

# TESTING A COMPREHENSIVE COMMUNITY PROBLEM-SOLVING FRAMEWORK FOR COMMUNITY COALITIONS

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*Community problem solving is believed to help coalitions achieve community changes and subsequent population-level reductions in targeted community health problems. This study empirically examined a community problem solving model used by CADCA, a national coalition training organization, to determine if the model explains how coalitions become effective community change agents and the extent to which it fits for different types of coalitions. The sample consisted of 551 substance abuse coalitions, and SEM was used to test the research questions. Results suggest the overall conceptual model fits the data and provides an adequate representation of the community problem solving process for coalitions. Additionally multi-group modeling indicates the model fits for a variety of coalitions. CADCA's model appears to have wide utility and applicability and appears to have honed in on critical elements of community problem solving that may increase the likelihood of coalition success at reducing substance abuse within their community. © 2012 Wiley Periodicals, Inc.*

The Office of National Drug Control Policy (ONDCP) and the Substance Abuse and Mental Health Services Administration (SAMHSA) grant program was the source of funding for this project. The views and opinions contained in this publication do not necessarily reflect those of SAMHSA or the U.S. Department of Health and Human Services, and should not be construed as such.

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## OVERVIEW

Coalitions are collaborative entities comprised of various stakeholders working together to address a common goal of improving community health and well-being, such as reducing teen pregnancy (Paine-Andrews et al., 2002), cardiovascular disease (Francisco, Paine, & Fawcett, 1993), or substance abuse (Hallfors, Cho, Livert, & Kadushin, 2002) rates. Increasingly, researchers, practitioners, and funders are recognizing that effective collaboration is difficult to promote and the sole focus on community-level outcomes (e.g., population-level changes in health) may mask other important benefits of coalitions. As a result, coalition researchers have begun to pay more attention to the overall community problem-solving process coalitions pursue, particularly the community and systems changes that may play important intermediate roles in achieving the larger goal of broader community or population-level change (e.g., Allen, Watt, & Hess, 2008; Green & Kreuter, 2003; Roussos & Fawcett, 2000). There is a growing body of evidence to support this emphasis on systems change: Effective community coalitions create conditions for improving population-level outcomes (Hingson et al., 2005) by enhancing system linkages (Provan, Nakama, Veazie, Teufel-Shone, & Huddleston, 2003), improving organizational policies and procedures (e.g., Lachance et al., 2006; Zakocs & Guckenburger, 2007), and shifting community operations (Clark et al., 2010; Paine-Andrews et al., 2002).

Although the coalition community problem-solving process has been explored in a few case studies (Paine-Andrews et al., 2002; Watson-Thompson, Fawcett, & Schultz, 2008), a conceptual model detailing this process has not been empirically assessed. Such an exploration would assist researchers and practitioners in more fully understanding and supporting effective coalition efforts. The purpose of this article is to empirically examine a proposed conceptual model for coalition community problem solving and determine its utility for different groups of coalitions.

## THE COALITION COMMUNITY PROBLEM SOLVING FRAMEWORK

Social-ecological frameworks emphasizing environmental and policy influences on health behaviors (Green, Richard, & Potvin, 1996; McLeroy, Bibeau, Steckler, & Glanz, 1988) have become increasingly popular within the field of health promotion (e.g., Elder et al., 2006). These theories suggest population-level health behaviors are strongly tied to environmental conditions; when communities have policies, programs, and practices in place promoting healthy behavior and preventing risky conduct, population level health outcomes will improve.

It is within this theoretical context that coalition researchers have begun to place their research and intervention efforts and to emphasize the importance of community changes as a key intermediate outcome for coalition efforts (Butterfoss, 2007; Kegler, Twiss, & Look, 2000). For example, researchers have demonstrated the relationship between high levels of community change, facilitated by local coalitions, and subsequent reductions in targeted public health problems such as teen pregnancy and substance abuse (Fawcett et al., 1997; Francisco et al., 1993). In a recent study on collaborative efforts targeting intimate partner violence, Javdani and Allen (2010) found that when coalitions promoted policy and practice changes, they improved their communities' response to intimate partner violence. Yet despite this growing body of evidence for the importance of targeting community changes, the process by which community coalitions become effective change agents is not yet fully understood.

The community problem-solving and change framework, a popular model embraced by the Institute of Medicine (Institute of Medicine, 2002), the Centers for Disease Control and Prevention (Fawcett et al., 1995), and the Workgroup for Community Health and Development at the University of Kansas (Collie-Akers et al., 2007; Fawcett et al., 2001), provides a comprehensive theory of change that can guide researchers' efforts in understanding the coalition community change agent process. (See Figure 1). Below we describe the components of the model.

### *Coalition Operational and Problem-Solving Capacity*

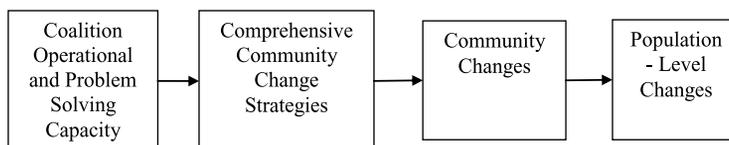
Coalition operational and problem-solving capacity refers to the internal work of the coalition, such as activities to create, improve, and maintain the coalition (Butterfoss, 2007; Foster-Fishman, Berkowitz, Lounsbury, Jacobson, & Allen, 2001). Coalitions vary extensively in this capacity, and research suggests a coalition with strong internal operations is more likely to achieve its goals (Watson-Thompson et al., 2008; Zakocs & Edwards, 2006). Although numerous factors have been related to effective internal operations, such as group cohesion and leadership (Zakocs & Edwards, 2006), the community problem-solving model is intentional in its focus on factors related to effective problem-solving processes and building coalitions as community change agents. In this model, coalition operational and planning capacity comprises three dimensions: (a) coalition use of essential decision-making processes, (b) development and use of quality planning products, and (c) expanded coalition membership.

### *Coalition Use of Essential Decision-Making Processes*

Essential processes are “modifiable factors or activities that have been shown to increase the likelihood of making an impact” (KU Work Group for Community Health and Development, 2007; [http://communityhealth.ku.edu/ctb/explore\\_best\\_processes.shtml](http://communityhealth.ku.edu/ctb/explore_best_processes.shtml)). By engaging in these essential processes, coalitions are more likely to bring about changes in programs, policies, and practices specific to the community health problem they are tackling (Watson-Thompson et al., 2008). Examples of essential processes are as follows: assessing community needs and resources in the community; developing a framework of change to describe how the coalition will achieve outcomes; identifying, adapting, and implementing interventions; and evaluating the coalition.

### *Development and Use of Quality Planning Products*

Another element of coalition operational and problem-solving capacity is the development and use of quality planning products. Planning products, including community assessments, logic models, and evaluation plans, are critical to effective problem-solving capacity because they improve coalition functioning (Fawcett et al., 2001; Hays, Hays, DeVille, & Mulhall, 2000; Watson-Thompson et al., 2008). In an empirical case study,



**Figure 1.** Framework for effective community problem solving.

one key determinant of the coalition's ability to decrease risk for cardiovascular disease was the development of planning products: strategic plan, logic model, and action plan (Collie-Akers et al., 2007).

### ***Expanded Coalition Membership***

Coalitions by definition bring different stakeholders together to work in collaboration toward a mutually agreed upon goal (Himmelman, 2001). These stakeholders or members then do the work of the coalition, each within their realm of influence, contributing varied skills, relationships, knowledge, and resources. As such, coalitions with a larger membership may have more expertise and assets to put into play at addressing the targeted community concern and are more likely to have a broader reach within their community change efforts (Foster-Fishman et al., 2001; Mays, Halverson, & Kaluzny, 1998, as cited in Lasker, Weiss, & Miller, 2001).

### ***Comprehensiveness of Strategies***

The next step in the community problem-solving model is the coalition's ability to engage in multistrategy, comprehensive action. Significant social problems, such as substance abuse, are influenced by a complex array of factors across multiple ecological layers (Bronfenbrenner, 1979). As a result, shifts in individual-level behavior require strategies that simultaneously improve conditions in families, organizations, systems, and communities. Coalition interventions must be broad-based, comprehensive, and seek change at multiple levels (Sorensen, Emmons, Hunt, & Johnston, 1998). For example, Hingson and colleagues (2005) found coalitions that had the most significant reductions in alcohol-related crash fatalities had pursued more comprehensive strategies, including reducing alcohol availability and expanding treatment. Other researchers have found that coalitions are more likely to create community and population-level changes when they pursue a comprehensive array of strategies that expand beyond the individual level (Roussos & Fawcett, 2000; Watson-Thompson et al., 2008) and reach diverse stakeholders (e.g., youth, families, local organizations; Paine-Andrews et al., 2002).

One way to assess the comprehensiveness of a coalition's efforts is to consider the breadth or range of programs and strategies implemented (Florin, Mitchell, & Stevenson, 1993). Seven strategy types have been identified (Paine-Andrews et al., 2002):

- *Providing information*, such as educational presentations and media campaigns
- *Enhancing skills*, including parenting classes and skill-building workshops for youth
- *Providing support*, including mentoring and alternative activities
- *Enhancing access/reduce barriers* to community services and supports
- *Changing consequences* of behaviors by creating incentives and disincentives, such as community awards, taxes, and citations
- *Changing the physical design of the environment* so individuals are less likely to engage in problem behaviors
- *Modifying/changing policies* within government, communities, and organizations

Coalitions targeting a broader array of these strategies are considered to be more comprehensive in their approach.

Comprehensiveness also refers to the depth of a coalition's efforts (Florin et al., 1993), as defined by the degree to which coalitions are implementing the most intensive strategies available. The last four strategies listed above are considered the most intensive because they target environmental changes. Environmental or systems changes are considered to be more effective, sustainable mechanisms for producing population change because they shift the form or function of a context or setting (Foster-Fishman, Nowell, & Yang, 2007). Thus, coalitions with a more comprehensive array of strategies also pursue more types of environmental changes.

### *Facilitation of Community Changes*

The final component of the problem-solving model is the extent to which coalitions facilitate community change, defined as new or modified programs, policies, and practices that are related to the mission and goals of the coalition (Francisco et al., 1993; Fawcett et al., 1995). Community changes are the result of the coalition's actions and strategy efforts and can include translation of an evidence-based prevention program to Spanish (programmatic change), getting physicians to include discussions of intimate partner violence with parents/youth during school check-ups (practice change), and implementation of an ordinance that bans the sale of alcohol during local festivals (policy change). Effective coalitions promote numerous community changes: In a case study of a chronic disease coalition, the coalition facilitated 321 community changes within a 2-year period of time (Collie-Akers et al., 2007). Although not the distal outcomes for a coalition (see Figure 1), community changes are an important intermediate step toward long-term results for a coalition (Allen et al., 2008; Hays et al., 2000; Roussos & Fawcett, 2000).

## **CURRENT STUDY**

Although the theory of change described by the community problem-solving model appears promising, empirical testing of the model is needed. The purpose of this study is to examine the proposed community problem-solving model, paying particular attention to if and how coalitions facilitate the intermediate outcomes of community and systems changes. This focus, versus an examination of the full community problem-solving model, was adopted because of the increased recognition that an enhanced understanding of the intermediary processes of coalition efforts is vital to improving coalition success (Javdani & Allen, 2010). Because coalitions vary significantly in their size, budget, and geographic locations, and these characteristics have important implications for coalition functioning (Office of National Drug Control Policy, 2007), the extent to which this model fits for different types of coalitions was also explored. The following research questions were examined:

1. To what extent does the proposed model explain how coalitions become effective agents of change?

Hypothesis 1: Coalitions with more operational and problem-solving capacity will pursue more comprehensive strategies.

Hypothesis 2: Coalitions that pursue more comprehensive strategies will achieve more community changes.

2. To what extent does this model fit for different types of coalitions?

Exploratory Question 1: To what extent does coalition age moderate the model?

Exploratory Question 2: To what extent does the coalition's geographic locale (urban versus rural) moderate the model?

## METHOD

The participants in this cross-sectional study were coalitions working to address local substance abuse problems.

### *Setting and Sample*

The sample comprised coalitions that participated in a national survey conducted in 2007 by Community Anti-Drug Coalitions of America (CADCA). CADCA is a national, nonprofit organization whose mission is "to strengthen the capacity of community coalitions to create and maintain safe, healthy and drug-free communities." CADCA provides training, membership, and advocacy services for the substance abuse coalition field.

CADCA's Annual Survey of Coalitions (Annual Survey) was used to measure the variables of interest in this study. The Annual Survey is an online survey completed by coalition leaders; it was created to gain a better understanding of anti-drug coalitions in America.

All coalitions within the United States with a focus on alcohol, tobacco and other drugs were eligible to complete the CADCA Annual Survey. Participating coalitions were also required to have at least three community sectors (e.g., law enforcement, schools and youth serving organizations) represented on the coalition. Coalitions were invited to participate in the Annual Survey using CADCA's coalition network, including contacts via a variety of coalition funding sources (e.g., Drug Free Communities Support Program Grantees and Weed and Seed sites), CADCA coalition members, coalition listservs, state coalition networks, and coalitions trained by CADCA's national training center. E-mail and mail invitations were sent to all coalitions identified through this network. Coalitions could also volunteer to participate through a web-based link on CADCA's website. E-mail reminders were sent out during the field period to promote survey participation. A prize drawing was used as an incentive for survey completion and included paid registration for CADCA trainings, digital cameras, and gift certificates.

Participating coalitions accessed the survey through an online survey portal hosted by CADCA. This portal is part of CADCA's broader database system, which is the most comprehensive, nationwide list of substance abuse coalitions that exists to date. A unique login and password were assigned to each coalition that allowed them access to their individual survey. To prevent coalitions from taking the survey more than once, CADCA staff checked the survey data base when a coalition requested login information to take the survey. Of the 2240 unique coalitions in the CADCA database in 2007, 625 participated in the survey resulting in a 28% response rate. Seventy-four coalitions were excluded from this study because of missing key demographic data (i.e., coalition age and geographic location), resulting in a final sample of 551 coalitions.

Coalitions varied considerably in age, ranging from less than 1 year to 40 years old with a mean age of 8.6 years. Forty-one percent of the sample was 5 years old or younger and 30% was 6 to 10 years old. The remainder of the sample was older than 10 years with 12% being 11 to 15 years of age, 13% being 16 to 20 years of age, and only 4% being older than 20 years. Coalitions also varied considerably in membership;

**Table 1. Demographics and Other Key Variables**

<i>Construct</i>	<i>Variable</i>	<i>SEM coalitions (full sample - N = 551)</i>
Covariates	Coalitions younger than 5 years	41%
	Urban coalitions	19%
	Rural coalitions	48%
Coalition capacity	Average total # products	2.32 (of 5)
	Average product use	3.25 (of 5)
	Average essential processes	.37 (of 1)
	Expanded membership	79%
Comprehensiveness of strategies	Pursue program and systems change efforts	.42 (of 1)
	Overall comprehensiveness	5.21 (of 7)
Community	Facilitated new programs	72%
Changes	Facilitated new policy/procedures	49%
	Breadth of community changes	2.22 (of 8)

*Note.* SEM = structural equation modeling.

on average, coalitions had 21.6 different sectors represented in their membership, with a range of 2 to 37 different sectors participating in these coalitions. Example sectors included youth groups, schools, faith-based organizations, local government, business organizations, prevention agencies, and law enforcement. Coalitions were also located in diverse geographic areas. Two percent of the sample was frontier, 48% rural, 29% suburban, and 19% urban. Finally, there was considerable variation in coalition budget. Most coalitions (42%) had a budget less than \$100,000, followed by coalitions with budgets between \$100,000 and \$199,000 (30%), \$200,000 and \$299,000 (13%), \$300,000 and \$399,000 (6%), \$400,000 and \$499,000 (3%), \$500,000 and \$999,999 (3%), and over \$1 million (2%). Scores for each variable and coalition demographic information is provided in Table 1.

*Imputation.* Fully Conditional Specification (FCS) in SPSS 17 was utilized to impute missing values at the scale level. FCS is an imputation procedure in which each imputed variable is specified a priori and conducted sequentially so that missing values are imputed beginning with the first variable specified in the sequence.

## MEASURES

The Annual Survey of Coalitions contains items and scales measuring a variety of coalition characteristics, including sector involvement, age, use of the essential processes, and coalition promotion of community changes. Correlations, item reliabilities, means, and standard deviations for each variable are presented in Table 2. As this table illustrates, measures have strong psychometric properties with alphas ranging from .823 to .920 for all scales.

### *Coalition Operational and Problem-Solving Planning Capacity*

Four constructs comprise operational and problem-solving capacity: (a) coalition use of essential processes, (b) development of quality planning products, (c) use of quality planning products, and (d) expanded coalition membership.

**Table 2. Correlations, Reliabilities, and Descriptive Statistics for Younger Coalitions ( $n = 224$ ) and Older Coalitions ( $n = 327$ )**

	<i>PD</i>	<i>PU</i>	<i>Mem</i>	<i>EP</i>	<i>PSCE</i>	<i>UCA</i>	<i>BCC</i>	<i>FPoly</i>	<i>FProg</i>
PD	(.852)	.501**	N/A	.097	.159**	.096	.156**	N/A	N/A
PU	.472**	(.920)	N/A	.232**	.175**	.169**	.275**	N/A	N/A
Mem	N/A	N/A	(N/A)	N/A	N/A	N/A	N/A	N/A	N/A
EP	.073	.276**	N/A	(.895)	.287**	.356**	.269**	N/A	N/A
PSCE	.213**	.231**	N/A	.323**	(.874)	.802**	.382**	N/A	N/A
UCA	.188**	.188**	N/A	.334**	.821**	(.823)	.285**	N/A	N/A
BCC	.071	.145*	N/A	.203**	.372**	.298**	(.823)	N/A	N/A
FPoly	N/A	N/A	N/A	N/A	N/A	N/A	N/A	(N/A)	N/A
FProg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	(N/A)
Full sample ( $N = 551$ )									
<i>M</i>	2.31	N/A	0.79	0.38	0.40	5.21	2.22	N/A	N/A
(SD)	(1.81)	N/A	(0.41)	(0.29)	(0.22)	(1.88)	(1.74)	N/A	N/A
Younger coalitions (coalitions 5 years old and younger)									
<i>M</i>	2.30	N/A	0.78	0.33	0.36	4.78	1.92	N/A	N/A
(SD)	(1.83)	N/A	(0.41)	(0.28)	(0.22)	(1.96)	(1.63)	N/A	N/A
Older coalitions (coalitions 6 years old and older)									
Mean	2.32	N/A	0.79	0.41	0.43	5.50	2.42	N/A	N/A
(SD)	(1.80)	N/A	(0.40)	(0.29)	(0.21)	(1.76)	(1.79)	N/A	N/A
Levene's Test	.196	N/A	.696	.729	.267	7.792**	4.386*	N/A	N/A
<i>t</i> test	-.096	N/A	-.302	-3.33**	-3.76**	-4.44**	-3.36**	N/A	N/A

Note. *M* = mean; *SD* = standard deviation; *df* = degrees of freedom; *PD* = development of quality planning products; *PU* = use of planning products; *Mem* = expanded coalition membership; *EP* = coalition essential processes; *PSCE* = pursued policy and systems change efforts; *UCA* = used comprehensive approach; *BCC* = breadth of community change; *FPoly* = facilitated policy/practice change; *FProg* = facilitated programmatic change).

The lower triangle of the correlation matrix contains the correlations for the younger coalitions ( $n = 224$ ), the upper triangle contains the correlations for the older coalitions ( $n = 327$ ) in the sample. The entries in parentheses along the diagonal are the reliabilities for the scale scores (based on the full sample,  $n = 551$ ). We did not report reliabilities for *FPoly*, *FProg*, and *Mem* because these were yes/no variables and are represented by "N/A." Both Levene's test for equality of variances and the two-sample *t* test for equality of groups means have  $df = 549$ .

\* $p < .05$ . \*\* $p < .01$ .

**Coalition essential processes.** These subscales assessed if a coalition had implemented activities related to seven essential processes. Coalitions indicated whether or not they had completed each of the activities in each subscale (yes/no). For each subscale, all the items the coalition indicated they had completed were totaled and a percent score was created for each subscale. An average subscale percentage score was created as the total scale score. The subscales and example items are as follows:

- Assessing community needs and resources (seven items)—Collected data to determine or monitor the extent of substance abuse problems in the community
- Analyzing information about the problem or goal (four items)—Used data to prioritize substance abuse needs

**Table 3. Correlations, Reliabilities, and Descriptive Statistics for Rural Coalitions (n = 263) and Urban Coalitions (n = 102)**

	<i>PD</i>	<i>PU</i>	<i>Mem</i>	<i>EP</i>	<i>PSCE</i>	<i>UCA</i>	<i>BCC</i>	<i>FPoly</i>	<i>FProg</i>
PD		.410**	N/A	-.139	.194	.066	-.014	N/A	N/A
PU	.524**		N/A	.190	.245**	.225**	.184	N/A	N/A
Mem	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A
EP	.109	.271**	N/A		.205**	.372**	.202**	N/A	N/A
PSCE	.207**	.229**	N/A	.325**		.785**	.410**	N/A	N/A
UCA	.188**	.187**	N/A	.325**	.820**		.324**	N/A	N/A
BCC	.212**	.280**	N/A	.294**	.418**	.354**		N/A	N/A
FPoly	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A
FProg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Full sample (N = 365)									
<i>M</i>	2.36	3.25	N/A	0.39	0.41	5.30	2.23	N/A	N/A
(SD)	(1.83)	(1.03)	(N/A)	(0.30)	(0.22)	(1.81)	(1.77)	(N/A)	(N/A)
Rural coalitions									
<i>M</i>	2.33	3.21	N/A	0.39	0.41	5.31	2.20	N/A	N/A
(SD)	(1.83)	(1.06)	(N/A)	(0.29)	(0.21)	(1.83)	(1.84)	(N/A)	(N/A)
Urban coalitions									
<i>M</i>	2.43	3.37	N/A	0.38	0.41	5.28	2.31	N/A	N/A
(SD)	(1.85)	(0.92)	(N/A)	(0.32)	(0.25)	(1.79)	(1.60)	(N/A)	(N/A)
Levene's Test	0.007	3.205	N/A	2.743	3.389	0.012**	0.990**	N/A	N/A
<i>t</i> test	-0.46**	-1.37**	N/A	0.31	-0.04**	0.13	-0.51**	N/A	N/A

*Note.* *M* = mean; *SD* = standard deviation; *df* = degrees of freedom; *PD* = development of quality planning products; *PU* = use of planning products; *Mem* = expanded coalition membership; *EP* = coalition essential processes; *PSCE* = pursued policy and systems change efforts; *UCA* = used comprehensive approach; *BCC* = breadth of community change; *FPoly* = facilitated policy/practice change; *FProg* = facilitated programmatic change).

The overall *N* for this sample varies from that of the Age analysis because we selected out coalitions that were located in Frontier (*N* = 12) and Suburban (*N* = 161) regions as well as coalitions with missing data on the regional variable (*N* = 13). Both Levene's test for equality of variances and the two-sample *t* test for equality of groups means have *df* = 363.

- Developing a framework of change (four items)—Developed a logic model and objectives for what the coalition will accomplish
- Developing and using strategic and action plans (three items)—Developed population-level strategies/activities for changing community conditions and behaviors
- Identifying, adapting and implementing interventions (five items)—Matched prioritized substance abuse needs with evidence-based programs/strategies
- Evaluating the coalition (11 items)—Collected data to assess immediate/intermediate outcomes of programs/strategies
- Sustaining projects and initiatives (seven items)—Used data as a basis for new grants or funding proposals

*Development of quality planning products.* Coalitions were asked if they had developed or revised each of the five products—community assessment, logic model, strategic/action

plan, evaluation plan, and sustainability plan—in the last 12 months (yes/no). A scale score (0-5) was created indicating the total number of products developed or revised in the last 12 months.

*Use of planning products.* Respondents rated how often their coalition used each of the five planning products to inform the decisions of the coalition, ranging from 1 (*not at all*) to 5 (*always*). A total product use score indicating how often coalitions used the products was created by taking the mean across all 5 products.

*Expanded coalition membership.* To measure growth in coalition membership, coalitions were asked if new members had joined the coalition in the last 12 months (1 = yes; 0 = no).

### ***Comprehensiveness of Strategies***

This construct assessed the degree to which each coalition was engaged in a comprehensive set of change strategies. Coalitions were provided a list of common interventions used to address substance abuse. Coalitions indicated if they had been involved in any of the interventions in the last year (1 = involved; 0 = not involved). These interventions were organized into the following seven change strategies: providing information, enhancing skills, providing support, enhancing access/reduce barriers, changing consequences, changing the physical design of the environment, and modifying/changing policies.

For each of the change strategies, all interventions in which the coalition indicated they had engaged were totaled. Because the number of interventions varied under each strategy, a percent score was created for each strategy. Two subscales were then created. The first subscale—programmatic interventions—was created by averaging the scores for the first three change strategies (providing information, enhancing skills, and providing support). The second subscale—systems change strategies—included the average of the remaining four strategies (enhancing access/reducing barriers, changing consequences, modifying/changing policies, and changing the physical design of the environment). These two subscales were then averaged to create a Total Program and Systems Change Efforts scale score.

A fourth subscale was created to measure the extent to which coalitions used a comprehensive approach. Coalitions were rated a score of 0-7 for this variable, indicating the total number of change strategies they had implemented in the last 12 months.

### ***Facilitating Community Change***

Three variables were used to measure the extent to which coalitions were creating community change. To measure programmatic change, respondents indicated (0 = no; 1 = yes) if their coalition had helped bring about a new program in the last year. To measure policy/practice change, respondents indicated (0 = no; 1 = yes) if their coalition had helped bring about a new policy or practice change in the last year. Respondents also indicated sectors in which they were able to bring about (a) program and (b) policy/practice changes (i.e., nonprofit, business, government/law, and education/school). To measure the breadth of community changes across sectors within the community, a total score was created by adding up the sectors in which coalitions had brought about program changes and policy/practice changes (scores ranged 0-8).

### **Moderators—Coalition Age and Geographic Target Area**

Two variables were used to test for group moderation; coalition age and geographic target area. Coalition age was dichotomized to test for moderation between coalitions that were five years old or younger (41% of the sample) and those that were six years old or older (59%). Similarly, a geographic target area variable was used to test moderation between rural (48% of the sample) and urban (19% of the sample) coalitions. We excluded frontier coalitions from the moderator analysis because the sample was too small; suburban coalitions were not included because of their similarity to urban coalitions. Funders also make the distinction between rural and urban issues; comparing these two samples allowed us to test whether there were differences as they relate to community problem solving.

*Structural equation modeling.* To test our two research questions, we utilized structural equation modeling (SEM) with observed and latent variables (Tanaka, 1987). To estimate our models we utilized covariance matrices and maximum likelihood (ML) estimation (Kline, 2005), which were tested with LISREL 8.80 software (Jöreskog & Sörbom, 2009); unstandardized parameter estimates are reported in all models. To ensure goodness of fit, we looked for small and nonsignificant chi-square statistics, standardized root mean square residual (SRMR) of  $\leq .10$ , root mean square error of approximation (RMSEA) of  $\leq .08$ , and a small expected cross-validation index (ECVI; Hair, Anderson, Tatham, & Black, 1998; Kline, 2005).

## **RESULTS**

SEM was the primary statistical tool used to answer our research questions.

### ***To What Extent Does the Proposed Model Explain How Coalitions Become Effective Agents of Change?***

To examine our first research question, we developed a SEM based on our theoretical conceptualization of the latent and manifest constructs. This provided a reference model to then compare against modified models that allowed manifest variables to co-vary. Figure 2 illustrates the full measurement model (referred to as Model 1). As this model illustrates, we added some correlations to allow within-factor covariance among the manifest variables. We also allowed a cross factor correlation between completed essential processes (element of coalition capacity) and pursued program and systems change efforts (element of comprehensive of strategies) after considering the work conducted by Fawcett and colleagues. Their work suggests that coalition use of these essential processes promote the pursuit of community changes (KU Work Group for Community Health and Development, 2007; Watson-Thompson et al., 2008).

Because we utilized latent variable modeling, it is necessary to confirm that each latent variable accurately represents the unmeasured variance of their respective manifest variables. To test this, we analyzed the path estimates between each latent and manifest construct of our measurement model (shown in Figure 2) and found that the latent variables load as expected with all path estimates greater than .10 and all *t*(19) greater than the critical value of 1.96. From this we can infer the existence of our underlying latent constructs among the manifest indicators, which supports the construct validity of the measurement model. For example, the latent variable *comprehensiveness of strategies*

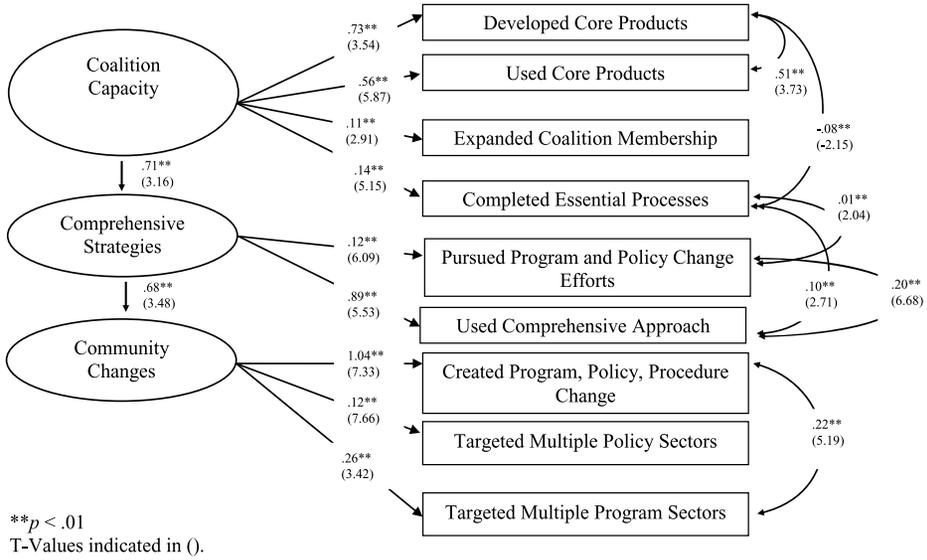


Figure 2. Unstandardized estimates and *t* values for Model 1—Full model.

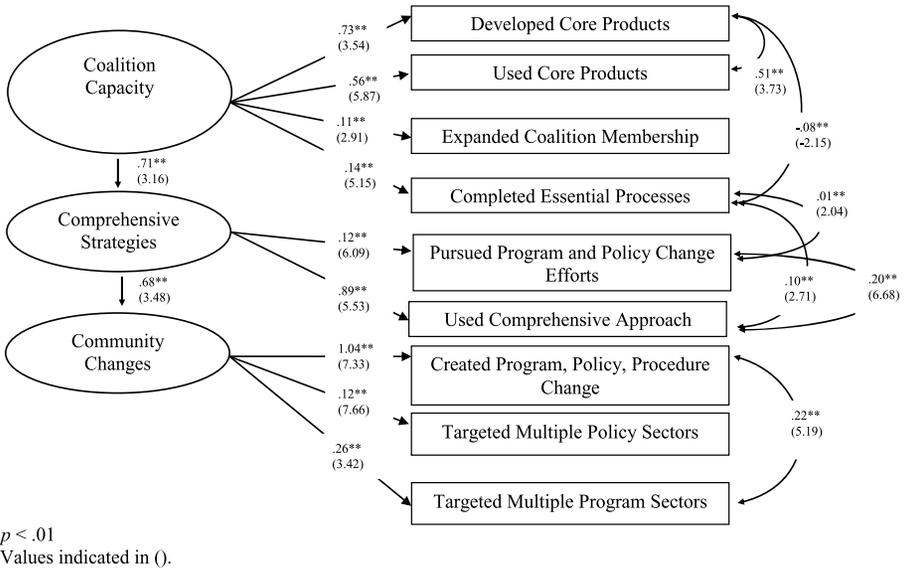


Figure 3. Unstandardized estimates and *t* values for Model 2—Multigroup model comparing coalition age.

accurately represents the unmeasured variation between *pursue program and systems change* and *use comprehensive approach*. The results (including unstandardized estimates and *t* values) of our measurement model are presented in Figure 3.

Because we confirmed the existence of the latent variables within our model, we can then move on to the full model and examine research question 1: To what extent does the proposed model explain how coalitions become effective agents of change? The results of our full structural equation model confirm that our modified theoretical model fits the data. Analysis of the fit indices for Model 1, illustrated in Figure 2, suggest that the overall conceptual model does fit the data and provides an adequate representation

of the community problem-solving process for coalitions (the model explains 51% of the variance in community changes). Specific fit indices are as follows:  $\chi^2(19) = 23.76$ , nonsignificant [*ns*], RMSEA = .021, SRMR = .027, and ECVI = .14.

### ***Assessing Problem-Solving Capacity, Comprehensive Strategies, and Community Changes***

We used Model 1 to examine hypotheses one and two. We found strong support for hypothesis 1: Coalitions with more operational and problem-solving capacity pursued more comprehensive strategies ( $\gamma = 1.02, p < .01$ ). We also found support for hypothesis 2: Coalitions that pursued more comprehensive strategies reported greater community changes ( $\beta = 0.71, p < .01$ ). We also found significant direct meditational effects between coalition capacity and community changes ( $t = 4.76, p < .001$ ).

### ***Do Younger and Older Coalitions Exhibit Different Processes?***

We utilized multigroup modeling to test whether coalition age served as a moderator to the paths in our model (exploratory question 1). We compared a constrained model (Model 2) in which all parameter estimates across younger (5 years or less) and older (6 years and older) coalitions were set as equal to an unconstrained model in which all parameters were free to vary across groups (Model 3). Utilizing a chi-squared difference test between Models 2 and 3 to identify moderation (Singh, 1995), we found that coalition age does not moderate these relationships  $\chi^2(17) = 14.7, ns$ . According to most fit indices, Model 2 (the constrained model) provided acceptable fit to the data:  $\chi^2(64) = 70.49, ns$ , the SRMRs of .059 for younger coalitions and 0.043 for older coalitions also provided evidence of acceptable fit, as was the RMSEA of .019 (90% confidence interval [CI] = .00 to .042), and the ECVI at .22 (90% CI = .21 to .27). Although Model 3 also provided evidence of acceptable fit, it was not a significant improvement over Model 2 according to several indices: the chi-square difference test; SRMR values for Model 3 of .049 for younger coalitions and .032 for older coalitions provided good fit to the data but were not a considerable improvement over Model 2; the RMSEA of .026 (90% CI = .00 to .05) or the ECVI of .26 (90% CI = .24 to .30). Thus, the proposed conceptual model (Figure 2) appears to similarly explain the community problem-solving process in both younger and older coalitions. Unstandardized estimates and *t* values for Model 2 can be found in Figure 3.

In regard to the measurement model for coalition age, we conducted a similar multi-group analysis to test for measurement variance. We compared Model 2 (the fully constrained model) to a model that allowed only factor loadings between latent and manifest variables to freely vary (Model 4). Model 4 provided indication of acceptable fit according to the nonsignificant chi-squared statistic  $\chi^2(55) = 61.67, ns$ , the SRMRs of .047 for younger coalitions and .037 for older coalitions, the RMSEA of .021 (90% CI = .00 to .045), and the ECVI at .24 (90% CI = .23 to .28). However, according to a chi-squared difference test  $\chi^2(9) = 8.82, ns$  between Model 2 and Model 4, we can confidently conclude that there is measurement invariance between groups. That is, indicators of the latent variables do not significantly differ across the two models and we can conclude that they are conceptually similar across groups.

### ***Do Rural and Urban Coalitions Exhibit Different Processes?***

To test whether coalitions' geographic location moderated the relationships in our model (exploratory question 2), we conducted another multigroup model comparison

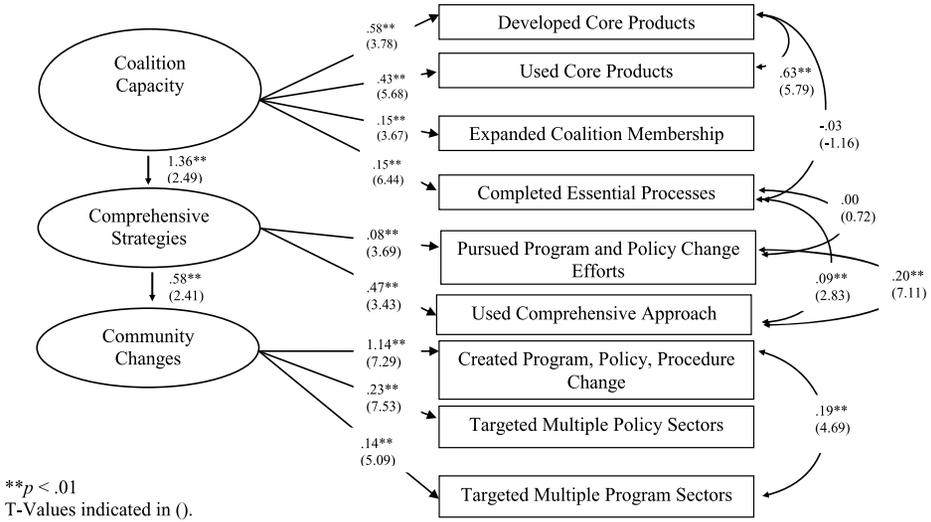


Figure 4. Unstandardized Estimates and *t* values for Model 5—Multigroup model comparing coalition region.

(Models 5 and 6, respectively) equivalent to the coalition age comparison above (exploratory question 1), in which Model 5 provided the fully constrained estimates and Model 6 allowed estimates to freely vary across groups. Model 5 provided marginally acceptable fit to the data. The nonsignificant chi-squared statistic  $\chi^2(64) = 70.32$ , *ns*, the SRMRs of .11 for urban coalitions and .047 for rural coalitions, the RMSEA of .023 (90% CI = .00 to .052), and the ECVI of .34 (90% CI = .32 to .40) give an indication that the model fit the data relatively well. Model 6, however, was not a significant improvement with evidence concluded from the chi-square difference test,  $\chi^2(47) = 44.21$ , *ns*. The Model 6 SRMR values of .064 for urban coalitions and .033 for rural coalitions, the RMSEA of .00 (90% CI = .00 to .044), and the ECVI of .37 (90% CI = .37 to .41) did not give evidence that Model 6 was a significant improvement compared to Model 5. As with coalition age, our findings suggest that the geographic location of coalitions does not moderate the relationships in our model (see Model 5 for unstandardized estimates and *t* values).

Regarding the measurement model for geographic region, we again compared a fully constrained model (Model 5) to a model that allowed factor loadings between latent and manifest variables to freely vary (Model 7). Model 7 provided indication of acceptable fit according to the nonsignificant chi-squared statistic  $\chi^2(55) = 53.77$ , *ns*, the SRMRs of .066 for urban coalitions and .036 for rural coalitions, the RMSEA of .00 (90% CI = .00 to .045), and the ECVI at .34 (90% CI = .34 to .40). According to a chi-squared difference test  $\chi^2(9) = 16.55$ , *ns* between Model 5 and Model 7, we can confidently conclude that there is measurement invariance between groups. Because indicators of the latent variables in our model do not significantly differ, we can again conclude that the latent variables are conceptually similar across groups.

## DISCUSSION

Overall, the findings in this study provide support for the community problem-solving framework as it applies to the work of substance abuse coalitions across the United States. As this study suggests, coalitions are more likely to produce community changes

and thus achieve important intermediate outcomes when they develop their operational and problem-solving capacity and pursue a more comprehensive array of strategies. In addition, the findings support the developmental sequence suggested in this model. Coalitions are more likely to pursue a breadth of comprehensive strategies when they have strong operational and problem-solving capacity; the pursuit of more comprehensive strategies, in turn, is related to higher levels of community changes. In addition, the finding that comprehensive changes fully mediates the relationship between coalition capacity and community changes provides further support for the community problem-solving framework presented in this article.

Although this study targeted only substance abuse coalitions, the sample of coalitions included in this analyses were quite diverse in age, budget, membership size, and geographic location, suggesting the applicability of the proposed framework to a variety of coalitions. In addition, the robustness of the proposed community problem-solving model is further indicated by the fact that the framework was not moderated by coalition age or geographic location. Prior studies indicate that the age of a coalition (Office of National Drug Control Policy, 2008) and its geographic location (Office of National Drug Control Policy, 2007) are predictive of coalition's capacity and effectiveness. However, our findings suggest that for young and old coalitions and urban and rural coalitions, the different steps in the community problem-solving process captured in Figure 1 are equally important.

### ***Implications for Practitioners and Researchers***

These findings highlight the importance of building a coalition's operational and problem-solving capacity, including the development and use of planning and evaluation tools (Collie-Akers et al., 2007; Hays et al., 2000; Watson-Thompson et al., 2008) and expanding coalition membership (Foster-Fishman et al., 2001). They also highlight the importance of coalitions pursuing comprehensive strategies, particularly strategies that highlight environmental change. Because the coalition field has been dominated by a programming and individual-level change orientation in the past (Florin et al., 1993; Hallfors et al., 2002), this suggests that practitioners may need to expand the scope of training and technical assistance offered to incorporate an emphasis on systems change and effective environmental strategies.

These findings also suggest effective community problem solving is critical for coalitions to potentially achieve targeted distal health outcomes. The community problem-solving model examined in this study depicts a process by which coalitions can achieve intermediate outcomes of community change that others have suggested are important triggers for successfully reaching long-term goals (Allen et al., 2008; Roussos & Fawcett, 2000). There appears to be value in viewing coalitions as community problem solvers; coalitions appear to be on the right path if they move along the community problem-solving road and future studies will need to examine if the road leads to the ultimate destination of population-level outcomes. Further studies are also required to determine how to best build coalition capacity to be strong community problem solvers. Although CADCA's community problem-solving model appears to offer a strong theory of change for coalitions, the process by which a community problem-solving framework is triggered requires additional investigation. What role training and technical assistance may play in this is not yet fully understood and efforts are needed to build a greater understanding of the process by which community problem-solving capacity is developed. The benefits of this knowledge have broad effects including helping coalitions engaged in these

change efforts, the intermediaries that provide training and supports to coalitions, and the researchers who examine coalition processes.

### ***Limitations***

There are several limitations to this study to be considered. First, the cross sectional nature of this study limits our ability to fully assess the causal relationships implied in this model. Second, the findings may have some limited generalizability because the sample included only substance abuse coalitions. It is possible that a different set of dynamics influence the pursuit of community changes in other types of coalitions, such as those targeting domestic violence or obesity. However, we believe the proposed conceptual framework has some utility for other coalition types, given the manifest variables assessed in this model are factors identified as important in most other coalition studies (Collie-Akers et al., 2007; Fawcett et al., 2001; Institute of Medicine, 2002) and the importance of community changes as key intermediate outcomes has been highlighted by coalition researchers in other fields (e.g., Allen et al., 2008; Kegler et al., 2000).

### ***Next Directions***

Additional research is required to examine the mechanisms by which coalitions become strong community problem solvers. A longitudinal study should examine how this process manifests over time and how the process of change may be moderated by other important factors such as coalition access to resources and community conditions such as poverty or other social problems. Additionally, the final element of the community problem-solving framework needs to be examined. Specifically, it will be important to test the link between the intermediate and long-term outcomes and if facilitation of community changes results in coalition effectiveness at reducing population-level substance abuse rates within their community.

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