

# Substance abuse prevention program content: systematizing the classification of what programs target for change

William B. Hansen<sup>1\*</sup>, Linda Dusenbury<sup>1</sup>, Dana Bishop<sup>1</sup> and James H. Derzon<sup>2</sup>

## Abstract

We conducted an analysis of programs listed on the National Registry of Effective Programs and Practices as of 2003. This analysis focused on programs that addressed substance abuse prevention from among those on the effective or model program lists and that had manuals. A total of 48 programs met these inclusion criteria. We coded program manuals for content that was covered based on how much time was devoted to changing targeted mediating variables. The value of this approach is that program content can be judged using an impartial standard that can be applied to a wide range of intervention approaches. On average, programs addressed eight of 23 possible content areas. Our analyses suggested there were seven distinguishable approaches that have been used in substance abuse prevention programs. These include (i) changing access within the environment, (ii) promoting the development of personal and social skills, (iii) promoting positive affiliation, (iv) addressing social influences, (v) providing social support and helping participants develop goals and alternatives, (vi) developing positive schools and (vii) enhancing motivation to avoid substance use. We propose that the field use such analyses as the basis of future theory development.

## Introduction

Much of the scientific debate about what constitutes effective prevention programming revolves around the content included in interventions. At the root of this debate is a shared understanding that programs operate by changing characteristics of the individual, the social group or the social or physical environment that subsequently influence behavior [1]. In some lexicons, these operating characteristics are referred to as risk and protective factors [2]. In other contexts, these operating characteristics are referred to as mediators and moderators [3]. In the latter case, mediators are risk and protective factors that are modifiable; moderators are risk and protective factors that may affect outcomes but are not modifiable. In either case, preventive interventions seek to change one or more of these characteristics. When examining programs, what the program targets for change is referred to as the content of the program.

Kurt Lewin is famous for saying, 'There is nothing so practical as a good theory'. The field has routinely encouraged program developers to be theory based in their approach to program development [4]. Indeed, programs that wish to be included on the Substance Abuse and Mental Health Services Administration (SAMHSA) model program list are required to define the program's underlying theory. A diverse set of theories and assumptions describe what prevention programs have used as their source of content. Many of the theories often referred to, such as Social Learning Theory [5] or the Theory of Reasoned Action [6], are from social psychology and place an emphasis on the individual. Few theories, such as Social Control Theory [7], have focused on the role of the

<sup>1</sup>Tanglewood Research, Greensboro, NC 27409, USA and

<sup>2</sup>Pacific Institute for Research and Evaluation, Calverton, MD 20705, USA

\*Correspondence to: W. B. Hansen.

E-mail: billhansen@tanglewood.net

environment. However, even when referenced, program developers use theory loosely and without a tight correspondence to theoretical postulates. When theory is vaguely defined, its value diminishes. In the case of prevention programs, the practical issue is whether programs are truly theory driven or based mainly on magic mixes of content elements and practices. For example, Foxcroft *et al.* [8, 9] conducted a systematic review of alcohol misuse prevention programs and noted that among the 56 studies included in the review, 25 theories were represented. Since each theory typically includes multiple concepts, the total number of terms used to describe programs by program developers exceeds the 25 theories noted. Such a lengthy list suggests that, at a minimum, the theoretical language of prevention includes terms that can be simplified. Unfortunately, no taxonomy exists for systematically simplifying and describing these underlying theories along comparable dimensions.

How is this situation to be resolved? Researchers have recently begun to push for a revision of theory that underlies health behavior [10]. In prevention as in other areas of science, theory should reflect two aspects: empirical findings and parsimonious language. What is needed initially is at least a common terminology for describing the variables that are addressed in prevention programs.

The goals of this paper are to describe a system we recently developed for classifying program content and to present an initial description of theory based on practice. We completed this project as part of a meta-analysis of SAMHSA model programs for preventing substance use. An extensive literature exists on methods for calculating effect size statistics. Numerous systematic reviews and meta-analytic studies have examined program outcomes [8, 9, 11, 12]. These reviews have paid extensive attention to understanding dependent variables. In contrast, none of these analyses adequately define the independent variable side of the equation. The reason for this is relatively straightforward. Systematic review and meta-analysis rely exclusively on research reports to define independent variables. In the case of prevention, this means that the basis on which programs are

described—and the basis therefore for defining program content—is also what is presented in the research report. Research papers and manuscripts are summaries and are typically cryptic in their portrayal of an intervention. These summaries often give an incomplete description of an intervention [13]. Further, program developers' brief descriptions, even when accurate, are often couched in idiosyncratic language and are uneven in what is presented. These descriptions cannot be relied on to classify a program's components and strategies. To our knowledge, no prior systematic review or meta-analysis of substance abuse prevention programs has directly examined intervention materials. Our approach was to examine intervention materials directly and base coding on a list of constructs that could be expanded or contracted as seemed practical in order to define intervention content.

---

## Methods

---

### Programs

Programs listed as model and effective by SAMHSA were considered for inclusion in the study. Two criteria were initially established for selecting programs. First, substance abuse prevention programs had to be listed on the National Registry of Effective Programs and Practices (NREPP) prior to 2004. Second, programs had to include manuals that would guide implementation. Because manuals were not required as part of NREPP review, the preponderance of programs included was from the model programs list; programs on the effective list often did not have manuals available. Forty-eight of 96 programs met criteria for inclusion. The list of programs is presented in Table I.

### Procedures

We obtained program manuals from program developers or from program marketing firms, paying for programs that could not be provided free of charge. We systematically evaluated manuals and rated program content. Our goal in

**Table 1.** *Programs included in analysis*

Across Ages	Multisystemic Therapy
All Stars Core	(MST)
ATLAS	Nurse-Family Partnership
Border Binge Drinking Reduction Program	OSLC Treatment Foster Care Positive Action
Brief Alcohol Screening (BASICS)	Project STAR
Brief Strategic Family Therapy (BSFT)	Project Toward No Drug Use (TND)
CASASTART	Project Toward No Tobacco Use (TNT)
Challenging College Alcohol Abuse	Project Success
Communities Mobilizing for Change on Alcohol Community Trials	Project Northland
Intervention	Project ALERT
Coping Power	Project ACHIEVE
Coping with Work, Family and Stress	Protecting You/Protecting Me Reconnecting Youth
Creating Lasting Family Connections	Reducing the Risk Residential Student Assistance Program
Family Matters	Responding in Peaceful and Positive Ways
Friendly PEERSuasion	SMART leaders/Fan Club
Get Real About AIDS	Smoking Cessation Mass Media Intervention
Good Behavior Game	Skills, Opportunities and Recognition (SOAR)
Guiding Good Choices	Social Competence Promotion
Healthy Workplace	STARS for Families
Keepin It REAL	Strengthening Families Program
Leadership and Resiliency Program (LRP)	Team Awareness
Life Skills Training (LST)	Too Good for Drugs
Lions-Quest Skills for Adolescence	
Multidimensional Family Therapy	

reviewing manuals was to identify which content was and was not addressed by each program.

To construct a categorization scheme, we began with earlier reviews of research on program components [1, 2]. The list of variables included in these reviews had previously been refined through the examination of measures used for evaluating programs as part of Centre for Substance Abuse Prevention's Core Measures Initiative [14]. The list was modified as coding proceeded with new categories being added when distinguishable approaches were identified. Categories were not specifically

tied to extant theories, despite the fact that, as noted above, it is common for programs to reference theory when they are described. Rather, categories were intended to be descriptive. This list is viewed as a preliminary examination of content; modifications are expected. Nonetheless, for purposes of this analysis, the list sufficed for classifying program content from all 48 programs.

Overall, we identified 23 definable and distinct content areas. For ease of navigation, we grouped content areas into four dimensions: (i) intervention components that focused on changing an individual's motivation or disposition to use substances, (ii) intervention components that focused on promoting the development of 185 personal competence, (iii) intervention components designed to develop interpersonal or social skills and (iv) interventions designed to change social and environmental characteristics.

### *Motivation*

Motivational approaches are designed to make substance use unappealing. These approaches focus on six specific prevention strategies. These include the following:

- (i) Attitudes—materials and/or activities designed to promote anti-drug attitudes.
- (ii) Beliefs about consequences—materials and/or activities designed to help people understand that using substances will lead to negative consequences, usually provided within the context of information about substances.
- (iii) Commitment to not use or reduce use—materials and/or activities including ceremonies to encourage people to make public or private commitments not use substances.
- (iv) Normative beliefs—materials and/or activities designed to help people understand that most people do not use drugs and do not think drug use is acceptable.
- (v) Values/values incongruence—materials and/or activities designed to help people identify what is important to them and to help them recognize that substance use would interfere with their life's goals.

### *Personal competence*

Personal skills or competence development approaches address self-management topics. These include the following:

- (i) Academic skills—materials and/or activities designed to help students build academic skills such as studying, reading and completing homework.
- (ii) Decision-making skills/impulsivity—materials and/or activities designed to help people consider alternatives, weigh consequences and make appropriate choices.
- (iii) Emotional self-regulation—materials and/or activities designed to help people effectively manage emotions including anger, anxiety and/or stress.
- (iv) Goal-setting skills—materials and/or activities designed to help people set and achieve goals.
- (v) Self-esteem—materials and/or activities designed to help people develop and maintain a positive self-image and sense of self-worth.

### *Interpersonal and social skills*

Interpersonal and social skills development approaches focus on developing the ability to deal with social influences. These approaches include the following:

- (i) Assertiveness/resistance skills—materials and/or activities designed to help people stand up for themselves, ask for what they want, express themselves and say no when they want to, particularly to offers to use substances, without being passive or aggressive.
- (ii) Media literacy—materials and/or activities designed to help people recognize that the purpose of advertizing is to sell alcohol and tobacco products and that media messages about substance use are often manipulative and deceptive. These approaches help people become critical consumers and recognized that there are subtle influences in the media they should resist.
- (iii) Communication skills—materials and/or activities designed to help people listen, express

themselves effectively (both verbally and nonverbally) and avoid misunderstandings.

- (iv) Social problem-solving skills—materials and/or activities designed to help people work with others to resolve conflicts effectively and make group decisions. There is often a structured process participants are encouraged to follow.
- (v) Social skills—materials and/or activities designed to help young people interact effectively with peers and adults and form friendships.

### *Social environment*

Social and environmental change strategies are designed to improve the social and physical environment. These methods include the following:

- (i) Availability, access, enforcement—materials and/or activities designed to limit access to drugs by passing laws, establishing policy, limiting points of purchase and increasing enforcement. Often programs will provide guidelines about how to identify and address community issues related to substance use, including the formation of committees and coalitions.
- (ii) Alternatives—materials and/or activities designed to give people positive things to do that do not involve drugs and to help them find things to do when they are bored.
- (iii) Bonding—materials and/or activities designed to help people form positive attachments to family, church, school or other positive institutions that proscribe or prohibit substance use.
- (iv) Classroom management/discipline/positive school environment—materials and/or activities designed to promote a positive school climate and culture and help teachers with classroom management.
- (v) Family management/discipline/positive home environment—materials and/or activities designed to help parents manage family interactions, such as how to set rules, discipline children, hold family meetings, etc.

- (vi) Monitoring—materials and/or activities designed to promote parental supervision, tracking, noticing and listening.
- (vii) Positive peer affiliation—the ultimate goal is to help people find friends who will have a positive influence on them. This includes instructions for parents and adult leaders about designing opportunities to help people develop friendships with others who have positive attitudes and behaviors, including strategies for parents to prohibit friendships. Also included are instructions for students about how to select good friends.
- (viii) Support and involvement—opportunities designed to give young people increased support from others such as a support group or a social club and engage them in positive activities in their communities, such as service projects.

Two coders participated in the review of content. Standardized forms were created that allowed coders to quantify ratings and make notes and comments to support ratings where needed. The first pre-coded content, identifying session or page numbers where content was addressed and noted questions where content was not clear. The second coder verified content coding, resolved content questions from the first coder and noted the extent to which content was covered. A third researcher was available when either the first or the second coder faced any type of ambiguity in coding.

The team scored programs for the extent of coverage (quantity) they provided for each content area. Programs do not use standardized methods for charting the time requirements of or time blocks to be allocated for activities. In school-based programs, time units are typically (but not always) class periods. In family programs and community programs, time blocks are less clear. Our goal was to create a measure that allowed time-on-content to be as systematically characterized as possible. For curricula, coders rated each program's coverage as either (i) providing no coverage, (ii) providing a little or minimal coverage (typically judged as devoting less than one session), (iii) providing

some content (typically judged as devoting one or two sessions to the topic) or (iv) providing extensive coverage of the content (labeled as 'a lot' and typically judged based on having three or more sessions devoted to the topic). A similar approach was adopted for judging environmental strategies wherein coders rated each strategy as providing 'little', 'some' or 'extensive' coverage based on the number of types of activities called for and the level of detail in the steps called for in agendas and activities.

### Analysis

We completed descriptive analyses for each content area. We also completed a principal components factor analysis with varimax rotation of the quantity ratings to determine which content areas were associated with each other. Numbers of factors allowed corresponded to the number of eigenvalues observed  $>1.0$ .

---

## Results

---

Table II presents the degree to which each content area was included. Overall, the most common motivation-focused program content included in these programs was a focus on beliefs about consequences with over three-quarters of programs (77%) addressing these beliefs 'some' or 'a lot' based on an analysis of program manuals. Slightly more than half of the programs (52%) addressed attitudes and slightly fewer than half of the programs addressed normative beliefs (46%). About four in 10 programs addressed commitment (42%). Only one in four programs (25%) addressed values or values incongruence.

The most common personal skills-focused content was related to developing competence at emotional self-regulation, including stress, anxiety and anger management. Just over half of the programs (54%) included some focus on this type of instruction. Decision-making skills were taught in half (50%) of the programs. Four in 10 programs (42%) included instruction about setting and

**Table II.** Program content observed in 48 prevention programs

Content area	Number including			
	Some		A lot	
<b>Motivation-focused content</b>				
Attitudes	15	31%	10	21%
Beliefs about consequences	19	40%	16	33%
Commitment	13	27%	7	15%
Normative beliefs	16	33%	6	13%
Values incongruence	9	19%	3	6%
<b>Personal skills-focused content</b>				
Academic skills	4	8%	8	17%
Decision-making skills	13	27%	11	23%
Emotional self-regulation	12	25%	14	29%
Goal setting	8	17%	12	25%
Self-esteem	7	15%	2	4%
<b>Social skills-focused content</b>				
Communication skills	10	21%	12	25%
Media literacy	13	27%	3	6%
Resistance skills	19	40%	13	27%
Social problem-solving skills	7	15%	9	19%
Social skills	10	21%	8	17%
<b>Environmental-focused content</b>				
Access, availability and enforcement	2	4%	6	13%
Alternatives	6	13%	4	8%
Bonding	8	17%	12	25%
Classroom management	5	10%	4	8%
Family management	4	8%	13	27%
Monitoring	4	8%	7	15%
Positive peer affiliation	8	17%	3	6%
Social support and involvement	8	17%	4	8%

achieving goals. One in four programs (25%) addressed building academic skills and competence. Very few programs addressed self-esteem (19%).

Two-thirds of programs (67%) included some form of resistance skills training. Almost half of the programs (46%) included a component that addresses the development of interpersonal communication skills. About one-third of programs included an emphasis on general social skills development (38%), media literacy skills (35%) or social problem-solving skills (34%).

Overall, few programs incorporated environmental strategies for prevention (see Table II). The most popular of the environmental approaches included bonding (42%) and promoting positive family management and discipline practices (35%).

Providing additional social support was a part of one-quarter (25%) of the programs. Promoting parental monitoring (23%), providing opportunities for associating with positive peers (23%) and providing positive alternatives (21%) were included in fewer than one-quarter of the programs. Finally, strategies for reducing access and availability and increasing the enforcement of laws regarding the possession and sale of substances (17%) and providing training to improve classroom management (18%) were seen in fewer than one in five programs.

Program developers typically create interventions that address multiple content areas. Except for environmental programs that address access, availability and enforcement (which was classified as only one content area in our analysis), nearly all NREPP programs include content from multiple areas. The average program addressed 8.5 content areas (standard deviation = 4.3) either some or a lot.

Six factors had eigenvalues >1.0 (with values of 5.9, 3.7, 2.3, 1.8, 1.5 and 1.2, respectively). Typically, more than three factors are uninterpretable; however, in this case, analyses revealed programmatic approaches that have been well-articulated in the prevention literature. Table III presents the results of this analysis. Bolded items were those with factor loadings >0.50. Items have been ordered so that those which load on two factors can be represented next to other items within both factors. Factor analysis is helpful for identifying patterns in data; however, it should be noted that factor structure does not easily translate backwards. That is, a program's factor scores do not allow its accurate characterization. Individual programs often lack some elements within a factor and include elements that are not important to that factor. Nonetheless, an examination of these data provide useful information about how typical programs are structured.

The first factor included one highly negative loading for programs that stressed access, availability and enforcement and six positive loadings for content that stressed the development of personal and social skills. Thus, this factor represents two distinct approaches to prevention. These two

**Table III.** *Principal components analysis results*

Content	Factors						
	Area	1	2	3	4	5	6
Access, availability and enforcement	E	<b>-0.56</b>	0.02	-0.12	-0.18	-0.10	0.25
Decision-making skills	P	<b>0.82</b>	0.09	0.21	0.02	0.10	0.12
Emotional self-regulation	P	<b>0.71</b>	-0.02	0.16	0.34	0.21	-0.20
Social skills	S	<b>0.65</b>	0.28	0.03	-0.03	0.38	0.05
Communication skills	S	<b>0.63</b>	0.35	-0.34	0.16	-0.11	0.14
Social problem-solving skills	S	<b>0.62</b>	0.44	-0.33	-0.03	0.19	0.00
Resistance skills	S	<b>0.62</b>	-0.04	<b>0.58</b>	-0.24	-0.03	0.06
Media literacy	S	0.17	-0.14	<b>0.79</b>	0.03	-0.16	0.02
Beliefs about consequences	M	0.22	0.02	<b>0.75</b>	0.24	-0.33	0.21
Attitudes	M	-0.12	0.18	<b>0.70</b>	0.24	0.08	0.22
Family management	E	0.21	<b>0.89</b>	0.01	-0.04	0.01	-0.05
Monitoring	E	0.01	<b>0.82</b>	0.02	0.06	0.32	-0.06
Bonding	E	0.15	<b>0.63</b>	-0.42	0.20	0.23	0.05
Positive peer affiliation	E	0.09	<b>0.63</b>	0.22	0.14	<b>0.51</b>	0.12
Academic skills	P	0.15	0.25	-0.21	0.00	<b>0.83</b>	-0.13
Classroom management	E	0.24	0.25	-0.18	0.03	<b>0.76</b>	0.12
Social support and involvement	E	-0.01	0.19	0.07	<b>0.78</b>	-0.02	0.07
Self-esteem	P	0.38	-0.19	0.01	<b>0.66</b>	-0.02	0.21
Alternatives	E	-0.09	0.35	0.28	<b>0.63</b>	0.11	-0.25
Goal-setting skills	P	0.46	-0.01	-0.10	<b>0.53</b>	0.48	-0.04
Values and values incongruence	M	0.21	-0.13	0.18	<b>0.53</b>	0.04	<b>0.56</b>
Normative beliefs	M	-0.22	-0.17	0.22	-0.05	-0.08	<b>0.84</b>
Commitment	M	0.08	0.45	0.07	0.12	0.12	<b>0.64</b>

E = environmental, M = motivational, P = personal competence, S = social competence.

approaches are juxtaposed; when one happens, the other is not likely to occur.

The second factor included family management, monitoring and supervision (typically a feature of family intervention programs) as well as approaches to intervention that focused on creating positive bonds (often to family but also to school or community group) and developing a positive peer group. To the extent that this typifies a distinctive approach to prevention programming, it is likely that the central theme may be promoting positive affiliations.

The third factor included four content variables. Two of the content areas addressed social influences. Resistance skills training and media literacy have similar roots and have often been seen by researchers as parallel. It is interesting that programs that feature these approaches also focused attention on developing anti-substance abuse atti-

tudes and promoting beliefs about the consequences of substance use.

The fourth factor included the most diverse set of content areas observed. These included enhancing youths' goal-setting skills, providing them with alternatives and increased support from others such as a support group or a social club and engaging them in positive activities in their communities such as service projects. In addition, programs that loaded on this factor tended to include activities to build self-esteem and helped people see their values as not fitting with substance use.

Two of the three content areas that loaded on the fifth factor included an emphasis on developing positive schools, developing academic skills and competence and improving classroom management. In addition, programs that loaded on this factor promoted the association with positive peers.

The final factor includes three motivational components. Commitment to avoid substance use is the strongest of the three as an individual predictor of outcomes. Normative beliefs and values incongruence appear to be less important.

A comparison of the *a priori* classification area [e.g. motivation (M), personal skills (P), social skills (S) or environment (E)] and the factor structure suggests that, by design, programs are eclectic in the content they address. That is, with the exception of programs that included environmental strategies or that focused on values and value incongruence, normative beliefs and commitment, programs types usually addressed multiple areas.

---

## Discussion

---

Attention to theory dominates discussions on the development of effective social interventions. In practice, however, programs draw from multiple theories and evaluations of these programs test the effectiveness of multiple theories, principles and practices. In this study, we found that programs use a wide variety of content elements. What is clear from our analysis of these programs is that drug use prevention interventions span a broad spectrum of content. No content area was included in all programs. Most programs include a variety of approaches. Overall, there is little to suggest that programs are theory driven. Most programs are an amalgam of approaches that fit several theoretical notions of the program developer but that are independent of formal theories. As a consequence, evaluations of these programs neither stand as robust tests of any single theoretical approach nor test any single-minded application of purpose.

What is lacking at this point in time are coherent theories that attempt to explain drug use by focusing only on the relevant variables. However, given a list of variables that program developers find plausible, constructing such theories may be pursued in some constructive manner. When describing underlying theories, it may be more useful and more practical to consider the seven theory

types observed as a result of the factor analysis. At least from this perspective, theory may reflect practice. Thus, the approaches identified here may serve a useful basis as a point of departure for expanding discussion within the field about theory. Researchers and program developers should be encouraged to revisit the role of theory in substance abuse prevention and craft anew explanations that underlie an intervention's actual approach.

The eclectic inclusion of variables and inconsistent application of variables called for by multiple theories do not serve as a functional guide to future program development. Our classification scheme is an initial attempt to use manuals as a method for defining program content. There may yet be significant debate about specific variables. For example, we interpreted bonding to be an environmental approach because it was associated primarily with other environmental variables, but it is possible that bonding may also be a motivational characteristic. As a further example, it is likely that concepts such as emotional self-regulation may need to be defined more precisely. We noted that programs classified as including this approach tended to address anger management or stress and anxiety management, but not both. Nonetheless, our assessment of content has utilitarian value in that it provides the field with a method for assessing what a program intends to change in order to accomplish subsequent effects on the prevalence of substance use.

Our experience with factor analysis suggests that 48 cases and 23 variables are unlikely to result in more than two or three distinct factors. The emergence of seven factors (representing eight distinguishable approaches) where there is very little overlap in terms of which variables were associated with which factors is therefore unusual. The effort spent developing well-articulated approaches to prevention is evident in these data. What is also evident is that program developers borrow across theories to construct effective prevention programs. From this perspective, the factor analysis not only reveals the contribution of theory to program development but also attests to the inadequacy of evaluations of these programs as



providing support for a theory of substance abuse prevention.

These outcomes have the potential to meaningfully inform the field of prevention about how program developers construct programs and the philosophy they use to guide program development. It is apparent from these analyses that programs are not truly theory driven. Rarely did any program adhere strictly to a theory's tenets. In part, this reflects the fact that most theories referenced as a source of support in program development were developed primarily as explanatory tools, not as directives for intervention. Indeed, there is extensive overlap that exists among theories commonly referenced in support of interventions [10]. Individual variables are associated with more than one theory and it is rarely the case that interventions reflect a single theoretical viewpoint. It is therefore not unexpected that programs should be eclectic in their approach. Further, for some variables, well-defined theory does not exist. Program developers have been practical in the sense they have been willing to include any content that may help them achieve their goals.

Program developers adopted some content more frequently than other content. Addressing beliefs about consequences, teaching decision-making skills and addressing attitudes were among the more popular approaches. There were also approaches that program developers rarely used. Promoting parental monitoring, providing opportunities for associating with positive peers, providing positive alternatives, addressing access, availability and enforcement and improving classroom management were rarely included. Other content areas were present in between 25 and 50% of programs. Using program content as a basis for classifying program types, at least seven typologies identify how programs have been constructed.

By virtue of their presence on the NREPP list, the programs reviewed in this analysis all claim some level of effectiveness. However, several caveats should be noted. First, the SAMHSA list of model programs is highly selective, which introduces bias in our sample. For example, programs self-nominate for review; >1000 programs have

applied, <200 have passed review. This selection process is likely to affect the strategies available for consideration. The programs that meet these criteria have been judged by experts to be successful and have effects that are well-documented. Other programs may be as effective, but may not be easy to evaluate using methods required by NREPP. For example, methodologies and measurement practices used in the field are biased toward individual-level strategies and outcomes—they are the easiest to measure, document and control for alternative explanations. Environmental approaches and approaches developed by practitioner groups such as community coalitions may be more difficult to assess and validate and, as will be seen, are not frequently represented on this list. Results of the analyses should be considered in this light.

It should be noted that the analyses presented in this paper do not provide any evidence whatsoever about the effectiveness of these approaches. For example, we know nothing about the content of programs that were excluded from the SAMHSA model programs list. In this paper, we did not test whether programs that use these approaches are more successful than those that do not. We do not know if these approaches are used disproportionately in successful programs and if they are used less often in programs that have failed to show results. Further, we do not know what proportions of programs that employ these approaches are successful. All of these issues await further research. The results of these analyses are, at best, descriptive and do not infer what constitutes an effective program.

There are other sources of information about program content than program manuals. Journal articles are one source of information. Meta-analysts have consistently noted that these are a poor source of this information, in part because articles do not provide consistent information or use consistent language. Manuals themselves provide key information that can be used to construct logic models about how programs are intended to work. For the programs we reviewed, there is also information on the SAMHSA website. We did not conduct an analysis specifically comparing how

programs are described in the research literature; however, based on descriptions in the literature and descriptions provided by SAMHSA, we expect there to be noticeable differences between published descriptions and those based on our content analysis.

Limits on funding and time did not allow the employment of multiple reviewers for each program. It would be valuable for multiple independent coders to replicate our findings. Eventually, once methods are refined and replicated, it may be possible to create a registry that can be easily referenced both by practitioners looking for programs with specific characteristics and by researchers who wish to use evaluation tools that match survey content to program content. Such a system would provide researchers and practitioners a comprehensive evidence-based registry of effective content to prevent and reduce future substance use.

Ultimately this type of standard methodology for classifying program components should advance prevention research in terms of identifying the active and essential components of effective programs. Systematic analyses of the effectiveness of program components should prompt a re-examination of theory and should encourage researchers and program developers to examine variables they address in interventions with greater precision. There is now a need for program developers to think anew about the theories that drive intervention development. Despite burgeoning publications, future research needs to focus more precisely on tests of theories that can be applied to improving program performance. To date, components analyses of prevention programs have been limited and inconclusive. Component and mediating variable analysis should be a standard for research on program efficacy and effectiveness. Ultimately, the field may need a new set of theories to explain how programs intend to achieve effects. However, once the field identifies these components, it should be possible to concentrate prevention practice efforts on them, making prevention strategies more effective, efficient and practical.

---

## Acknowledgements

---

This paper was funded in part by contract from the Center for Substance Abuse Prevention, Contract Number 277-99-6023.

---

## Conflict of interest statement

---

None declared.

---

## References

---

1. Hansen W. School-based substance abuse prevention: a review of the state of the art in curriculum, 1980–1990. *Health Educ Res* 1992; **7**: 403–30.
2. Hawkins J, Catalano R, Miller J. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychol Bull* 1992; **112**: 64–105.
3. MacKinnon DP, Dwyer JH. Estimating mediated effects in prevention studies. *Eval Rev* 1993; **17**: 144–58.
4. Dusenbury L, Falco M. Eleven components of effective drug abuse prevention curricula. *J School Health* 1995; **65**: 420–5.
5. Bandura A. *Social Learning Theory*. New York: General Learning Press, 1977.
6. Ajzen I, Fishbein M. Attitude-behavior relations: a theoretical analysis and review of empirical research. *Psychol Bull* 1997; **84**: 888–918.
7. Hirschi T. *Causes of Delinquency*. Berkeley, CA: University of California Press, 1969.
8. Foxcroft DR, Ireland D, Lister-Sharp DJ *et al*. Longer-term primary prevention for alcohol misuse in young people: a systematic review. *Addiction* 2003; **98**: 397–411.
9. Foxcroft DR. *Alcohol Misuse Prevention for Young People: Evidence and Effectiveness*. Paper presented at the First Annual Symposium on Addictive and Health Behaviors Research, Mayo Clinic, Jacksonville, Florida, 2005.
10. Noar SM, Zimmerman RS. Health Behavior Theory and cumulative knowledge regarding health behaviors: are we moving in the right direction? *Health Educ Res* 2005; **20**: 275–90.
11. Tobler NS. Meta-analysis of 143 adolescent drug prevention programs: quantitative outcome results of program participants compared to a control or comparison group. *J Drug Issues* 1986; **16**: 537–67.
12. Tobler NS, Stratton HH. Effectiveness of school-based drug prevention programs: a meta-analysis of the research. *J Prim Prev* 1997; **18**: 71–128.
13. Lipsey MW, Crosse S, Dunkle J *et al*. Evaluation: the state of the art and the sorry state of the science. In: Lipsey MW, Cordray DS (eds). *Evaluation Studies Annual Review: Vol. 11*. Beverly Hills, CA: Sage Publications, 1985, 153–74.
14. CSAP. *Core Measures Initiative Website*. Available at: <http://www.activeguidellc.com/cmi/>. Accessed: 23 May 2005.

Received on September 29, 2005; accepted on July 18, 2006