-aged students only, but middle school and high school components were added in 1986 and 1988, respectively, to broaden the program's reach (Des Jarlais, 2006). Although implementation time and lesson objectives vary by grade level, all D.A.R.E. curricula share certain elements in common. For example, all curricula are led by police officers who must attend and graduate from a two-week training program that includes instruction on drugs, gangs, internet safety, several other topics, and teaching techniques (D.A.R.E. America, 2010). All students participating in D.A.R.E. must complete a student workbook and a D.A.R.E. essay, have good attendance, follow D.A.R.E. and school rules, and be good role models and citizens in order to receive an award and graduate from the program.

Revised D.A.R.E. Program

Between 1994 and 2002, several events prompted D.A.R.E. to revise the original curricula (Des Jarlais, 2006). For example, Ennett et al. (1994) published a meta-analysis of several studies that examined the effectiveness of the D.A.R.E. curricula. Among other things, the authors concluded that the D.A.R.E. curricula were ineffective in reducing illicit drug use among youths, especially in the long-term. Similarly, both the Center for Substance Abuse Prevention and the U.S. Department of Education established programs (e.g., the National Registry of Effective Programs) designed to guide the use of federal funds related to drug prevention that did not include D.A.R.E in its registry, as it was judged to be ineffective (Des Jarlais, 2006). As a result of the lack of compelling evidence supporting the use of D.A.R.E., federal funding to train D.A.R.E. officers was reduced. Then, in 2003, in response to growing criticism regarding the program's lack of empirical support, D.A.R.E. made changes within its leadership hierarchy and organizational mission, which were followed by the development of new, science-based curricular components, training models, instructional methodologies, and partnerships (e.g., with the UCLA Anderson School of Business). This forged a more comprehensive program that met National Health Education Standards and may have boosted the program's research-base (D.A.R.E. America, 2010). Ultimately, what resulted was a new D.A.R.E. program that focused on enhancing the decision-making processes and protective factors (e.g., bonding, family, school, and community) that have been shown to foster resiliency in students at-risk for drug use.

New D.A.R.E. elementary school curriculum. The new D.A.R.E. elementary school curriculum is intended for students in 5th through 6th grades and consists of nine lessons and a culminating activity that involve more participation, active learning, supplemental take-home activities (e.g., "Family Talk"), and optional lessons (e.g., use of inhalants; D.A.R.E. America, 2010). A complete list of lesson objectives for the new elementary school curriculum is presented in Table 1. Although the potential dangers of misusing drugs, medicine, and other substances are discussed in all elementary-level curricula, the lessons for younger students focus more on child safety and prevention issues and are briefer than similar lessons for older students. For example, the D.A.R.E. curriculum for students in kindergarten through 2nd grade consists of four sessions, whereas the curriculum for students in 3rd through 4th grade consists of five sessions.

New D.A.R.E. middle school curriculum. The middle school curriculum, which is called "keepin' it REAL (kiR)," was added to the D.A.R.E. curricula in 2006 (D.A.R.E. America, 2010). In the context of the curriculum, "REAL" is an acronym for "Refuse, Explain, Avoid, and Leave." Originally developed by researchers at Pennsylvania State University and Arizona State University, the curriculum consists of 10 lessons designed to be implemented over the course of 10 weeks. Each lesson lasts approximately 40-45 minutes and involves the use of a series of videos, which depict high school-aged students using "REAL" strategies to resist drugs. Prior to being adopted by the D.A.R.E. program, "keepin' it REAL" was listed as an evidenced-based program on SAMHSA'S National Registry of Evidence-based Programs and Practices (see for instance, Hecht et al., 2003; Kulis et al., 2007).

Table 1. *Objectives for the Current D.A.R.E. Elementary School Curriculum (Available online: http://www.dare.com)*

Lesson 1: Purpose and Overview of the D.A.R.E Program

Students will be able to say in their own words the theme of the D.A.R.E program by participating in discussions. Students will explain the steps in the D.A.R.E Decision-Making Model by practicing with a partner. Students will write a personal reflection in response to the lesson.

Lesson 2: Tobacco and You

Students will review the D.A.R.E. Decision-Making Model by applying it to authentic situations. In a graphic representation, students will compare their estimates of the extent of tobacco use among adolescents with estimates reported in national surveys. Students will compare and contrast "common" beliefs about tobacco use through discussion, and analyze the validity of personal beliefs about tobacco use through a think, pair, share activity. They will recognize and correct personal misconceptions about tobacco use. Students will identify harmful effects of tobacco to the body by creating a warning label. Students will write a personal reflection in response to the lesson.

Lesson 3: Smoke Screen

Students will draw conclusions regarding the impact of advertising on the sale of tobacco by analyzing marketing techniques. Students will apply the D.A.R.E. Decision-Making Model to tobacco situations through group consensus. Students will recognize the harmful effects of marijuana use on the body by competing a worksheet in a think, pair, share format. Students will write a personal reflection in response to the lesson.

Lesson 4: Alcohol and You

In a graphic representation, students will compare their estimates of the extent of alcohol use among adolescents with estimates reported in national surveys. Students will compare and contract "common" beliefs about alcohol use through discussion, and analyze the validity of personal beliefs about alcohol use through a think, pair, share activity. They will recognize and correct personal misconceptions about alcohol use. Students will identify harmful effects of alcohol use to the body and the brain by completing a true/false worksheet. Students analyze risky situations and apply the D.A.R.E. Decision-Making Model in addressing strengths, needs, and health benefits of NOT using alcohol. Students will write a personal reflection in response to the lesson.

Lesson 5: The Real Truth

Students will review the D.A.R.E. Decision-Making Model by applying it to authentic personal situations. Students will recognize and describe the powerful effects of alcohol advertising by viewing a video and discussing the impact of alcohol advertising ploys. Students will identify harmful effects of inhalants on the body through questions and answers. Teams of students will brainstorm and list in a relay race the health risks in using drugs such as tobacco, alcohol, marijuana, and inhalants. Teams of students will brainstorm and list in a relay race and healthy things to do with friends that do not involve the use of tobacco, alcohol, marijuana, or inhalants. Students will write a personal reflection in response to the lesson.

Lesson 6: Friendship Foundations

Students will discuss recently observed advertisements and how the concept of friends was used in the ads. Students will describe qualities of positive friendships. Students will identify personal social support networks by starring specific resources. Students will identify types of peer pressure, and effective refusal responses in a written situation. Students will apply the D.A.R.E. Decision-Making Model in written peer pressure situations. Students will write a personal reflection in response to the lesson.

Lesson 7: Putting it Together

Students will discuss recent personal peer pressure situation, and how they responded. Students will demonstrate confident response styles in using "way to be in charge" through role-play. Students will apply the D.A.R.E. Decision-Making Model process by analyses of confident responses to the role-play situations. Students will write a personal reflection in response to the lesson.

Lesson 8: Personal Action

Students will discuss recent personal examples of how they responded Confidently and Responsibly in situations. Students will identify internal sources of personal pressure by group analyses and discussion. Students will develop a plan of action to make healthy and wise decisions about alcohol, tobacco, and other drugs in the D.A.R.E. Report. Students will write a personal reflection in response to the lesson.

Lesson 9: Practice! Practice! Practice!

Students will practice refusal skills to enhance health by using authentic pressure situations in a game activity. Students will evaluate and reflect their learning by sharing the D.A.R.E. Report and Pledge.

Lesson 10: Special Event

Students will participate in an appropriate D.A.R.E. culminating activity, which recognizes individual achievement of all the participants, and reinforces the knowledge and skills they have learned.

New D.A.R.E. high school curriculum. The high school curriculum is designed to extend and reinforce skills that students have already learned through exposure to D.A.R.E.'s kindergarten through middle school curricula (D.A.R.E. America, 2010). Examples of learning objectives include educating students about the personal and social consequences of substance abuse, reinforcing decision-making processes, and resisting peer pressure. Additionally, the curriculum emphasizes "helping students to recognize and cope with feelings of anger without causing harm to themselves or others and without resorting to violence or the use of alcohol and drugs" (D.A.R.E. America, 2010).

OUTCOMES ASSOCIATED WITH D.A.R.E.

As previously noted, Ennett et al.'s (1994) meta-analysis indicated that D.A.R.E. was not effective in reducing illicit drug use among youths. Similarly, a more recent study examining D.A.R.E. outcome results published between 1991-2002, reported an overall effect size that was small and not statistically significant (West & O'Neal, 2004), thus, providing further evidence of the ineffectiveness of D.A.R.E. The 11 studies included in the 2004 meta-analysis were chosen because they contained a control group and had been published in a peer-reviewed scientific journal. Specifically, the authors reported that D.A.R.E. was ineffective by noting that "the overall weighted effect size for the included D.A.R.E. studies was extremely small (correlation coefficient = 0.011; Cohen d = 0.023; 95% confidence interval = −0.04, 0.08) and nonsignificant (z = 0.73, NS)" (p. 1027). Considering this record of null findings, the purpose of this current review is to explore whether the status of D.A.R.E.'s effectiveness has changed since West and O'Neal's (2004) meta-analysis, which included studies published between 1991 and 2002. Specifically, two key questions are addressed in this current summary and synthesis: (1) Do contemporary evaluations of the effectiveness of the D.A.R.E. program distinguish between the old and new versions of the curricula? (2) Has the status of D.A.R.E.'s empirical effectiveness changed since 2003, when major revisions were initially undertaken with the existing curricula?

METHOD

To answer the above questions, a systematic review of contemporary literature was completed using electronic search engines (i.e., ERIC, Google Scholar, PsycINFO, and PubMed). Because Ennett et al.'s (1994) and West and O'Neal's (2004) meta-analyses provide extensive reviews of D.A.R.E. articles published between 1991 and 2002, and because the present analysis is focused on examining the effectiveness of the new D.A.R.E., the current review includes only articles published between 2002 and 2010. Furthermore, given the interest in exploring D.A.R.E.'s status as an empirically supported program, only empirical articles published in peer-reviewed journals were considered.

Review of the Literature

The literature review revealed seven studies that examine the effectiveness of D.A.R.E. These studies are briefly reviewed in the following section. To begin with, an investigation by Ahmed, Ahmed, Benett, and Hinds (2002) examined the effectiveness of D.A.R.E. in preventing the initiation of cigarette smoking in 236 fifth- and sixth-grade students. The measures included a 25-item questionnaire that featured questions from the Center for Disease Control's (1995) *Youth Risk Behavior Survey*, whereas outcome variables included (a) initiation of cigarette smoking, (b) current smoking status, (c) reasons for smoking, (d) knowledge of health risks, and (e) participant's experience of the effectiveness of D.A.R.E. in preventing smoking behavior. Because the program was implemented during the 1998-1999 school year, it appears that the participants received the old version of D.A.R.E. Overall, the results were in support of D.A.R.E.'s effectiveness in preventing the initiation of cigarette smoking indicating that the D.A.R.E. group had significantly lower rates of smoking at follow-up (May 1999) and was less likely to initiate smoking than the non-D.A.R.E. group (odds 4.9; $p = 0.003$; 95% CI: 1.7-14.0). Students in the D.A.R.E. group also had significantly higher knowledge scores on the health risks of smoking ($p = 0.002$), and students with the highest knowledge scores on the health risks of smoking had significantly lower rates of smoking overall ($p = 0.001$).

Table 2. *Summary of Studies Reviewed.*

Reference	Results	Participants	Effect Size(s)
Ahmed, Ahmed, Benett, & Hinds (2002)	The D.A.R.E. group had significantly lower rates of smoking at follow-up (May 1999) and was less likely to initiate smoking than the non-D.A.R.E. group (odds 4.9; $p = 0.003$; 95% CI: 1.7-14.0). Students in the D.A.R.E. group also had significantly higher knowledge scores on the health risks of smoking ($p = 0.002$), and students with the highest knowledge scores on the health risks of smoking had significantly lower rates of smoking overall ($p = 0.001$).	N = 236 fifth and sixth grade students	Not Stated
Perry et al. (2003)	None of the conditions (D.A.R.E. vs. Control; D.A.R.E. Plus vs. Control; and D.A.R.E. Plus vs. D.A.R.E.) yielded significant differences with regard to any of the outcome variables (self-reported tobacco, alcohol, and marijuana use; multi-drug use; violence; and victimization) at baseline or follow-up. However, boys at D.A.R.E. Plus schools were marginally less likely to increase current smoking ($p \leq 0.08$) and victimization ($p \leq 0.10$).	N= 6,237 seventh grade students	Not Stated
Komro et al. (2004)	At second follow-up, boys in the D.A.R.E. Plus condition exhibited fewer acts of physical violence (ES =.10) and verbal violence (ES = .10) than boys in the control condition. However, Komro et al. (2004) state that such differences were "entirely mediated by a decrease of norms that support violence [$p < 0.05$], an increase in outcome expectancies about being violence-free [$p < 0.05$], and an increase in parental consequences for fighting" [$p < 0.05$] (p. 335). No Significant differences were found with regard to any of the remaining outcome variables (weapon carrying and victimization). Among girls, those in the D.A.R.E. Plus condition had significantly lower scores on the Victimization Scale than those in the D.A.R.E. only condition (ES = .09). However, no significant differences were found with regard to any of the remaining outcome variables (physical violence, verbal violence, and weapon carrying).	N = 6,237 seventh grade students	Boys—Acts of Physical Violence = 0.10 Boys—Acts of Verbal Violence = 0.10 Girls—Victimization = 0.09
Zhong et al. (2005)	The results indicated that the new D.A.R.E. had significant ($p < 0.05$) effects on normative beliefs about tobacco (ES = -0.411), alcohol (ES = -0.381), and marijuana (ES = -0.431) use. Similarly, the new D.A.R.E. also had significant ($p < 0.05$) effects on attitudes toward tobacco (ES = -0.176), alcohol (ES = -0.338), and marijuana use (ES = -0.203). With regard to refusal skills, however, the new D.A.R.E. only had significant effects ($p < 0.10$) on refusal skills related to alcohol use (0.085).	N = 513 8th grade students	Normative Beliefs about Tobacco Use = -0.411 Normative Beliefs About Alcohol Use = -0.381 Normative Beliefs About Marijuana Use = -0.431 Attitudes Toward Tobacco Use = -0.176 Attitudes Toward Alcohol Use = -0.338 Attitudes Toward Marijuana Use = -0.203 Refusal Skills Related To Alcohol Use = 0.085
Merrill, Pinsky, Killeya-Jones, Sloboda, & Dilasciol (2006)	Structural/organizational strengths include a well-defined organizational focus, uniform training and means for rapid dissemination, continuing education mechanisms, mechanisms for program monitoring and fidelity of implementation, branding, and predictable and consistent financing. Structural/organizational weaknesses include unstable funding and an inability to incorporate components for continual upgrading of the curricula that reflect "research evidence and 'principles of prevention'" (p. 1).	D.A.R.E. America leadership, 50 D.A.R.E. state coordinators, two city coordinators (from Washington DC and New York City), and two focus groups held with D.A.R.E. officers	-
Pan & Bai (2009)	The overall effects of the D.A.R.E. program on drug use (-0.08) and psychosocial behavior (0.36) were small.	20 studies published between 1991 and 2003	Drug Abuse = -0.08 Psychosocial Behavior = 0.36
Ennet, Tobler, Ringwalt, & Flewelling (2009)	D.A.R.E.'s largest effect was on knowledge (0.42), whereas its smallest effects were on self-esteem (0.06) and drug use (0.06). Mean effect sizes for attitudes about drug use, social skills, and attitude towards police were 0.11, 0.19, and 0.13 respectively.	Eight studies published between 1986 and 1993	Knowledge about Drugs = 0.42 Attitudes about Drug Use = 0.06 Social Skills = 0.11 Self-Esteem = 0.06 Attitude Toward Police = 0.13 Drug Use = 0.06

Next, Perry et al. (2003) studied the effects of D.A.R.E. on drug use and violence. The participants included 6,237 students drawn from 24 schools that were randomly assigned to one of three conditions: D.A.R.E. only, D.A.R.E. Plus, and delayed program control. D.A.R.E. Plus differs from regular D.A.R.E. in several important ways. Firstly, officers teaching D.A.R.E. Plus receive 2-hours of additional training. Secondly, it includes "On the VERGE," a 4-session, classroom-based program, which includes parental involvement. Thirdly, it includes extra-curricular activities and neighborhood action teams created and facilitated by community organizers. Because all D.A.R.E. programs were implemented during the 1991-2001 school years, it is likely that the participants in both conditions received the old version of D.A.R.E. That is, the participants in the D.A.R.E. only condition received just the old version of D.A.R.E.; whereas in the D.A.R.E. Plus condition received the old version of D.A.R.E. plus additional components. Additionally, based on the authors' descriptions of the D.A.R.E. Plus program, it does not appear to be the same as the new D.A.R.E. program developed after 2003. For example, D.A.R.E. Plus does not include "keepin' it REAL (kiR)," which is one of new D.A.R.E.'s empirically supported components. Overall, the study's results regarding D.A.R.E.'s effectiveness were mixed. For example, none of the conditions (D.A.R.E. vs. Control; D.A.R.E. Plus vs. Control; and D.A.R.E. Plus vs. D.A.R.E.) yielded significant differences (p with regard to any of the outcome variables (self-reported tobacco, alcohol, and marijuana use; multi-drug use; violence; and victimization) at baseline or follow-up. However, boys at D.A.R.E. Plus schools were marginally less likely to increase current smoking ($p \leq 0.08$) and victimization ($p \leq 0.10$).

Komro et al. (2004) studied the same participants featured in Perry et al.'s (2003) study. So, the participants again included 6,237 students drawn from 24 schools that were randomly assigned to one of three conditions: D.A.R.E. only, D.A.R.E. Plus, and delayed program control. Primary outcome variables, which were measured via a self-report questionnaire, included physical violence, verbal violence, weapon carrying, and victimization. Because all D.A.R.E. programs were implemented during the 1991-2001 school years and because the authors did not clearly state whether they were evaluating old vs. new D.A.R.E., it is assumed that the participants in both D.A.R.E. conditions received the old version of D.A.R.E. Although the authors concluded that the "D.A.R.E. Plus program was more effective in preventing violence among boys than among girls," their overall results were not in support of D.A.R.E.'s effectiveness (p. 335). For example, at second follow-up, boys in the D.A.R.E. Plus condition exhibited fewer acts of physical violence (ES =.10) and verbal violence (ES = .10) than boys in the control condition. However, Komro et al. (2004) state that such differences were "entirely mediated by a decrease of norms that support violence [$p < 0.05$], an increase in outcome expectancies about being violence-free [$p < 0.05$], and an increase in parental consequences for fighting" [$p < 0.05$] (p. 335). No significant differences were found with regard to any of the remaining outcome variables (weapon carrying and victimization). Among girls, those in the D.A.R.E. Plus condition had significantly lower scores on the Victimization Scale than those in the D.A.R.E. only condition (ES = .09). However, no significant differences were found with regard to any of the remaining outcome variables (physical violence, verbal violence, and weapon carrying).

Using self-report surveys, Zhong et al. (2005) evaluated the new D.A.R.E.'s effectiveness on influencing normative beliefs, attitudes, and refusal skills related to substance use (i.e. tobacco, alcohol, and marijuana use). Zhong et al. (2005) clearly state that they are evaluating the new version of D.A.R.E, which includes curricula related to the study's outcome variables. The participants included 513 eighth-grade students from a larger study conducted by the Institution for Social Policy at the University of Akron. Overall, the authors' findings were in support of D.A.R.E.'s effectiveness. For example, the new D.A.R.E. had significant ($p < 0.05$) effects on normative beliefs about tobacco (ES = -0.411), alcohol (ES = -0.381), and marijuana (ES = -0.431) use. Similarly, the new D.A.R.E. also had significant ($p < 0.05$) effects on attitudes toward tobacco (ES = -0.176), alcohol (ES = -0.338), and marijuana use (ES = -0.203). With regard to refusal skills, however, the new D.A.R.E. only had significant effects ($p < 0.10$) on refusal skills related to alcohol use (negligible ES = 0.085).

Merrill, Pinsky, Killeya-Jones, Sloboda, and Dilasciol (2006) studied the organization, structure and function of the new D.A.R.E. Data were gathered via interviews with D.A.R.E. America leadership,

50 D.A.R.E. state coordinators, two city coordinators (from Washington, DC, and New York City), and two focus groups held with D.A.R.E. officers. Although no outcome data was presented, the authors' results highlighted several structural/organizational strengths and weaknesses of the new D.A.R.E. program. For example, strengths included a well-defined organizational focus, uniform training and means for rapid dissemination, continuing education mechanisms, mechanisms for program monitoring and fidelity of implementation, branding, and predictable and consistent financing. In contrast, weaknesses included unstable funding and an inability to incorporate components for continual upgrading of the curricula that reflect "research evidence and 'principles of prevention'" (p. 1).

Pan and Bai (2009) reviewed 20 studies that assessed the effectiveness of the D.A.R.E. program in the United States. Studies were published between 1991 and 2003, which indicates that the majority of studies they reviewed examined the old D.A.R.E. Their results indicated that the overall effects of the D.A.R.E. program on drug use (-0.08) and psychosocial behavior (0.36) were small.

Finally, Ennet, Tobler, Ringwalt, and Flewelling (2009) conducted a meta-analytic review of eight studies that assessed the effectiveness of D.A.R.E. with certain outcome classes. Studies were published between 1986 and 1993, which indicates that all studies they reviewed examined the old D.A.R.E. Outcome classes included knowledge about drugs, attitudes about drug use, social skills, self-esteem, attitude toward police, and drug use. The results indicated that D.A.R.E.'s largest effect was on knowledge (0.42), whereas its smallest effects were on self-esteem (0.06) and drug use (0.06). Mean effect sizes for attitudes about drug use, social skills, and attitude towards police were 0.11, 0.19, and 0.13 respectively.

DISCUSSION

Considering that D.A.R.E. is referred to as one of the most popular drug prevention programs in the world (Griffith, 1999), it is prudent for school psychologists, administrators, and other educational professionals to consider the empirical evidence regarding outcomes associated with the program. To date, there appears to be a disconcerting lack of evidence supporting the use of D.A.R.E. In aggregate, recent empirical evidence reveals that the *old* D.A.R.E. is not effective in reducing outcomes related to substance use and violence. However, recent research offers preliminary evidence that the *new* D.A.R.E. may be effective in influencing normative beliefs about substance use, attitudes toward substance use, and adoption of refusal skills to resist substance abuse.

Reasons for D.A.R.E.'s Widespread Use, Despite the Lack of Empirical Support

Considering the research findings presented above, one might ask: Why do school districts continue to participate in D.A.R.E. when its effectiveness is unclear? To answer this question, we reviewed several studies examining people's perceptions of D.A.R.E. For example, Lucas (2008) studied 420 parents' perceptions of D.A.R.E.'s effect on parent/child attitudes and behavior. Findings indicated that parents perceived the program to be useful in helping children understand and resist drugs, increasing both parents'/children's awareness of drug problems, and increasing parent-child conversations about drug problems. However, they also stated that "most parents did not see an impact on their child's school performance or overall attendance" (p. 99). Thus, it appears that parents did not perceive the D.A.R.E. program as having a direct link to academic outcomes.

Similarly, Birkeland, Murphy-Graham, and Weiss (2005) studied reasons why school districts continue to offer D.A.R.E. despite unsupportive evaluations of the program's effectiveness. Because data were collected between 2001 and 2003, it appears that participating school districts were using the old version of D.A.R.E. Their sample consisted of 16 school districts in Colorado, Massachusetts, Kentucky, and Illinois. The authors reported that sampled school districts decided to continue participation in D.A.R.E., despite its questionable effectiveness, because school officials believed the evaluations were not sensitive to improvements in relationships between police and students.

Finally, Donnermeyer and Wurschmidt (1997) examined educator's perceptions of D.A.R.E. using a statewide survey. Because the study was published in 1997, these perspectives were regarding the old version of D.A.R.E. The participants included 286 5th and 6th-grade teachers and principals. In general,

the participants assigned favorable ratings to each of the following: Teacher/officer interactions, role playing exercises, the graduation ceremony, program quality, and program impact on students. This indicated that D.A.R.E was generally well-liked and was valued among the participants.

Empirical Evidence and Data-Based Decisions

Despite the lack of empirical evidence supporting the use of D.A.R.E., it appears that in general, the D.A.R.E. program continues to be implemented in many schools throughout the United States, and in other countries around the world. However, the lack of empirical evidence has influenced some school districts to discontinue D.A.R.E. Weiss, Murphy-Graham, and Birkeland (2005) studied the influence of unsupportive evaluations on school districts' participation in D.A.R.E. The authors' findings indicated that one school district dropped D.A.R.E. independent of the unsupportive evaluations. Five districts dropped D.A.R.E. as a result of the unsupportive evaluations. Two districts dropped D.A.R.E. because of the unsupportive evaluations and because the Safe and Drug Free Schools (SDFS) and Communities Act (SDFSCA) only provided federal funding for research-based programs. Two districts dropped D.A.R.E. as a result of SDFSCA requirements and because D.A.R.E. was not featured on the list of approved, evidenced-based programs published by the U.S. Department of Education. Thus, it appears that in some instances the empirical evidence regarding the ineffectiveness of the D.A.R.E curriculum has resulted in districts abandoning this particular strategy.

CONCLUSIONS

The results of this contemporary literature review on D.A.R.E.'s effectiveness indicate that the old D.A.R.E. was not effective in reducing outcomes related to substance use and violence. Secondly, a recent study of the new D.A.R.E. curricula reveals preliminary evidence influencing normative beliefs about substance use, attitudes toward substance use, and adoption of refusal skills to resist substance abuse. However, additional research is needed before it can be concluded that D.A.R.E. is effective in these areas. Finally, future evaluations need to clearly state whether they are evaluating the old vs. new D.A.R.E., considering that with the recently incorporated evidence-based components (e.g., keepin' it REAL), it is possible that the new D.A.R.E. may be more effective than its predecessor. Whereas the objectives of D.A.R.E. are laudable, the empirical evidence to date does not provide compelling evidence of effectiveness. Thus, given the contemporary socio-political zeitgeist emphasizing "evidence-based" and "empirically supported" prevention and intervention efforts in our nation's schools, it is perplexing that a national D.A.R.E day has been established in the United States.

The importance of data-based decision-making cannot be understated, particularly in light of educational policy. School practitioners, particularly school psychologists, are often called upon to provide expertise in identifying empirically-based intervention programs. Thus, it is imperative that educational professionals attend to the extant empirical evidence and also continue to collect data to examine outcomes associated with new curricula. In the case of the D.A.R.E., previous research yielded evidence illustrating that the old D.A.R.E. is largely ineffective in producing changes in youth's attitudes and behaviors, however, with few studies of the new D.A.R.E. curriculum, further research is necessary to discern both short-term and long-term effects.

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Renee D. Singh, M.Ed., is a doctoral student at the University of California, Santa Barbara; Shane R. Jimerson, PhD., is a professor at the University of California, Santa Barbara; Tyler L. Renshaw, M.Ed., Elina Saeki, M.Ed., Shelley R. Hart, M.S., and James Earhart, M.Ed., are doctoral students at the University of California, Santa Barbara; Kaitlyn Stewart, M.Ed., is a graduate student at the University of California, Santa Barbara.

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