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Going the Distance: Technical Assistance to Community Prevention Coalitions and its impact on Prevention Coalitions Over Time

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Abstract

Prevention Coordinators are the linking agents providing technical assistance between universities and communities in the PROSPER model to support the implementation and sustainability of youth and family programs that have reduced substance abuse in prior research. This study examines the outcomes and trajectory of the frequency of contact of technical assistance (i.e. dosage) with community collaborative prevention coalitions across the three stages of coalition development. After communities were randomized, members of PROSPER coalitions (n=12) provided information about the quality of their operations at five time points across four and one-half years; prevention coordinators reported on the frequency of contact with their community coalitions at 14 intervals across the same period of time. This study only utilizes the intervention communities. Results from correlational models show that levels of dosage relate to the quality of internal coalition processes over time, but that the direction of the relationship changes over time: high frequency of contact early on relates to lower coalition-rated functioning initially. In contrast, early frequency of contact relates to higher levels of coalition functioning at later time points. Furthermore, longitudinal mixed models show that levels of dosage were consistent over time. These results provide empirical support of the importance of a proactive technical assistance model and add further evidence that important distinctions exist among different coalition developmental phases.

Keywords

technical assistance; dosage; community prevention system; process evaluation; longitudinal

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Compliance with Ethical Standards

b) **Disclosure of potential conflicts of interest:** The authors declare that they have no conflict of interest.

c) **Ethical approval:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

d) **Informed consent:** Informed consent was obtained from all research participants included in the study.

Introduction

In 2018, approximately 20 million people reported problems with substance abuse (Substance Abuse and Mental Health Services Administration, 2019). That said, much has been learned in the last 25–30 years regarding “what works” to successfully prevent substance abuse, and a variety of evidence-based interventions (EBIs) are now available for use by communities (Center for the Study and Prevention of Violence, 2012). However, preventing substance misuse and abuse suffers from a research-to-practice gap such that results found in well-controlled research trials often do not easily translate into community settings (Spoth et al., 2013).

This research to practice gap has typically been addressed in two ways. First, community coalitions can be built to bring EBIs to community settings (Hawkins et al., 2008; Spoth, Greenberg, Bierman, & Redmond, 2004). A community coalition brings together stakeholders that represent different parts of the community to form a collaborative group focused on promoting healthy youth development or preventing substance abuse. This community coalition then becomes knowledgeable about and skilled in prevention science and EBI selection, delivery, and monitoring. Second, providing technical assistance has also been identified as critical for the successful translation of EBIs (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005).

Often, community coalitions, such as PROSPER, address both strategies: they create the system to bring programs to community settings, and they provide external experts to support and assist the community-driven effort. In theory, providing this technical assistance is akin to an external consultancy, supporting capacity building to sustain a new skills (Ermeling, Tatsui, & Young, 2015). In this way, this technical assistance promotes high quality implementation and sustainability of the community prevention system, and high quality and sustainability of program implementation (Chinman et al., 2005; Keener, 2007). Consequently, given the importance of this work, the goal of this study is to examine the process and outcomes of the technical assistance delivered in one empirically validated community prevention system, PROSPER (Spoth et al., 2004).

Community Coalitions and EBIs

Community coalitions are regarded as a viable mechanism for the scale-up and long-term dissemination of prevention services (Butterfoss, 2006; Rugs, Hills, Moore, & Peters, 2011). Coalitions are multi-disciplinary, they bring diverse stakeholders together, and may help to coordinate and streamline resources (Goodman, 2000; Hays, Hays, DeVille, & Mulhall, 2000; Wolff, 2001). Although some research suggests that community coalitions are ineffective at achieving important outcomes (Hallfors, Cho, Livert, & Kadushin, 2002; Roussos & Fawcett, 2000; Saxe et al., 2006), at least two coalition based models, Communities that Care (CTC) and PROSPER (PROMoting School-community-university Partnerships to Enhance Resilience) indicate that coalition based delivery of EBIs can yield public health impacts for youth and families and be sustained over time (Oesterle et al., 2018; Spoth et al., 2015). Both PROSPER and CTC include technical assistance for program implementation, sustainability, and the overall functioning of coalitions.

Community coalitions implementing EBIs are faced with a myriad of tasks, many of which follow a developmental sequence (Butterfoss, Goodman, & Wandersman, 1993; Florin, Mitchell, Stevenson, & Klein, 2000; Hawkins, Catalano, & Arthur, 2002; Livet & Wandersman, 2005). We apply a three-stage model to our work in PROSPER (Chilenski et al., 2016; Feinberg, Chilenski, Greenberg, Spoth, & Redmond, 2007). The early stage of coalition development, *organization*, involves forming the coalition and tasks that organize the coalition into a working cohesive body. For example, roles and operating procedures are established. Goals and priorities are clarified. The second stage, called *operations*, includes tasks associated with EBI implementation and fidelity monitoring, such as hiring, training, and supervising facilitators, recruiting participants, scheduling observations, and more. We consider the third stage *sustainment*, or successful continuation of the initiative at high levels of quality. Although sustaining the effort needs to be considered from the beginning, a coalition's operations change once one to two "implementation years" have been conducted and a routine has been established. Implementation of programs can become routine in this stage. New activities such as raising money and in-kind resources, increasing awareness of the effort and programs, and communicating activities and results to key stakeholders becomes important (Chinman, Imm, & Wandersman, 2004).

The ways in which coalitions function across these stages appears related to important outcomes, including both EBI implementation quality and sustainability. For example, in a study of CTC sites, coalition functioning and sustainability planning predicted coalition sustainability over a 4-year period (Feinberg, Bontempo, & Greenberg, 2008), and in PROSPER, readiness predicted to the quality of coalition functioning during the organizational stage (Greenberg, Feinberg, Meyer-Chilenski, Spoth, & Redmond, 2007), but not into the operations stage (Feinberg et al., 2007). Other work indicates that higher levels of funding, stronger leadership, more efficiency in coalition activities, strong relationships both within the coalition and with external partners, and fidelity to the CTC model were associated with better EBI implementation (Brown, Feinberg, Shapiro, & Greenberg, 2013).

Empirical links between Technical Assistance and Coalition Functioning

Although it is widely believed that providing technical assistance (TA) improves implementation quality and contributes to sustainability of innovations (Fixsen et al., 2005; Mihalic & Irwin, 2003), data describing TA, and their impacts are relatively scarce (Katz & Wandersman, 2016). Appropriately, much of the early work came from qualitative or mixed methods observational research on community coalitions (Florin, Mitchell, & Stevenson, 1993; Goodman, Steckler, Hoover, & Schwartz, 1993; Kegler, Steckler, Malek, & McLeroy, 1998). Little is known about how variations in the frequency and quality of TA affect the activities of coalitions. Some research suggests that effective TA is organized around specific tasks of coalition work, effective cultivation of relationships both internal and external to the coalition, and the developmental stages of the coalition, and that these factors also relate to TA dosage and mode of delivery (Katz & Wandersman, 2016; Wandersman et al., 2008).

A few empirical studies have examined characteristics of TA and its relation to coalition functioning and program implementation. The links between *dosage* (typically defined as the number of TA contacts provided to an implementer or coalition) and outcomes such as

program implementation fidelity, sustainability, and coalition functioning are inconsistent. Chinman et al. (2008) analyzed relations between TA dosage provided to sites in the *Getting to Outcomes* evaluation and found that dosage was positively related to quality of performing some tasks (such as developing an outcome evaluation), but not to others (such as use of best practices), while other research found no relations (Keener, 2007; Mitchell, Stone-Wiggins, Stevenson, & Florin, 2004). An additional study of CTC coalitions by Feinberg et al. (2008) found a moderated relation between dosage and the length of time a coalition had been operating, with newer coalitions more impacted by TA than those that had been in operation longer.

Other studies generally find that face-to-face contact is more strongly linked to coalition outcomes than phone or e-mail contacts (Becker, Lynde, & Swanson, 2008; Feinberg, Ridenour, et al., 2008; Ray, Wilson, Wandersman, Meyers, & Katz, 2012), while a relationship variable such as collaboration between the TA provider and the coalition leader (i.e., “working alliance” (DiGirolamo & Tkach, 2019) positively related to later coalition functioning (Chilenski et al., 2016). Some research indicates that proactive, anticipatory TA initiated by the provider was important given that implementers rated lower in capacity were less likely to request support (Fagan, Hanson, Hawkins, & Arthur, 2008; Kegeles, Rebchook, & Tebbetts, 2005). Another qualitative study also found that the provider--program implementer relationship was central to effective TA (Satterlund, Treiber, Kipke, Kwon, & Cassady, 2013).

Because coalitions typically progress through developmental stages and confront different challenges and tasks at each stage, it seems reasonable to assume that the amount of TA will vary by stage. Indeed, a number of researchers advocate tailoring TA to the developmental stage (Florin et al., 1993; Wandersman, Chien, & Katz, 2012). While conceptual frameworks such as *Getting to Outcomes* describe variations in TA related to developmental stages of coalitions (Wandersman et al., 2012), with the exception of our earlier work (Chilenski et al., 2018), we found very little empirical data involving changes over time in dosage or quality of TA, or ways in which this variability might be related to outcomes such as coalition functioning or program implementation quality.

Given the substantial resources devoted to TA and the growing demand for EBIs in applied settings, more information on specific TA characteristics, as well as the relations among these variables and outcomes, is needed. Because the literature on TA delivery over time and subsequent coalition outcomes is limited, the goal of the current study was to examine longitudinal relations between TA dosage and the subsequent functioning of community coalitions.

The Current Study

In the current study, we investigate the ways in which TA dosage, as measured by the average frequency of contact between the TA provider and the coalition/coalition leader in a given month, related to the functioning of community coalitions. We expected that greater frequency of TA would be positively associated with better coalition functioning, including positive interpersonal dynamics, stronger leadership, better organization procedures, greater focus on task completion, and reduced conflict. We expected that associations between TA

dosage and coalition functioning would be invariant across all stages. However, because the literature on TA indicates that it varies by developmental stage, we hypothesized that the frequency of TA would vary by stage. As in prior work, we identified three stages in PROSPER: organizational, operations, and sustainment (Chilenski et al., 2018). We hypothesized that coalitions would receive more TA at the beginning of each stage, when tasks were new and unfamiliar.

Because the amount of contact between TA providers and coalitions is so fundamental, we first investigated the associations of the frequency of TA with both concurrent and future community coalition functioning. After assessing the longitudinal associations between contact and coalition functioning, we explored changes over time in the frequency of contact. We explored our hypotheses utilizing 4.5 years of data spanning the organizational, operations, and sustainment stages of coalitions.

Method

This study included 12 PROSPER intervention communities in Iowa and Pennsylvania (Spoth et al., 2004). Communities were small (school district enrollment between 1301 – 5200 students) and located in non-metropolitan areas. A minimum of 15% of the student population was eligible for free and/or reduced-price lunches, and less than 50% of the population was employed by or attending a university. Communities participating in other prevention research projects were not included. Twenty-eight school districts met the inclusion criteria, had both an interested Extension educator and school district, and agreed to be randomized. Although there were 14 intervention communities, two were added later to replace communities that had discontinued participation. This study included the 12 communities with complete longitudinal data. The research was approved by both universities' Institutional Review Boards.

The overall PROSPER project included many measures. To date, PROSPER has improved youth risk and protective factors, adolescent substance use and delinquency (Redmond et al., 2009; Spoth, Redmond, et al., 2011), and community social capital (Chilenski, Ang, Greenberg, Feinberg, & Spoth, 2014). PROSPER communities also maintained high levels of program implementation fidelity and sustainability (Greenberg et al., 2015; Spoth, Gyll, Redmond, Greenberg, & Feinberg, 2011). The current study extends these analyses.

PROSPER Community Coalitions

PROSPER coalitions were comprised of community stakeholders interested in youth-focused prevention and were led by a Cooperative Extension Educator and a representative of the local public school district. PROSPER was embedded within the University-based Extension system for four main reasons. First, Extension is the only organization with a direct connection to the research expertise of the land grant university and has a history of effective and extensive collaborative networking among community agencies and institutions who serve youth and families (Coward, VanHorn, & Jackson, 1986). Extension also has a long history of providing educational programming for youth and families in communities (Mincemoyer, Perkins, & Lillehoj, 2004). Second, Extension has a long-standing implementation support infrastructure for county Extension educators through state-level

faculty on campus such as regular learning communities and in-service trainings. Third, Extension Educators typically hold MS degrees and have expertise and experience in applied, community-based programming. Additionally, at the time of PROSPER's initiation, the use of evidence-based programming was prioritized by Extension (Spoth et al., 2004).

The Extension leader and school co-leader were responsible for building a cohesive and representative coalition, including identifying and recruiting other coalition members. Typically, community coalitions included 10–12 individuals from organizations including the local school district, mental health and substance abuse service agencies, youth-serving organizations such as the YMCA or the United Way, faith-based organizations, local government, the business community, and law enforcement. Some coalitions also included youth and parent members. Leading the community coalition was part of the Extension Educator's paid job. Some coalition members in schools and community agencies were able to integrate their PROSPER responsibilities, such as attending meetings and contributing to PROSPER goals, into their regular job; others were volunteers. Once formed, all 14 PROSPER coalitions attended a two-day training focused on coalition building, developing a shared vision, understanding the research and theory behind implementation of evidence-based programs, and communication with the broader community.

PROSPER Programs

In PROSPER intervention communities, each community coalition chose one family-focused and one school-based program from a small list of universal, substance misuse prevention interventions with strong evidence of effectiveness. The family-based options, which included *Strengthening Families Program for Parents and Youth ages 10–14* (SFP:10–14; (Iowa State University Extension, 1995), the *Adolescent Transitions Project* (Dishion, Andrews, Kavanagh, & Soberman, 1996), and *Preparing for the Drug Free Years* (later renamed *Guiding Good Choices*; (Park et al., 2000), were extracurricular programs targeted toward 6th grade youth and their parents. The school-based programs, *Life Skills Training* (Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990), *Project Alert* (Ellickson, 1984), and *All Stars* (Hansen & Dusenbury, 2004) were targeted toward 7th graders and were taught by classroom teachers as part of the school curriculum. Thus, the school-based program reached virtually every 7th grade youth in the participating school district, while the family-focused program reached a much smaller proportion (approximately 17% project-wide) of the target population. All community coalitions selected SFP:10–14 as their family-focused program in both Pennsylvania and Iowa, but there was some variability in which school-based program was adopted.

The programs were widely embraced by the target communities. Their emphasis on resilience and positive youth development, being able to choose the program, and including feedback from school personnel, parents, and at times youth, were reasons why this occurred. Implementing the programs within a coalition context theoretically increases the support base of stakeholders across the community. School personnel were particularly appreciative that the PROSPER programs met both their goals for outreach to parents and the standards for health education outlined by the local school board and the Pennsylvania

Department of Education. Communities were also attracted to the resources that PROSPER offered, including training, program materials, and ongoing technical assistance.

The PROSPER Technical Assistance Model

The PROSPER technical assistance model, in which the *Prevention Coordinator* provides direct technical assistance to community coalitions, was comprehensive. The *Prevention Coordinator* is the linking agent between the community coalition and the resources and knowledge found within the university setting or other state-level resources (Spoth et al., 2004). Each coalition was assigned a consistent Prevention Coordinator (25% FTE). The Prevention Coordinators were expected to check in with each community coalition a minimum of three times each month, typically with two phone calls and attend the monthly in-person coalition meeting. During the phone calls, the Prevention Coordinators would review the community coalition's recent activities, providing "on the spot" technical assistance as appropriate in the form of problem solving or brainstorming solutions. The Prevention Coordinator and Community Coalition Leader would also talk about and plan next steps. At community coalition meetings, the Prevention Coordinator would often answer questions about collaboration or evidence-based programming and prevention science, among other topics providing other expert guidance as needed. Other additional, as-needed communications with coalition leaders or members in the form of email or phone check-ins also occurred and were expected. For example, at times this included activities such as connecting the coalition leader to key stakeholders or being a partner when conducting outreach to key stakeholders in the community. Prevention Coordinators would often also approach individuals at the University-level for advice or direction, develop materials or informational resources, or provide feedback on recruitment materials or other promotional materials. In between phone or in-person meetings, the Prevention Coordinator would also need to conduct follow-up activities related to their next steps and prepare for future contacts.

Other technical assistance activities included an annual meeting of Prevention Coordinators, state-level and university-level faculty or staff, coalition members, and coalition leaders. Professional learning community meetings began after 2.5 years. Both the annual meeting and the learning communities promoted professional development, collaborative learning, and strategic planning. Prevention Coordinators received weekly supervision and support from University/state-level prevention researchers and Extension Faculty. See Chilenski et al. (2016) for more details.

Research Participants & Procedures

Data for this project were collected over a 4.75 year period from Prevention Coordinators and community coalition members. Table 1 presents an overview of the project timeline and assessment schedule. The organizational stage covered the first 9 months of the project, and included three measurement occasions (i.e., waves) from Prevention Coordinators, and two from community prevention coalition members. The operations stage covered the next 1.5 years, including six waves of data collection by Prevention Coordinators and one from community prevention coalition members. The sustainment stage started after the operations stage, 2.25 years into the project. Data for this study were collected for another 2.50 years

which included three waves of data from community prevention coalition members and five waves of data from their Prevention Coordinators.

Prevention Coordinators.—Ten Prevention Coordinators provided technical assistance to the 12 community coalitions across the study period. The Prevention Coordinators were majority female (70%) and 100% white. They had an average of 19.4 years of experience implementing evidence-based or prevention programs within the University-based Extension System or other settings. They responded to questions in a web-based survey every three to six months that assessed the frequency of their contact with each of their coalitions for a total of 14 different time points; each coalition was rated by one Prevention Coordinator at each time point.

Coalition Members.—One hundred and seventy-seven PROSPER community coalition members participated in one or more waves of data collection (up to six) between the Fall of 2002 and the Fall of 2006. Typical participants included representatives from local youth-serving organizations or parents, including individuals from the University-based Extension System, public middle school, mental health or substance abuse agencies. Participants were recruited throughout the study period as individuals left and were replaced in their respective positions.

Respondents ranged in age from 24 to 62 years ($M = 42.8$, $SD = 8.92$), 40.0% were male, and 99.4% self-identified as White. The majority of individuals had a minimum of a college degree (90.9%) and lived in or near the school district associated with the PROSPER coalition (75.9%). The average number of respondents per community across the five data points was 15 (ranging from 12 to 22). At each wave of data collection individuals participated in one-hour computer-assisted, face-to-face interviews and were compensated with \$20.

Measures

All scales were standardized by taking the mean of the scale items and then aggregated to the coalition-level. See Table 2 for descriptive statistics.

Contact.—Prevention Coordinators responded to one item, *overall frequency of contact* that described how often they interacted with their coalitions/coalition leaders. Item text was, “In the last [3/6] months, how frequent has your contact been with this group?” Response options were on a seven-point scale (1 = none or never; 2 = once in a while, 3 = every two months, 4 = monthly = 5 = twice per month, 6 = once a week, 7 = several times per week).

Coalition Functioning.—Four measures completed by coalition members described the internal functioning of PROSPER coalitions. *Team leadership* assessed how much the coalition leader(s) involved and recognized coalition members; an example item is, “the team leadership... gives praise and recognition at meetings (8-items, $\alpha = .78 - .85$; (Kegler, Steckler, McLeroy, & Malek, 1998).” *Team culture* assessed group togetherness and cohesiveness; an example item is, “there is a strong feeling of belonging in this team.” (8-items, $\alpha = .80 - .92$; (Kegler, Steckler, McLeroy, et al., 1998). *Team goals* assessed the

degree to which the coalition established their operating procedures and articulated their goals; an example item is, “The PROSPER team has agreed on how it will govern itself and make decisions.” (2-items, $r = 0.31 - .69$; (Perkins et al., 2011). Team *focus on work* assessed the coalition’s productivity and accomplishment of tasks; an example item is, “People pay a lot of attention to getting work done.” (5-items; $\alpha = .66 - .72$; (Moos & Moos, 1998). One item, *team tension*, assessed the degree of tension in the PROSPER coalition (1 = no tension to 4 = a lot of tension; (Feinberg et al., 2007).

Analysis Considerations

Hypothesis 1: Coalitions that have higher levels of contact with their TA provider will have better coalition functioning.—The overall frequency of contact was our independent variable in these models. Coalition functioning indicators were our dependent variables. All analyses used coalition-level Spearman Correlations. This analysis strategy was utilized for several reasons. First, although we had longitudinal data available for all variables, the independent and dependent measures were not collected on the same schedule (see Table 1). Consequently, a multilevel model with the frequency of contact as a time-varying covariate would not have been appropriate. A coalition-level correlational analysis simplified the merging and analysis of data from two different types of reporters. This strategy allowed us to more easily understand how the frequency of contact maps onto the phases of coalition functioning with a small sample. More specifically, a coalition-level n of 12 generally has insufficient power to detect meaningful coalition-level associations as significant; a correlation’s effect size is more easily interpretable when traditional significance criteria may not reveal potential associations. In addition, the distribution of a few variables became slightly skewed at later time points. Spearman rankings helped to minimize the impact of skewness on the results.

Analyses followed four steps: First, we created coalition-level values for each dependent variable by averaging individual coalition member responses together at each interview time point. Second, we estimated Spearman Correlations with contact and later reports of coalition functioning for each phase. We kept the three waves of dependent variables distinct during the sustainability phase (early, mid, late), as we wanted to allow for the possibility of effect decay over time. The coalitions’ financial responsibilities also change at each time point, thus qualitative differences in coalition activities also occurred at waves 4, 5, and 6. All correlations controlled for the percent of families living below the federal poverty threshold in 2000 (National Center for Education Statistics, 2003; US Census, 2000), as community poverty tends to be a good measure of community stress and was a strong predictor of early coalition functioning in prior research (Feinberg et al., 2007; Greenberg et al., 2007).

Following prior research, we used a measure of effect size to determine substantively meaningful associations among variables and balance our need to limit both Type 1 and Type 2 errors with a small sample size. We selected a level of $r = +/- .35$ in all correlation models as our minimum level of effect size. This correlation size explains slightly more than 10% variance.

Hypothesis 2: Coalitions will receive more TA at the beginning of each phase than at later timepoints within the same phase.—This hypothesis investigated the developmental trajectory of contact as rated by the Prevention Coordinator over time. Because the dosage variable was ordinal, we used proc glimmix in SAS, Version 9.2 for analyses. We specified a multinomial error structure with a cumulative logit link, and set the models to use an adaptive Gaussian quadrature (method = quad) to estimate the marginal log likelihood (Hoffman, 2015). The estimates produced with this type of model are not typical beta weights, but logits which are converted to probabilities for easier interpretation. The cumulative logit link produces the cumulative probability of each response category of the dependent variable; these can easily be subtracted to produce the probabilities of each response category of the dependent variable. Model fit indices, including the AIC and BIC, and where appropriate the -2 Log Likelihood deviance, were compared across several different types of models that used data from all 14 data points, including: (a) the empty model (i.e., model specifying only a random intercept); (b) polynomial growth models; (c) polynomial growth models that included random slopes; (d) piecewise models that allowed for different slopes and starting points to be estimated for each stage of coalition functioning, and then finally (e) piecewise models that included random slopes for each of the three phases. After selecting the best longitudinal model for each frequency of contact variable, we converted the estimates to probabilities and graphed the estimates to visualize and more easily interpret the best longitudinal model.

Results

Descriptive Statistics

See Table 2. Descriptive statistics show that the communities in this sample have low levels of poverty ($M = 6.67\%$, $SD = 2.52$). Across the study, Prevention Coordinators most often reported having contact with their coalitions once per week. The second most frequently endorsed response was twice per month. Ratings of internal coalition functioning were quite positive and seem to decrease slightly over time.

Hypothesis 1: Coalitions that have higher levels of contact with their technical assistance provider will have better coalition functioning.

Table 3 summarizes Spearman Correlations with the frequency of contact. During the organizational phase, there were few sizeable associations. Contrary to our predictions, a high frequency of contact predicted lower ratings of team focus on work and higher levels of tension at early stages of coalition development. However, these associations changed at later waves. The frequency of contact during the organizational stage predicted positive ratings of internal coalition processes during the operations stage: ratings of leadership, culture, goals, and team focus on work were all correlated with dosage at or above the .35 threshold. Correlations were not as consistent at Wave 4 (early sustainment), with only team focus on work reaching threshold. Correlations were consistently positive and strong at Wave 5 (mid-sustainment) and also at Wave 6 (later-sustainment).

Correlations with frequency of contact during the implementation phase also predicted positive ratings of team leadership, team culture, and team work focus within that phase.

Associations were weaker at Wave 4, but became stronger at Wave 5, predicting more positive ratings of culture, goals, and team work focus, and lower ratings of tension. Four meaningful associations remained at Wave 6; the frequency of contact predicted higher ratings of team culture and goals, and lower ratings of tension.

Correlations of contact during early sustainment also predicted higher ratings of team leadership, culture, goals, and team work focus, and lower ratings of tension at Wave 5, mid-sustainment. Three meaningful associations remained at Wave 6. The frequency of contact related to higher ratings of team leadership and goals, and lower ratings of team tension.

Hypothesis 2: The overall frequency of contact will vary according to phase.

We next examined the best longitudinal model of contact over time. Table 4 displays the results of this hypothesis which include the model fit statistics for the baseline, random intercept-only (i.e. empty) model, and the two next best-fitting models. The best fitting model to describe the frequency of contact over time is the random intercept-only model. In other words, the best longitudinal model is one that estimates only a stable and consistent frequency of contact for each community over time. The predicted probabilities of each observed response are displayed in figure 1. Approximately 45% of PROSPER coalitions had contact with their Prevention Coordinators two times per month. Another 35% of PROSPER coalitions had contact with their Prevention Coordinators approximately once every week. The remaining 25% of communities had contact with their Prevention Coordinators once per month, or less.

Discussion

Supporting youth and families through positive youth development and family skills-building and cohesion-building programs is one way to lessen the frequency and degree of substance abuse and mental health challenges in our communities (Substance Abuse and Mental Health Services Administration, 2019). Given the importance of getting evidence-based interventions into communities to prevent these problems and promote healthy development, the goal of this research was to expand the knowledge base about the nature of technical assistance, an expert consultancy support model (Ermeling et al., 2015), and its importance for community groups implementing evidence-based interventions. This paper investigated the longitudinal relations between frequency of contact between community prevention coalitions and their TA providers, with the functioning of coalitions over time. Our study had the advantage of following coalitions over a period of several years as they progressed through multiple developmental phases, including planning, implementation, and sustainability. Our first hypothesis was that frequency of contact between Prevention Coordinators and PROSPER coalitions would predict better coalition functioning. This relation turned out to be far more complex than we anticipated. Our second hypothesis expected that the TA dosage would increase at the beginning of each phase, when tasks were new and unfamiliar, and decrease over time. However, results showed that the TA dosage remained largely invariant over time.

Specific to the first hypothesis, in the initial stages of coalition development, higher levels of TA contact was associated with lower coalition-reported functioning on a number of

dimensions, including greater team tension and reduced focus on work. The reasons for this are not immediately clear; though our data are separated in time, our correlational analyses did not allow us to establish causal relations. All community coalitions attended a two-day orientation that included specific sessions on coalition building, developing a shared vision, implementation research and evidence-based programming, and engaging community stakeholders. However, perhaps Prevention Coordinators devoted more time and attention to coalitions that they recognized were experiencing more difficulty getting established and successfully completing tasks. Although the PROSPER model instructed Prevention Coordinators to contact their coalitions on a biweekly basis and to attend monthly coalition meetings, Prevention Coordinators were also encouraged to do whatever was needed to support struggling coalitions and had a considerable amount of time dedicated to their role (25% FTE per community). Also, another possible explanation is that coalitions receiving more TA initially developed a better understanding of the work, which may have made them feel not as successful early on.

Interestingly, this early investment appears to have paid off; at later waves, increased contact was associated with better coalition functioning. During the operations period, when coalitions were overseeing the delivery of EBIs to youth and families, coalitions that had received more early-stage contact from Prevention Coordinators showed better functioning in the areas of leadership, culture, goals, and work efficiency. To some extent, these benefits were also carried forward into the sustainment period, where perceptions of team culture, goals, community support, and reduced tension were also positively associated with early frequency of contact. These findings suggest that greater dosage of TA at early stages of coalition development may be important for launching prevention coalitions onto a productive trajectory, particularly those that may have gotten off to a rocky start. They also validate the use of longitudinal data and a developmental perspective when evaluating coalition functioning over time (Chilenski et al., 2018; Florin et al., 1993; Livet & Wandersman, 2005).

We illustrate these findings with two examples. First, the community coalition leader SM of Coalition A had worked for many years as a traditional 4-H Educator and had extensive experience working with youth, but was less familiar and comfortable with prevention programming and had little understanding of implementation science when the project began. Similarly, the partnering school district had little prior EBI experience. Coalition A initially struggled to establish programming, implementation monitoring protocols, and recruit families. Consequently, the coalition's TA provider spent a lot of time helping SM master these new skills, build the relationship with the school district, and provide effective coalition leadership. Eventually, SM developed a solid relationship with the Prevention Coordinator and gained considerable skills related to program implementation and data-driven decision making. This growth was reflected in the later coalition functioning scores of Coalition A. Alternatively, Coalition B's Extension educator, MC, had worked with prevention initiatives before and did not need much support from the TA provider to quickly establish their coalition and implement programs. Thus, their initial dosage of TA was relatively low and their coalition functioning scores relatively high. Over time, however, Coalition B experienced significant turnover in its membership, especially with critical school district members, and this created barriers to effective family recruitment and

program implementation. Possibly as a result of this instability and the barriers it caused, Coalition B's coalition functioning scores declined somewhat over time.

Our second hypothesis, also guided by the developmental perspective, was that the dosage of TA would vary according to coalition developmental stage. Specifically, we expected that the dosage would increase at the beginning of each stage, when tasks were new and unfamiliar, and decrease across the rest of the stage. This hypothesis was not supported by the data; no consistent pattern based on developmental stage or chronological time improved model fit. Consequently, the best predictive model was flat. This was probably related to the specifications of the PROSPER approach. As previously mentioned, PROSPER had a fairly prescribed TA model, which communicated expectations that TA providers needed to reach out to their coalitions a minimum of two times per month, in addition to attending their monthly coalition meeting. Also included were annual meetings that foreshadowed the coming year's activities. The specifications of the PROSPER TA model also encouraged more TA for coalitions as needed. Unlike many community coalitions, PROSPER coalitions received a consistent level of TA over five plus years. It is unclear whether this relatively large dosage of TA delivered over a long period contributed directly to the positive impacts of PROSPER on youth substance use and problem behavior, but these results are consistent with a recent CTC evaluation, which provided consistent TA for a period of five years and also found sustained reductions of youth problem behavior measured over time in one cohort (Oesterle et al., 2018).

Future coalition research should further explore the possible link between the frequency of TA, or other characteristics of TA with EBP impacts, particularly for empirically validated coalition approaches such as CTC and PROSPER (Oesterle et al., 2018; Spoth et al., 2015). Because most real-world prevention coalitions typically do not provide the same intensity and duration of TA provided by CTC and PROSPER (Fagan, Hanson, Hawkins, & Arthur, 2009; Spoth et al., 2004), the field needs to clarify the relations between TA dosage and program outcomes, in order to make the best use of limited resources. For example, whether maintaining TA at a consistent level across the lifespan of the coalition is necessary to achieve maximum EBI impact, or whether (as many assume) coalitions can be "weaned" from TA over time, and how long positive effects on youth outcomes can be sustained in new cohorts after TA support ceases.

This study had a number of limitations that must be acknowledged. First, our analytic approach was constrained by the small sample size of 12 coalitions. Although the Spearman correlations indicate some very interesting relations that invite definitive follow up, they do not allow us to infer causal relations among variables. Furthermore, this study focused on understanding the frequency of contact between PROSPER coalitions and their TA providers. Therefore, it did not include other potentially important factors related to nature of the TA provided, such as whether it was face-to-face or remote, what topics were addressed, and whether the TA was initiated by the coalition or by the PC. These factors have a great deal of practical significance for the field of EBI translation. For example, provider-initiated TA may be very important for the success of struggling coalitions, since prior research suggests that these groups are less likely to seek out assistance than those who are doing well (Fagan et al., 2008; Kegeles et al., 2005; Mihalic & Irwin, 2003). This

dynamic may have played a role in our finding showing the negative relations between TA frequency and coalition functioning early in coalition development, followed by the later positive impact of TA frequency on coalition functioning. Additionally, although some data indicates that face-to-face TA is both preferred and more effective than distance methods such as phone or e-mail (Becker et al., 2008; Feinberg, Ridenour, et al., 2008; Ray et al., 2012), face-to-face technical assistance may be both impractical and prohibitively expensive, posing significant barriers to EBI scale-up. Therefore, it could be valuable to determine whether distance methods are as effective as face-to-face, or whether a slightly less effective distance method is effective enough given its potential for scale. It may also be important to consider whether dosage or developmental timing of different TA modalities make a difference for important outcomes such as coalition sustainability or EBP impacts. For example, perhaps in-person training is crucial at the beginning of an effort and at key transitions in the work and distance methods can be utilized in between these key points.

Despite these limitations, this study uniquely advances our understanding of the role of TA in facilitating the long-term functioning of prevention coalitions. Our results suggest that coalitions receiving more frequent TA early in their process ultimately fare better than those receiving less, and this may be particularly true for coalitions experiencing early challenges. This also raises questions regarding the quality of the relationship that develops between the TA provider and the coalition, as it seems reasonable to think that positive TA provider-coalition relationships could facilitate problem-solving and contribute to positive outcomes in the long term. Future research should further draw on the literature and empirical work on the working alliance (DiGirolamo & Tkach, 2019) and explore these and other factors together with the goal of improving the effectiveness of TA, which would maximize the public health impact of community prevention.

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What's It Mean? Implications for Consulting Psychology

Consulting psychologists have a knowledge base and many skills that could be applied in the fields of prevention science and community psychology, working with community collaborative efforts that aim to improve health and other related outcomes of community residents. This research bridges these fields and provides powerful evidence that regularly scheduled contact between technical assistance providers and community prevention coalitions is an important component supporting success of these efforts.

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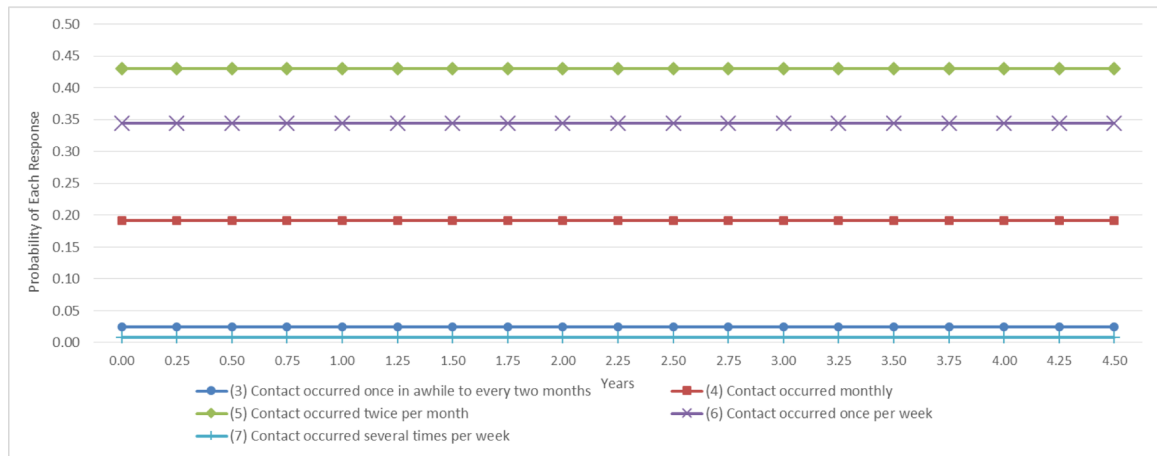


Figure 1: Displaying the predicted probabilities of the cumulative logit link longitudinal models that estimated the cumulative probability of each frequency of contact response option for the best fitting longitudinal model without predictors, the random intercept only model (i.e., empty model). For example, almost 45% of coalitions had contact with their Prevention Coordinators two times per month and another 35% of coalitions had contact with their Prevention Coordinators weekly.

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Table 1:

PROSPER project timeline and assessment schedule relevant to this paper

Stage	2002			2003			2004			2005			2006		
	Apr- Jun	Jul- Sept	Oct- Dec	Jan- Mar	Apr- Jun	Jul- Sept	Oct- Dec	Jan- Mar	Apr- Jun	Jul- Sept	Oct- Dec	Jan- Mar	Apr- Jun	Jul- Sept	Oct- Dec
Intervention Activities															
Organizational=>															
Operations=>															
Sustainment=>															
First trainings	X														
Family Program				X	X							X	X		
School Program							X	X	X	X	X	X	X	X	X
TA Activities															
Biweekly contacts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Attend Monthly Mtgs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Annual Meeting	X								X						
PC Receive Support	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Learning Communities										X	X	X	X	X	X
Assessment Timeline															
Coalition Interviews															
	W1~		W2		W3		W4		W5		W6		W7		W8
PCs Rate Contact	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W14

Table Notes:

~The pretest assessment of the team member interviews was not included in this current study, however, we included it here to be consistent with earlier papers.

Table 2:

Descriptive statistics of all study variables at each measurement occasion (n=12)

Variable	Mean	Std Dev	Minimum	Maximum
Poverty Rate	6.67	2.52	1.80	10.70
Frequency of Contact - Planning	5.06	0.76	4.00	6.67
Frequency of Contact - Implementation	5.21	0.81	3.83	6.50
Frequency of Contact – Sustainability	5.33	0.44	5.00	6.00
Leadership				
Wave 2	3.74	0.14	3.56	3.95
Wave 3	3.70	0.19	3.35	3.93
Wave 4	3.69	0.22	3.15	3.86
Wave 5	3.70	0.22	3.13	3.96
Wave 6	3.67	0.28	2.88	3.95
Culture				
Wave 2	3.58	0.22	3.14	3.90
Wave 3	3.57	0.27	3.11	3.86
Wave 4	3.48	0.30	2.80	3.83
Wave 5	3.54	0.39	2.46	3.89
Wave 6	3.38	0.48	2.48	3.83
Goals & Governance				
Wave 2	3.73	0.19	3.38	4.00
Wave 3	3.57	0.38	2.56	3.93
Wave 4	3.48	0.29	3.06	4.00
Wave 5	3.49	0.44	2.40	3.90
Wave 6	3.47	0.44	2.50	3.94
Work Efficiency				
Wave 2	0.93	0.08	0.74	1.00
Wave 3	0.91	0.10	0.70	1.00
Wave 4	0.93	0.11	0.64	1.00
Wave 5	0.93	0.13	0.56	1.00
Wave 6	0.88	0.18	0.40	1.00
Tension				
Wave 2	1.46	0.33	1.00	2.00
Wave 3	1.67	0.37	1.00	2.38
Wave 4	1.80	0.52	1.00	3.00
Wave 5	1.83	0.47	1.00	2.67
Wave 6	1.73	0.50	1.00	2.40

Table 3:

Results of Spearman Correlations between the overall frequency of contact variables and ratings of team functioning, partial out the effect of poverty (n=12)

	Organization~	Implementation~	Sustainability~
Wave 2: Organization			
Leadership	-.30	---	---
Culture	-.30	---	---
Goals	-.02	---	---
Focus on Work	-.40 ⁺	---	---
Tension	.37 ⁺	---	---
Wave 3: Mid-Implementation			
Leadership	.42 ⁺	.57 [*]	---
Culture	.45 ⁺	.60 ^{**}	---
Goals	.38 ⁺	.04	---
Focus on Work	.44 ⁺	.67 ^{**}	---
Tension	-.07	-.10	---
Wave 4: Early Sustainability			
Leadership	-.18	.22	---
Culture	.06	.26	---
Goals	.01	.28	---
Focus on Work	.55 [*]	.52 [*]	---
Tension	.05	-.33	---
Wave 5: Mid Sustainability			
Leadership	.65 ^{**}	.24	.47 ⁺
Culture	.51 ⁺	.45 ⁺	.52 [*]
Goals	.64 ^{**}	.36 ⁺	.58 [*]
Focus on Work	.46 ⁺	.56 [*]	.53 [*]
Tension	-.45 ⁺	-.53 [*]	-.45 ⁺
Wave 6: Later Sustainability			
Leadership	.49 ⁺	.12	.36 ⁺
Culture	.23	.44 ⁺	.29
Goals	.52 [*]	.36 ⁺	.40 ⁺
Focus on Work	.30	.22	.28
Tension	-.41 ⁺	-.38 ⁺	-.47 ⁺

Notes:

~ In order to allow for separation in chronological time between the independent and dependent variables, we used only the data collected at earlier time points within each stage to predict concurrent stage team functioning. For example, in viewing Table 1, data collected from PCs at Waves 1

and 2 are used to predict team functioning reported by team members at the Wave 2 team member survey time point, rather than utilizing all three waves of PC-reported data to predict the Wave 2 team member interview data.

⁺ $r \Rightarrow +/- .35$

*
 $p .10$

**
 $p .05$

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Table 4:

Model fit statistics and parameter estimates for the best two multi-level unconditional growth models testing how the frequency of overall contact changes, and how the frequency of team-initiated contact changes over time, compared to the Random Intercept Only (i.e., empty) model

	Random intercept only [^]	Random intercept, Time linear	Piecewise: 3 pieces, 2 jumps, plus random piece sustainability
Model Fit Statistics			
-2 Log Likelihood	355.82	355.80	345.15
AIC	365.82	367.80	369.15
BIC	367.81	370.19	373.92
Degrees of Freedom	5	6	12
Parameter Estimates			
Fixed Effects			
Intercept (7)	-4.75 ^{***}	-4.79 ^{***}	-4.69 ^{**}
Intercept (6)	-0.60	-0.64	-0.14
Intercept (5)	1.29 [*]	1.25 [*]	1.93 [*]
Intercept (4)	3.68 ^{****}	3.65 ^{****}	4.48 ^{****}
Intercept (3)	--	--	--
Intercept (2)	--	--	--
Time: Linear Slope Term	--	0.02	--
Time: Slope for Organization	--	--	-3.48
Jump: Between Organization & Implementation~	--	--	1.62
Time: Slope for Implementation	--	--	-0.62
Jump: Between Implementation & Sustainability ⁺	--	--	0.88
Time: Sustainability	--	--	-0.32
Random Variances			
Intercept	1.03	1.02	1.53
Intercept-Slope Covariance	--	--	-0.54
Slope Sustainability Phase	--	--	0.85
Slope Organization Phase	--	--	--

* $p < .05$ ** $p < .01$ *** $p < .001$ **** $p < .0001$ [^] Best fitting model