COMMUNITY-BASED APPROACHES TO PREVENTION: LINKING COALITION CAPACITY, COMMUNITY READINESS, AND IMPLEMENTATION TO REDUCTIONS IN ADOLESCENT ALCOHOL USE

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ABSTRACT

Sean M. Hanley: Community-based Approaches to Prevention: Linking Coalition Capacity, Community Readiness, and Implementation to Reductions in Adolescent Alcohol Use
(Under the direction of J. Michael Bowling)

Background: The adverse consequences of adolescent alcohol use are substantial and varied. Community-based approaches to prevention have gained favor over the past 30 years, and the use of coalitions has become a popular model by which to plan and implement interventions. Although theory suggests that coalition capacity and community readiness are likely to affect the quality of implementation and the efficacy of the interventions, empirical work in this regard is lacking.

Methods: Using data from an evaluation of the Vermont Strategic Framework State Incentive Grant, a theory-based multiple mediation model was tested that examined the direct effects of coalition capacity and community readiness, and the mediated effects of intervention comprehensiveness, evidence base, and fidelity of implementation, on past-month alcohol use and binge alcohol use among high school students in 24 intervention communities. Coalition and community member surveys were used to collect data on coalition characteristics and community readiness, data from progress reports were abstracted to measure implementation characteristics, and Youth Risk Behavioral Surveillance System survey data was used to measure past-month use. It was hypothesized that greater levels of coalition capacity and community readiness would lead to greater reductions in alcohol and binge alcohol use over time and that implementation characteristics would mediate these relationships.

Results: Significant effects of coalition capacity on alcohol use were found, although no significant mediators of this relationship emerged. There were no significant effects on binge alcohol use. Exploratory analyses indicated that the total number of interventions implemented significantly mediated the relationship between readiness and reductions in binge alcohol use.

Discussion: This study provides an empirical test of theoretical relationships commonly proposed in the community-based substance use prevention literature. One hypothesis was supported and the results of exploratory analyses identified a new, potentially important mediating factor. Improvements in measures and the application of the proposed mediation models to larger studies are needed to improve our understanding of the mechanisms operating in communities that produce behavioral change.

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LIST OF ABBREVIATIONS

ADAP	Alcohol and Drug Abuse Programs
CBO	Community-based organization
CDC	Centers for Disease Control and Prevention
CE&F	Comprehensiveness, effectiveness, and fidelity
CRM	Community Readiness Model
CSAP	Center for Substance Abuse Prevention
CTC	Communities That Care
MLDA	Minimum legal drinking age
MPP	Midwestern Prevention Project
RWJF	Robert Wood Johnson Foundation
SAMHSA	Substance Abuse and Mental Health Services Administration
SEM	Structural equation modeling
SEW	State Epidemiology Workgroup
SIG	State Incentive Grant
SPF	Strategic Prevention Framework
SPF SIG	Strategic Prevention Framework State Incentive Grant
VT SPF SIG	Vermont Strategic Prevention Framework State Incentive Grant
YRBS	Youth Risk Behavior Surveillance System

CHAPTER 1: INTRODUCTION

Alcohol continues to be the most widely used substance by adolescents in the United States. According to 2013 data from Monitoring the Future, about 26% and 39% of 10th and 12th grade students, respectively, reported using alcohol in the past 30 days, while about 14% and 22% reported binge drinking in the past two weeks (Monitoring the Future 2013a; Monitoring the Future 2013b). By the time they reach 12th grade, nearly 70% have initiated alcohol use (Monitoring the Future 2013c). Although the overall trend in adolescent alcohol use has been declining over the past two decades, these figures nonetheless represent reasons for concern.

The adverse consequences of adolescent alcohol use are substantial and varied. It is estimated that the economic cost of underage alcohol use in the U.S., as measured by medical costs, lost work productivity, and pain and suffering, totaled $62 billion in 2010, or $1.29 per drink consumed. The majority of these costs are attributable to violence and crime perpetration, motor vehicle crashes, and risky sexual behavior. In 2009, nearly one million violent crimes, 38,000 motor vehicle fatalities and injuries, and 28,000 unplanned pregnancies resulted from underage alcohol use (UDETC 2011). The consequences of underage alcohol use, however, are not confined to adolescence. Those who initiate use before the age of 15 are four to five times as likely to develop alcohol dependency in adulthood compared to those who wait until age 21 (Grant and Dawson 1997; SAMHSA 2004). Preventing alcohol use and its attendant consequences in adolescence, therefore, remains an important public health priority. This study examines the effectiveness of efforts to prevent adolescent alcohol use in the context of community-based environmental interventions implemented throughout the state of Vermont.

A variety of approaches to preventing underage drinking have emerged over the past few decades, including school- and family-based programs, environmental interventions such as policies restricting access to alcohol, and community-based approaches that often involve a combination of school, family, and environmental interventions. Community-based interventions have gained

favor over the past 30 years for both practical and theoretical reasons. In the case of the former, communities have seen the burden of alcohol use prevention fall largely on their shoulders as funding and priorities have shifted in the face of alcohol deregulation (e.g., alcohol retail privatization) at the state and federal levels (Roussos and Fawcett 2000; Giesbrecht and Haydon 2006; Giesbrecht 2007). Communities, as a result, began to seek local solutions for problems occurring within the community. In the case of the latter, the use of community-based approaches has been driven by theoretical assumptions that, while intuitively appealing, have not been well explicated and remain largely untested. The use of coalitions, for example, is a common approach used in community-based prevention efforts because it brings together multiple sectors of the community whose collective resources can be harnessed to address a common purpose, providing leverage that would otherwise be unavailable to a single community organization (Flewelling, Austin et al. 2005). The empirical evidence in support of coalition efforts, however, is equivocal with respect to changes in health behavior and outcomes. What is even less understood are the characteristics of coalitions that are associated with changes in health behavior and the mechanisms by which these characteristics affect change. One such characteristic is capacity, which has been defined by some as the ability of the coalition to identify, mobilize, and address health or social issues within the community (Goodman et al. 1998).

There is also little knowledge of how community readiness is associated with changes in outcomes and the mechanisms that elicit these changes. Readiness, which refers to the extent to which a community is psychologically and behaviorally prepared to implement an intervention (Chilenski, Greenberg et al. 2007; Weiner, Amick et al. 2008), or more simply the climate for implementation in the community (Stith, Pruitt et al. 2006), is seen as an important antecedent to effective community-based prevention. Because community-based interventions typically require the buy-in and support of community members for successful implementation, the underlying hypothesis is that communities that are psychologically and behaviorally prepared for prevention efforts may experience greater improvements in health indicators compared to those exhibiting less readiness. Although some conceptual progress has been made and methods have been developed to measure the construct (Oetting, Donnermeyer et al. 1995), its relationship to and

mechanisms by which it affects changes in health behavior is even less understood than that of coalition capacity. Few empirical studies have examined its relationship to outcomes, and those that have done so have been hampered by methodological shortcomings (Feinberg, Greenberg et al. 2004; Parker, Alcaraz et al. 2011) and a focus on proximal outcomes (e.g., perceived coalition functioning) (Hays, Hays et al. 2000; Feinberg, Greenberg et al. 2004) rather than changes in health behavior. There also appear to be no empirical studies that propose and test the mechanisms by which readiness may affect outcomes.

Most of the work on coalition capacity and community readiness thus far has focused on "upstream" relationships. The literature, for example, is replete with studies that identify factors that enhance coalition capacity or community readiness (Kegler, Steckler et al. 1998; Bowen, Martin et al. 2000; Hays, Hays et al. 2000; Nargiso, Friend et al. 2013). Capacity and readiness are, therefore, conceptualized in these instances as the dependent variable or the outcome of interest. Far fewer, however, have examined them as predictors of outcomes, particularly health behavioral outcomes (Zakocs and Edwards 2006), in a methodologically rigorous manner that allows for causal relationships to be implied.

One possible explanation for this has been the lack of a theoretical framework that explicitly ties coalition characteristics and community readiness to health behavior outcomes and proposes the mechanisms by which these relationships operate. Two frameworks, however, provide some guidance in this regard and form the basis for the hypotheses to be tested in the present study. The first of these is the Community Problem-Solving and Change Framework developed by the Community Anti-Drug Coalitions of America (Yang, Foster-Fishman et al. 2012) to explain how community coalitions operate to affect change in population-level health outcomes. It formalizes what has often been assumed but untested in the literature: that higher levels of coalition capacity improve the ability of the coalition to plan a comprehensive prevention approach in the community, which, in turn, leads to community-level changes (e.g., implementation of prevention activities), which then lead to improvements in population health. The second theoretical framework relevant to the current study is the Model of Coalition Functioning developed by Feinberg and colleagues (2004) in their evaluation of the Communities that Care

program in Pennsylvania. It shares conceptual similarities with the Community Problem-Solving and Change Framework, but it moves the field forward by suggesting that the selection and quality of implementation of interventions also mediates the community readiness-outcomes relationship.

The current study empirically tests these relationships. Specifically, the comprehensiveness and effectiveness (i.e., evidence base) of strategies implemented in the community are two mediators examined. Strategies that address multiple levels of influence on behavior are more likely to affect changes than are those that are more limited in scope (Roussos and Fawcett 2000; Hingson, Zakocs et al. 2005; Yang, Foster-Fishman et al. 2012). Likewise, those strategies that have prior evidence of their effectiveness can reasonably be expected to affect change more so than those that do not. A vast body of literature related to the development and evaluation of interventions designed to prevent a wide variety of health problems has emerged, including adolescent alcohol use (Spoth, Greenberg et al. 2009), and many compendia now exist that attempt to describe the strength of the evidence supporting their effectiveness (Anderson, Chisholm et al. 2009; Babor, Caetano et al. 2010; Administration 2013; CDC 2013b; Center for the Study and Prevention of Violence 2013; Nelson, Xuan et al. 2013).

The third dimension that will be examined as a mediator is the fidelity with which strategies are implemented. Fidelity has been defined in various ways in the prevention literature, but is generally understood to be the degree to which the intervention was implemented as intended by the developers (Mihalic 2004; Carroll, Patterson et al. 2007; Breitenstein, Gross et al. 2010). The underlying assumption is that intervention activities that are implemented with greater fidelity will lead to more favorable outcomes than those that are implemented with less fidelity.

The data for the current study come from the Strategic Prevention Framework State Incentive Grant in Vermont, which was a 5-year community-based intervention implemented in 24 communities throughout the state designed to prevent substance use and its consequences among youth and young adults. Communities implemented a wide variety of intervention activities during the course of the project, many of which were environmental strategies designed to affect population-level indicators of use and consequences. Available measures also include those of

interest for the current study, specifically coalition capacity, community readiness, and implementation comprehensiveness, effectiveness, and fidelity.

Specific Aims

The study's specific aims, which are presented below, address some of the existing gaps in our understanding of community-based substance use prevention approaches. Note that not all grantees in the current project were coalitions, but in some instances were community-based organizations (CBOs). For ease of discussion, the term "coalition" is used to describe both coalitions and CBOs.

Aim 1: Examine whether coalition capacity and community readiness are related to changes over time in current and binge alcohol use among adolescents.

Aim 2: Examine whether any observed relationships between coalition capacity, community readiness, and changes over time in adolescent current and binge alcohol use are mediated by the comprehensiveness, effectiveness, and fidelity of implementation of the chosen strategies.

Conceptual Model

Figure 1 below presents the conceptual model that guides the current study. It integrates elements of both the Community Problem-Solving and Change Framework and the Model of Coalition Functioning, but differs from those two frameworks in a couple of important ways. First, the model below explicitly identifies the comprehensiveness, effectiveness, and implementation fidelity of strategies as mediators of both coalition capacity and community readiness. This addresses one of the important gaps in the current literature, which is a better understanding of how these two constructs affect health outcomes. And, second, unlike the Model of Coalition Functioning, it does not view community readiness as an antecedent to coalition capacity, but rather views the two constructs as working together to affect health outcomes through common mediators. This suggests that capacity and readiness are not causally related, but rather may exert independent effects on the outcomes through a common set of factors, thus allowing for a richer examination of the role of the proposed mediators.

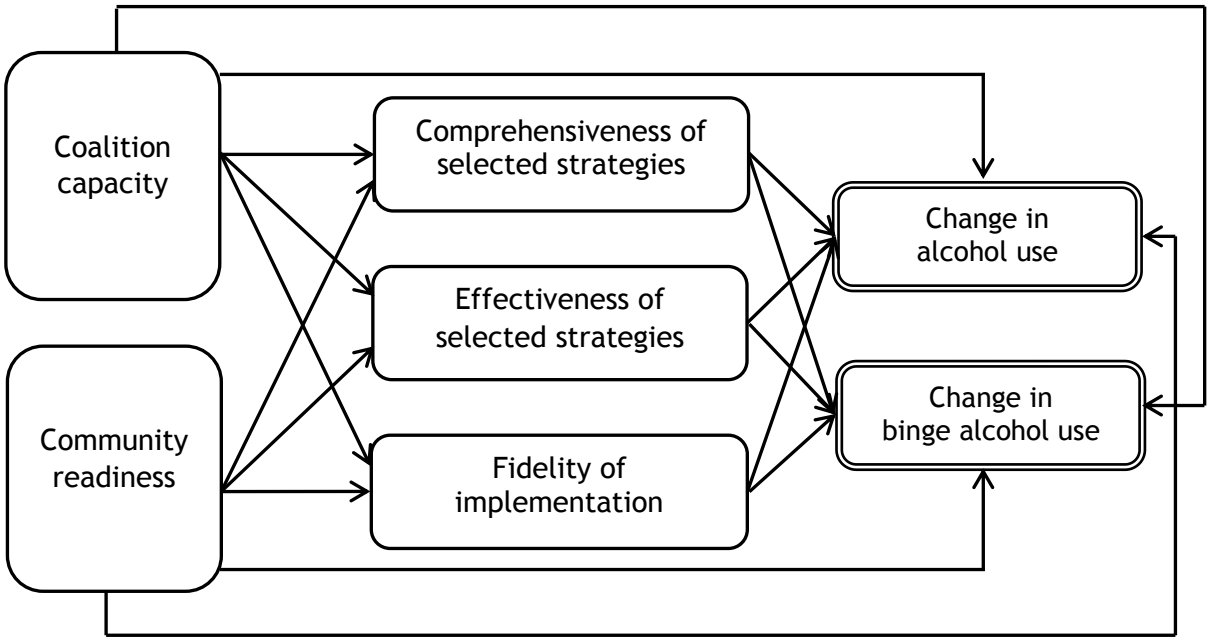

Figure 1. Conceptual model.

Hypotheses

The specific aims and conceptual model give rise to the study's hypotheses, which are presented below.

Hypothesis 1: There will be larger relative reductions over time in the prevalence of current and binge alcohol use in communities with coalitions that have higher levels of *capacity* compared to communities with coalitions that have lower levels of *capacity*.

Hypothesis 2: There will be larger relative reductions over time in the prevalence of current and binge alcohol use in communities characterized by higher levels of *readiness* compared to communities characterized by lower levels of *readiness*.

Hypothesis 3: The relationship between *capacity* and reductions in current and binge alcohol use will be mediated by the comprehensiveness, effectiveness, and fidelity (CE&F) of strategies, such that *capacity* will be positively associated with CE&F, and CE&F will, in turn, be associated with greater relative reductions in prevalence of use.

Hypothesis 4: The relationship between *readiness* and reductions in current and binge alcohol use will be mediated by the CE&F of strategies, such that *readiness* will be positively associated with CE&F, and CE&F will, in turn, be associated with greater relative reductions in prevalence of use.

The Vermont Strategic Framework State Incentive Grant (VT SPF SIG), the project from which data for the current project are drawn, provides a valuable opportunity to test these hypotheses and consequently make significant contributions to our understanding of how community-based interventions affect population-level health behaviors. There are a number of aspects of the VT SPF SIG that make it particularly well-suited for testing these hypotheses. First, preliminary evidence from the main outcome evaluation has shown that the intervention had significant positive effects on binge alcohol use and, although non-significant, effects on current alcohol use that were in a favorable direction. Thus, unlike many other community-based substance use prevention efforts that have produced disappointing or null results, there is an opportunity in the current study to explore why the intervention appears to have worked. Second, the study draws upon previous theoretical frameworks to develop a conceptual model that will guide the hypotheses. Many community-based interventions have lacked an explicit theoretical foundation (Weiss 1995; McLeroy, Norton et al. 2003). Third, for each community, there exist theory-informed measures of both coalition capacity and community readiness that have built upon prior theoretical and measurement work in these areas. Fourth, there also exist measures of fidelity of implementation for every intervention activity in each of our communities. The extant literature strongly points to a positive relationship between fidelity and outcomes (Mihalic 2004; Durlak and DuPre 2008), but many evaluations of community-based interventions have not collected fidelity data, particularly in cases where there is wide variation in the interventions implemented both within and between communities (Rindskopf and Saxe 1998). Fifth, the 24 intervention communities in the VT SPF SIG, which comprise the units of analysis for the current study, constitute a larger sample size of communities than other similar studies. The empirical evidence supporting the effectiveness of community-based efforts has been hampered by a lack of sufficient sample sizes (i.e., number of communities) and a reliance on case studies of single communities (Rindskopf and Saxe 1998). Sixth, unlike many studies that have relied on proximal outcomes such as perceptions of coalition functioning (Hays et al. 2000; Feinberg et al. 2004; Allen 2005), the current study is able to examine effects on current and binge alcohol use, which have direct public health relevance. Seventh, the serial cross-sectional nature of the outcome data

allow for the examination of changes in the prevalence of current and binge alcohol use over time. Furthermore, the measures of coalition capacity, community readiness, and intervention comprehensiveness, effectiveness, and implementation fidelity precede the measurement of the change in prevalence of use, allowing the temporality of the relationships between the independent and dependent variables to be established. The vast majority of similar investigations have been hindered by cross-sectional designs that have not allowed for such causal inferences to be made (Feinberg, Greenberg et al. 2004; Zakocs and Edwards 2006; Nargiso, Friend et al. 2013). And finally, preliminary results from the main outcome evaluation of the VT SPF SIG indicate a positive bivariate relationship between coalition capacity, fidelity, and reductions in current and binge alcohol use, which lends support to the utility of examining the relationships proposed here. By doing so, the study will help to address critical gaps in the literature that currently inhibit our understanding of community-based interventions and optimal ways by which to address adolescent alcohol use.

CHAPTER 2: BACKGROUND AND SIGNIFICANCE

Communities are well-justified in implementing prevention efforts to curb adolescent alcohol use. It is estimated that nearly 10 million underage youth report drinking alcohol in the past month (Brewer 2013). Those who do are at an increased risk for use of other drugs (Kirby and Barry 2012), violence perpetration and victimization (Waller, Iritani et al. 2012), unintentional injury (Hingson and Winter 2003), unsafe sexual behaviors (Dunn, Bartee et al. 2003), poor school performance (Miller, Naimi et al. 2007), and dependency in adulthood (Hingson, Heeren et al. 2006).

Excessive alcohol use is largely responsible for the health and social consequences associated with alcohol use. Excessive use refers to either heavy drinking, defined as more than one drink per day for women and more than two drinks per day for men, or binge drinking, defined as four or more drinks on one occasion for women and five or more drinks on one occasion for men. According to estimates from the Centers for Disease Control and Prevention, 80,000 deaths per year in the United States can be attributed to excessive alcohol use, nearly 5,000 of which are among those under the age of 21. These figures translate to 2.4 million and 280,000 potential years of life lost, respectively (CDC 2013a). Excessive drinking was responsible for $223 billion in costs in 2006, a 50% increase since 1992 (Brewer 2013). This total is higher than the costs associated with both smoking ($193.5 billion) and physical inactivity ($150 billion) (Bouchery, Harwood et al. 2011).

Who bears theses costs? It is estimated that the federal government ultimately paid $41 billion, or 18% of the $223 billion total in 2006. State and local governments, however, paid a higher proportion, estimated to be $54 billion, or nearly a quarter of the total costs (Bouchery, Harwood et al. 2011). Clearly, the health and social costs of alcohol use are substantial. Given the toll these costs exert on communities, it is not surprising that they have turned to local solutions to address the problem of adolescent alcohol use.

Previous Approaches to Preventing Adolescent Alcohol Use

A variety of approaches have been used to address adolescent alcohol use in the U.S., dating as far back as the post-Prohibition era in the 1930's in which the authority to set alcohol policy rested with individual states. In an effort to regulate the consumption of alcohol, many states established minimum legal drinking age (MLDA) laws, which are still today among the most visible and successful efforts to prevent underage alcohol use (Maisto and Rachal 1980). By the 1970's, however, many states began to lower the MLDA to 18 years of age. In response to the resulting increases in alcohol-related traffic fatalities and other adverse consequences, the federal government passed the National Minimum Drinking Age Act of 1984, which required states to set their minimum drinking age at 21 or face a 10% decrease in their federal highway dollars. By 1988, all 50 states and the District of Columbia had adopted the minimum legal drinking age of 21. Reductions in alcohol use prevalence and alcohol-related traffic fatalities followed, but by the early 1990's, these gains began to abate (IOM 2004), necessitating the development of novel prevention approaches.

A number of prevention efforts aimed at adolescent alcohol use have emerged over the past two decades. Although no comprehensive taxonomy currently exists, these approaches may be differentiated by the setting in which they are implemented (e.g., school, family, community), the socioecological level of influence targeted (e.g., intrapersonal, interpersonal, environmental), the nature of the intervention components implemented (e.g., curricula, policy), or even intervention targets specific to market-based considerations (e.g., supply- or demand-side economics). The evidence for the effectiveness of these approaches varies greatly, however, and may be partially due to a lack of consensus on appropriate outcome measures (Feinberg, Greenberg et al. 2004; Flewelling, Paschall et al. 2004), study designs that do not rule out competing explanations such as strong secular trends (Bauman, Suchindran et al. 1999; Flewelling, Austin et al. 2005; Saxe, Kadushin et al. 2006; Flewelling, Grube et al. 2012), contamination or a lack of suitable control communities (Grube 1997; Collins, Johnson et al. 2007), poor implementation fidelity (Hallfors et al. 2002; Collins, Johnson et al. 2007; Durlak and DuPre 2008; Durlak, Weissberg et al. 2011), use of inadequate methodologies (Rindskopf and Saxe 1998; Collins,

Johnson et al. 2007), or simply not being subjected to rigorous evaluation. Although a comprehensive review of alcohol use interventions for adolescents is outside the purview of the current study, a brief discussion of common types of approaches, differentiated by the setting in which they are implemented, follows, along with a description of the available evidence supporting their effectiveness.

School-based Interventions

Schools comprise one of the most common settings in which underage alcohol use interventions are delivered, particularly in the form of classroom curricula. This setting is attractive for prevention efforts because the target audience is readily accessible and captive, implementation of prevention curricula can be standardized and incorporated into existing health education classes thereby promoting sustained use of the curriculum, training of teachers and other school personnel can be standardized, and evaluation activities such as student surveys and randomization of classrooms or schools can be readily carried out.

Schools are also a logical setting in which to conduct prevention efforts because of the strong influence of peer use and assessments of social norms on adolescents' alcohol use (Ennett 2006; Simons-Morton 2007). In their social network analysis of 5,000 students in three public school systems, for example, Ennett and colleagues (2006) found that those adolescents whose best friend was a current alcohol user were 3-4 times as likely to be current users themselves as those whose best friend was not a current user. There is also emerging evidence that school context can affect alcohol use independent of the effect of peers or norms (Ennett, Flewelling et al. 1997; Aveyard, Markham et al. 2004; Aveyard, Markham et al. 2004; O'Malley, Johnston et al. 2006; Bisset, Markham et al. 2007). Bisset, Markham, and Aveyard (2007), for example, found that students in schools with school cultures characterized by appropriate levels of student support and control were 13% less likely to report current alcohol use in 7th grade compared to those in schools characterized by cultures with less support and control.

Because alcohol use often occurs in social contexts, many school-based curricula have been developed to address the influence of peers and social context on use. Multiple systematic reviews

and meta-analyses of the school-based prevention literature have identified a variety of characteristics that differentiate curricula with varying degrees of effectiveness. One of the most common characteristics of effective curricula are those that employ a "social influences" approach by targeting students' normative beliefs, skills for resisting offers to use, and beliefs about the social consequences of use (Botvin, Baker et al. 1990; Tobler and Stratton 1997; Wilson, Gottfredson et al. 2001; Cuijpers 2002; Gottfredson and Wilson 2003; Catalano, Berglund et al. 2004). Although there is general agreement that such curricula can be effective in preventing adolescent alcohol use (Tobler and Stratton 1997; Gottfredson and Wilson 2003), the effect sizes are often small (Wilson, Gottfredson et al. 2001). There also exist many curricula that solely target knowledge and attitudes, an approach that has largely been shown to be ineffective but in wide use nonetheless (Ringwalt, Vincus et al. 2009). The effectiveness of school-based curricula may also be hampered by attrition and disengagement of substance-using adolescents, thereby inhibiting the ability of curricula to reach those most in need (Grube 1997). Furthermore, the evidence base surrounding curricula previously thought to be effective has had to be reconsidered in some cases because of null or transient effects found in subsequent evaluations (Komro, Perry et al. 2008; Center for the Study and Prevention of Violence 2009; Ringwalt, Clark et al. 2010). In short, although school-based curricula have perhaps been subjected to evaluation more so than any other substance use prevention approach, it is difficult to draw definitive conclusions about their effectiveness in preventing underage alcohol use. The body of evidence, however, suggests a modest positive effect.

Family-based Interventions

The development of family-based interventions has lagged behind school-based interventions, partially because of the time commitment and logistical difficulties involved in engaging parents in prevention activities (Bauman, Foshee et al. 2001; Kumpfer, Alvarado et al. 2003). A body of evidence that has emerged over the past 20 years, however, suggests that such interventions can be effective in preventing adolescent substance use, particularly because of the family's role as the primary unit of socialization (NIDA 1998). In the evaluation of their Family

Matters program, Bauman and colleagues (2001) found that families receiving the intervention, which consisted of four activity booklets mailed to the home and follow-up telephone discussions with health educators after completion of each booklet, had 16% fewer adolescents who initiated smoking at one-year follow up compared to control families. Although the effect size of d=0.15 was modest, it is comparable to those found in rigorously-evaluated school-based substance use prevention programs. Spoth and colleagues (2004) conducted a controlled trial of two other family-based programs, the Iowa Strengthening Families Program and Preparing for the Drug Free Years, and assessed the effects of the two programs against a control condition. Both programs had previously been found to have positive effects on adolescent substance use (NIDA 1998; Molgaard and Spoth 2001) and were again found to have effects, even at follow-up intervals of 2.5 years (Spoth, Reyes et al. 1999), 4 years (Spoth, Redmond et al. 2001), and 6 years (Spoth, Redmond et al. 2004) past baseline. A controlled trial conducted by the developers of Familias Unidas, a parent-centered intervention aimed at preventing substance use and risky sexual behavior among Hispanic adolescents, found a significant decrease in past 30-day substance use for those in the intervention group compared to a control group (Pantin, Prado et al. 2009).

Family-based programs such as those cited above may be delivered in the home (Bauman 2001), in school settings after hours (Spoth, Redmond, Shin, and Azevedo, 2004), or using a combination of both (Pantin, Prado et al. 2009), and may use individual or group sessions to enhance parenting and communication skills, promote parent-child bonding, or employ cognitive behavioral strategies (NIDA 1998; Bauman, Foshee et al. 2001; Kumpfer, Alvarado et al. 2003; Pantin, Prado et al. 2009). Like effective school-based programs, they rely on theory-based approaches to address social influences of use (Bauman, Foshee et al. 2001), use interactive rather than didactic strategies (NIDA 1998; Kumpfer, Alvarado et al. 2003), focus on skill development (NIDA 1998; Catalano, Berglund et al. 2004; Spoth, Redmond et al. 2004), and attempt to bolster protective factors while reducing risk factors associated with use (Spoth, Redmond et al. 2004). The risk and protective factors they target, however, are often different than those targeted by school-based curricula given the former's focus on the family context. Three protective factors offering particular promise include positive parent-child relationships, parental monitoring, and

parental anti-use attitudes (Kumpfer, Alvarado et al. 2003). Kumpfer and colleagues (2003) also note that those prevention programs that change ongoing family dynamics have proven to be the most effective, while others have observed that interventions targeting the whole family are more effective than those simply focusing on a single adult or child (NIDA 1998).

As with many public health interventions, family-based substance use prevention programs have been plagued by difficulties in dissemination (NIDA 1998). The potential reach of such programs has also been hampered by low participation rates (Bauman, Ennett et al. 2001). Their potential to reduce substance use and their cost effectiveness (Bauman, Foshee et al. 2001), however, have made them a significant part of the adolescent substance use prevention agenda (NIDA 1998).

Community-based Interventions

A third class of interventions used to prevent adolescent alcohol use is those that are implemented in community settings and involve the coordinated efforts of multiple sectors of the community. This type of intervention is the crux of the current study. Modern community-based interventions targeting health outcomes can be traced back to the cardiovascular health trials of the 1970's and 1980's, including the Stanford Three-Community (Stern, Farquhar et al. 1976) and Five-City (Farquhar, Fortmann et al. 1990) projects, the North Karelia Project (Puska, Nissinen et al. 1985), the Minnesota Heart Health program (Luepker, Murray et al. 1994) and the Pawtucket Heart Health program (Carleton, Lasater et al. 1995). These projects demonstrated that multicomponent interventions implemented in broad segments of the community could have measureable and sustained impacts on population health, including physiological markers such as mean serum cholesterol level, blood pressure and body mass index, and behavioral outcomes such as smoking prevalence (Puska, Nissinen et al. 1985; Carleton, Lasater et al. 1995; Winkleby, Taylor et al. 1996).

The success of these projects spurred interest in community-based interventions to address a variety of health and social issues in the following decades, and federal funding followed. Whereas the early cardiovascular trials were largely driven by the research agenda of the

investigators, lessons learned from these trials gave rise to subsequent community trials that were characterized by collaborative partnerships between researchers and communities (Roussos and Fawcett 2000; Wandersman and Florin 2003). Recent reviews and meta-analyses of community-based approaches to an array of health outcomes including physical activity (Plotnikoff, Costigan et al. 2013), mental health (Farahmand, Duffy et al. 2012), cancer screening (Morrow, Dallo et al. 2010), HIV (Pinkerton, Kahn et al. 2002) and tuberculosis prevention (Kangovi, Mukherjee et al. 2009), and injury prevention (Roen, Arai et al. 2006) point to the popularity and continued reliance on this strategy.

The popularity of community-based interventions extends to substance use prevention as well. A number of such interventions have been implemented in the past few decades, often with mixed results. One of the first was the *Midwestern Prevention Project* (MPP), which was initially implemented in 1984 in 50 middle schools in the Kansas City area using a quasi-experimental design (Pentz, Dwyer et al. 1989). Intervention components targeted multiple socioecological levels of influence and included a school-based curriculum, a parent education program, media advocacy, and community organizing activities. Results indicated a 30% decrease in past month alcohol use at one year follow-up for intervention compared to control students, as well as significant reductions in past month cigarette and marijuana use. The project was replicated 3 years later with 57 schools in 12 communities in the Indianapolis area, this time using an experimental design (Chou, Montgomery et al. 1998). Significant effects in favor of the intervention were again found for past month alcohol use at 6- and 18-month follow-up periods, although effects did not persist beyond this timeframe.

Shortly thereafter, Perry and colleagues (1996) implemented a similar program, *Project Northland*, with middle school students in 24 communities in northeast Minnesota beginning in 1991. Like MPP, Project Northland targeted multiple levels of influence via a school-based curriculum, parent education, and community organizing activities. Unlike MPP, however, Project Northland was not designed to affect tobacco and marijuana use, but instead specifically focused on alcohol use given the former's lack of sustained results on this outcome. Utilizing a randomized design, Perry and colleagues found significant positive effects on past week and past month alcohol

use in intervention versus control students after 2.5 years. In a replication study conducted in Chicago with an urban and high minority sample of students, however, Komro and colleagues (2008) reported no significant effects of the intervention on any of the main outcomes examined, including alcohol use.

Around the same time the original Project Northland was conducted, the Robert Wood Johnson Foundation (RWJF) began funding community-based substance use prevention efforts through its *Fighting Back* initiative. Fourteen sites were originally funded in 1990, with implementation continuing through 2002. As with MPP and Project Northland, the emphasis of the Fighting Back initiate was on demand reduction; that is, reducing the demand for drugs and alcohol through intervention activities that target, for example, normative beliefs, perceptions of consequences, and resistance skills. In their report on findings from the main outcome evaluation, Saxe and colleagues (2006) reported a significant favorable effect on risk of alcohol dependence among 16-44 year olds, but no other effects on any of the other seven substance use outcomes examined. The authors concluded that, despite 10 years of implementation and $88 million in funding, the initiative had no measureable impact on use of the targeted substances.

In response to the overwhelming number of applications received by RWJF for the Fighting Back initiative, the Center for Substance Abuse Prevention (CSAP) in the Substance Abuse and Mental Health Services Administration (SAMHSA) began its *Community Partnership Program* in 1990 by funding 251 communities to develop and evaluate interventions that were responsive to local needs. This was also one of the first federal funding initiatives that emphasized the use of community-based coalitions to implement prevention activities. A cross-site quasi-experimental evaluation of 24 community partnerships randomly selected from the universe of 251 grantees indicated that the only significant effect was a positive effect on past month alcohol use among adults. No effects for any other substance, nor any effects among adolescents, were found. Subsequent analysis using matched pairs of communities, however, indicated a positive effect on past month alcohol use among 10th grade students in 4 of the 24 community pairs (Yin, Kaftarian et al. 1997).

Given the disappointing results of these early community-based substance use prevention trials, which largely focused on demand reduction strategies aimed at individual behavior, two projects were initiated in the early 1990's that relied heavily upon a supply-side approach; that is, reducing the availability of substances. The first of these, the *Community Trials Project* conducted by Holder and colleagues (2000), was a 5-year study conducted in two communities in California and one in South Carolina, with matched communities serving as comparisons. The project included community mobilization efforts, responsible beverage service training for clerks and servers in the community, and enhanced enforcement of underage drinking and driving laws. Unlike the school- and family-based interventions used in previous projects, these environmental approaches were designed to limit the availability of alcohol and to increase the visibility and perceptions of consequences of alcohol use among underage drinkers in the community. These strategies proved effective insofar as 8 of the 11 outcomes examined, including past year alcohol use and alcohol-related motor vehicle crashed, showed effects in favor of the intervention. A subsequent sub-study conducted by Grube (1997) examining compliance with laws concerning alcohol sales to minors indicated that off-premise sites (e.g., retail outlets) in experimental communities were about half as likely to sell to decoys as were sites in comparison communities.

A project by Wagenaar and colleagues (2000) conducted around the same time used a similar approach. *Communities Mobilizing for Change on Alcohol* was a randomized controlled trial in 15 communities in Minnesota and Wisconsin that was also designed to restrict the availability of alcohol to underage youth. The program relied heavily on a community organizing component to foster support for the project, followed by media advocacy activities, all of which were designed to restrict the sale of alcohol to minors, reduce the provision of alcohol to minors through social sources (e.g., family and friends), and to reduce community tolerance for underage drinking. Results showed modest though statistically non-significant positive effects on past month alcohol use among 18-20 year olds and sales of alcohol to minors by off-premise establishments, and a significant positive effect of alcohol sales to minors by on-premise establishments. This project, along with the Community Trials Project, represented a shift in the field by utilizing environmental strategies to restrict youth access to alcohol rather than relying on more traditional intra- and

interpersonal strategies that characterized earlier community-based interventions. Environmental strategies are those that are designed to affect the context in which substance use takes place and may include, for example, changes in policies or increases in law enforcement activities (Holder, Gruenewald et al. 2000; Wagenaar, Murray et al. 2000; Treno and Lee 2002) that aim to reduce the social acceptability of use (Florin, Friend et al. 2012).

Reflecting this shift toward environmental strategies, the *Enforcing Underage Drinking Laws* program, sponsored by the Office of Juvenile Justice and Delinquency Prevention, was initiated in 1997 and represented the first national comprehensive approach to underage drinking. Each state was awarded $360,000 in grant money to enact efforts designed to prevent consumption and prohibit the sale of alcohol to minors, while funds were also made available through discretionary grants to support local efforts (Wolfson, Patterson et al. 2002). In an evaluation using the first wave of data collected after the initiation of the program, Wolfson and colleagues (2001) found no effects on behaviors such as past month and binge use, but reported some indications of increased enforcement such as the number of arrests made for purchasing and possessing alcohol.

In 1997, CSAP continued its support of community-based substance use prevention initiatives through its *State Incentive Grant* (SIG) program, funding from which was made available to states through a competitive application process. States, in turn, made funds available to local communities through competitive grants programs. In an evaluation of the Vermont SIG, Flewelling and colleagues (2005) report findings of a statewide evaluation of 23 communities that implemented a comprehensive array of evidence-based strategies that were designed to reduce adolescent substance use. These strategies included student assistance programs in schools, universal school-based curricula, programs for high-risk youth, and to a lesser extent, environmental strategies. Three years after implementation, significant effects in favor of the intervention were found for marijuana and cigarette use outcomes despite secular trends towards non-use in comparison communities. Favorable though non-significant effects were also found for the six other substance use behaviors examined, including alcohol use. Taken together, this state's experience suggests that the implementation of a comprehensive mix of evidence-based strategies,

environmental or otherwise, in community settings can be effective in reducing substance use behaviors among adolescents.

Following in the footsteps of the SIG was CSAP's *Strategic Prevention Framework State Incentive Grant* (SPF SIG) program. Like the SIG, the SPF SIG was designed to strengthen the prevention infrastructure in states and to support community development and prevention programming at the local level. Begun in 2004, the SPF SIG funded 77 states, territories, and tribal organizations to fund local communities who adhere to a 5-step model designed to foster the identification of needs and strengths within the community, develop capacity to plan prevention programming, and implement and evaluate evidence-based interventions. A particular emphasis of the SPF SIG program was the use of environmental strategies to address substance use in the community. To this end, communities were required to implement interventions that included strategies such as policy development, increased enforcement, and media advocacy (SAMHSA 2009). In one of the few evaluations of the SPF SIG currently available, Eddy and colleagues (2012) report outcomes from one community funded through the Wisconsin SPF SIG. Intervention activities included two school-based curricula for middle school students (Life Skills Training and All Stars), two family-based programs (Guiding Good Choices and Staying Connected with Your Teen), and the aforementioned Communities Mobilizing for Change on Alcohol environmental intervention designed to restrict youth access to alcohol. Results showed favorable trends over time for past month alcohol use, binge use, and average age of alcohol initiation among middle and high school students, although lack of sufficient controls or suitable comparison data temper the conclusions that can be drawn from the data. Florin and colleagues (2012) also report findings from the SPF SIG program implemented in 14 Rhode Island communities. Preliminary results suggest that the statewide prevalence of adolescent alcohol use declined significantly over the first 21 months of implementation as compared to the US as a whole, although methodological challenges precluded the authors from drawing definitive conclusions. Data for the current study are drawn from the implementation of the SPF SIG program in Vermont, which was one of five states funded in 2005 as part of the second cohort of grantees.

The *Communities That Care* (CTC) model shares similarities with the SPF SIG framework in that it guides communities through a needs assessment process to identify risk and protective factors associated with adolescent substance use and delinquency behaviors, as well as the process of selecting evidence-based programs designed to address those factors. Designed by Hawkins, Catalano, and Arthur (2002), the model has been used extensively throughout the United States but has only recently been subjected to an evaluation under controlled conditions (Hawkins, Oesterle et al. 2009). In this randomized controlled trial, 24 communities in 7 states were randomly assigned to condition, with the 12 intervention communities implementing the CTC model. Over the course of 4 years, communities received training in needs assessment and evidence-based program selection and implemented a variety of school- and family-based interventions. After 4 years, the prevalence of alcohol use in the past month and binge drinking in the past two weeks among 8th grade students were lower in intervention versus control communities, with the magnitude of effect ranging between 25%-40% greater use in control communities.

In one of the more recent community-based interventions designed to prevent adolescent alcohol use, Flewelling and colleagues (2012) conducted a randomized controlled trial of a variety of environmental interventions implemented in 18 communities in Oregon called *Reducing Youth Access to Alcohol*. Intervention components included community mobilization activities, reward and reminder visits to alcohol outlets, media advocacy, enhanced enforcement of underage drinking laws, and community outreach efforts, all of which were designed to reduce the amount of alcohol available to youth in the community. No effects were found for past month or binge alcohol use, which highlights the difficulty in affecting these behaviors at a population level. Positive effects were found, however, for the likelihood that alcohol outlets would sell to underage-looking operatives, suggesting that the activities did elicit behavioral changes among one of the proximal targets of the intervention.

Taken together, the results of the most prominent community-based interventions cited here substantiate the common critique that, while popular, the evidence for their effectiveness is far from definitive (Kreuter, Lezin et al. 2000; Treno and Lee 2002; Wandersman and Florin 2003; Flewelling, Austin et al. 2005; Saxe, Kadushin et al. 2006; NAS 2012). In its current National Drug

Control Strategy, the Office of National Drug Control Policy identifies a national prevention strategy grounded at the community level as its primary overarching principle (ONDCP 2013). Given the prominent role community approaches hold within the national prevention landscape (IOM 2004; ONDCP 2013), and given the millions of scarce federal, state, and local dollars invested in them annually, it is imperative we investigate the conditions under which their effects can be optimized and the mechanisms by which they can reduce population-level substance use. The current study addresses these issues by examining the role of coalition capacity, community readiness, intervention comprehensiveness and effectiveness, and fidelity of implementation on reducing adolescent alcohol use throughout the state of Vermont.

Features of Community-based Interventions

Community-based interventions designed to address community health are characterized by some common elements. The obvious commonality is the fact that the interventions are implemented in community settings. Defining "community" is a complex task but can generally be described as a group of people who share geography, interests or goals, or a common history (NAS 2012). In the context of community-based alcohol prevention interventions, community has most typically been conceptualized in terms of shared geography, such as a town or neighborhood.

Implicit in the decision to situate intervention activities in community settings is the need to reach broad swaths of the population rather than targeted subpopulations such as those at highest risk (Roussos and Fawcett 2000; NAS 2012). Although interventions in other settings may also attempt to reach the entire population of interest (e.g., universal school-based curricula), this is particularly true of community-based interventions. Using a population approach such as this attempts to shift the entire risk distribution in the community, thereby eliciting population-level changes in the outcome (Rose 1985; NAS 2012). Small changes in the prevalence of health risk behaviors can, therefore, facilitate large impacts on population-level health when those small changes are multiplied across all members of the population. Variation exists, however, in the degree to which the community is involved in the planning and implementation of the intervention activities, or whether it is simply the setting in which the activities occur (Holder and Giesbrecht

1990; McLeroy, Norton et al. 2003; NAS 2012). Community-based interventions characterized by the latter are more limited in their ability to affect population health (NAS 2012).

Another common, although not necessarily defining characteristic of community-based interventions is the use of environmental strategies (Treno and Lee 2002). Some of the earliest community-based substance use interventions cited earlier, for example, relied heavily upon curricula, whereas more recent interventions have taken an environmental approach. Unlike school- or family-based curricula that are often individually-focused and take a "demand side" approach (i.e., reduce demand for substances), environmental approaches are inherently population-focused and often take a supply-side approach (i.e., restrict supply of substances) to prevention (Holder, Gruenewald et al. 2000; Treno and Lee 2002). Because alcohol use is most often a social behavior, environmental strategies may be particularly effective insofar as they attempt to change community structure and the context in which alcohol use takes place (Holder, Gruenewald et al. 2000; Wagenaar, Murray et al. 2000; Treno and Lee 2002). In this way, environmental strategies take an ecological approach to prevention by targeting influences at the upper levels of the socioecological framework. That is, they attempt to alter community-level factors that contribute to, for example, the consumption of alcohol by adolescents. The Community Trials Project (Holder, Gruenewald et al. 2000) is an example of a successful intervention that specifically targeted environmental-level influences through such means as community mobilization and enforcement of underage drinking laws.

Environmental interventions in the context of alcohol prevention can take many forms. The Center for Disease Control and Prevention's (CDC) Guide to Community Preventive Services currently recommends eight environmental strategies that have been found to be effective in reducing alcohol use and its attendant consequences, most of which are policy-related (CDC 2013). Among these are dram shop liability laws that hold owners of retail establishments liable for harms caused by patrons who are sold to or served in their establishment, restriction on hours or days of sale, regulation of alcohol outlet density, enhanced enforcement of underage drinking laws, and increased alcohol taxes. Other promising strategies include responsible beverage service training, "reward and reminder" programs designed to educate alcohol outlets about underage alcohol sales

laws, party dispersal patrols, and media advocacy (Holder, Gruenewald et al. 2000; Flewelling, Grube et al. 2012).

A third common characteristic of community-based interventions is their use of multicomponent strategies (Zakocs and Edwards 2006; Fagan, Hawkins et al. 2011) that involve multiple sectors of the community and target multiple levels of influence on behavior. The rise of community-level approaches to prevention in the 1970's and 1980's not coincidentally corresponded with the development of ecological theories of behavior and life course development advanced by Bronfenbrenner (1977) and others. These theories suggest that behavior is a function of multiple levels of influence, including intrapersonal, interpersonal, organizational (e.g., school), and community factors that, if collectively modified, are more likely to affect behavior change than when only a limited number of levels of influence are addressed (Roussos and Fawcett 2000; Wandersman and Florin 2003; NAS 2012). Indeed, some of the most effective community-based interventions cited earlier were those that incorporated school, family, and environmental components (Pentz, Dwyer et al. 1989; Perry, Williams et al. 1996). Empirical evidence from Kumpfer and colleagues (2003) suggests that the effect of each individual component included in multicomponent interventions may, in fact, be additive.

The implementation of complex, multicomponent interventions that characterize community-based prevention strategies requires a shared vision (Saxe, Kadushin et al. 2006) and engagement across multiple sectors of the community (Roussos and Fawcett 2000). A fourth common characteristic of community-based interventions, therefore, is the use of community partnership such as coalitions (Fagan, Hawkins et al. 2011). Coalitions foster a shared vision and engagement of multiple sectors by bringing together representatives from organizations throughout the community that have a vested interest in the issue the coalition is designed to address. Common coalition partners in the field of alcohol prevention have included health service providers, local law enforcement, governmental agencies, and schools, and may even include representatives from the alcohol industry.

Coalitions confer many advantages upon community-based prevention efforts. First, as mentioned, they bring together a diverse set of actors who are united around a common cause. In

doing so, the coalition is able to leverage information and resources that would otherwise be unavailable to a single organization (Hays, Hays et al. 2000; Fagan, Hawkins et al. 2011; NAS 2012). The confluence of multiple sectors of the community also minimizes duplication of services and helps ensure a more efficient use of scarce resources (Butterfoss, Goodman et al. 1993; Fagan, Hawkins et al. 2011). It may also increase buy-in, promote a sense of legitimacy among community members, and reinforce the notion of addressing community issues with community solutions (Saxe, Kadushin et al. 2006). Although empirical evidence for their effectiveness in producing community-level change is limited (Bowen, Martin et al. 2000; Chaskin 2001; Granner and Sharpe 2004; Collins, Johnson et al. 2007), they nonetheless are the most common structure through which community-based interventions are implemented.

The Role of Coalition Capacity

As Wandersman, Goodman, and Butterfoss (2005) note, because coalitions require resources, structure, and leadership to function, they can best be conceptualized as organizations. As such, organizational theory has often been applied to the study of their functioning. Most theoretical treatments of coalition functioning have focused on the *capacity* of the coalition to effectively address the health or social issue of interest (O'Neill, Lemieux et al. 1997; Butterfoss and Kegler 2002; Wandersman, Duffy et al. 2008). This may include the ability to conduct a needs assessment, develop a strategic plan for addressing issues identified in the needs assessment, harness resources and personnel, implement the intervention activities, and monitor and evaluate the activities throughout the life of the project.

A variety of definitions of coalition capacity have been proposed. Goodman and colleagues (1998), for example, suggest that it is characteristics of the coalition that affect its ability to identify, mobilize, and address social and public health problems. Chaskin (2001) proposes that it is the interaction of human capital, organizational resources, and social capital existing within a given community that can be leveraged to solve collective problems and improve or maintain the well-being of a community. Yang and colleagues (2012) define it as the internal operations of the coalition such as the activities that are undertaken to create, improve, and

maintain the coalition. This latter definition perhaps better reflects much of the research on coalition capacity up to this point. That is, most of the existing theoretical and empirical work on coalition capacity has focused on coalition functioning rather than on examining the relationship between capacity and outcomes. Much research concerning the identification of dimensions of capacity (Goodman et al. 1998), the measurement of these dimensions (Granner and Sharpe 2004), and ways by which to enhance capacity (Bowen, Martin et al. 2000; Mancini, Nelson et al. 2006) has been published. Far less, however, has examined the extent to which higher levels of capacity are related to improvements in outcomes. Those studies that have done so have often focused on proximal outcomes such as perceived effectiveness (Allen 2005), functioning (Zakocs and Edwards 2006), or institutionalized changes occurring within the community (Allen, Javdani et al. 2012). Very few have examined the effects on distal outcomes such as health behaviors or indicators of population-level health. In their review of the literature on coalition effectiveness, for example, Zakocs and Edwards (2006) identified articles published between 1980 and 2004 that examined the effects of coalition activities in the context of health outcomes. Of the 26 that met the inclusion criteria, 19 measured coalition functioning as an outcome, while only 3 examined changes in community-wide health behaviors. This is perhaps not surprising. As disappointing results from early community-based trials began to emerge, calls came to examine relationships further up the causal chain (Kreuter et al. 2000; Berkowitz 2001). Rather than continuing to pour resources into community-based interventions that were not yielding intended or sustained effects, researchers began turning their attention to ways to develop coalitions and enhance their capacity. In so doing, coalitions became the outcome of interest in much of the literature. As more positive findings from community trials have begun to emerge over the past 5-10 years, however, there is now an opportunity to utilize the research done on defining and measuring capacity and shift some of the focus back on capacity as a predictor of community-level outcomes. Doing so will allow us to better understand how and why community-based interventions are or are not successful in affecting health outcomes.

As noted, much of the study of coalition capacity has centered on methods by which to enhance it. A necessary first step, however, is the identification of the construct's dimensions. An

expert panel convened in 1995 by the CDC's Division of Chronic Disease Control and Community Intervention undertook this task and identified nine such dimensions: participation and leadership, skills, resources, social and inter-organizational networks, sense of community, understanding of community history, community power, community values, and critical reflection (Goodman et al, 1998). In a review of the literature, Chaskin (2001) offers four dimensions, many of which overlap with the CDC workgroup's dimensions: sense of community, commitment, ability to solve problems, and access to resources. In a similar review, Zakocs and Edwards (2006) identified 55 characteristics of coalition capacity that were linked to indicators of effectiveness, six of which were identified in five or more articles: formalization of rules and procedures, leadership style, member participation, membership diversity, agency collaboration, and group cohesion. In an analysis of 43 domestic violence coalitions, Allen (2005) found that those coalitions characterized by an inclusive climate and a diverse active membership were more likely to be rated as effective. The difficulty in drawing definitive conclusions about these proposed dimensions of capacity and their relationship to outcomes, however, lies in the fact that a multitude of definitions and measures have been used (Chaskin, 2001). More empirical work is needed so that meaningful guidance can be provided to community coalitions to enhance their capacity for addressing health issues. The current study attempts to build the empirical base by relating one proposed set of dimensions to reductions in adolescent alcohol use.

The Role of Community Readiness

Like coalition capacity, community readiness has a long history in the field of community-based research. Unfortunately, it also shares the some of the same shortcomings with respect to conceptual ambiguity and lack of empirical support for its relationship to community-level outcomes. Chilenski and colleagues (2007) define readiness as the ecological context and organizational system in which the implementation of community change efforts takes place. This definition emerged from the fields of community psychology and organizational studies and, as a result, has a distinctive psychological quality. That is, according to Chelinski and colleagues, it may best be described as the psychological readiness of the community to implement change

efforts. Weiner and colleagues (2008), in their review of the organizational change literature, conclude that it encompasses both psychological and behavioral dimensions. Not only must organizations (or communities) be willing to implement change, they must also be behaviorally capable. One could argue, however, that this latter dimension is more in keeping with notions of capacity rather than readiness. This overlap between capacity and readiness is just one example of the ambiguity that exists in the literature. In the same review of organizational readiness, for example, Weiner and colleagues found little consistency in conceptualization or terminology associated with readiness across106 articles reviewed.

Given this ambiguity, a variety of dimensions of readiness have been identified. Chelinski and colleagues (2007) identify four dimensions including community attachment, initiative, efficacy, and leadership. Community attachment refers to the psychological and emotional ties residents have to their community. They theorize that those residents who feel stronger attachments to their communities will be more likely to join other residents in addressing community issues compared to those who feel less attachment. Similarly, initiative refers to the level of engagement of community residents. Those communities with residents who have previously engaged in implementing collaborative initiatives such as community-based interventions are more likely to engage in future initiatives. Efficacy refers to the community's past success in implementing initiatives and their collective belief in their ability to implement successful initiatives in the future. Past success is thought to predict future success in this regard. Leadership refers to the effectiveness and consensus-building skills of local leaders. This implies that the success of the given initiative is not only dependent upon the presence of a leader, but also on the quality of the leadership. These same dimensions are reflected in the readiness measures used by Feinberg and colleagues (2004) in their evaluation of the Communities That Care model in Pennsylvania.

Much of the conceptual and measurement work around readiness has been conducted by researchers at the Tri-Ethnic Center for Prevention Research at Colorado State University. They developed the Community Readiness Model (CRM) to characterize communities' readiness to implement substance use prevention interventions and to identify theoretical mechanisms by which

to increase readiness. Consistent with theories such as Diffusion of Innovation (Rogers 2003) and the Transtheoretical Model (Prochaska and DiClemente 1983), they place readiness in the context of a stage-based model in which communities progress through nine stages of readiness ranging from community tolerance (i.e., acceptance of behavior) to professionalization (existence of sophisticated intervention activities, training, and evaluation) (Edwards, Jumper-Thurman et al. 2000). To assess a community's stage of readiness, assessments are made across six dimensions, some of which share similarities to those proposed by Chelinski and colleagues (2007) and Feinberg and colleagues (2004). Leadership, for example, is present among all three conceptualizations. The CRM also includes a community climate dimension, which refers to the "personality" of the community and can be thought to be similar in some ways to the attachment and initiative dimensions proposed by Chelinski and colleagues. The CRM, however, makes some unique contributions. More so than the other models, it explicitly includes psychological dimensions including knowledge about the problem and community knowledge of prevention efforts. It also makes an assessment of the community's material resources for prevention (e.g., people and funding) and prevention efforts already in place.

Research in the area of readiness has used the CRM for various purposes. Carlson and Harper (2011) used the model to assess a long-term care facility's readiness to offer specialized services to LGBT residents. Parker and colleagues (2011) used the model to retroactively describe why a violence prevention intervention previously found to be effective was not implemented successfully in a replication trial. In a similar manner, Sliwa and colleagues (2011) used it as a basis by which to identify communities for an obesity prevention replication trial. Ogilvie and colleagues (2008) investigated whether readiness as assessed by the CRM could be enhanced throughout the course of an inhalant prevention project implemented in four rural Alaskan communities.

A common characteristic of these studies and others that have used the CRM is that, like coalition capacity, readiness is often treated as a descriptor or the object of an intervention. In this way, as with capacity, it is often treated as the dependent variable in empirical investigations. The underlying assumption is that if readiness can be enhanced, it will lead to better

implementation and ultimately better outcomes. This assumption, however, remains largely untested. In one of the few empirical investigations of the effect of readiness on outcomes, Feinberg and colleagues (2004) found readiness to be strongly related to perceived effectiveness of coalitions implementing the Communities That Care model. This study makes important contributions to the readiness literature in a few other ways. First, it is explicitly guided by a theoretical model that proposes how the investigators perceive readiness to affect outcomes. Secondly, it proposes a mediator – internal and external functioning – in the readiness-outcome relationship. This is important because few studies of readiness have suggested a mechanism by which readiness operates to affect outcomes. Third, the study was undertaken with a predominantly rural sample whereas many community-based prevention studies have been conducted in urban areas. This has particular relevance for the current study insofar as much of the state of Vermont is rural.

This study, however, has a couple of important limitations that future research can address. One is that, like many studies in this area, a cross-sectional design was used, which limits causal inferences that can be made between readiness and outcomes. As the authors note, longitudinal designs in which the measurement of readiness precedes the measurement of outcomes will greatly add to our understanding of the role the former plays in community-based interventions. The study also relied on perceived effectiveness as the outcome of interest, but did not assess the relationship between readiness and more distal outcomes such as changes in behavior or indicators of health. Although examination of proximal outcomes such as perceptions may yield important clues, it is ultimately changes in behavior and health indicators that are the goal of community-based prevention. The current study addresses both of these limitations by utilizing a longitudinal design and measuring underage alcohol use behaviors.

The Role of Intervention Implementation

If causal relationships between coalition capacity, community readiness, and outcomes can be determined, an important next step is to identify the mechanisms by which these relationships operate. Because little work has been done to examine whether the relationships even exist, even

less work has been done to identify mediators of the relationship. One potential class of mediators of the effect of coalition capacity and community readiness on outcomes relates to the attributes of the intervention activities that are implemented. As conceptualized for this study, implementation involves three dimensions: comprehensiveness, effectiveness, and fidelity. The Community Problem-Solving and Change Framework (Yang, Foster-Fishman et al. 2012), which serves as a basis of the conceptual model for the current study, proposes that the *comprehensiveness* of strategies mediates the relationship between capacity and outcomes. In their evaluation of the framework with 551 coalitions, Yang and colleagues (2012) found that those coalitions with greater levels of capacity pursued more comprehensive strategies than those with lower levels of capacity, and those that pursued such strategies reported more favorable outcomes such as the implementation of new programs and policies and the number of community sectors affected. They also found that the use of a comprehensive array of strategies significantly mediated the capacity-outcomes relationship. Although empirical evidence other than that provided by Yang and colleagues is largely lacking, comprehensiveness is nonetheless championed as a necessary component of an effective prevention program. Federal guidance provided to states and communities, such as the CDC's Community Guide (CDC 2013b, 2014), states that comprehensive approaches with varied and mutually-reinforcing components are more likely to be successful than those that are more limited in scope, and the requirements of several federal funding mechanisms such as the SPF SIG are specifically designed to elicit comprehensive prevention programming. Thus, given that practice is in front of research in this regard, it is necessary to examine these relationships to determine whether such guidance is warranted.

The second potential mediator, intervention *effectiveness*, refers to the demonstrated efficacy of the selected strategies. Those interventions that have shown evidence of their effectiveness in prior evaluations can be expected to subsequently illicit more favorable outcomes than those with weaker evidence bases. A substantial body of literature has emerged that attempts to describe the evidence base of various interventions, including a review from Anderson and colleagues (2009) and a compendium from Nelson and colleagues (2013) that focus on interventions designed to prevent alcohol use and its consequences. The intervention

effectiveness-outcomes relationship, therefore, has substantial support and indeed is the very basis for the determination of an intervention's effectiveness. The coalition capacity-effectiveness and community readiness-effectiveness relationships, however, have less empirical support. In their evaluation of the Rhode Island SPF SIG, Florin and colleagues (2012) found that training and technical assistance were associated with coalition members' confidence in their ability to consider evidence of effectiveness when choosing environmental interventions. The authors, however, conceptualized this as an increase in capacity but did not examine whether this increased capacity lead to implementation of more evidence-based interventions. Given this evidence, though, it stands to reason that increases in capacity may facilitate selection of more effect strategies and/or higher quality implementation of those strategies. As for the community readiness-effectiveness relationship, there appear to be no data currently available that indicate that communities exhibiting greater readiness are more likely to select and implement interventions with greater prior evidence of their effectiveness than those communities exhibiting less readiness. However, given that evidence-based interventions, particularly environmental interventions, are often complex and involve multiple components, it is logical to suggest that those communities with greater readiness will be more ready to accept and support such complex interventions compared to those with less readiness.

Fidelity refers to the degree to which an intervention is implemented as planned by the developer or as prescribed by guidelines (Mihalic 2004; Carroll, Patterson et al. 2007; Breitenstein, Gross et al. 2010). There is mounting evidence from the past two decades of prevention research that implementation fidelity is central to achieving favorable outcomes (Botvin, Baker et al. 1995; Harachi, Abbott et al. 1999; Hallfors et al. 2002; Wolfson, Patterson et al. 2002; Wilson, Lipsey et al. 2003; IOM 2004; Durlak and DuPre 2008; Flewelling, Grube et al. 2012). There is also, however, a debate in the field about the relative contributions of fidelity and adaption to outcomes, with some arguing for close adherence to program guidelines and others advocating for modifications made to suit the needs of the recipients (Castro, Barrera et al. 2004; Elliott and Mihalic 2004). The Institute of Medicine's 2012 report, "An Integrated Framework for Assessing the Value of Community-Based Prevention" (IOM, 2012), for example, states that adapting interventions to local

context facilitates community ownership and buy-in, which may in turn lead to enhanced outcomes.

The mediating role of fidelity in substance use prevention community trials has not been explored empirically up until now, particularly in the context of coalition capacity and community readiness. In their evaluation of the Rhode Island SPF SIG, Nargiso and colleagues (2013) recently published results from an examination of the mediating role of coalition capacity on outcomes, or what the authors term coalition "efforts" and "outputs." Efforts included the number of hours devoted to implementing strategies such as media advocacy, policy changes, and enforcement of underage drinking laws, while outputs included amount of media coverage obtained, number of changes to community substance use policies, and the number of arrests resulting from increased enforcement of underage drinking laws. The authors found that greater capacity was related to greater policy efforts, although not greater policy outputs, and greater media and enforcement outputs. This study adds to the sparse literature by providing preliminary evidence for the effect of capacity on proximal outcome measures, which, in this case, bear some similarity to measures of fidelity. Unfortunately, the authors did not subject the data to a true mediation analyses, nor were they able to examine whether capacity was related to distal outcomes such as community-level substance use. The present study will address these issues through the use of longitudinal data and an examination of effects on underage alcohol use behaviors. It will also examine the mediating role of fidelity on the readiness-outcome relationship, which has yet to be explored in the literature.

CHAPTER 3: METHODS

Study Design

SPF SIG funds were awarded by CSAP to the first cohort of 21 states, territories, and recognized tribes ("grantees" hereafter) in 2004, with a second cohort of 5 grantees following in 2005. An additional 16 grantees comprised the third cohort, which was funded in 2006, and a final 25 grantees comprised the fourth cohort, funded in 2009. The state of Vermont was funded as a member of the second cohort.

Upon receiving federal funding, Vermont awarded funds to communities throughout the state through a competitive process initiated in the fall of 2007, with all communities funded in November 2007. For the purposes of the project, community was defined as, at a minimum, an area served by an educational supervisory union (i.e., school district), although communities serving multiple supervisory unions were also allowed to apply for funding. In all, 24 communities in the state were funded, with the remaining serving as comparison communities, thus yielding a quasi-experimental study design. Each of the 24 intervention communities comprised multiple towns such that 194 of the 255 towns within the state were contained within intervention communities. The remaining 61 towns comprised the comparison communities. Schools in each community, regardless of intervention assignment, participated in the CDC's Youth Risk Behavior Surveillance System (YRBS) biennial school survey so outcome measures could be tracked throughout the life of the project.

Existing substance use prevention coalitions were the designated grantees in 22 of the 24 communities, with funding awarded to community-based organizations in the remaining two communities. As the designated grantees, these coalitions and community-based organizations ("coalitions" hereafter) were responsible for carrying out the obligations of the grant, which included implementation of the five-step Strategic Prevention Framework (SPF) model in their respective communities. Coalitions were funded up to $68,000 to implement the first three steps

of the model (needs assessment, capacity building, strategic plan development) and upon successful completion of these steps and approval of their strategic plan by the state, were eligible for up to an additional $120,000 to implement the latter two steps (implementation and monitoring and evaluation). The SPF SIG program was administered throughout the state by the Division of Alcohol and Drug Abuse Programs (ADAP) in the Vermont Department of Health.

Because intervention communities varied at the start of the project with respect to their capacity to implement the SPF model, they were funded as either capacity building or implementation grantees. Those funded as capacity grantees were expected to focus their initial efforts on the first three steps of the SPF model before transitioning to the last two steps, while implementation grantees were funded as such based on their capacity to progress more quickly through the first three steps. Eleven communities were funded as the former while 13 were funded as the latter.

Figure 2 provides a Gantt chart of intervention and data collection activities by quarter and year. Each activity is described more fully in the sections that follow.

	2008				2009				2010				2011			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Interventions implemented																
YRBS administration[a]																
Capacity survey																
Readiness survey																
Comprehensiveness assessment																
Effectiveness assessment																
Fidelity assessment																

Figure 2. Intervention and data collection activities timeline. [a]YRBS also administered in first quarter of 2003, 2005, and 2007.

Intervention

As required by CSAP, the state of Vermont convened a State Epidemiology Workgroup (SEW) upon receiving funding in 2005. The purpose of the SEW was to oversee and provide guidance to communities using population-based data to guide intervention activities. One of the initial responsibilities of the SEW was to examine statewide epidemiologic data to identify those outcomes that would serve as the priorities for funded communities. After a 9-month review of the data, the SEW determined that all funded communities would be required to address underage

alcohol use as the primary priority, and either high risk alcohol use or marijuana use among young adults (i.e., age 18-25) as a secondary priority. Communities identified their secondary priority based on the results of their individual needs assessment that was conducted as part of the SPF SIG process. Twenty of the 24 intervention communities chose to focus on high risk alcohol use among young adults as a secondary priority while the remaining four focused on marijuana use among young adults. The outcomes of interest for the present study, however, are restricted to those that relate to underage alcohol use given that all funded communities were required to address this outcome with their intervention activities.

The SPF SIG program is conceptualized as an environmental approach to substance use prevention and, as such, funded communities were required to implement prevention strategies that addressed the context in which substance use occurs in the community. Communities were provided with a list of 22 environmental strategies for addressing substance use, along with the core components of each to facilitate fidelity of implementation. These strategies took a variety of forms but were broadly characterized as communication (e.g., media campaigns), enforcement (e.g., alcohol sale compliance checks), policy (e.g., zoning and outlet density ordinances), or comprehensive strategies (e.g., strategies which potentially involve multiple diverse components based on the community assessment and community organizing activities, such as Communities Mobilizing for Change on Alcohol). The 22 strategies were selected because each had an evidence base supporting their effectiveness, although the strength of the evidence varied considerably between strategies. Many communities also complemented these strategies with an array of prevention education activities including classroom prevention curricula and parenting programs.

The number of strategies implemented by the 24 funded communities varied, with an average of 7.9 and a range of 4-15. On average, 7.3 environmental strategies were implemented, with a range of 4-14. Communication activities were the most widely used environmental strategy, with all 24 communities implementing at least one such activity. Enforcement activities were the next most popular with 13 communities implementing at least one activity, followed by policy and comprehensive activities (8 and 6 communities, respectively, implementing at least one activity).

Six communities complemented their environmental strategies with prevention education activities.

The populations that communities targeted with intervention activities varied as a function of the findings of their needs assessment. Because the SPF SIG program required a primary focus on underage alcohol, each of the 24 funded communities targeted youth under age 21. Each community was also required to address young adult use regardless of secondary priority, and as such, each targeted 18-25 year olds with at least one intervention strategy. Parents were also targeted by each of the 24 communities with at least one strategy. Communities varied, however, in the ways in which they targeted these different populations, with some intervention activities aimed at specific age groups and others aimed at all ages. The population of interest for the present study is those under the age of 21 given that all funded communities were required to address underage alcohol use.

Communities also differed considerably in the timing of their prevention activities, with some activities beginning as early as October 2008. All communities began implementation by April 2010, and all completed implementation by June 2011 when funding from the state ended. As such, the statewide pre-intervention period is defined as November 2007 through September 2008, with the intervention period defined as October 2008 through June 2011.

Data Collection

The data for the current study come from five main sources: student surveys, coalition capacity surveys, community readiness surveys, work plans, and quarterly progress reports submitted by communities. Past month alcohol use and binge alcohol use, which serve as the outcome measures for the current study, come from the YRBS survey, which is administered in Vermont to a census of high school students (grades 9-12) in February and March of odd-numbered years via a paper and pencil questionnaire. Because the geographic bounds of a community were defined by supervisory unit for the purposes of the Vermont SPF SIG, and because participation in the YRBS was a prerequisite for a community to be funded, these data are particularly valuable for the current study because they can be tied directly to each of the 24 communities.

The pretest period in the current study is defined as 2003-2007 and the posttest period is defined as 2011. Data from 2009 are excluded from the analyses for a couple of reasons. First, an underage drinking media campaign was implemented statewide throughout much of 2008. Communities funded by the SPF SIG were asked to provide additional support to the media campaign in their communities, whereas unfunded communities were not. Although the support activities undertaken by funded communities were not particularly intense and likely did not contribute measurably to changes in outcomes, it is still the case that a modest level of intervention activities began in funded communities as early as 2008. Second, three communities began intervention activities in earnest in late 2008 and an additional two began in early 2009 before the YRBS was administered that year. The remaining 19 communities began activities after the 2009 survey administration. As a result, the designation of 2009 as a pretest or posttest year becomes problematic. Data from the main outcome evaluation (unpublished data) indicate a similar pattern of results when 2009 is included as a posttest year versus when it is excluded altogether. The 2009 data, therefore, are excluded from the current study for conceptual simplicity.

The coalition capacity survey was administered with a paper and pencil questionnaire in Spring 2008, before intervention activities began, and again in Fall 2010 via paper and pencil and online questionnaires. The capacity survey was conducted with the coordinator and other members of the funded coalition in each of the 24 intervention communities. Surveys were attempted with all members of the coalition when membership was ten or fewer. When greater than ten, a random sample of members was selected. Where possible, the same members were surveyed in both administrations, with replacements randomly selected for the 2010 administration to account for member turnover. A total of 219 respondents across the 24 intervention communities completed the survey in 2008, with 258 completing it in 2010. The number of participants in each wave was roughly equivalent between capacity building and implementation grantees.

The community readiness survey was fielded in each of the 24 communities in Spring 2008, a year before intervention activities began, and again in Spring 2011 after most intervention

activities had concluded. A paper and pencil questionnaire was used in 2008, while in 2011 respondents were given a choice between a paper and pencil or web questionnaire. Communities were instructed to administer the survey with at least 4-7 key informants who were identified as stakeholders in the community's prevention efforts. They were also instructed to survey the same respondents in 2011 as they did in 2008 when possible. A total of 209 respondents completed the survey in 2008 (mean = 8.7 per community), with 150 completing it in 2011 (mean = 6.3 per community).

Before initiating intervention activities, each of the 24 communities were required to submit work plans that were reviewed and approved by ADAP. Each work plan specified the components of the intervention strategies that each community planned to implement. ADAP staff provided guidance to each community throughout the planning process to ensure that the core components of each of their selected interventions were contained in their work plans before implementation began. The interventions the community cited in their work plans serve as the basis for the assessments of the comprehensiveness and effectiveness (i.e., prior evidence base) of the chosen strategies.

Progress toward implementation of the core components was assessed by the state's evaluation coordinator through reviews of the quarterly progress reports that each community was required to submit. These assessments formed the basis for the implementation fidelity scores that were assigned to each intervention. In most cases, fidelity was assessed for each intervention twice, once in June 2010 after at least six months of implementation had been completed by most communities, and again in August and September 2011 after communities' final quarterly progress reports were submitted. In cases where a component was implemented entirely during one assessment period, fidelity of that component was assessed only once.

Sample

A total of 63,329 9^{th}-12^{th} grade students in intervention communities participated in the YRBS survey. Of these, 47,698 participated during the pretest period (2003-2007) while 15,361 participated during the posttest period (2011). The average number of students per community

across all years was 680.84 (SD=483.13). Table 1 provides respondent demographic characteristics by time period and Chi-square tests of differences across time. Students at posttest were more likely to be nonwhite, be in a higher grade level, and have mothers who obtained higher levels of education than those at pretest.

Table 1. Student demographic characteristics by time period.

Characteristic	Pretest (n=47,698)	Posttest (n=15,361)	X^2 (df)	p
Gender (% female)	50.04	49.50	1.34 (1)	0.2477
Race (% nonwhite)	10.36	14.32	179.77 (1)	<0.0001
Grade (%)			52.59 (3)	<0.0001
9th	28.58	26.05		
10th	26.97	26.58		
11th	24.49	25.51		
12th	19.96	21.86		
Maternal education			188.55 (5)	<0.0001
Grade school or less	1.32	1.70		
Some high school	6.77	6.57		
Completed high school	29.04	24.69		
Some college	16.36	15.88		
Completed college	33.11	34.02		
Graduate or professional school	13.40	17.14		

Measures

Alcohol use outcomes

Because underage alcohol use was a priority for all intervention communities, the outcomes of interest for the present study are current alcohol use and binge alcohol use. Table 2 below presents the measures used in the analyses. Given the skewed nature of alcohol use among the study's student population, both items were dichotomized such that 0 represented no use and 1 represented any use. Community-level estimates for each item were then computed via two generalized linear mixed regression models (PROC GLIMMIX) in SAS 9.3 that regressed the individual-level outcome on dummy variables for time (pretest vs. posttest) gender, grade, race (dichotomized as white or nonwhite), and maternal education. A logit link was used given the binary distribution of the outcome measures and a random intercept was fit to accommodate clustering of respondents by community. The LSMEANS option was used to produce model-adjusted means by community at pre- and posttest. These means represented the prevalence of the outcome at both time points. The purpose of generating community-level estimates in this manner

was to remove the potentially confounding influence of differing demographic characteristics between communities. Community-level change scores were then computed by subtracting the posttest mean from the pretest mean such that higher positive values represented greater declines in use over time. The two outcome variables used in the study, therefore, are continuous measures of change in the prevalence of alcohol and binge alcohol use from pretest to posttest.

Table 2. YRBS alcohol use outcome measures.

Outcome	Question wording	Measurement scale
Current alcohol use	During the past 30 days, on how many days did you have at least one drink of alcohol?	0 days 1 or 2 days 3 to 5 days 6 to 9 days 10 to 19 days 20 to 29 days All 30 days
Current binge alcohol use	During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?	0 days 1 day 2 days 3 to 5 days 6 to 9 days 10 to 19 days 20 or more days

Coalition capacity

The coalition capacity survey assessed 15 dimensions of capacity that were measured by 76 items identified through a search of existing measures and a thorough review of the capacity literature. The 15 dimensions reflect those most commonly cited in the literature by Chaskin (2001), Zakocs and Edwards (2006), and others. Once the measures were identified, they were tailored to the needs of the Vermont SPF SIG project. Items regarding cultural competency and understanding of environmental strategies, for example, were included because of the emphasis on these two concepts in the SPF SIG model. All items were measured on a 5-point scale ranging from "Weak or Never" to "Strong or Always." Table 3 provides the 15 dimensions that were measured, the number of items used to measure the dimension, and an example item for each. The full instrument can be found in Appendix A.

Coalition capacity measures were derived from the second wave of the survey. Because the initial capacity survey was conducted at the outset of the project well before implementation

began, and because 11 of the 24 communities were funded to focus initial efforts on building capacity, data from the first survey likely does not accurately reflect each coalition's capacity level prior to implementation.

Coalition-level measures for each item were created by averaging responses across all respondents in the coalition. Univariate statistics for each item were examined, followed by the computation of reliability statistics (e.g., Chronbach's alpha) for each dimension. Two poorly performing items from the "Coalition meetings and communications" and "Funding and sustainability" dimensions were excluded and a mean score was computed for each dimension among the remaining constituent items. The resulting scale scores were continuous measures ranging from 1 to 5 where high values represented greater capacity. Chronbach's alpha scores exceeded 0.80 for all dimensions with the exception of "Support from Board" ($\alpha = 0.76$).

Community readiness

Community readiness was assessed using a tool developed specifically for the Vermont SPF SIG but adapted from a similar tool used in the evaluation of the Connecticut SPF SIG, both of which were based on the Community Readiness Model developed by the Tri-Ethnic Center for Prevention Research (Oetting, Donnermeyer et al. 1995). The tool includes 70 items, some of which are not pertinent for the present study. Table 4 presents the items used in the current study, grouped by the six dimensions identified in the Community Readiness Model. The number of items used for each dimension is noted, as well as the item numbers from the instrument (see Appendix B). An example item for each dimension is also provided. Note that the items are limited to those in the instrument that specifically relate to underage alcohol use.

Table 3. Coalition capacity dimensions and items.

Dimension	Items	Example item
Vision, mission, and goals	6	Our coalition's vision, mission, and goals are clear and well-documented.
Coalition structure and membership	8	All of the necessary sectors of the community are represented.
Coalition leadership	6	Our coalition coordinator/director effectively promotes the mission and goals of the coalition.
Outreach and communication	7	Our coalition keeps the community updated on its activities (e.g., through a newsletter, website, etc.).
Coalition meetings and communications	7	Our coalition has a regular meeting cycle that members can count on.
Opportunities for member growth and responsibility	6	Our coalition makes a conscious effort to develop new leaders.
Effectiveness in planning and implementation	6	Our coalition develops an annual work plan that lists goals and activities.
Relationship with local government and other community leaders	4	Representatives from out coalition meet with local officials and community leaders.
Partnerships with other organizations	5	Our coalition collaborates with other community organizations.
Coalition members' sense of ownership and participation	8	Members actively participate in the decision-making process.
Ability to collect, analyze, and use data	4	Our coalition has a members or a consultant with experience in collecting and analyzing data.
Understanding of and commitment to environmental change strategies	4	Coalition members are familiar with the concept of population-level change.
oCultural competence	4	Our coalition reviews its activities and products to ensure they are culturally appropriate for the intended recipients.
Funding and sustainability	8	Our coalition has received funding from multiple sources.
Support from Board	2	Our coalition receives useful guidance from its board of directors

As with the coalition capacity measure, community readiness constitutes a community-level variable and as such, a similar process was used to construct it. Unlike the capacity measure, however, readiness was based on the first wave of data only. As noted earlier, the second readiness survey was conducted in early 2011 after many interventions had concluded, and participation rates were lower than in the first wave. Furthermore, no activities were undertaken to explicitly improve community readiness prior to implementation, and it is reasonable to expect that readiness is more immutable than capacity such that using the first wave of data is appropriate for these analyses. Preliminary analyses of the data support this assumption. Based on paired t-tests, none of the six dimensions of readiness changed significantly between the baseline and follow-up periods, with all significance levels exceeding 0.90.

Items were first averaged across all respondents within the community to create a community-level measure for each item and univariate statistics were examined. Where necessary, items were reverse coded so that high scores indicated greater readiness. Because the items were measured on different scales, each was then standardized with a mean of 0 and a standard deviation of 1. Reliability statistics were then computed among the items for each dimension, with the exception of the leadership dimension, which was a single item measure. Two poorly performing items were removed from the "Knowledge of prevention efforts" and "Community climate" dimensions and a mean score was computed for each dimension. The resulting scores were continuous measures where higher scores represented greater readiness. Chronbach's alpha scores all exceeded 0.70 with the exception of "Knowledge of prevention efforts" ($\alpha = 0.53$).

Table 4. Community readiness dimensions and items.

Dimension	Number of items	Item numbers in Appendix B	Example item
Existing prevention efforts	24	6a-6v, 6x, 6z	Please indicate the degree to which you believe each of the following strategies is functioning effectively in this town city…coalition/task force or council that addresses substance use
Knowledge of prevention efforts	4	5e, 7j, 7l, 7q	In your opinion, how much do each of the following issues limit or pose a barrier to alcohol and other drug prevention activities in this town/city…Insufficient awareness of current efforts among community members
Leadership	1	7a	In your opinion, how much do each of the following issues limit or pose a barrier to alcohol and other drug prevention activities in this town/city…Lack of leadership
Community climate (e.g., support for prevention)	9	5f, 5g, 5i, 5k, 5l, 5n, 5o, 7e, 7p	I think that most residents in this town/city…feel alcohol and other drug prevention strategies for youth are a good investment for the community
Community perceptions about the extent of the problem	3	7f, 7g, 7o	In your opinion, how much do each of the following issues limit or pose a barrier to alcohol and other drug prevention activities in this town/city…Underage drinking is not considered a priority problem for our community.
Resources for prevention	6	7b, 7c, 7i, 7k, 7m, 7n	In your opinion, how much do each of the following issues limit or pose a barrier to alcohol and other drug prevention activities in this town/city…Too few community members with time or willingness to volunteer.

Comprehensiveness

The comprehensiveness of strategies was assessed using data abstracted from the work plans each community submitted prior to the start of the implementation period. Each intervention was categorized into one of four strategy types as detailed in Table 5 below. The strategies in the last column of the table represent the universe of interventions implemented in the 24 communities. A total comprehensiveness score was computed for each community by determining the number of different strategy types used. As such, the score ranged from 1 to 4. Five communities implemented strategies from only one domain, 4 implemented strategies from two domains, 9 implemented strategies for three domains, and 6 implemented strategies from all four domains. The categories and procedures used to construct this measure mirror those used by Mitchell and colleagues (1996) to assess the comprehensiveness of prevention activities implemented by community coalitions in Rhode Island. As here, the authors categorized each intervention into one of several categories and computed the number of categories in which at least one intervention was implemented. This measure of "scope" was found to be significantly correlated with independent qualitative assessments of the comprehensiveness of coalitions' activities.

Effectiveness

As with the comprehensiveness measure, each community's work plan served as the data source for the assessment of effectiveness. Each type of intervention was assigned a value based on scoring rubrics devised by Nelson and colleagues (2013) and Anderson and colleagues (2009). In separate reviews of the alcohol prevention literature, both authors assigned values to each of a variety of interventions that reflect the strength of the available evidence of their effectiveness. The value of the score ranges from 0 to 3 with 0 representing no effectiveness and 3 representing a high degree of effectiveness. There is considerable overlap in the interventions assessed by both authors such that in many cases, both provide an assessment of effectiveness. In a few instances, however, intervention types are assessed by only one author. And in some instances, an intervention type was not assessed by either. In the case where both authors provide a rating, the average of the two values was used in the analysis. When a rating is available from only one

Table 5. Categories of strategies implemented in communities.

Strategy type	Communities using strategy type	Example strategies
Communications	24	Media campaign/social marketing campaign Sticker shock Social norms campaign Common Theme campaign Other public communications strategies Communities Mobilizing for Change on Alcohol Responsible Retailers
Enforcement	17	Server training Compliance checks Party patrols Sobriety checkpoints Increased enforcement of laws Communities Mobilizing for Change on Alcohol Responsible Retailers
Policy	12	Middle/high schools Land use/Policies to reduce underage access Zoning/Outlet density Social host liability Youth advocacy TASP/Diversion enhancements Communities Mobilizing for Change on Alcohol Responsible Retailers
Prevention Education	11	ATOD student curriculum ATOD parent curriculum

author, that rating was used. In cases where neither author provides a rating, a value that was derived from a review of the pertinent literature was used. Table 6 provides the ratings of effectiveness for each intervention strategy by author, as well as the final value used in the current study. Scores were averaged by community to provide an overall community-level measure of effectiveness. This yielded a continuous measure ranging from 0 to 3 where higher scores indicate greater effectiveness.

Table 6. Ratings of effectiveness of research support by intervention strategy.

Strategy type	Strategy	Nelson	Anderson	Literature review	Final value
Communication	Media campaign/social marketing campaign	0	2		1
	Sticker shock	0	1		0.5
	Social norms campaign	2	2		2
	Common Theme campaign		1		1
	Other communications strategies		0		0
Enforcement	Server training	2	1		1.5
	Compliance checks	4	2		3
	Party patrols	2			2
	Sobriety checkpoints	3	3		3
	Increased enforcement of laws	2			2
Policy	Middle/high schools				1[a]
	Land use/Policies to reduce underage access	1[b]			1
	Zoning/Outlet density	3	3		3
	Social host liability	3			3
	Youth advocacy			1[c]	1
	TASP/Diversion enhancements			1[d]	1
Multi-component	Communities Mobilizing for Change on Alcohol		3		3
	Responsible Retailers		1		1
Prevention Education	ATOD student curriculum	0	1		0.5
	ATOD parent curriculum		2		2

[a]Assessment based collectively on evidence provided in Grube and Nygaard (2001) and Evans-Whipp et al. (2010).
[b]Although the authors do not provide an explicit value for this intervention strategy, text on p. 144 suggests that studies on this topic are limited and what evidence does exist is mixed.
[c]Assessment based collectively on evidence provided in Winkleby et al (2004) and Morton and Montgomery (2011).
[d]Assessment based on Henggeler et al. (2006).

Implementation fidelity

Implementation fidelity was measured using a rating tool developed for use in a national cross-site evaluation of state grantees funded in the first two cohorts of the SPF SIG program. Based on an extensive review of environmental approaches to substance use prevention, core components of each intervention were identified and a 4-point rating scale for each component was developed to measure fidelity. In cases where communities implemented school- and family-based curricula, the state's evaluation coordinator consulted the curriculum's implementation guides to identify the core components. Those components that were not implemented received a score of 0, while those implemented with weak, moderate, or strong fidelity were given ratings of

1, 2, or 3, respectively. The standards for the fidelity ratings were developed by a workgroup comprising several of the states' SPF SIG evaluators and investigators from the national cross-site team (Westat, 2008).

The fidelity ratings of each intervention were averaged within community by taking a weighted average of the two fidelity assessments (June 2010 and September 2011). The weights were based on the number of intervention components assessed in each year. In instances where fidelity was measured only once because implementation of the intervention took place entirely during one assessment period, that score was used as the final measure. These procedures yielded one fidelity measurement for each intervention the community implemented. To obtain an overall fidelity measure across all interventions within a community, an average of these intervention-specific fidelity measures was taken. This yielded one continuous measure of fidelity per community with a value between 0 and 3. Only those interventions that target underage drinking were included when computing the fidelity score.

Analysis Plan

All analyses were conducted at the community level (n=24). Mplus version 7.11 was used for all analyses. Because coalition capacity and community readiness were conceptualized as latent variables, a confirmatory factor analysis was conducted to establish a suitable measurement model. Latent variables were fixed to a mean of zero and a standard deviation of one and each observed variable was freely estimated. Observed variables with non-significant ($p \geq 0.05$) factor loadings were removed and the model was refit. This resulted in singular latent measures of capacity and readiness that were used in all subsequent analyses. Although use of singular measures of these two constructs obscures their potential multidimensionality, the small sample size precluded an examination of models containing the individual sub-dimensions that comprise the latent variables.

Structural equation modeling (SEM) was then used to test the hypothesized model. SEM is particularly well-suited for simultaneously testing multiple mediation pathways such as the ones proposed in the current study. It is also does not assume the variables in the model are measured

without error and that residuals are not correlated, both of which are assumed with traditional path analysis.

An analysis was conducted to determine the power needed to detect significant effects as proposed in the model in Figure 1. Using a SAS macro developed by Kadel (2010), the magnitude of the mediated effect size was varied to determine the sample size needed given α=0.05 and ß=0.80. The parameters of the effect size as required by the macro were drawn from the study data. These parameters included the expected size of the total effect between the predictor and the outcome, expected percent attenuation of the effect once the mediator was introduced, and the residual variance of the outcome. Using the average value of these standardized parameters (0.272, 14.2%, and 0.861, respectively) derived across all simple mediation models indicated that a sample size of 153 would be needed to detect a medium-sized mediation effect with 80% power. Using values representing a large effect size (0.434, 29.6%, and 0.774) indicated a sample size of 55 would be required.

Given the small sample size in the current study, a model building approach was used in which the paths in the model were first tested individually, followed by more complex models comprising those relationships found to be statistically significant in the initial step. This reduced the total number of parameters to be tested in any one model, thus requiring less power to detect effects. More specifically, both outcomes were regressed individually on the two predictors and the three mediators, and each mediator was regressed individually on the two outcomes. Each possible singular mediation pathway was then tested, followed by multiple mediation models, culminating in the full models specified in Figure 1 (the two outcomes were assessed in separate full models). At each step, Chi-square, CFI, and TLI indices were consulted to assess model fit where non-significant Chi-square tests and CFI and TLI values of 0.95 or greater were considered indicative of good model fit (Kenny, 2014a).

The direct effect, and indirect effect, and total effect were examined for each model and are presented in the results section that follows. The direct effect refers to the effect of the predictor on the outcome controlling for any mediators, whereas the indirect effect refers to the effect of the predictor on the outcome through one or more mediators. The total effect refers to

the entirety of the effect of the predictor on the outcome and is the sum of the direct and indirect effects. In the case of a multiple mediation model, specific indirect effects refer to the mediated effect from a given predictor to a given outcome through a particular mediator, while the total indirect effect refers to the sum of the specific indirect effects.

Maximum likelihood estimation was used in all analyses, and 1000 bootstrap replications were used to account for the non-normality of the parameter estimates associated with the mediated effects. Hypotheses 1 and 2 were tested by examining the total effects of coalition capacity and community readiness on changes in alcohol and binge use regardless of the effect of any of the three mediators. Hypotheses 3 and 4 were tested by examining the indirect effects, calculated as the product of the two constituent pathways.

CHAPTER 4: RESULTS

Table 7 presents the correlations between the coalition capacity dimension scores, mediators, and outcomes. Table 8 presents the correlations between the community readiness dimension scores, mediators, and outcomes. Table 9 presents the correlations between the mediators and outcomes. High inter-item correlations were observed between capacity dimension scores while low correlations were observed among the readiness dimension scores. In the case of the latter, the highest correlations were observed between items that tapped knowledge of prevention efforts, leadership, and resources for prevention.

With respect to capacity and the mediators (Table 7), there were significant correlations between select capacity dimensions and effectiveness and fidelity. All the correlations between capacity dimensions and effectiveness were in a negative direction, suggesting that greater capacity was related to the selection of less effective interventions. Note, however, that only one such correlation was significant. Conversely, all the correlations between capacity dimensions and fidelity were in a positive direction, indicating that greater capacity was associated with the selection of more effective interventions. No significant correlations were found with respect to any capacity dimensions and comprehensiveness.

With respect to capacity and the outcomes (Table 7), there were significant relationships between select capacity dimensions and reductions in alcohol use. All but one coefficient was in a positive direction, indicating that greater capacity was related to greater reductions in alcohol use. The same was true for the relationship between capacity dimensions and reductions in binge alcohol use.

When examining readiness and the mediators (Table 8), only one readiness dimension emerged as significantly related to comprehensiveness. No dimensions were related to effectiveness or fidelity. The directionality of the coefficients, however, indicate that greater

readiness may be associated with use of less comprehensive and effective strategies, while it may be related to greater fidelity of implementation.

When examining readiness and the outcomes (Table 8), there were no significant relationships between any dimensions of readiness and reductions in either alcohol use or binge alcohol use. Although non-significant, the negative coefficients suggest that greater readiness was associated with smaller reductions in alcohol or binge use.

An examination of the correlations between the mediators (Table 9) revealed only one significant relationship, which was that use of more comprehensive strategies was associated with use of more effective strategies. As expected, there was a strong positive relationship between the two outcomes (Table 9). None of the relationships between the three mediators and two outcomes were significant, although all were in the expected direction.

Table 7. Bivariate correlations, means, and standard deviations of coalition capacity variables (n=24).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	0.76*														
3	0.79*	0.81*													
4	0.70*	0.75*	0.75*												
5	0.34	0.44*	0.55*	0.51*											
6	0.62*	0.64*	0.59*	0.70*	0.19										
7	0.79*	0.86*	0.88*	0.86*	0.56*	0.59*									
8	0.76*	0.73*	0.79*	0.87*	0.44*	0.69*	0.86*								
9	0.68*	0.70*	0.74*	0.82*	0.41*	0.69*	0.80*	0.88*							
10	0.64*	0.62*	0.78*	0.86*	0.54*	0.70*	0.78*	0.88*	0.87*						
11	0.42*	0.49*	0.46*	0.62*	0.33	0.50*	0.42*	0.36	0.51*	0.61*					
12	0.54*	0.57*	0.69*	0.82*	0.55*	0.62*	0.74*	0.83*	0.83*	0.93*	0.57*				
13	0.73*	0.71*	0.78*	0.86*	0.36	0.76*	0.79*	0.80*	0.79*	0.88*	0.66*	0.84*			
14	0.71*	0.81*	0.74*	0.81*	0.39	0.75*	0.72*	0.70*	0.67*	0.76*	0.75*	0.66*	0.81*		
15	0.66*	0.77*	0.69*	0.76*	0.31	0.75*	0.72*	0.79*	0.65*	0.73*	0.44*	0.65*	0.79*	0.85*	
CMP	-0.03	-0.08	0.09	0.01	-0.11	-0.25	0.03	0.16	0.10	0.06	-0.21	0.01	-0.08	-0.15	-0.14
EFF	-0.24	-0.25	-0.20	-0.34	-0.62*	-0.20	-0.33	-0.17	-0.11	-0.30	-0.34	-0.37	-0.33	-0.34	-0.29
FID	0.36	0.40	0.24	0.49*	0.28	0.52*	0.35	0.49*	0.48*	0.45*	0.29	0.48*	0.34	0.47*	0.50*
ALC	0.35	0.31	0.19	0.33	-0.11	0.53*	0.36	0.47*	0.53*	0.37	0.09	0.45*	0.45*	0.24	0.45*
BNG	0.25	0.24	0.10	0.33	0.12	0.35	0.39	0.48*	0.38	0.23	-0.25	0.30	0.19	0.07	0.37
Mean	4.12	3.59	4.31	3.96	4.48	3.62	4.05	4.20	4.30	4.20	4.18	4.16	3.92	3.69	3.47
SD	0.34	0.41	0.35	0.52	0.26	0.51	0.38	0.45	0.39	0.45	0.57	0.34	0.45	0.60	0.83

Note 1: 1=Vision, mission, and goals; 2=Coalition structure and membership; 3=Coalition leadership; 4=Outreach and communication; 5=Coalition meetings and communications; 6=Opportunities for member growth and responsibility; 7=Effectiveness in planning and implementation; 8=Relationship with local government and other community leaders; 9=Partnership with other organizations; 10=Coalition members' sense of ownership and participation; 11=Ability to collect, analyze, and use data; 12=Understanding of and commitment to environmental change strategies; 13=Cultural competence; 14=Funding and sustainability; 15=Support from Board; CMP=Comprehensiveness; EFF=Effectiveness; FID=Fidelity of implementation; ALC=Reduction in the prevalence of 30-day alcohol use from pretest to posttest; BNG=Reduction in the prevalence of 30-day binge alcohol use from pretest to posttest
*p<.05

Table 8. Bivariate correlations of community readiness variables (n=24).

	1	2	3	4	5	6
2	0.19					
3	0.04	0.60*				
4	0.22	-0.04	-0.12			
5	0.07	0.23	0.25	0.05		
6	0.21	0.78*	0.79*	0.03	0.30	
CMP	0.39	-0.21	-0.17	0.40*	-0.24	-0.08
EFF	0.30	-0.40	-0.19	0.39	-0.27	-0.37
FID	0.07	0.28	0.26	-0.33	0.10	0.31
ALC	-0.06	-0.16	-0.16	-0.24	0.12	-0.18
BNG	-0.10	-0.11	-0.25	-0.22	-0.21	-0.15

Note 1: 1=Existing prevention efforts; 2=Knowledge of prevention efforts; 3=Leadership; 4=Community climate; 5= Community perceptions about extent of problem; 6=Resources for prevention; CMP=Comprehensiveness; EFF=Effectiveness; FID=Fidelity of implementation; ALC=Reduction in the prevalence of 30-day alcohol use from pretest to posttest; BNG=Reduction in the prevalence of 30-day binge alcohol use from pretest to posttest
Note 2: Community readiness variables are standardized to a mean of 0 and a SD of 1. All others are unstandardized.
*p<.05

Table 9. Bivariate correlations, means, and standard deviations of mediators and outcomes (n=24).

	CMP	EFF	FID	ALC	BNG
EFF	0.72*				
FID	-0.38	-0.35			
ALC	0.13	0.14	0.30		
BNG	0.18	0.03	0.37	0.78*	
Mean	2.67	1.30	2.14	0.08	0.06
SD	1.09	0.35	0.38	0.05	0.04

Note 1: CMP=Comprehensiveness; EFF=Effectiveness; FID=Fidelity of implementation; ALC=Reduction in the prevalence of 30-day alcohol use from pretest to posttest; BNG=Reduction in the prevalence of 30-day binge alcohol use from pretest to posttest
*p<.05

The full measurement model is presented in Figure 3 and in Table 10. All 15 capacity dimensions loaded significantly on the capacity latent variable, while only three of the 6 readiness dimensions did so with respect to the readiness latent variable. Model fit indices indicated a poor model fit (Chi-square p<.0001; TLI=0.523; CFI =0.573). The full complement of standardized and unstandardized loadings is presented in Table 10. The readiness dimensions that did not load significantly on the latent variable, labeled 16, 19, and 20 in Figure 3, were removed and the measurement model was refit. Modest gains in the TLI (0.632) and CFI (0.678) and model fit indices were obtained, although the Chi-square test was still significant (p<.0001), indicating poor fit. No theoretical justification could be made for modifying the measurement model further.

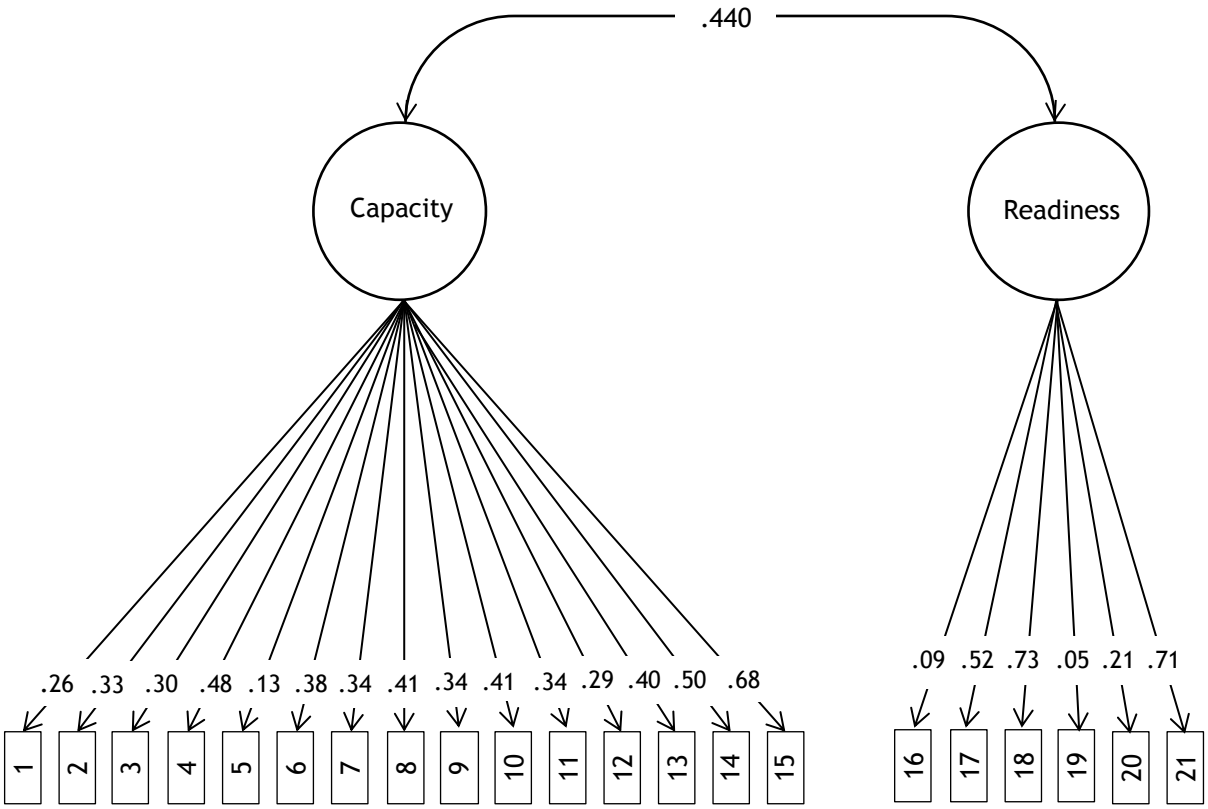

Figure 3. Measurement model. 1=Vision, mission, and goals; 2=Coalition structure and membership; 3=Coalition leadership; 4=Outreach and communication; 5=Coalition meetings and communications; 6=Opportunities for member growth and responsibility; 7=Effectiveness in planning and implementation; 8=Relationship with local government and other community leaders; 9=Partnership with other organizations; 10=Coalition members' sense of ownership and participation; 11=Ability to collect, analyze, and use data; 12=Understanding of and commitment to environmental change strategies; 13=Cultural competence; 14=Funding and sustainability; 15=Support from Board; 16=Existing prevention efforts; 17=Knowledge of prevention efforts; 18=Leadership; 19=Community climate; 20=Community perceptions about extent of problem; 21=Resources for prevention
Note: Factor loadings are unstandardized.

Table 10. Measurement model factor loadings (n=24).

	Standardized ß	Unstandardized B	SE
Latent variable: Coalition capacity			
1 - Vision, mission, and goals	0.785	0.263*	0.046
2 - Coalition structure and membership	0.818	0.328*	0.056
3 - Coalition leadership	0.861	0.297*	0.050
4 - Outreach and communication	0.931	0.478*	0.089
5 - Coalition meetings and communications	0.517	0.134*	0.050
6 - Opportunities for member growth and responsibility	0.759	0.379*	0.073
7 - Effectiveness in planning and implementation	0.902	0.337*	0.053
8 - Relationship with local government and other community leaders	0.925	0.409*	0.071
9 - Partnership with other organizations	0.887	0.338*	0.068
10 - Coalition members' sense of ownership and participation	0.927	0.412*	0.093
11 - Ability to collect, analyze, and use data	0.603	0.335*	0.125
12 - Understanding of and commitment to environmental change strategies	0.873	0.294*	0.083
13 - Cultural competence	0.917	0.400*	0.066
14 – Funding and sustainability	0.846	0.498*	0.080
15 - Support from Board	0.828	0.675*	0.111
Latent variable: Community readiness			
16 - Existing prevention efforts	0.201	0.094	0.098
17 - Knowledge of prevention efforts	0.738	0.520*	0.132
18 – Leadership	0.749	0.733*	0.214
19 - Community climate	0.081	0.046	0.092
20 - Community perceptions about extent of problem	0.263	0.213	0.206
21 - Resources for prevention	1.050	0.708*	0.160

*p<.05

The next step in the analyses was to initiate the model building process by first specifying simple models regressing each of the mediators separately on each of the two main predictors. These represent the "a" path in traditional mediation nomenclature, the results for which are presented in Table 11. The only significant relationship observed was between capacity and fidelity, indicating that those communities characterized by coalitions with higher capacity were more likely to implement with higher fidelity compared to those communities with coalitions characterized by lower capacity.

Table 11. Results for simple bivariate predictor-mediator models (n=24).

Predictor	Capacity				Readiness			
	Standardized	Unstandardized			Standardized	Unstandardized		
Mediator	B	ß	SE	p	ß	ß	SE	p
Comprehensiveness	0.003	0.003	0.200	0.988	-0.077	-0.082	0.212	0.698
Effectiveness	-0.318	-0.109	0.083	0.190	-0.369	-0.126	0.065	0.054
Fidelity	0.486	0.179	0.077	0.020	0.310	0.114	0.066	0.083

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

The next step was to regress the two outcomes, changes in alcohol use and binge alcohol use, on each of the two predictors and the three mediators. Again, simple bivariate models were used to preliminarily explore relationships. The coefficients from the models regressing the outcomes on the mediators represent the "b" paths while those from models regressing the outcomes on the predictors represent the "c" paths, or the total effect. The results of these models are shown in Table 12. Capacity was positively and significantly related to reductions in alcohol use, indicating that communities with coalitions characterized by greater capacity saw larger relative reductions in alcohol use than did those communities with coalitions with lower capacity. This significant relationship provides justification for exploring potential mediation relationships further.

Table 12. Results for simple bivariate predictor-outcome and mediator-outcome models (n=24).

	Reductions in alcohol use				Reductions in binge alcohol use			
	Standardized	Unstandardized			Standardized	Unstandardized		
	B	ß	SE	P	ß	ß	SE	p
Predictors								
Capacity	0.434	0.020	0.009	0.022	0.325	0.013	0.008	0.125
Readiness	-0.173	-0.008	0.009	0.353	-0.151	-0.006	0.008	0.438
Mediators								
Comprehensiveness	0.129	0.006	0.010	0.560	0.184	0.007	0.007	0.315
Effectiveness	0.140	0.019	0.031	0.533	0.033	0.004	0.024	0.871
Fidelity	0.303	0.038	0.027	0.161	0.367	0.040	0.028	0.148

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

Table 13 provides the results of the individual simple mediation models involving capacity and alcohol use. As noted in Table 12, the total effect of capacity on reductions in alcohol use was significant. For the first two models involving comprehensiveness and effectiveness, respectively, the direct effect of capacity on reductions in alcohol use was significant, while the indirect effects in both models were non-significant. This suggests that the introduction of comprehensiveness and effectiveness as mediators did not explain the relationship between capacity and reductions in alcohol use. Although the indirect effect in the third model incorporating fidelity was non-significant, the non-significant direct effect suggests that the relationship between capacity and reductions in alcohol use was attenuated with the introduction of the fidelity measure. Note also that the relationship between capacity and fidelity was significant (p=0.020). This provides partial support for the mediating role of fidelity in this relationship.

Table 13. Results for capacity-alcohol use mediation models (n=24).

	Standardized			Unstandardized		
	β	SE	p	B	SE	p
Model 1: (X^2 p<.01; CFI=.715; TLI=.672)						
Capacity→Comprehensiveness→Alcohol						
Capacity→Comprehensiveness (a)	0.003	--	--	0.003	0.201	0.987
Comprehensiveness→Alcohol (b)	0.128	--	--	0.006	0.009	0.523
Total effect (c)	0.434	0.169	0.010	0.020	0.009	0.021
Indirect effect (a*b)	0.000	0.052	0.994	0.000	0.002	0.994
Direct effect (c')	0.433	0.183	0.018	0.020	0.009	0.032
Model 2: (X^2 p<.01; CFI=.721; TLI=.678)						
Capacity→Effectiveness→Alcohol						
Capacity→Effectiveness (a)	-0.318	--	--	-0.109	0.083	0.191
Effectiveness→Alcohol (b)	0.309	--	--	0.042	0.027	0.117
Total effect (c)	0.434	0.170	0.011	0.020	0.009	0.022
Indirect effect (a*b)	-0.098	0.124	0.428	-0.005	0.006	0.421
Direct effect (c')	0.532	0.184	0.004	0.025	0.010	0.013
Model 3: (X^2 p<.01; CFI=.763; TLI=.727)						
Capacity→Fidelity→Alcohol						
Capacity→Fidelity (a)	0.486	--	--	0.179	0.077	0.020
Fidelity→Alcohol (b)	0.120	--	--	0.015	0.027	0.566
Total effect (c)	0.434	0.170	0.011	0.020	0.009	0.022
Indirect effect (a*b)	0.058	0.115	0.613	0.003	0.006	0.628
Direct effect (c')	0.376	0.197	0.056	0.018	0.010	0.067

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

Table 14 presents results for the analogous models in which reduction in binge alcohol use served as the dependent variable. No direct or indirect effects emerged as significant, which was not unexpected given the lack of a total effect observed in Table 12.

The next step in the analyses was the revise the models in Tables 13 and 14 by replacing capacity with readiness. Although there were no significant total effects observed for the readiness-alcohol use and readiness-binge alcohol use relationships in Table 12, these mediation analyses were conducted to identify any paths of note that might inform subsequent models. Table 15 presents the results for the individual readiness-alcohol use mediation models while Table 16 presents those for the readiness-binge alcohol use models. No direct or indirect paths emerged as significant in any of the models.

Table 14. Results for capacity-binge alcohol use mediation models (n=24).

	Standardized			Unstandardized		
	Ƀ	SE	P	B	SE	p
Model 4: (X^2 p<.01; CFI=.699; TLI=.653)						
Capacity→Comprehensiveness→Binge						
Capacity→Comprehensiveness (a)	0.004	--	--	0.004	0.200	0.984
Comprehensiveness→Binge (b)	0.183	--	--	0.007	0.007	0.315
Total effect (c)	0.325	0.190	0.088	0.013	0.008	0.125
Indirect effect (a*b)	0.001	0.059	0.991	0.000	0.002	0.990
Direct effect (c')	0.324	0.212	0.127	0.013	0.009	0.163
Model 5: (X^2 p<.01; CFI=.704; TLI=.659)						
Capacity→Effectiveness→Binge						
Capacity→Effectiveness (a)	-0.317	--	--	-0.109	0.083	0.191
Effectiveness→Binge (b)	0.151	--	--	0.018	0.024	0.462
Total effect (c)	0.324	0.191	0.089	0.013	0.008	0.126
Indirect effect (a*b)	-0.048	0.104	0.645	-0.002	0.004	0.647
Direct effect (c')	0.372	0.202	0.065	0.015	0.009	0.107
Model 6: (X^2 p<.01; CFI=.752; TLI=.714)						
Capacity→Fidelity→Binge						
Capacity→Fidelity (a)	0.486	--	--	0.179	0.077	0.020
Fidelity→Binge (b)	0.273	--	--	0.030	0.029	0.312
Total effect (c)	0.325	0.191	0.089	0.013	0.009	0.126
Indirect effect (a*b)	0.133	0.160	0.405	0.005	0.007	0.440
Direct effect (c')	0.192	0.196	0.328	0.008	0.008	0.334

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

Table 15. Results for readiness-alcohol use mediation models (n=24).

	Standardized			Unstandardized		
	Ƀ	SE	p	Ƀ	SE	p
Model 7: (X^2 p=.69; CFI=1.00; TLI=1.00)						
Readiness→Comprehensiveness→Alcohol						
Readiness→Comprehensiveness (a)	-0.078	--	--	-0.083	0.209	0.692
Comprehensiveness→Alcohol (b)	0.116	--	--	0.005	0.010	0.604
Total effect (c)	-0.180	0.193	0.351	-0.008	0.009	0.344
Indirect effect (a*b)	-0.009	0.055	0.870	0.000	0.003	0.868
Direct effect (c')	-0.171	0.190	0.367	-0.008	0.009	0.369
Model 8: (X^2 p=.78; CFI=1.00; TLI=1.00)						
Readiness→Effectiveness→Alcohol						
Readiness→Effectiveness (a)	-0.370	--	--	-0.126	0.065	0.051
Effectiveness→Alcohol (b)	0.086	--	--	0.012	0.034	0.727
Total effect (c)	-0.179	0.193	0.353	-0.008	0.009	0.348
Indirect effect (a*b)	-0.032	0.114	0.781	-0.001	0.005	0.771
Direct effect (c')	-0.147	-0.213	0.489	-0.007	0.010	0.485
Model 9: (X^2 p=.99; CFI=1.00; TLI=1.00)						
Readiness→Fidelity→Alcohol						
Readiness→Fidelity (a)	0.313	--	--	0.115	0.066	0.083
Fidelity→Alcohol (b)	0.399	--	--	0.051	0.034	0.136
Total effect (c)	-0.182	0.194	0.348	-0.009	0.009	0.343
Indirect effect (a*b)	0.125	0.130	0.336	0.006	0.006	0.346
Direct effect (c')	-0.307	0.217	0.157	-0.014	0.010	0.171

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

Table 16. Results for readiness-binge alcohol use mediation models (n=24).

	Standardized			Unstandardized		
	ß	SE	P	ß	SE	p
Model 10: (X^2 p=.54; CFI=1.00; TLI=1.00)						
Readiness→Comprehensiveness→Binge						
Readiness→Comprehensiveness (a)	-0.082	--	--	-0.088	0.211	0.678
Comprehensiveness→Binge (b)	0.173	--	--	0.006	0.007	0.342
Total effect (c)	-0.155	0.201	0.442	-0.006	0.008	0.429
Indirect effect (a*b)	-0.014	0.054	0.791	-0.001	0.002	0.782
Direct effect (c')	-0.140	0.194	0.470	-0.006	0.008	0.454
Model 11: (X^2 p=.60; CFI=1.00; TLI=1.00)						
Readiness→Effectiveness→Binge						
Readiness→Effectiveness (a)	-0.327	--	--	-0.127	0.066	0.053
Effectiveness→Binge (b)	-0.027	--	--	-0.003	0.025	0.900
Total effect (c)	-0.152	0.200	0.447	-0.006	0.008	0.434
Indirect effect (a*b)	0.010	0.098	0.918	0.000	0.004	0.918
Direct effect (c')	-0.162	0.225	0.472	-0.006	0.009	0.464
Model 12: (X^2 p=.81; CFI=1.00; TLI=1.00)						
Readiness→Fidelity→Binge						
Readiness→Fidelity (a)	0.318	--	--	0.117	0.066	0.078
Fidelity→Binge (b)	0.465	--	--	0.051	0.029	0.081
Total effect (c)	-0.161	0.197	0.413	-0.006	0.008	0.399
Indirect effect (a*b)	0.148	0.132	0.262	0.006	0.006	0.283
Direct effect (c')	-0.309	0.204	0.130	-0.012	0.008	0.143

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

Finally, as a test of the full model proposed in Figure 1, an inclusive model was run in which both predictors and all three mediators were entered into the same model. This was done separately for the alcohol use and binge alcohol use outcomes. Table 17 presents the results of the full model for the alcohol use outcome while Table 18 presents those for the binge alcohol use outcome. In both cases, the total effect of capacity on the outcome was positive and significant, which mirrors the results observed in the simpler models presented above. Although the direct effects were attenuated to the point of non-significance, neither the total indirect effect nor any of the specific indirect effects were significant, which indicates that mediation was not present in either model. Figures 4 and 5 present the results from Tables 17 and 18 in graphic form.

Table 17. Results for full model – alcohol use (n=24).

	Standardized			Unstandardized		
	Ƀ	SE	P	Ƀ	SE	p
Model 13: (X^2 p<.01; CFI=.579; TLI=.509)						
Capacity&Readiness→CE&F→Alcohol						
Capacity→Comprehensiveness	0.002	--	--	0.002	0.269	0.994
Readiness→ Comprehensiveness	0.007	--	--	0.007	0.258	0.978
Capacity→Effectiveness	-0.219	--	--	-0.075	0.089	0.400
Readiness→ Effectiveness	-0.222	--	--	-0.076	0.071	0.282
Capacity→Fidelity	0.466	--	--	0.171	0.089	0.053
Readiness→Fidelity	0.047	--	--	0.017	0.079	0.829
Comprehensiveness→Alcohol	0.023	--	--	0.001	0.016	0.951
Effectiveness→Alcohol	0.264	--	--	0.036	0.045	0.421
Fidelity→Alcohol	0.216	--	--	0.027	0.030	0.357
Capacity→CE&F→Alcohol						
Total	0.615	0.211	0.004	0.029	0.011	0.008
Total indirect	0.043	0.192	0.824	0.002	0.009	0.817
Capacity→Comprehensiveness→Alcohol	0.000	0.112	1.000	0.000	0.005	1.000
Capacity→Effectiveness→Alcohol	-0.058	0.129	0.653	-0.003	0.006	0.648
Capacity→Fidelity→Alcohol	0.101	0.131	0.442	0.005	0.006	0.454
Direct	0.572	0.306	0.062	0.027	0.014	0.064
Readiness→CE&F→Alcohol						
Total	-0.413	0.211	0.050	-0.019	0.010	0.057
Total indirect	-0.048	0.133	0.716	-0.002	0.006	0.705
Readindess→Comprehensiveness→Alcohol	0.000	0.099	0.999	0.000	0.004	0.999
Readiness→Effectiveness→Alcohol	-0.059	0.119	0.621	-0.003	0.005	0.600
Readiness→Fidelity→Alcohol	0.010	0.078	0.897	0.000	0.003	0.892
Direct	-0.365	0.230	0.113	-0.017	0.011	0.115

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

Table 18. Results for full model – binge alcohol use (n=24).

	Standardized			Unstandardized		
	Ƀ	SE	P	Ƀ	SE	p
Model 14: (X^2 p<.01; CFI=.525; TLI=.474)						
Capacity&Readiness→CE&F→Binge						
Capacity→Comprehensiveness	0.010	--	--	0.011	0.270	0.967
Readiness→ Comprehensiveness	-0.012	--	--	-0.012	0.263	0.962
Capacity→Effectiveness	-0.211	--	--	-0.072	0.089	0.415
Readiness→Effectiveness	-0.238	--	--	-0.081	0.072	0.256
Capacity→Fidelity	0.460	--	--	0.169	0.089	0.058
Readiness→Fidelity	0.060	--	--	0.022	0.080	0.784
Comprehensiveness→Binge	0.593	--	--	0.022	0.012	0.071
Effectiveness→Binge	-0.297	--	--	-0.035	0.040	0.379
Fidelity→Binge	0.523	--	--	0.057	0.032	0.075
Capacity→CE&F→Binge						
Total	0.463	0.207	0.025	0.019	0.010	0.054
Total indirect	0.309	0.246	0.209	0.012	0.010	0.227
Capacity→Comprehensiveness→Binge	0.006	0.196	0.975	0.000	0.007	0.973
Capacity→Effectiveness→Binge	0.063	0.125	0.614	0.003	0.005	0.587
Capacity→Fidelity→Binge	0.240	0.210	0.252	0.010	0.009	0.283
Direct	0.154	0.290	0.596	0.006	0.011	0.581
Readiness→CE&F→Binge						
Total	-0.311	0.207	0.134	-0.012	0.008	0.142
Total indirect	0.095	0.149	0.524	0.004	0.006	0.507
Readindess→Comprehensiveness→Binge	-0.007	0.178	0.969	0.000	0.007	0.967
Readiness→Effectiveness→Binge	0.071	0.148	0.633	0.003	0.006	0.621
Readiness→Fidelity→Binge	0.031	0.141	0.825	0.001	0.005	0.817
Direct	-0.406	0.228	0.075	-0.016	0.009	0.083

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

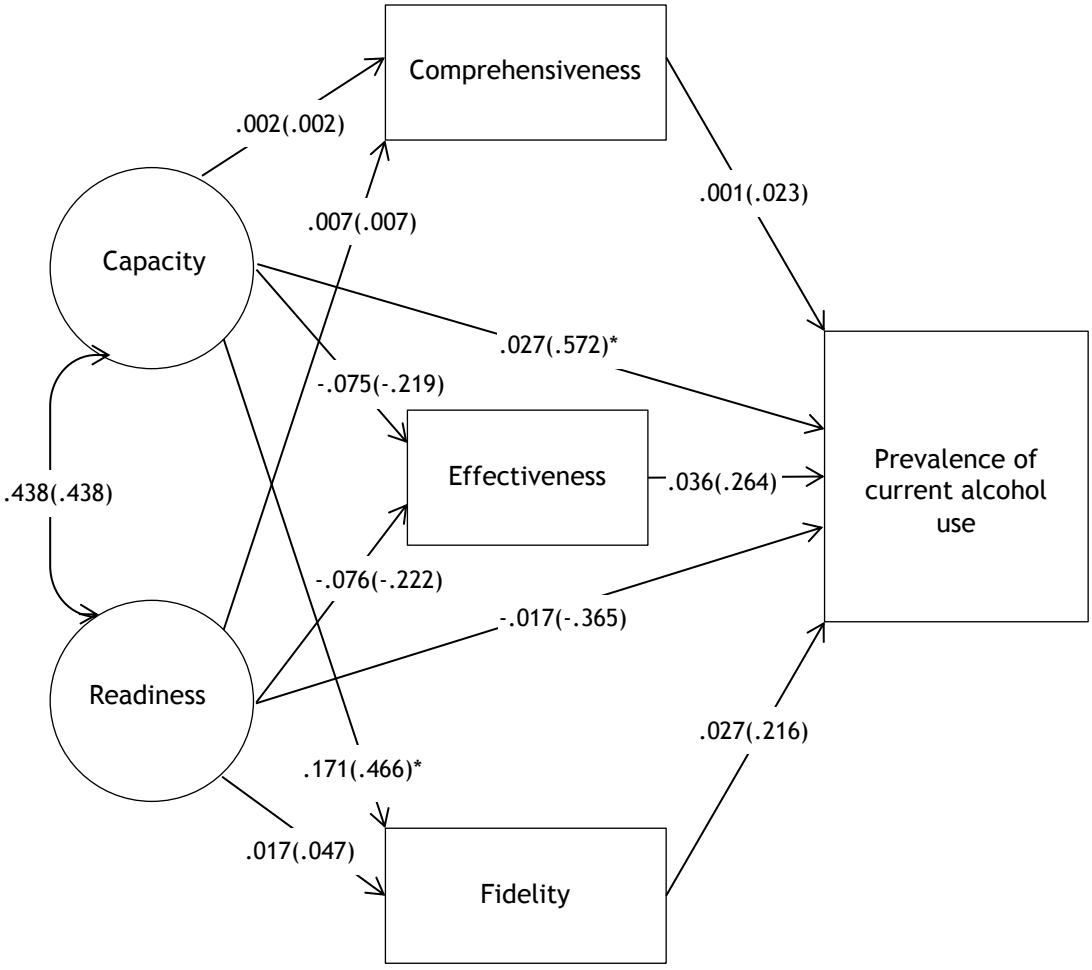

Figure 4. Results for full model – alcohol use (n=24). Standardized coefficients are presented in parentheses. *p<.10

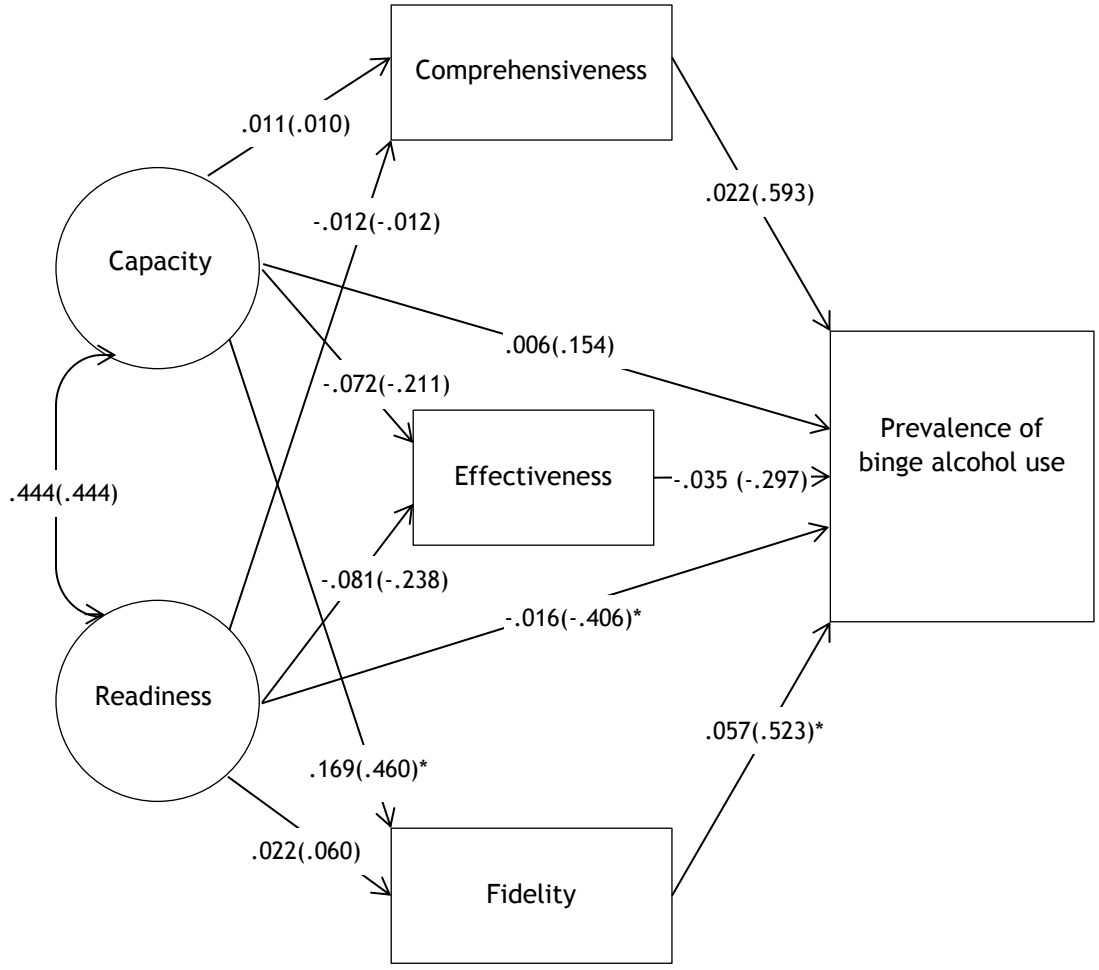

Figure 5. Results for full model – binge alcohol use (n=24). Standardized coefficients are presented in parentheses. *p<.10

Post hoc analyses

Given the lack of significant findings with respect to mediated effects, new models were fit that explored whether the relationship between capacity, readiness, and the two main outcomes was accounted for by the total number of intervention activities the communities implemented. This was done to examine whether the sheer number of activities used by a community was a greater determining factor in achieving outcomes than the characteristics of those activities. To test this, a variable was constructed that represented the number of interventions each community implemented over the entire course of the project. As before, only those interventions that targeted underage alcohol use were included in the total. The variable was then entered as a mediator in each of the pairwise relationships between the two predictors and two outcomes, the results for which are displayed in Table 19. The effects of capacity and readiness on the variable were both positive and significant (B=1.005, p=0.047; B=1.182, p=0.021), indicating that greater capacity and readiness were related to use of a greater number of interventions. The effect of the number of interventions on alcohol use and binge alcohol use controlling for capacity and readiness, however, was non-significant (B=0.001, p=0.875; B=0.006, p=0.093). In neither case was the indirect effect significant, indicating that the total number of interventions did not mediate the capacity- or readiness-alcohol use relationships.

Table 19. Results for simple models with total interventions mediator - alcohol use (n=24).

	Standardized			Unstandardized		
	Β	SE	p	Β	SE	p
Model 15: (X^2 p<.01; CFI=.753; TLI=.715)						
Capacity→Total interventions→Alcohol						
Capacity→Total interventions	0.380	--	--	1.005	0.505	0.047
Total interventions→Alcohol	0.032	--	--	0.001	0.004	0.875
Total effect	0.434	0.170	0.011	0.020	0.009	0.022
Indirect effect	0.012	0.088	0.888	0.001	0.004	0.878
Direct effect	0.421	0.216	0.051	0.020	0.011	0.070
Model 16: (X^2 p=.99; CFI=1.00; TLI=1.00)						
Readiness→Total interventions→Alcohol						
Readiness→Total interventions	0.448	--	--	1.182	0.513	0.021
Total interventions→Alcohol	0.341	--	--	0.006	0.004	0.093
Total effect	-0.178	0.192	0.356	-0.008	0.009	0.350
Indirect effect	0.152	0.120	0.204	0.007	0.005	0.161
Direct effect	-0.330	0.208	0.112	-0.015	0.010	0.106

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

The models were repeated for the binge alcohol use outcome, the results for which are presented in Table 20. As in Table 19, the effects of capacity and readiness on the number of interventions used were positive and significant. The effect of the number of interventions on binge alcohol use, however, was also positive and significant, indicating that those communities implementing more interventions saw greater reductions in binge alcohol use compared to those implementing fewer interventions. In the case of the readiness model, a significant positive indirect effect (B=0.012, p=0.039) was observed, indicating that the number of interventions mediated the relationship between readiness and reductions in binge alcohol use. Also of note is that the direct effect between readiness and binge alcohol use was negative and significant (B=-0.018, p=0.011), indicating counterintuitively that controlling for the number of interventions implemented, those communities with greater readiness saw lower reductions in binge alcohol use compared to those communities with less readiness. The fact that the number of interventions emerged as a significant mediator in a positive direction, however, underscores the predictive strength of this variable.

Table 20. Results for simple models with total interventions mediator - binge alcohol use (n=24).

	Standardized			Unstandardized		
	Ƀ	SE	p	Ƀ	SE	p
Model 17: (X^2 p<.01; CFI=.736; TLI=.696)						
Capacity→Total interventions→Binge						
Capacity→Total interventions	0.175	--	--	1.006	0.504	0.046
Total interventions→Binge	0.381	--	--	0.006	0.003	0.020
Total effect	0.325	0.190	0.088	0.013	0.008	0.125
Indirect effect	0.150	0.112	0.178	0.006	0.004	0.159
Direct effect	0.175	0.229	0.445	0.007	0.009	0.444
Model 18: (X^2 p=.88; CFI=1.00; TLI=1.00)						
Readiness→Total interventions→Binge						
Readiness→Total interventions	0.453	--	--	1.196	0.518	0.021
Total interventions→Binge	0.669	--	--	0.010	0.003	0.000
Total effect	-0.157	0.199	0.430	-0.006	0.008	0.417
Indirect effect	0.303	0.150	0.043	0.012	0.006	0.039
Direct effect	-0.460	0.188	0.014	-0.018	0.007	0.011

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

The total number of interventions was then entered into models as a mediator in parallel with comprehensiveness, effectiveness, and fidelity. The results of these models are presented in Tables 21 and 22. With respect to the alcohol use models (Table 21), capacity was related to fidelity and total number of interventions, while the total effect of capacity on reductions in alcohol use was positive, the same results for which were seen in previous models. Neither the total indirect effect nor any of the specific indirect effects were significant, suggesting that the introduction of the total interventions variable into this model did not explain variation in the outcome. Readiness was positively related to the total number of interventions as seen previously, while the relationship between readiness and effectiveness was negative, suggesting that those communities with greater readiness selected interventions with less evidence of effectiveness compared to those communities with less readiness.

When the total number of interventions was added to the binge alcohol use models (Table 22), the results did not differ appreciably from previous results. With respect to capacity, there were significant positive effects of capacity on fidelity and total interventions, as well as a significant total effect of capacity on reductions in binge alcohol use. With respect to readiness, it was positively related to the total number of interventions (B=1.206, p=0.026), and total interventions was positively related to reductions in binge alcohol use (B=0.014, p=0.019). Despite this, however, the specific indirect effect of total interventions was not significant (B=0.017,

p=0.064), which indicates that this particular variable did not mediate the relationship between readiness and binge alcohol use in this model. The total indirect effect was positive and significant (B=0.024, p=0.020), however, which indicates that the total number of interventions, in combination with the other three mediators, did, in fact, mediate this relationship. Note that the direct effect of readiness on binge alcohol use was negative and significant (B=-0.031, p=0.005), which indicates that, controlling for the effects of the four mediators, communities with greater readiness saw less reduction in binge alcohol use than did those with less readiness. The combination of these two findings speaks to the collective strength of the mediators, which appears to be largely driven by the total number of interventions.

Table 21. Results for multiple mediator models with total interventions – alcohol use (n=24).

	Standardized			Unstandardized		
	Ƀ	SE	p	Ƀ	SE	p
Model 19: (X^2 p<.01; CFI=.639; TLI=.571)						
Capacity→CEF+Total Interventions→Alcohol						
Capacity→Comprehensiveness	0.005	--	--	0.006	0.200	0.977
Capacity→Effectiveness	-0.317	--	--	-0.108	0.083	0.193
Capacity→Fidelity	0.487	--	--	0.179	0.077	0.020
Capacity→Total interventions	0.381	--	--	1.007	0.503	0.045
Comprehensiveness→Alcohol	-0.160	--	--	-0.007	0.020	0.730
Effectiveness→Alcohol	0.464	--	--	0.063	0.048	0.190
Fidelity→Alcohol	0.159	--	--	0.020	0.037	0.590
Total interventions→Alcohol	0.026	--	--	0.000	0.006	0.934
Total effect	0.434	0.169	0.010	0.020	0.009	0.022
Total indirect effect	-0.061	0.222	0.785	-0.003	0.010	0.777
Capacity→Comprehensiveness→Alcohol	-0.001	0.102	0.993	0.000	0.004	0.993
Capacity→Effectiveness→Alcohol	-0.147	0.181	0.417	-0.007	0.008	0.415
Capacity→Fidelity→Alcohol	0.077	0.154	0.617	0.004	0.007	0.626
Capacity→Total interventions→Alcohol	0.010	0.119	0.934	0.000	0.005	0.930
Direct effect	0.494	0.287	0.085	0.023	0.014	0.097
Model 20: (X^2 p=.17; CFI=.958; TLI=.884)						
Readiness→CEF+Total Interventions→Alcohol						
Readiness→Comprehensiveness	-0.093	--	--	-0.100	0.192	0.605
Readiness→Effectiveness	-0.377	--	--	-0.129	0.064	0.044
Readiness→Fidelity	0.317	--	--	0.117	0.065	0.071
Readiness→Total interventions	0.454	--	--	1.200	0.537	0.025
Comprehensiveness→Alcohol	0.003	--	--	0.000	0.024	0.995
Effectiveness→Alcohol	0.085	--	--	0.012	0.058	0.841
Fidelity→Alcohol	0.436	--	--	0.055	0.036	0.124
Total interventions→Alcohol	0.333	--	--	0.006	0.007	0.399
Total effect	-0.185	0.188	0.325	-0.009	0.009	0.321
Total indirect effect	0.257	0.253	0.309	0.012	0.012	0.309
Readiness→Comprehensiveness→Alcohol	0.000	0.136	0.998	0.000	0.007	0.998
Readiness→Effectiveness→Alcohol	-0.032	0.159	0.840	-0.002	0.007	0.836
Readiness→Fidelity→Alcohol	0.138	0.135	0.306	0.006	0.006	0.307
Readiness→Total Interventions→Alcohol	0.151	0.169	0.371	0.007	0.008	0.358
Direct effect	-0.442	0.304	0.146	-0.021	0.015	0.159

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

Table 22. Results for multiple mediator models with total interventions – binge alcohol use (n=24).

	Standardized			Unstandardized		
	Ƀ	SE	p	Ƀ	SE	p
Model 21: (X^2 p<.01; CFI=.630; TLI=.561)						
Capacity→CEF+Total Interventions→Binge						
Capacity→Comprehensiveness	0.005	--	--	0.006	0.200	0.977
Capacity→Effectiveness	-0.317	--	--	-0.108	0.083	0.191
Capacity→Fidelity	0.486	--	--	0.179	0.077	0.020
Capacity→Total interventions	0.382	--	--	1.008	0.503	0.045
Comprehensiveness→Binge	0.018	--	--	0.001	0.019	0.972
Effectiveness→Binge	0.112	--	--	0.013	0.045	0.769
Fidelity→Binge	0.346	--	--	0.038	0.039	0.330
Total interventions→Binge	0.381	--	--	0.006	0.005	0.224
Total effect	0.325	0.190	0.087	0.013	0.008	0.124
Total indirect effect	0.278	0.269	0.301	0.011	0.011	0.309
Capacity→Comprehensiveness→Binge	0.000	0.114	0.999	0.000	0.004	0.999
Capacity→Effectiveness→Binge	-0.036	0.153	0.815	-0.001	0.006	0.809
Capacity→Fidelity→Binge	0.168	0.203	0.407	0.007	0.009	0.436
Capacity→Total interventions→Binge	0.146	0.129	0.258	0.006	0.005	0.232
Direct effect	0.047	0.300	0.876	0.002	0.012	0.871
Model 22: (X^2 p=.11; CFI=.951; TLI=.862)						
Readiness→CEF+Total Interventions→Binge						
Readiness→Comprehensiveness	-0.124	--	--	-0.132	0.189	0.485
Readiness→Effectiveness	-0.382	--	--	-0.131	0.067	0.051
Readiness→Fidelity	0.328	--	--	0.120	0.064	0.061
Readiness→Total interventions	0.457	--	--	1.206	0.540	0.026
Comprehensiveness→Binge	-0.241	--	--	-0.009	0.017	0.596
Effectiveness→Binge	-0.052	--	--	-0.006	0.039	0.877
Fidelity→Binge	0.407	--	--	0.044	0.024	0.066
Total interventions→Binge	0.913	--	--	0.014	0.006	0.019
Total effect	-0.177	0.194	0.363	-0.007	0.008	0.352
Total indirect effect	0.600	0.263	0.022	0.024	0.010	0.020
Readiness→Comprehensiveness→Binge	0.030	0.131	0.820	0.001	0.005	0.815
Readiness→Effectiveness→Binge	0.020	0.140	0.887	0.001	0.005	0.884
Readiness→Fidelity→Binge	0.133	0.113	0.236	0.005	0.004	0.232
Readiness→Total Interventions→Binge	0.417	0.247	0.092	0.017	0.009	0.064
Direct effect	-0.777	0.279	0.005	-0.031	0.011	0.005

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

The final step in the post hoc analyses was to explore the relationship between capacity and reductions in alcohol use, which emerged as significant in many of the models. This was done by running separate models regressing the two outcomes on each of the dimensions of capacity. The purpose of these analyses was to identify any capacity dimensions that appear to be particularly important for eliciting reductions in alcohol and binge use. The results of the models testing the effect of the capacity dimensions on the two outcomes are presented in Table 23. Six dimensions were significantly related to reductions in alcohol use, while two were significantly related to reductions in binge alcohol use. Next, the total number of interventions was added to

these eight models to examine whether it mediated any of the relationships. No significant indirect effects were found, however (results not shown).

Table 23. Total effects of capacity dimensions on alcohol and binge alcohol use (n=24).

	Alcohol				Binge			
	Standardized	Unstandardized			Standardized	Unstandardized		
	B	ß	SE	p	ß	ß	SE	p
1. Vision, mission, and goals	0.346	0.048	0.024	0.042	0.245	0.029	0.028	0.289
2. Coalition structure and membership	0.306	0.036	0.023	0.128	0.242	0.024	0.020	0.222
3. Coalition leadership	0.192	0.026	0.024	0.287	0.103	0.012	0.019	0.527
4. Outreach and communication	0.335	0.030	0.019	0.105	0.329	0.026	0.018	0.150
5. Coalition meetings and communications	-0.112	-0.020	0.038	0.593	0.116	0.018	0.030	0.545
6. Opportunities for member growth and responsibility	0.529	0.049	0.014	0.001	0.346	0.028	0.018	0.130
7. Effectiveness in planning and implementation	0.359	0.045	0.023	0.055	0.387	0.041	0.021	0.046
8. Relationship with local government and other community leaders	0.475	0.050	0.018	0.005	0.481	0.044	0.018	0.017
9. Partnership with other organizations	0.525	0.064	0.022	0.003	0.380	0.040	0.022	0.064
10. Coalition members' sense of ownership and participation	0.372	0.039	0.021	0.059	0.233	0.021	0.021	0.316
11. Ability to collect, analyze, and use data	0.088	0.007	0.018	0.686	-0.248	-0.018	0.013	0.162
12. Understanding of and commitment to environmental change strategies	0.445	0.062	0.032	0.051	0.300	0.036	0.031	0.246
13. Cultural competence	0.454	0.049	0.020	0.017	0.192	0.018	0.018	0.336
14. Funding and sustainability	0.245	0.019	0.014	0.169	0.071	0.005	0.014	0.719
15. Support from Board	0.447	0.026	0.011	0.023	0.366	0.018	0.011	0.089

Note: Mplus does not provide standard errors and p-values for standardized coefficients from simple bivariate models.

CHAPTER 5: DISCUSSION

This study examined whether levels of a coalition's capacity for implementing substance use prevention interventions and the readiness of the community in which they were implemented were related to reductions in current adolescent alcohol and binge alcohol use. Empirical tests of these relationships have been very limited thus far. A fair amount of theory development has taken place, and many efforts have been made to identify dimensions and predictors of capacity and readiness, but the current study aims to turn the focus on the downstream relationships and explore whether and how these constructs are related to behavior change.

The results of the study supported only one of the four proposed hypotheses. Greater levels of coalition capacity were significantly related to greater reductions in the prevalence of current alcohol use and binge alcohol use from pretest to posttest (see Tables 17 and 18). This relationship held true even after controlling for the presence of our mediators, suggesting a robust relationship, but one for which the underlying mechanism has yet to be elucidated. There was no support found for the parallel hypothesis relating community readiness to changes in alcohol or binge use.

The lack of results concerning comprehensiveness as a mediator was particularly disappointing given its central role in the Community Problem-Solving and Change Framework on which the study's conceptual model was partially based. A more nuanced measure of comprehensiveness beyond a count of intervention domains utilized may provide a more valuable measure. One that is theory driven and incorporates the socioecological levels targeted (e.g., individual, interpersonal, community, etc.) by the interventions, for example, may uncover important relationships.

Although neither of the two mediation hypotheses was supported, the model building approach used to identify mediators did reveal a couple of interesting insights. First, the relationship between capacity and fidelity was positive and significant (see Table 11). It,

therefore, appears that coalitions that have greater capacity are better able to implement interventions as intended. As proposed by previous investigators, this may be due to greater material or human resources, stronger organizational structures, or more social capital that allows the coalition to effectively implement what are often complex and multifaceted interventions. The mechanisms by which capacity affects fidelity are an additional layer of mediation analyses that were outside the scope of the current study but nonetheless may provide a richer understanding of how best to ensure high quality implementation in community contexts. A further examination of these mechanisms in future studies is warranted.

Secondly, none of the three main mediating variables – comprehensiveness, effectiveness, or fidelity – was related to either of the two outcomes in simple bivariate analyses (see Table 12), nor did any emerge as significant in the formal mediation analyses conducted via structural equation modeling, whether through simplified models (Table 13-16) or full models (Tables 17 and 18). So although a significant total effect was found for capacity on reductions in the prevalence of alcohol use, none of the proposed mediators were responsible for this relationship. This was disappointing given that the mediators and their hypothesized relationship to the outcomes were drawn from theory and have been identified in past research as important factors in eliciting change. It was also disappointing given that the validity of these relationships are often considered axiomatic and are common tenants of the guidance provided to communities by funders and federal and state agencies. The fact that fidelity did not emerge as a significant mediator was particularly disappointing given that it was shown to be significantly related to capacity in the earlier bivariate models.

The logical next question to ask then is, if comprehensiveness, effectiveness, and fidelity did not mediate the capacity-alcohol use relationship, what did? To explore this question, post hoc analyses examined whether a measure of the total number of interventions implemented may have explained the relationship. A simple mediation model showed that although capacity led to use of a greater number of interventions, the number of interventions did not elicit reductions in the prevalence of alcohol use, nor was the mediated significant (see Model 15 in Table 19). Similar results were found when the variable was added to the full model (see Model 19 in Table 21). The

mechanism responsible for the capacity-alcohol use relationship, therefore, remains unexplained in these analyses.

Although no other significant total effects were found for the remaining pairwise relationships (i.e., capacity-binge alcohol use, readiness-alcohol use, readiness-binge alcohol use), which suggests that there was no effect to mediate, the total number of interventions was nonetheless entered into the models to examine whether any interesting findings emerged. Not only did readiness emerge as a significant predictor of the total number of interventions (see Models 16 and 18), the latter's effect on binge drinking was also significant (see Models 17 and 18), both of which were in a favorable direction. Even more interestingly, the total number of interventions emerged as a significant mediator in the readiness-binge use model (see Model 18). This finding is quite noteworthy given the relatively crude nature of the measure and the small sample size. Also noteworthy is the fact that the mediated effect was significant and positive, while the direct effect was significant and negative. So although communities with greater readiness saw smaller reductions in binge alcohol use independent of the number of interventions implemented, communities with greater readiness implemented more interventions, which led to greater reductions in binge alcohol use. This is an example of what Kenny (2014b) refers to as inconsistent mediation in which the mediated and direct effects are in opposite directions and the former acts as a suppressor, rendering the direct effect significant even though the total effect is insignificant. The robustness of these findings was tested by entering the total number of interventions into the full readiness-binge use model along with the other three mediators. Although the specific indirect effect of the total number of interventions was non-significant (B=0.017, p=0.064), the total indirect effect of all four mediators was significant (B=0.024, p=0.020), an effect that appears to be driven by the total interventions variable.

So what is to be made of these findings? First, it appears that attempts to build a coalition's capacity are a worthwhile effort. Coalitions that have higher capacity are more likely to reduce adolescent alcohol use than those with less capacity. This finding is consistent with past research that has drawn theoretical and empirical links between these two constructs. The current research, however, was not able to identify the mechanisms responsible for the relationship. It

may be that there are one or more mechanisms responsible for the relationship, or it may be that the current study lacked the power necessary to detect them. However, the current emphasis on the importance of building coalition capacity seems to have been borne out in the current study.

Second, given the robustness of the findings from post hoc analyses, it appears that when it comes to implementing community-based interventions for preventing adolescent alcohol use, more may, in fact, be better. For both alcohol use and binge alcohol use, the more interventions a community implemented, the greater the reduction in prevalence. This was true even after controlling for the three main mediators, including the comprehensiveness variable, which shares some conceptual similarity to the total number of interventions. That is, regardless of the comprehensiveness of strategies used, the sheer number of strategies seems to be an important factor in eliciting reductions in alcohol use.

The significant and unfavorable direct effect of readiness on binge alcohol use when the total number of interventions is entered into the model is difficult to reconcile. It may be that communities exhibiting greater readiness do so because the extent of the problem in their community is more intractable compared to those communities exhibiting less readiness. That is, it may be that the communities that are more ready and accepting of interventions are ones in which the prevalence is so great that it is less amenable to change. This is an issue that should be explored further and points directly to the need for more empirical studies of the relationship between readiness and behavioral outcomes.

The study's findings should be interpreted with caution given a few notable issues. First, the study appears to be underpowered given the sample size of 24 communities. Power calculations showed that a minimum of 55 communities would be required to detect a large mediated effect size, while 153 would be needed to detect a medium effect size. Although no significant mediated effects were found for any of the factors examined, it may be that there simply was not enough power to detect them. One should not interpret the findings as evidence that the comprehensiveness, effectiveness, and fidelity are not important factors in eliciting behavior change, but rather as areas requiring further exploration, particularly given the importance placed upon them in the literature and in funding requirements. There is a strong

theoretical basis for each, and the challenge now is to continue to try to validate them with empirical evidence.

Although it resulted in a small sample size, a community-level analysis such as the one conducted here is appropriate considering the nature of the research questions. Aggregating alcohol and binge alcohol use up to the community level allows for a direct assessment of the change in the prevalence of these behaviors, which is the thrust of the research questions. An argument could be made, however, for conducting an individual-level analysis in which the clustering of subjects within communities is accounted for through, for example, multi-level modeling procedures. Such an approach would retain the full sample size of 63,329 subjects, potentially providing for a more highly powered study. This approach was used in the forthcoming main outcome evaluation (unpublished data). However, given that the models in the current study included community-level measures of coalition capacity and community readiness, the effective sample size would have remained 24 in the subsequent analyses.

Another reason for conducting the analyses at the community level was to simplify the models by eliminating a time variable that precluded the construction of a mediating term common to both the "a" and "b" paths. In short, measuring change in the main outcomes (i.e., alcohol use and binge alcohol use) required the use of both the pretest and posttest prevalence rates. In the main outcome evaluation, this was done by testing a condition-by-time term which assessed whether the change in prevalence over time differed between the two assignment conditions (i.e., intervention vs. comparison communities). A similar approach could have been used in the present study by testing the "b" paths through a mediator-by-time interaction term in which this term served as the predictor of interest. However, an equivalent term would need to serve as the dependent variable in the "a" paths to ensure that a common mediating term was used in both paths. But because the values of the mediators did not vary by time, a mediator-by-time term was not conceptually defensible. To circumvent this issue and to simplify the models, a decision was made to eliminate the time variable from all analyses by constructing a change-in-prevalence score as the outcome variable. To construct this measure, community-level pre- and posttest prevalence rates were calculated and a change score was computed by subtracting the latter from the former.

The use of community-level change scores in this manner meant that the sample size for all analyses corresponded to the number of communities (i.e., 24).

The sample size of 24 was larger, however, than many studies that have examined similar relationships as those in the current study, thus helping to move the field beyond case studies and descriptive analyses that have characterized past research (Rindskopf and Saxe 1998). As SAMHSA and other federal agencies continue to support similar funding initiatives, an examination of the research questions posed here among a large sample of communities may be possible. The recently completed cross-site evaluation of the SPF SIG (Orwin and Flewelling 2014) is one such example. Data were collected in each funded community throughout each state using a common survey instrument that collected, among other things, information on needs and resources in the community and activities undertaken to increase capacity. Common metrics such as these could be very valuable in assembling data on a sufficient number of communities needed to rigorously test the relationships the current study sought to explore.

Caution in interpreting the findings should also be used given the poor fit indices associated with many of the models. Although a number of indices exist and opinions vary about the criteria used to assess adequate fit, common benchmarks include non-significant Chi-square values and TLI and CFI values greater than 0.95. In many of the cases in the current study, the fit indices did not meet these criteria. This suggests that the structure of the data is not well-accounted for by the models as specified. Therefore, the parameter estimates and associated significance levels may not be stable, which could lead to erroneous interpretations. Although the Mplus software allows for the identification of empirically-driven modifications to improve model fit, such modification indices were not used in the present study. The interest here was to model relatively simple relationships suggested by the theoretical literature and current practice. However, given the poor model fit indices, it is possible that the relationships among variables are much more complex than presented here. It may be, for example, that the mediators do not operate in parallel as proposed in Figure 1, but rather operate serially insofar as one may causally affect another. Alternatively, one could imagine an interaction between two or more of the variables whereby, for example, effectiveness mediates the capacity-alcohol use relationship but only when fidelity is high. A case

could also be made for a causal relationship between readiness and capacity such that the former is a prerequisite for the latter. Complex relationships such as these are certainly worthy of investigation in future studies but require even larger sample sizes, which precluded such exploration in the current study.

Another weakness of the current study is the poorly-performing readiness measure. Three of the six purported dimensions did not load on the latent factor (see Table 8 and Figure 3) and were subsequently dropped from the analyses. It may be that the resulting measure lacks construct validity in that it may not be measuring community readiness but instead may be measuring another construct altogether. Theory would suggest that greater readiness would be associated with greater reductions in alcohol use and binge alcohol use, but just the opposite was found. This pattern was also apparent when examining the bivariate correlations between the outcomes and the constituent readiness measures (see Table 8). This potential lack of construct validity may partially explain the unexpected unfavorable direct effect of readiness on binge alcohol use when examining the mediating role of the total number of interventions (see Model 22 in Table 22). Of the two main predictors examined in this study, the conceptual clarity and measurement precision associated with community readiness has lagged behind that for coalition capacity. It appears that the current study has unfortunately suffered from a similar lack of clarity and precision. Although the survey items were based on the Tri-Ethnic Center's Community Readiness Model, they were adapted for self-report and may not have fully captured the construct as intended. The CRM's means of assessing readiness relies on in-person interviews and qualitative assessments of a community's stage of readiness. It may be that an in-depth methodology such as this is necessary for accurately measuring the variety of dimension and nuances that may characterize the construct. However, if the field is to progress with a common assessment of readiness that can be disseminated widely among a large number of communities that studies such as the current one requires, valid and reliable self-administered instruments will be necessary.

Despite these limitations, it is worth emphasizing a few important contributions of the study. First, despite the low power, a significant effect of capacity on reductions in alcohol use was found, as was a significant mediated effect of the total number of interventions implemented

on the readiness-binge alcohol use outcome. The latter is particularly ripe for further research given its conceptual simplicity and ease of measurement. A "more is better" message is one that could be easily and effectively communicated to communities that wish to address adolescent alcohol use, and a simple count of the number of interventions implemented is one that could be readily measured in future evaluations.

Another strength of the study is that the measures of comprehensiveness, effectiveness, and fidelity were derived from coalition members' post hoc reports of the interventions activities that were used in the community. Rather than relying on reports of intended activities, which may differ markedly from those that are actually implemented, this study's measures directly reflect the activities as implemented. In doing so, the study overcame limitations of previous studies that have examined the relationship between coalition intentions and outcomes.

And finally, the study benefited from its reliance on theory and the empirical investigation of downstream relationships. Thus far, much of the work in this area has been on the development of the theoretical foundation of the constructs and the means by which to measure them. Although more work needs to be done in this area, particularly with respect to readiness as noted above, empirical tests of the relationships between these constructs and behavior are lacking. Unlike many prior studies which relied on process-related measures as outcomes, the current study directly assessed alcohol use, a behavior of considerable public health importance given its societal cost. Community-based efforts, which hold great promise and appeal to reduce these costs, will be enhanced as we gain a better understanding of their potential effectiveness and underlying mechanisms.

APPENDIX A: COALITION CAPACITY INSTRUMENT

This form is to be completed by coalition members in order to gauge the overall strength of the coalition and to identify areas that may need attention. For each characteristic please place a check mark under the scale value (from 1 to 5) that most appropriately indicates the strength and/or frequency of the characteristic. Please be candid in your responses, and keep in mind that it is OK (and even expected) that your coalition may not be strong in all areas. The value of the information you provide depends on providing a fair and accurate assessment. The coalition coordinator will summarize the information collected from members, but will not match individual surveys with the specific coalition members who completed them.

Note: If your organization is NOT a formal coalition, this form is to be completed by members of your organization and its various partners who are involved in planning, implementing, and/or evaluating the substance abuse, tobacco or obesity prevention work performed or coordinated by your organization. In this case, please consider your "coalition" to be all those persons (either in your organization or a partner organization) who are working with you on these prevention issues in your community or otherwise support your efforts in doing so.

Coalition Characteristics	**Weak or Never** ⟷ **Strong or Always**					**Don't know or doesn't apply**
	1	**2**	**3**	**4**	**5**	
A. Vision, mission and goals:						
1. Our coalition's vision, mission, and goals are clear and well-documented						
2. Community residents are aware of our vision, mission, and goals						
3. Our coalition periodically re-assesses and updates its mission and goals						
4. We evaluate our coalition's activities in light of its mission and goals						
5. Our coalition's vision, mission, and goals consider the needs and views of the community						
6. Coalition members agree with the coalition's vision, mission, and goals						
B. Coalition structure and membership:						
1. All of the necessary sectors of the community are represented						
2. Our coalition has about the right number of active members						
3. Coalition members' roles and responsibilities are well-defined						
4. Our coalition has active committees or work groups						
5. The persons needed to attend coalition meetings are usually there						
6. Members communicate with one another as needed (not just at scheduled meetings)						
7. Our coalition seeks to fill gaps in membership skills and expertise						

C. Coalition leadership – Our coalition coordinator/director….						
1. Effectively promotes the mission and goals of the coalition						
2. Encourages open dialog and expression of views among members						
3. Utilizes the skills and experience of the members						
4. Distributes responsibilities and tasks effectively						
5. Is skillful at building positive relationships with community partners						
6. Keeps the coalition focused on, and progressing towards, its goals						
D. Outreach and communication:						
1. Our coalition keeps the community updated on its activities (e.g., through a newsletter, web site, etc.)						
2. Our coalition goes to "where the residents are" to do outreach and to enhance its understanding of community issues						
3. Our coalition engages youth to help inform its planning efforts						
4. Our coalition works effectively with local media outlets						
E. Coalition meetings and communications:						
1. Our coalition has a regular meeting cycle that members can count on						
2. Agendas are sent to members in advance						
3. Childcare is provided if needed						
4. We accomplish meeting agendas in meetings that start and end on time						
5. Meetings are held in centrally accessible, comfortable places and at convenient times for all members						
6. Conflicts are resolved in an orderly and respectful manner						
7. Meeting minutes are recorded						
F. Opportunities for member growth and responsibility:						
1. New members receive an orientation and copies of relevant background materials						
2. Our coalition makes a conscious effort to develop new leaders						
3. Training is provided to members on relevant topics						
4. We use a mentoring or "buddy system" to help less experienced members learn what is needed						
5. Committees are given important tasks to do						
6. Meetings are held as scheduled even if the coordinator cannot attend						

G. Effectiveness in planning and implementation:						
1. Our coalition develops an annual work plan that lists goals and activities						
2. Plans are based upon review and input from coalition members						
3. Action plans and target dates are developed for each task or project						
4. Coalition members are assigned specific responsibilities						
5. Coalition activities and progress in completing tasks are monitored and reported to the membership						
6. Our coalition gets things done rather just talk about them						
H. Relationship with local government and other community leaders:						
1. Representatives from our coalition meet with local officials and community leaders						
2. A coalition representative attends important community meetings						
3. Our coalition coordinator understands the power structure and decision making process in community government						
4. Our coalition participates in community-wide events						
I. Partnerships with other organizations:						
1. Our coalition is knowledgeable about other community organizations and what they do						
2. Our coalition collaborates with other community organizations						
3. Our coalition utilizes information and resources from those organizations						
4. Our coalition keeps abreast of issues affecting the community						
5. Our coalition interacts and shares information with substance abuse prevention coalitions in other communities						
J. Coalition members' sense of ownership and participation						
1. Our coalition builds social time for members into meetings and events						
2. Members participate in social activities outside formal meetings						
3. All members are treated equally and with respect						
4. Members are asked about their interests and needs						
5. Member contributions are recognized						

6. Successes are celebrated						
7. Members actively participate in the decision making process						
8. Members feel free to speak their views without being criticized						

K. Ability to collect, analyze, and use data						
1. Our coalition has members, or a consultant, with experience in collecting and analyzing data						
2. Our coalition has members, or a consultant, with experience in conducting evaluations and preparing evaluation reports						
3. Coalition members participate in reviewing data for planning and evaluation purposes						
4. Our coalition has access to local data on substance abuse and consequences						
L. Understanding of and commitment to environmental change strategies:						
1. Coalition members are familiar with concept of population-level change						
2. Our coalition supports environmental change strategies (e.g., policy changes, regulation, enforcement, and advocacy) in addition to approaches targeting individuals						
3. Our coalition is committed to working with the media						
4. Our coalition has positive relationships with community partners needed to implement environmental strategies						
M. Cultural competence:						
1. Our mission statement recognizes the importance of respecting cultural diversity (including racial/ethnic, gender, socioeconomic, and lifestyle)						
2. Our coalition is engaged with diverse cultural groups and organizations						
3. Our membership reflects the cultural makeup of the community						
4. Our coalition reviews its activities and products to ensure they are culturally appropriate for the intended recipients						
N. Funding and sustainability:						
1. Our coalition has received funding from multiple sources						
2. Our coalition has the strong support of local government and other community organizations						
3. Our coalition has the necessary office space and equipment to function effectively						
4. Our coalition plans ahead for its long term sustainability in addition to its more immediate goals						
5. Our coalition has members with experience in writing successful grant applications						

X. Added items for 2010						
1. Our coalition engages young adults to help inform its planning efforts						
2. Our coalition engages parents to help inform its planning efforts						
3. Our coalition has a clear and effective strategy for fundraising						
4. Our coalition effectively promotes its value to the community						
5. Our coalition raises funds from local sources rather than relying solely on federal and state grants						
6. Our coalition has an accurate and dependable system for budgeting expenses and ensuring financial accountability						
7. Our coalition relies on external volunteers to help accomplish our goals						
8. Our coalition receives useful guidance from its board of directors						
9. Our coalition receives help in fundraising from its board of directors						

O. Background information – please place a check mark next to the response that best reflects your activities on the coalition.

1. Are you the coalition coordinator or director?

___ Yes ___ No

2. How many years have you been a member of the coalition?

___ <1 ___ 1-2 ___ 3-5 ___ >5

3. Do you remember completing a similar checklist regarding the coalition back in 2008?

___ Yes ___ No

4. How many coalition meetings do you attend?

___ all or almost all of them ___ about half of them ___ a few of them ___ hardly any or none

Thank you!

APPENDIX B: COMMUNITY READINESS INSTRUMENT

Directions: Please click on the response that best reflects your belief or perception regarding various substance abuse issues and the initiatives/activities designed to prevent them in the town/city on which you are reporting. Items for which you would not want your answer known to others, or that you are uncomfortable answering, may be left blank. Please click the "don't know" response on items for which you have no opinion or have insufficient information to answer. This response option always appears with a shaded background.

Respondent Demographics

1	Age: ▫ 12-17 ▫ 18-25 ▫ 26-35 ▫ 36-45 ▫ 46-55 ▫ 56 to 65 ▫ 66 and older
2	Gender: ▫ Male ▫ Female
3	Please identify the group(s) you represent for the purpose of this survey (check ALL that apply): ▫ Government ▫ Law Enforcement ▫ Youth Serving Organization ▫ Coalition that addresses alcohol and drug abuse issues ▫ Social/Human Service Agency ▫ School ▫ School Board ▫ Public Health ▫ Faith-Based Organization ▫ Substance Abuse Prevention Agency ▫ Substance Abuse Treatment Agency ▫ Mental Health Service ▫ Youth ▫ Parent ▫ Other (specify) _____
4	Are you a resident of the town/city on which you are reporting? ▫ Yes ▫ No

Community Awareness

The next set of questions asks about your opinion concerning community members' attitudes regarding substance use and substance abuse prevention. Please tell us how much you agree or disagree with each of the following statements.

1=Strongly Agree 2=Somewhat Agree 3=Somewhat Disagree 4=Strongly Disagree 9=Don't Know

5	I think that most residents in this town/city. . .					
		1	2	3	4	9
	a. Believe that underage drinking in this community is a serious problem that deserves attention	▫	▫	▫	▫	▫
	b. Believe that drinking and driving among youth and young adults in this community is a serious problem that deserves attention	▫	▫	▫	▫	▫
	c. Believe that excessive drinking among young adults (of legal age) in this community is a serious problem that deserves attention	▫	▫	▫	▫	▫
	d. Believe that marijuana use among youth and young adults in this community is a serious problem that deserves attention	▫	▫	▫	▫	▫
	e. Know about community programs that are working to prevent alcohol and drug abuse	▫	▫	▫	▫	▫
	f. Would support town ordinances that discourage underage drinking	▫	▫	▫	▫	▫
	g. Feel alcohol and other drug prevention strategies for youth are a good investment for the community	▫	▫	▫	▫	▫
	h. Feel alcohol and other drug prevention strategies for adults are a good investment for the community	▫	▫	▫	▫	▫
	i. Believe that prevention strategies for youth can be effective at preventing substance abuse	▫	▫	▫	▫	▫
	j. Believe that prevention strategies for adults can be effective at preventing substance abuse	▫	▫	▫	▫	▫
	k. Are willing to support substance abuse prevention programs with town/city tax dollars	▫	▫	▫	▫	▫
	l. Believe the use of alcohol and other drugs is a private matter that should be dealt with at home	▫	▫	▫	▫	▫
	m. Believe that occasional use of marijuana is not harmful	▫	▫	▫	▫	▫
	n. Believe enforcement of municipal liquor laws should be a priority (sales to minors, drunk driving arrests)	▫	▫	▫	▫	▫
	o. Believe that drinking alcoholic beverages should not be permitted at public events	▫	▫	▫	▫	▫

Substance Abuse Prevention Resources/Assets

6	Communities implement a variety of strategies to prevent alcohol and other drug use. Please indicate the degree to which you believe each of the following strategies is functioning effectively in this town/city. Check one answer for each strategy. 1=Does Not Exist 2=Ineffective 3=Somewhat Effective 4=Very Effective 9=Don't Know					
		1	2	3	4	9
	a. Coalition/task force or council that addresses substance abuse	¤	¤	¤	¤	¤
	b. Community policing programs or services	¤	¤	¤	¤	¤
	c. Enforcement of DWI policies	¤	¤	¤	¤	¤
	d. Policies that require alcohol server training	¤	¤	¤	¤	¤
	e. Zoning laws that restrict where alcohol outlets can operate	¤	¤	¤	¤	¤
	f. Drug-free school zones	¤	¤	¤	¤	¤
	g. Community or neighborhood watch programs (citizen surveillance programs)	¤	¤	¤	¤	¤
	h. Laws/ordinances that hold adults liable for providing alcohol or other substances to underage persons	¤	¤	¤	¤	¤
	i. Alcohol service law compliance checks	¤	¤	¤	¤	¤
	j. Motor vehicle driver sobriety check points	¤	¤	¤	¤	¤
	k. Other policy and/or enforcement strategies (keg registration, police party patrols, etc.)	¤	¤	¤	¤	¤
	l. Media advocacy (press releases/conferences and other media approaches to advocate for policy change)	¤	¤	¤	¤	¤
	m. Social marketing (PSAs, poster campaigns, other health communications aimed at changing behaviors)	¤	¤	¤	¤	¤
	n. Programs that support families (housing, child care, counseling services)	¤	¤	¤	¤	¤
	o. Information distribution (brochures, fact sheets, videos or presentations)	¤	¤	¤	¤	¤
	p. Youth life/social skills training programs (assertiveness, communication, drug refusal, problem-solving)	¤	¤	¤	¤	¤
	q. Parent education programs/parenting skills training	¤	¤	¤	¤	¤
	r. Peer leader or peer helper programs	¤	¤	¤	¤	¤
	s. Mentoring programs	¤	¤	¤	¤	¤
	t. School-based substance abuse education	¤	¤	¤	¤	¤
	u. Teen drop-in center/club	¤	¤	¤	¤	¤
	v. Youth community action groups (SADD, youth councils, faith-based organizations)	¤	¤	¤	¤	¤
	w. Structured youth development activities (sports leagues, theater and arts programs)	¤	¤	¤	¤	¤
	x. Screening and brief intervention for substance problems	¤	¤	¤	¤	¤
	y. Employee support programs (EAP, work/life assistance)	¤	¤	¤	¤	¤

	z. Adolescent substance abuse treatment services	☐	☐	☐	☐	☐
	aa. Adult substance abuse treatment services	☐	☐	☐	☐	☐
	bb. Recovery support activities (AA and other 12 step groups, recovery centers)	☐	☐	☐	☐	☐
	cc. Other (specify)_____	☐	☐	☐	☐	☐

Barriers

7	In your opinion, how much do each of the following issues limit or pose a barrier to alcohol and other drug prevention activities in this town/city? 1=Not A Barrier 2=A Moderate Barrier 3=A Large Barrier 9=Don't Know				
		1	2	3	9
	a. Lack of leadership	▫	▫	▫	▫
	b. Lack of coordination among organizations and groups	▫	▫	▫	▫
	c. Too few community members with time or willingness to volunteer	▫	▫	▫	▫
	d. Lack of consensus on how to address substance abuse issues	▫	▫	▫	▫
	e. Lack of political support for substance abuse prevention	▫	▫	▫	▫
	f. Underage drinking is not considered a priority problem in our community	▫	▫	▫	▫
	g. High risk drinking among persons under age 25 is not considered a priority problem in our community	▫	▫	▫	▫
	h. Marijuana use is not considered a priority problem in our community	▫	▫	▫	▫
	i. Lack of a strategic plan to address substance abuse prevention needs	▫	▫	▫	▫
	j. Insufficient awareness of current efforts among community members	▫	▫	▫	▫
	k. Limited financial resources to address substance abuse in the community	▫	▫	▫	▫
	l. Lack of knowledge of effective strategies to address substance abuse problems	▫	▫	▫	▫
	m. Lack of trained staff	▫	▫	▫	▫
	n. Lack of programs with culturally competent staff	▫	▫	▫	▫
	o. Perception that substance abuse is a personal problem, not a community problem	▫	▫	▫	▫
	p. Previous attempts at addressing substance abuse problems in the community went poorly	▫	▫	▫	▫
	q. Belief that existing programs are sufficient	▫	▫	▫	▫
	r. Other (specify) _____	▫	▫	▫	▫

Planning

8	How would you rate the willingness and ability of organizations (in this city/town) that have an interest in reducing and preventing substance use to carry out the following activities? 1=None 2=Low 3=Medium 4=High 9=Don't Know					
		1	2	3	4	9
	a. Collect data on the nature of local substance abuse problems	¤	¤	¤	¤	¤
	b. Identify available resources for substance abuse prevention (personnel, financial, organizational)	¤	¤	¤	¤	¤
	c. Secure support for prevention from local policy makers	¤	¤	¤	¤	¤
	d. Utilize needs assessment data to plan prevention programs and policies	¤	¤	¤	¤	¤
	e. Develop culturally appropriate prevention programs and strategies	¤	¤	¤	¤	¤
	f. Raise community awareness of substance abuse problems	¤	¤	¤	¤	¤
	g. Identify and implement new (but promising) prevention strategies	¤	¤	¤	¤	¤
	h. Convene community meetings to address substance abuse issues	¤	¤	¤	¤	¤
	i. Collaborate with each other	¤	¤	¤	¤	¤
	j. Collaborate with organizations concerned with preventing other types of problems (HIV, violence)	¤	¤	¤	¤	¤
	k. Allocate local funds to substance abuse prevention in the community	¤	¤	¤	¤	¤
	l. Develop policies related to or specifically for substance abuse prevention in the community	¤	¤	¤	¤	¤
	m. Identify the barriers to substance abuse prevention in the community	¤	¤	¤	¤	¤
	n. Develop a strategic plan to address substance abuse in the community	¤	¤	¤	¤	¤

Changes in Support for Prevention

9	Over the past several years, do you think that the level of support by residents of this community for efforts by state and local organizations to prevent and reduce the following behaviors has decreased, stayed about the same, or increased? 1=Decreased 2=Stayed About the Same 3=Increased 4= Don't Know				
		1	2	3	4
	a. Underage drinking	☐	☐	☐	☐
	b. Heavy or binge drinking	☐	☐	☐	☐
	c. Drinking and driving	☐	☐	☐	☐
	d. Tobacco use	☐	☐	☐	☐
	e. Marijuana use	☐	☐	☐	☐
	f. Prescription drug abuse	☐	☐	☐	☐
	g. Other illicit drug use	☐	☐	☐	☐

23	Please provide any additional comments or concerns that you feel are important to understand substance abuse prevention needs in this town/city, the resources available to help address these needs, and the readiness of community residents to support these efforts.

THANK YOU!

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