Measuring Coalition Functioning: Refining Constructs Through Factor Analysis

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Abstract

Internal and external coalition functioning is an important predictor of coalition success that has been linked to perceived coalition effectiveness, coalition goal achievement, coalition ability to support evidence-based programs, and coalition sustainability. Understanding which aspects of coalition functioning best predict coalition success requires the development of valid measures of empirically unique coalition functioning constructs. The goal of the present study is to examine and refine the psychometric properties of coalition functioning constructs in the following six domains: leadership, interpersonal relationships, task focus, participation benefits/costs, sustainability planning, and community support. The authors used factor analysis to identify problematic items in our original measure and then piloted new items and scales to create a more robust, psychometrically sound, multidimensional measure of coalition functioning. Scales displayed good construct validity through correlations with other measures. Discussion considers the strengths and weaknesses of the refined instrument.

Keywords

coalitions, Communities That Care, delinquency, measurement development, partnerships, prevention, substance abuse

Community coalitions are a popular means of addressing community-wide problems that can enable synergistic cooperation between community entities to achieve shared goals (Zakocs & Edwards, 2006). Coalition support for the implementation of programs and policies can lead to improved community health. For example, a group-randomized trial of Communities That Care (CTC) coalitions indicated they were able to reduce the incidence and prevalence of adolescent drug use and delinquency at the community level (Hawkins et al., 2008; Hawkins et al., 2009). Coalitions promote several practices and processes known to improve implementation quality, including collaboration among local agencies, shared decision making, and communication (Durlak & DuPre, 2008). High-quality coalition functioning is an important precursor to coalition success. Previous research indicates coalition functioning relates to coalition ability to support evidence-based programs (Brown, Feinberg, & Kan, 2010), coalition sustainability (Feinberg, Bontempo, & Greenberg, 2008), coalition ability to change public policy (Hays, Hays, DeVille, & Mulhall, 2000), and perceived coalition effectiveness (Feinberg, Greenberg, & Osgood, 2004a).

However, our understanding of the specific aspects of coalition functioning that promote different indicators of coalition success is limited. Identifying and measuring unique aspects of coalition functioning that predict coalition success is essential to furthering the science and practice of community collaboration. To facilitate progress in this area, our goal is to further the development of efficient and precise measurement of distinct aspects of coalition functioning. With such tools, future investigations can improve our understanding of what aspects of coalition functioning enable coalitions to be successful. Coalition members and technical assistance providers can also benefit from the use of high-quality self-assessment instruments that provide feedback on relevant strengths and weaknesses.

The goal of this study is to refine a multidimensional measure of coalition functioning through examination of its psychometric properties and the development of improved items and scales. This study builds on previous measurement development work from Feinberg, Gomez, Puddy, and Greenberg (2008), who identified scales with adequate to good internal consistency, relative stability over 1 year, generally acceptable test–retest reliability, and moderate construct validity. Through continuous quality-improvement efforts in an annual survey administration process, we identified weaknesses with some items and developed new replacement items. Furthermore, we developed new scales to measure participation benefits and costs, which are theoretically important coalition functioning constructs that existing research suggests are important for coalition success (Chinman, Wandersman, & Goodman, 2005). Following is a

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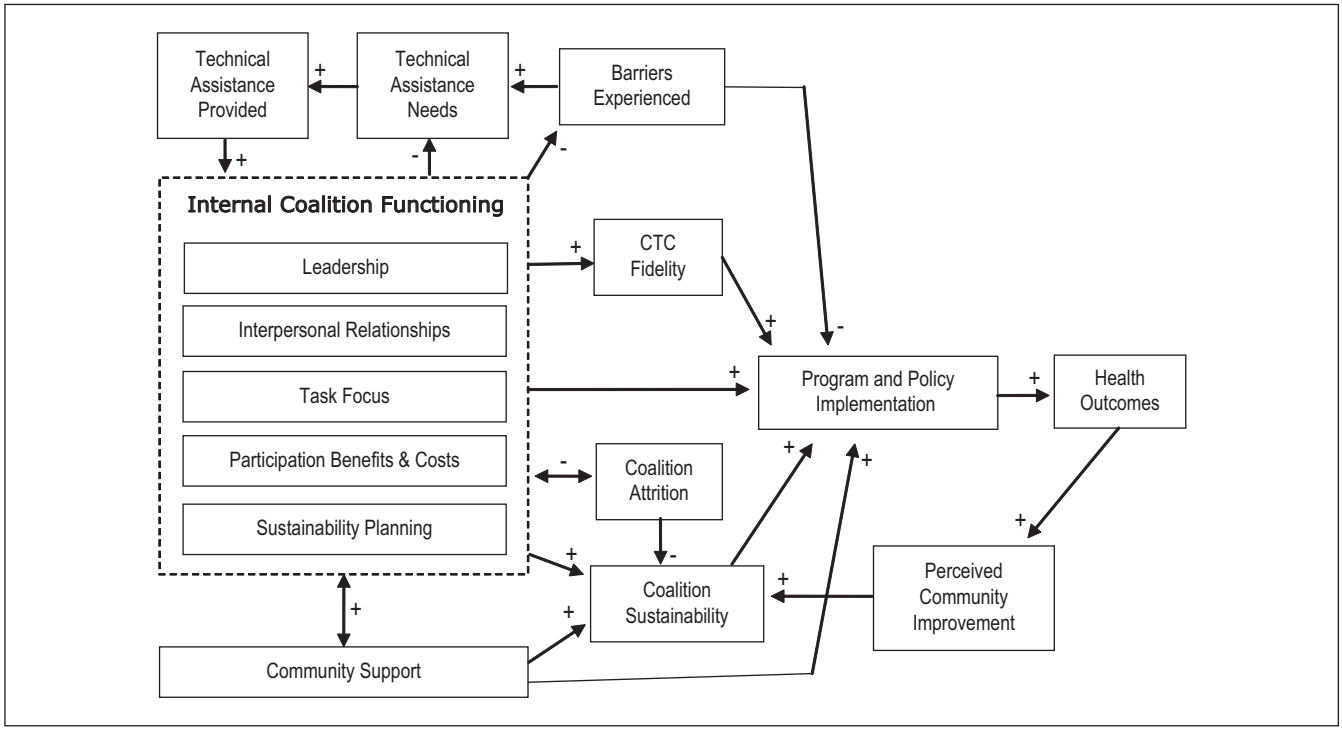

Figure 1. Theoretical model of coalition functioning

review of several relevant coalition functioning constructs and their consequences.

Coalition Functioning

Numerous coalition functioning constructs have been defined and measured and are available for investigators and implementers. However, selecting appropriate measures can be a bewildering experience because there are so many options. Unfortunately, most measures have little or no data available supporting their reliability and validity (Granner & Sharpe, 2004). Furthermore, there is no single dominant theoretical framework for understanding the critical aspects of coalition functioning. Several valuable frameworks exist, such as the Model of Community Health Governance (Lasker & Weiss, 2003), the Collaboration Framework (Hogue et al., 1995), and Community Coalition Action Theory (Butterfoss & Kegler, 2009). Our instrument measures several of the critical elements outlined in these models, as well as featured in an integrative framework explicating the core coalition competencies and processes (Foster-Fishman, Berkowitz, Lounsbury, Jacobson, & Allen, 2001).

Although Foster-Fishman et al.'s (2001) framework is logically sound and the salience of individual elements listed in the framework is empirically supported, the organization of the framework itself lacks empirical support. The challenge of organizing the critical elements of collaborative functioning into a conceptually and empirically sound framework is substantial because the different elements are interrelated with one another. The current article aims to advance the establishment of an empirically sound organizational schema by identifying elements of coalition functioning that are both conceptually and empirically distinguishable.

The development of our instrument coincides with an evolving conceptual model of coalition functioning that has emerged from and in turn guided several previous studies of Communities That Care (CTC) coalitions (Brown, Feinberg, & Greenberg, 2010; Feinberg, Bontempo, et al., 2008; Feinberg, Gomez, et al., 2008; Feinberg, Greenberg, & Osgood, 2004b; Feinberg, Greenberg, Osgood, Anderson, & Babinski, 2002; Feinberg, Jones, Greenberg, Osgood, & Bontempo, 2010; Feinberg, Ridenour, & Greenberg, 2008; Greenberg, Feinberg, Gomez, & Osgood, 2005). The model, outlined in Figure 1, is based on the premise that coalition functioning leads to health outcomes by supporting program and policy implementation (Feinberg, Greenberg, Osgood, Sartorius, & Bontempo, 2007). In the model, there are five domains of internal coalition functioning: leadership, interpersonal relationships, task focus, participation benefits/costs, and sustainability planning. One domain of external coalition functioning called community support is also part of the model. These internal and external coalition functioning constructs influence program and policy implementation directly as well as indirectly through several intermediary constructs, including CTC fidelity, coalition attrition, barriers experienced, perceived community improvement, and

coalition sustainability. Internal coalition functioning also has a corrective feedback loop, whereby poor functioning contributes to coalition perceptions that technical assistance support is needed. These perceptions of need for support ideally lead to increases in the amount of technical assistance provided, which in turn may improve poor functioning (Riggs, Nakawatase, & Pentz, 2008).

We have found our conceptual organization is useful when delivering feedback to CTC coalitions because it aids understanding of each coalition functioning construct's role and why it is important. Although we find our conceptual organization of coalition functioning useful, we note that other equally plausible conceptual organizations exist. We also note that we have yet to measure or include in our model several relevant aspects of coalition functioning, such as the effectiveness of formal and informal decision-making processes. Following is a more detailed explanation of the coalition functioning domains and intermediary variables outlined in Figure 1.

Leadership. Effective coalition leadership is critical to the development of a dynamic collective force capable of achieving coalition goals (Foster-Fishman et al., 2001). An empowering leadership style enhances team efficacy and member satisfaction in community coalitions (Kumpfer, Turner, Hopkins, & Librett, 1993). Similarly, skilled and effective leadership aids coalition success (Rogers et al., 1993; Zakocs & Guckenburg, 2007). Having paid staff who possess the appropriate organizational and interpersonal skills can also help keep the coalition moving forward with collaborative synergy (Butterfoss, 2007).

Interpersonal relationships. High-quality interpersonal relationships are central to coalition functioning because they serve as the medium through which effective collaboration occurs, promoting trust and commitment (Butterfoss, Goodman, & Wandersman, 1996; Foster-Fishman et al., 2001). Staff–board communication, conflict, and cohesion operate as cornerstones of productive interpersonal relationships between coalition members (Foster-Fishman et al., 2001; Giamartino & Wandersman, 1983; Rogers et al., 1993; Zakocs & Edwards, 2006). Community Coalition Action Theory indicates each of these constructs is central to the establishment of effective coalition processes, which in turn enable synergistic collaboration (Butterfoss, 2007).

Task focus. Although cohesion and task focus represent aspects of overall organizational climate (Moos, 1976), we organize the constructs into unique domains within coalition functioning because cohesion is a relational capacity and task focus is an organizational capacity (Foster-Fishman et al., 2001). Task focus is critical to coalition functioning because it enables progress on the issues most important to coalition members while minimizing diversions, mission drift, and wasted effort. Coalitions that maintain a clear focus and directedness rather than being diverted to peripheral issues and concerns are more likely to support high-quality program implementation (Foster-Fishman et al., 2001; Kegler, Steckler, McLeroy, & Malek, 1998). Clear decision-making procedures that are regularly followed can also help keep the coalition focused on goal achievement (Sofaer, 2004). Efficiency is also important for coalition success, as resources are always limited (Zakocs & Edwards, 2006).

Participation costs/benefits. Articulation of the benefits and difficulties of coalition involvement is essential when trying to attract key representatives from community sectors that are difficult to engage (Chinman & Wandersman, 1999; Chinman et al., 2005). Time is an important cost of coalition involvement and substantial benefits must exist for individuals to perceive participation as worthwhile. Several studies identify a relation between perceived costs and benefits of participation and level of involvement in coalitions (Chinman, Anderson, Imm, Wandersman, & Goodman, 1996; Chinman et al., 2005; McMillan, Florin, Stevenson, Kerman, & Mitchell, 1995; Prestby, Wandersman, Florin, Rich, & Chavis, 1990; Rogers et al., 1993).

Sustainability planning. To be successful, coalitions must sustain their own efforts and organization over a period of several years (Brown, Feinberg, & Greenberg, 2010). The loss of coalition support is likely to lead to implementation failure if coalition-supported programs and policies are not themselves independently sustainable. Intentional planning for the ongoing challenge of sustainability can contribute to coalition success when started in the early stages of coalition formation and continued throughout the life of the coalition (Johnson, Hays, Center, & Daley, 2004). Sustainability planning involves both financial planning for the attainment of continuation funds and the development of implementation plans that will establish independently sustainable programs and policies. Research indicates coalition functioning and sustainability planning are important predictors of coalition sustainability (Feinberg et al., 2008;[AQ: 3]Perkins et al., in press).

Community support. Strong community relations are important because they help the coalition mobilize resources and obtain the necessary support for effective program implementation (Butterfoss et al., 1996; Chutuape et al., 2010; Foster-Fishman et al., 2001). Acquiring the support of all community sectors who will be involved in program implementation is critical to avoiding implementation resistance and ensuring cultural competence during program implementation (Florin, Mitchell, Stevenson, & Klein, 2000; Foster-Fishman et al., 2001). Community support can also aid coalition sustainability by helping provide the coalition with needed in-kind support and human capital (Scheirer, 2005).

Intermediaries between coalition functioning and health outcomes. Numerous mediating constructs help explain the process by which coalition functioning leads to improved health outcomes. High coalition attrition compromises both coalition sustainability and future coalition functioning because of the lost expertise and access to resources that occurs when knowledgeable and connected members depart (Sofaer, 2004). Coalition sustainability is critical because coalitions must continue to operate over several years to establish independently sustainable programs and policies (Brown, Feinberg,

& Greenberg, 2010). Perceived community improvement is an important proxy for improved health outcomes that helps promote coalition sustainability by enhancing commitment to successful efforts (Wells, Feinberg, Alexander, & Ward, 2009). CTC fidelity helps ensure program selection is based on community needs and that coalition-supported programs are implemented with fidelity (Brown, Feinberg, & Greenberg, 2010). Barriers experienced by the coalition prevent it from implementing programs as intended due to obstacles such as a lack of needed resources, difficulty enrolling the target population, and a shortage of high-quality program implementers (Durlak & DuPre, 2008). Perceived technical assistance needs can reflect barriers experienced and/or a lack of expertise in solving existing problems (Feinberg, Ridenour, et al., 2008).

Communities That Care Coalitions

Our goal is to develop an instrument that can be useful to many different types of coalitions; however, all survey development work occurred in the context of a statewide implementation of the CTC coalition model in Pennsylvania (Greenberg et al., 2005). The CTC model guides coalitions through the process of collecting local epidemiological data on risk and protective factors associated with delinquency and substance use, selecting evidence-based programs that can address prioritized risk and protective factors, developing effective implementation and evaluation plans, and executing plans in a sustainable manner (Hawkins & Catalano, 2005; Hawkins, Catalano, & Arthur, 2002). An earlier quasi-experimental evaluation of the CTC coalitions in Pennsylvania indicated that they were effective in reducing the prevalence of adolescent drug use and delinquency at the community level (Feinberg et al., 2007; Feinberg et al., 2010).

The Present Study

One important challenge in measuring coalition functioning is identifying constructs that are empirically distinct from one another. If measures of different constructs yield substantial empirical overlap, it is unlikely that the measures will provide sufficient precision to identify which specific aspects of coalition functioning contribute to different indicators of coalition success. However, we recognize that measures of coalition functioning that are not empirically distinct may still be useful in practice settings. Coalitions that receive feedback on the quality of functioning in various domains may be able to generate concrete actions to address identified weaknesses that are critical to success—even if there is empirical overlap on some measures with other important coalition functioning constructs. Thus, our aim in refining and developing coalition measures is to enhance the reliability and validity of empirically distinct measures where possible. We also consider measures that overlap empirically to some extent as they may be useful to coalitions, and because we hope that other researchers and practitioners may learn from these measures and further improve on them.

Method

Data for this study are based on an annual evaluation of CTC coalitions funded by the Pennsylvania Commission on Crime and Delinquency. Further details on the history and structure of CTC in Pennsylvania can be found in Feinberg, Bontempo, and Greenberg (2008) and Feinberg et al. (2007). To collect coalition functioning survey data, we asked coalition leaders from all CTC coalitions in Pennsylvania to provide the names and email addresses of coalition members. With this information, we sent an email to participants with a secure link to the survey website. The online questionnaire took participants about 20 minutes to complete (longer for leaders who report on additional domains). Participants who did not have access to the Internet could complete a paper-and-pencil version of the questionnaire. We used the data to provide each coalition with an individualized feedback report and self-review form that coalitions could use to celebrate strengths and address weaknesses. Technical assistance providers funded by Pennsylvania Commission on Crime and Delinquency helped the coalitions understand and make use of the feedback reports. The data collection and feedback process has been conducted in this manner annually since 2003.

In this study, we analyzed data collected from 2005 to 2010. Response rates were 50% in 2005; 60% in 2006; 62% in 2007, 2008, and 2009; and 56% in 2010. Although this is a high response rate for an online survey, one limitation of the study is that we do not know if there are statistical differences between responders and nonresponders (we suspect that involved coalition members may have been more inclined to respond). In the 2005 to 2010 time period, the number of respondents ranged from 732 in 2010 to 988 in 2007, and the number of coalitions participating ranged from 53 in 2010 to 75 in 2005. On average, 58% of the respondents in a given year from 2005 to 2010 had completed the survey in the previous year. With respect to demographics, survey respondents from 2010 were 70% female, 89% White, 7% Black, 1% Hispanic, and 2% of another ethnicity. Respondents in 2010 were an average of 49 years old and had been involved in CTC for an average of 5.7 years. The population size of the counties where CTC coalitions worked ranged from 5,334 to 1,218,429, with a median of 143,768 people.

Measures

The coalition web-based self-report questionnaire provided all measures examined in this study. Measures are organized into two categories: coalition functioning scales and indicators of construct validity. Copies of a complete technical report with survey items are available from the first author.

Table 1. Number of Items and Alpha Coefficients for Scales in 2010, Organized by Domain

Coalition Functioning Domain: Coalition Functioning Scale	Number of Items	Alpha
Leadership domain:		
Coalition leadership style[d]	3	.85
Coalition leadership competence[nd]	4	.92
Mobilizer[a] skill[d]	4	.92
Interpersonal relationships domain:		
Cohesion[nd]	5	.84
Conflict[nd]	2	$r = .91$
Staff–board communication[nd]	2	$r = .81$
Task focus domain:		
Coalition Efficiency[d]	3	.94
Coalition directedness[nd]	4	.88
Participation benefits and costs domain:		
Participation benefits[d]	3	.87
Participation difficulties[d]	3	.84
Sustainability planning domain and scale[d]	3	.85
Community support domain and scale[d]	4	.88

a. Mobilizer is a coalition coordinator or lead staff person who is typically paid.
d. Scale empirically distinct (in bold font).
nd. Scale not empirically distinct (not in bold font).

The items in this instrument were derived from our own measurement development work as well as items and scales adapted from other research projects (Arthur, Hawkins, Catalano, & Olson, 1998; Kegler et al., 1998; Lasker & Weiss, 2000; Moos, 2002; Wandersman, Florin, Friedmann, & Meier, 1987). Table 1 lists all coalition functioning scales examined, which we grouped into six domains, as explained in the following subsections. Indicators of construct validity included CTC Fidelity, Technical Assistance Needed, Barriers Experienced that interfere with coalition success, Coalition Attrition, and Perceived Community Improvement due to CTC.

Leadership: Three scales. Coalition Leadership Style measured the extent to which leaders seek out members' views and reach out for help (e.g., The CTC leadership intentionally seeks out your views). Whereas Coalition Leadership Style captured an empowering leadership style, Coalition Leadership Competence focused on a more traditional leadership capacity in being powerful, respected, and interpersonally skillful. More specifically, Coalition Leadership Competence measured the extent to which the leadership is respected in the community, politically skillful, able to mobilize resources, and capable of resolving conflict (e.g., The CTC leadership is able to mobilize resources to aid CTC). Mobilizer Skill assessed perceptions of whether the lead staff person is knowledgeable and enthusiastic, possessing strong organizational and interpersonal skills (e.g., How skilled is your CTC Mobilizer or lead staff person in the following areas . . . Organizational skills). The measure of Mobilizer Skill is distinct from Coalition Leadership Competence because Mobilizer Skill focused on the lead staff person who is paid to manage daily coalition operations. Coalition Leadership Competence measured the characteristics of individuals who shape coalition efforts as influential leaders but not as paid staff.

Task focus: Two scales. Coalition Efficiency items quantified the work ethic, efficiency, and task focus of the coalition members (e.g., This is a highly efficient, work-oriented team). We define Coalition Directedness as the degree to which a coalition is focused in a specific direction and has decision-making procedures in place to help make progress toward its goals. Items measured the extent to which the coalition has a clear vision, goals, roles, and decision-making procedures that are followed (e.g., The CTC leadership has a clear vision for the coalition). Although some characteristics of Coalition Directedness and the leadership domain are related, we conceptualized Coalition Directedness as part of the task focus domain because it requires consensus among several members and provides the infrastructure necessary for task focus.

Interpersonal relationships: Three scales. Cohesion measured the extent to which there are feelings of unity, group spirit, trust, and belonging among coalition members (e.g., There is a strong feeling of belonging in this team). Conflict captured the level of tension and infighting caused by differences of opinions, personality clashes, hidden agendas, and power struggles (e.g., How much or how little tension have you noticed in your CTC board in the past 12 months). Staff–Board Communication measured the frequency and productiveness of communications between coalition staff and board members (e.g., How productive is communication between your CTC Staff [Program Director, Mobilizer, and other CTC staff] and the Prevention Board members).

Participation benefits and costs: Two scales. We define Participation Benefits as the extent to which members are personally rewarded for their coalition involvement. Items captured the extent to which participants learned new skills, developed valuable relationships, and experienced a sense of personal fulfillment from their involvement in the coalition (e.g., How much benefit have you gained from your involvement with CTC in these areas . . . developing valuable relationships). Participation Difficulties captured how much coalition involvement has interfered with work, family life, and personal free time (e.g., How much has CTC interfered with . . . your family life).

Sustainability planning: One scale. Sustainability Planning measured coalition exploration of funding strategies and the development of a realistic, concrete plan for how to continue offering programs (e.g., Has CTC explored potential funding sources for continuing similar programs).

Community support: One scale. We define Community Support as the degree to which key entities in the community

are supportive of coalition efforts (e.g., Does the administrative leadership in participating community agencies champion the CTC initiative).

Indicators of construct validity. CTC Fidelity measured the degree to which the coalition follows the CTC model, executing its elements properly (e.g., The CTC Prevention Board regularly assesses whether the programs we are supporting impact the prioritized risk factors). Barriers Experienced captured several common obstacles to coalition success, including a lack of program enrollment, uninvolved schools, insufficient resources, a lack of cooperation from community partners, and inadequate commitment to the coalition by its members (e.g., Individuals or families have not enrolled in the programs offered). Technical Assistance Needed assessed respondent perceptions of the coalition's level of need for technical assistance in several domains, including leadership development, program implementation, grant writing, and the interpretation of risk and protective factor data (e.g., Please rate how much training or technical assistance your CTC team needs in leadership development).

Perceived Community Improvement measured respondent perceptions of the degree to which CTC efforts contributed to community improvement in several areas such as community awareness, systematic and comprehensive prevention planning, the quality of services, collaboration, and the well-being of community residents (e.g., Please indicate how each of the following areas has changed over the last year due to CTC . . . Quality of local services and programs). To estimate Coalition Attrition, we used information from coalition leaders reporting on the number of members in the coalition, the number who left in the past year, and the number who joined. We calculated Coalition Attrition as the proportion of members at the beginning of the year that left the coalition for reasons other than a change in employment or residence. In other words, Coalition Attrition represented members who drop out of the coalition because of dissatisfaction, disinterest, or competing priorities.

Plan of Analysis

Our analysis began with coalition functioning data from 2005 because this was the first year of data not yet subject to factor analysis, following our initial measurement development paper using data from 2003 and 2004 (Feinberg et al., 2008).[AQ: 4] To ensure all survey items captured sufficient variability in the constructs of interest, we examined item distributions and removed items with skewness or kurtosis greater than 3. To identify empirically distinct scales, we used the SAS (ver. 9.2) Proc Factor procedure to conduct an exploratory factor analysis (EFA) with Varimax orthogonal rotation on the coalition functioning data. We used data from 2006 to 2009 to examine the stability of the refined factor structure with confirmatory factor analysis (CFA).

In 2010, we piloted new items for two existing scales that had only two items (Coalition Efficiency and Coalition Leadership Style), and we created two new scales—Participation Benefits and Participation Difficulties. We examined the factor structure of the revised instrument with an EFA. We then used CFA to examine the hierarchical nature of the scales. Next, we examined how Cronbach's alpha coefficients changed from the original scale formulation in 2004 to the reduced formulation in 2005 and the 2010 formulation with new items. We also computed coalition functioning scale intercorrelations using the 2010 data. Finally, we examined convergent validity between the coalition functioning scales and CTC Fidelity, Technical Assistance (TA) Needed, Barriers Experienced, Coalition Attrition, and Perceived Community Improvement due to CTC.

Results

Item Distributions

Examination of item distributions led to the removal of two items that suffered from floor effects, with a kurtosis greater than 3. One item was from the Conflict Scale, which only had two items initially and was thus excluded from subsequent EFA analyses. The other poorly distributed item was from the Barriers Experienced Scale and focused on the presence of conflict between the lead CTC sponsoring agency and the larger CTC coalition.

Exploratory Factor Analysis to Identify Empirically Distinct Scales

An initial EFA pooled all items using 2005 data to allow for scale emergence from the pattern of item loadings on factors. The initial EFA led to the identification of several factors that did not have at least two items with factor loadings above .5 on single unique factor and cross-loadings of less than .30 on all other factors. Specifically, items from the Coalition Directedness, Staff–Board Communication, and Coalition Leadership Competence Scales were removed from consideration as indicators of empirically distinct coalition functioning constructs. A follow-up EFA with the items from the remaining scales pooled together led to the identification of several items that did not meet the same factor loading criteria. Specifically, we deleted one item from Community Support, Coalition Leadership Style, Coalition Efficiency, Cohesion, and Sustainability Planning Scales. The only unchanged scale was Mobilizer Skill.

Factor Structure Stability

With the retained items from the EFA of 2005 data, we conducted EFA analyses on the 2006 through 2009 data sets separately. All retained items and scales continued to meet the same factor loading criteria in subsequent EFA analyses except for Cohesion, which did not meet the criteria in 2008 and was thus removed. Only five empirically distinct scales remained:

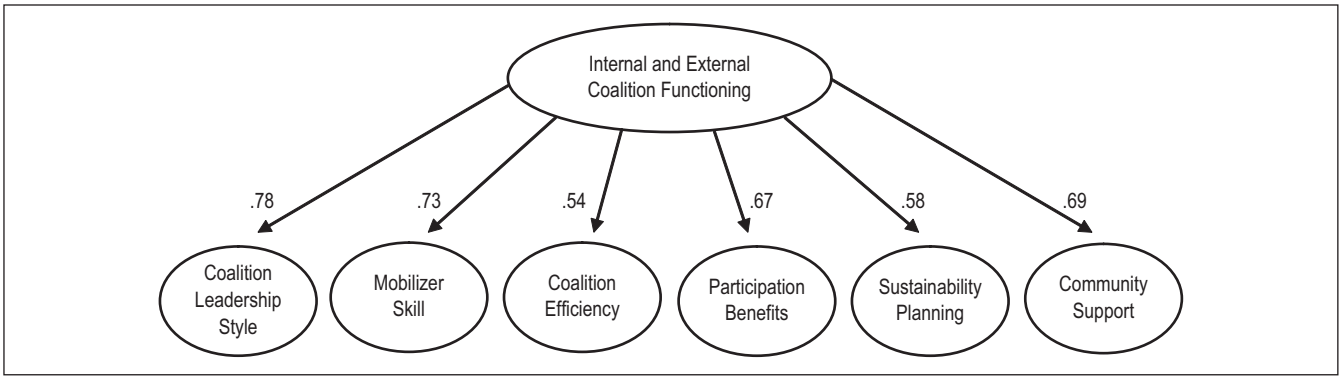

Figure 2. Hierarchical confirmatory factor analysis model of coalition functioning
Note. Comparative fit index = .98; Tucker–Lewis index = .97; root mean square error of approximation = .04. Coefficients are standardized, with first-order latent variable indicators omitted for simplicity.

Coalition Leadership Style, Mobilizer Skill, Coalition Efficiency, Community Support, and Sustainability Planning. To further examine the stability of the factor structure, we tested whether constraining the factor loadings from 2005 to equal factor loadings from 2009 would significantly reduce model fit in a CFA using MPlus version 6.0. To account for the fact that respondents were nested within CTC coalitions, parameter standard errors and the goodness-of-fit statistic were adjusted using aggregate analysis for all CFA models (Muthén & Satorra, 1995). Parameter constraints did not significantly reduce model fit (Wald test = 12.0, $df = 15$, $p = .68$).

New Items and Scales

In 2010, we piloted new items for the scales with only two items (Coalition Efficiency and Coalition Leadership Style) and two new scales (Participation Benefits and Participation Difficulties). We examined the factor structure of the revised instrument with an EFA and found that all items from the Participation Benefits and Participation Difficulties scales met factor loading criteria as distinct scales, as did the new item for the Coalition Efficiency scale. The new item for the Coalition Leadership Style scale had a factor loading of .61 but had a cross-loading of .34 on the Mobilizer Skill scale. We decided to retain the item in subsequent analyses because we felt that the degree of cross-loading was modest and it was helpful in avoiding a two-item scale.

Hierarchical Factor Structure

CFA models examined the hierarchical nature of the scales, with a single second-order coalition functioning factor accounting for the correlations between the first-order coalition functioning constructs identified as empirically distinct in the EFA (as illustrated in Figure 2). Our initial model indicated Participation Difficulties was not significantly related to the higher-order coalition functioning construct and was thus removed.

Fit indices for the revised CFA model were reasonable ($\chi^2 = 509$, $df = 164$, $p < .001$; comparative fit index [CFI] = .95; Tucker–Lewis index [TLI] = .94; root mean square error of approximation [RMSEA] = .06); however, modification indices identified a substantial correlation between the residuals of two indictors from the Mobilizer Skill construct. Modeling the correlation ($r = .60$) substantially improved model fit ($\chi^2 = 315$, $df = 163$, $p < .001$; CFI = .98; TLI = .97; RMESA = .04). Subsequent modifications could provide only negligible improvements in model fit. Computation of higher-order fit indices following procedures outlined by Marsh (1991) indicated the second-order coalition functioning construct adequately described intercorrelations between the first-order factors (higher-order CFI = .99; higher-order TLI = .99). We also examined whether a single coalition functioning factor could account for the correlations between all items with the first-order coalition functioning constructs removed. Model fit was poor when the first-order factors were removed ($\chi^2 = 3{,}417$, $df = 169$, $p < .001$; CFI = .48; TLI = .42; RMESA = .17).

Internal Consistency

Table 1 provides data on the number of items and Cronbach's alpha coefficient for all scales in 2010. The deletion of items that did not meet EFA factor loading criteria from the Community Support, Coalition Leadership Style, Cohesion, and Sustainability Planning scales did not lead to lower alpha values, and the Coalition Efficiency alpha increased from .77 to .89. The addition of a new item in 2010 to the Coalition Efficiency scale further increased the alpha to .94. The additional item in the Coalition Leadership Style scale increased the alpha in 2010 from .81 to .85.

Coalition Functioning Scale Correlations

Table 2 provides intercorrelations between each of the coalition functioning scales and a measure of Overall Coalition Functioning. To create an Overall Coalition Functioning

Table 2. Correlations Between Coalition Functioning Scales in 2010 (n = 582-641)

Coalition Functioning Domain: Coalition Functioning Scale	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Overall coalition functioning	—											
Leadership domain:												
(2) Coalition leadership style[d]	.73	—										
(3) Coalition leadership competence[nd]	.75	.74	—									
(4) Mobilizer skill[d]	.73	.51	.66	—								
Interpersonal relationships domain:												
(5) Cohesion[nd]	.71	.64	.65	.58	—							
(6) Conflict[nd]	.47	.42	.49	.50	.55	—						
(7) Staff–board communication[nd]												
Task focus domain:												
(8) Coalition efficiency[d]												
(9) Coalition directedness[nd]									—			
Participation benefits and costs domain:												
(10) Participation benefits[d]									.45	—		
(11) Participation difficulties[d]									–.06	.03	—	
(12) Sustainability planning domain/scale[d]									.48	.35	–.02	—
(13) Community support domain/scale[d]									.53	.37	–.06	.46

(12) Sustainability planning and (13) Community support are not part of the Participation benefits and costs domain. Instead they are their own domains and should not be tabbed in like the Participation benefits and Participation difficulties scales.

Note. If $r > .15$, $p < .001$. If $r > .08$, $p < .05$.
d. Scale is empirically distinct (in bold font).
nd. Scale is not empirically distinct (not in bold font).

scale, we computed the mean of the six empirically distinct coalition functioning scale scores that maintained a significant loading on the second-order coalition functioning variable in the hierarchical CFA (Coalition Leadership Style, Sustainability Planning, Mobilizer Skill, Coalition Efficiency, Community Support, Participation Benefits). Intercorrelations ranged from .28 to .51 for the empirically distinct scales (excluding Participation Difficulties). Participation Difficulties was not significantly related to any coalition functioning scale except Conflict (r = .16). When including the nondistinct scales, intercorrelations ranged from .21 to .74.

Convergent Validity

Table 3 provides correlations between both empirically distinct and nondistinct coalition functioning scales and the five criterion variables for construct validity: CTC Fidelity, Technical Assistance Needed, Barriers Experienced that interfere with coalition success, Coalition Attrition, and Perceived Community Improvement due to CTC. Among the distinct scales, Mobilizer Skill had the strongest relation to CTC Fidelity (r = .56); however, the nondistinct Coalition Directedness and Coalition Leadership Competence scales both maintained stronger relations with CTC Fidelity (r = .75 and .65, respectively). Coalition Directedness and Coalition Leadership Competence also maintained the strongest relations with Technical Assistance Needed (r = –.38 and r = –.36, respectively). Among the distinct scales, Community Support maintained the largest correlation with Technical Assistance Needed (r = –.33). Community Support also had the largest overall correlation with Barriers Experienced (r = .56) and Community Improvement (r = .57). The only coalition functioning scale significantly associated with Coalition Attrition was Participation Benefits (r = –.38). Participation Difficulties was the only coalition functioning scale that generally maintained weak relations with the criterion variables for construct validity and was the only coalition functioning construct lacking a significant relation with CTC Fidelity and Community Improvement. Relative to the coalition functioning scales, the Overall Coalition Functioning aggregated measure had strong correlations with CTC Fidelity (r = .68), Barriers Experienced (r = –.56), and TA Needed (r = –.32). Furthermore, Overall Coalition Functioning had a stronger correlation with Community Improvement (r = .62) than did any of the separate coalition functioning scales that comprised it.

Discussion

The refined coalition functioning measures demonstrated strong psychometric properties as reliable and stable constructs that represent empirically distinct but interrelated aspects of coalition functioning. Hierarchical CFA analyses indicated item intercorrelations both cluster into the identified scales and share some common cross-scale variance represented by the overarching coalition functioning construct. Thus, findings indicated that there was an overall construct of coalition functioning, with distinct components that overlap only in their shared relation to overall coalition functioning.

Furthermore, the overall coalition functioning measure and its scales demonstrated strong relations with several criterion

Table 3. Correlations Between Coalition Functioning Scales and Related Constructs in 2010 (n = 577-630)

Coalition Functioning Domain: Coalition Functioning Scale	CTC Fidelity	Barriers	TA Needed[a]	Cmty. Improve[b]	Coalition Attrition[c]
Overall coalition functioning	.68**	−.56**	−.32**	.62**	−.22
Leadership domain:					
Coalition leadership style[d]	.52**	−.39**	−.27**	.40**	−0.02
Coalition leadership competence[nd]	.65**	−.49**	−.36**	.49**	−.14
Mobilizer skill[d]	.56**	−.44**	−.26**	.42**	0.01
Interpersonal relationships domain:					
Cohesionn[d]	.48**	−.45**	−.29**	.38**	−.23
Conflict[nd]	−.37**	.34**	.23**	−.29**	.16
Staff–board communication[nd]	[illegible]	[illegible]	[illegible]	.40**	−.19
Task focus domain:					
Coalition efficiency[d]				.30**	−0.25
Coalition directedness[nd]				.49**	−.21
Participation benefits and costs domain:					
Participation benefits[d]				.41**	−.38*
Participation difficulties[d]				−0.02	−0.05
Sustainability planning domain/scale[d]				.49**	−0.22
Community support domain/scale[d]				.57**	−0.17

(12) Sustainability planning and (13) Community support are not part of the Participation benefits and costs domain. Instead they are their own domains and should not be tabbed in like the Participation benefits and Participation difficulties scales.

Note. CTC = Communities That Care; TA = technical assistance.
a. Technical assistance needed.
b. Perceived community improvement.
c. n = 44 because analysis is at the organizational level.
d. Scale is empirically distinct (in bold font).
nd. Scale is not empirically distinct (not in bold font). **[AQ: 5]**

variables for construct validity. Most coalition functioning scales had sizable associations with Perceived Community Improvement, Barriers Experienced, Technical Assistance Needed, and CTC Fidelity. However, Community Support may be particularly important as it had the largest correlation with Barriers Experienced and Perceived Community Improvement. Previous research has similarly identified the value of strong community linkages (Butterfoss et al., 1996; Florin et al., 2000). Coalitions seeking to improve Community Support may look to recruit coalition members who are well connected and increase communication with the community. Coalition Directedness may also be a particularly important aspect of coalition functioning, as it had the largest relation with CTC Fidelity and Technical Assistance Needed. The importance of Coalition Directedness is corroborated by previous research (Kegler et al., 1998; Shortell et al., 2002). Coalitions may be able to enhance Coalition Directedness through the development of a consensus statement explicating vision, goals, and decision-making procedures. The only criterion variable most coalition functioning constructs were not significantly related to was Coalition Attrition. Although there are many potential explanations for this finding, one important factor is that Coalition Attrition is a coalition-level variable. The power to detect significant correlations at the coalition level is substantially smaller than at the individual level (n = 44 vs. n = 582).

Empirically Distinct and Nondistinct Coalition Functioning Scales

Analyses enabled the identification of empirically distinct and nondistinct coalition functioning scales. Empirically distinct scales included Coalition Leadership Style, Mobilizer Skill, Coalition Efficiency, Community Support, Participation Benefits, Participation Difficulties, and Sustainability Planning. These more distinct scales are likely to be particularly useful for examining how unique aspects of coalition functioning predict different indicators of coalition success. The distinct scales represent each of the six conceptual domains except for the interpersonal relationships domain. Strong interpersonal relationships and effective communication may be central to all aspects of coalition functioning and thus difficult to empirically distinguish from other domains.

Scales that were not empirically distinct also demonstrated strong relations with criterion variables for construct validity, especially Coalition Directedness and Coalition Leadership Competence. Although these scales had empirical overlap with the distinct scales, they remain conceptually distinct aspects of coalition functioning. Strategic plans to enhance the aspects of coalition functioning that are not empirically distinct may still be different from plans designed to enhance empirically distinct aspects of coalition functioning. Because the scales are still related to coalition success,

efforts to improve on nondistinct aspects of coalition functioning should still promote coalition success.

Participation Benefits and Costs

The two new scales developed in 2010 (Participation Benefits and Participation Difficulties) were both empirically distinct. The Participation Benefits scale is a useful addition to the coalition functioning tool because it was the only scale significantly associated with Coalition Attrition. This finding is consistent with previous research, which had identified participation benefits as an important predictor of coalition attendance and involvement (Chinman et al., 1996; Prestby et al., 1990). Coalitions that undertake participation incentive and cost management efforts may be able to improve member attendance and involvement (Chinman et al., 2005).

The Participation Difficulties scale was internally consistent but not related to any other coalition functioning scales. Furthermore, it maintained little to no relation with the criterion variables for construct validity. This finding is different from previous research that identified perceived participation difficulties as a correlate of attendance and involvement in community coalitions (Chinman et al., 1996; Prestby et al., 1990). Findings may be different because this study used the coalition-level construct of coalition attrition, whereas previous research used individual-level measures of coalition participation. Additionally, there are differences in the measurement of participation difficulties. In this study, the Participation Difficulties scale asked about how much CTC interfered with work responsibilities, family life, and personal free time. Studies from both Chinman et al. and Prestby et al. used a larger number of participation difficulty items, inquiring about difficulties unmeasured in this study, such as feeling unwelcome at meetings, having problems with transportation, and disagreeing with the goals of the coalition. Future research needs examine which participation difficulties are most predictive of coalition involvement and attrition.

Implications for Practitioners

By creating a refined coalition web-based self-report questionnaire, it is possible to provide coalitions and technical assistance providers with more accurate feedback that they can use to improve coalition functioning. Such feedback reports and accompanying self-review forms can provide coalitions with a structured process to interpret survey results and develop strategic plans that can successfully improve local coalition functioning. Technical assistance providers can facilitate the feedback process to ensure the development of concrete and realistic action plans for coalition success.

Strengths, Limitations, and Future Research

The present study used 6 years of data from a statewide implementation of CTC to examine and refine a coalition functioning instrument. The analysis of several years of data on multiple coalition functioning scales is a major strength of this study, which rarely exists in the field. This second-generation instrument provides reliable and valid measures of numerous coalition functioning constructs that are associated with several criterion variables that indicate construct validity. Future measurement development efforts may identify additional distinct and important aspects of coalition functioning, some of which may be particular to certain types of coalitions.

The empirically distinct scales described here can be used in research aimed at identifying which aspects of coalition functioning have the strongest influence on coalition success. Future research should examine relations between the coalition functioning constructs and intermediate outcomes such as systems change, program implementation, and policy reform. Such studies can help identify the complex longitudinal paths that connect coalition functioning to improved health outcomes.

Coalition self-report questionnaires are limited by their sole reliance on self-reported data. Measurement of the constructs through other perspectives such as those of trained observers or technical assistance providers would provide valuable comparison data. Such data could help improve understanding of social desirability biases and aid in the identification of constructs that are empirically distinct from both insider and outsider perspectives.

A key limitation of the existing instrument is that it has been used primarily by CTC coalitions and all psychometric analyses are based on data from CTC coalitions in Pennsylvania. We do not know if the psychometric properties identified in this study are similar across settings and with different types of coalitions. Future studies in different geographical settings with coalitions using other models and focused on issues other than substance abuse and delinquency are needed. Such studies may help distinguish universally important aspects of coalition functioning from those that are specific to certain contexts.

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Authors' Note

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