Measuring Change in Collaboration Among School Safety Partners[*]

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Introduction

Safe Schools, Healthy Students grants, first funded in 1999 through the federal Departments of Education, Justice, and Health and Human Services, have been awarded to hundreds of cities and school districts over the last five years and include evaluation mandates. An increased level of *collaboration* is frequently an explicitly identified grant objective (and almost always an implicit objective) and, therefore, a target to be measured by program evaluators. Collaboration among the various organizations and individuals involved in these multi-faceted approaches is viewed as essential for success (Center for Mental Health in Schools, 2003; Gajda, 2004; Riggins, 2004). Typically, it is hoped that collaborations formed for the purposes of implementing the grants will remain after the funding ceases. Collaboration is seen as a prerequisite for sustainability of interagency programs (Hogue, 1993; Perkins, 2002; Peterson, 1991), particularly for those programs initially created with the support of time-limited funding sources.

From the perspective of evaluators, however, assessing collaboration is often difficult. Models of collaboration among agencies, groups, and community stakeholders are notoriously difficult to translate into valid and reliable instruments which can measure meaningful change in the level and pattern of collaboration. This paper reviews the existing models of collaboration, presents an instrument for its assessment consistent with common characteristics across models, examines reliability and validity evidence for the instrument, and suggests a method of graphical display to represent the sometimes elusive nature of collaboration.

Models of Collaboration

Collaboration has a variety of definitions and names, but is generally treated as meaning the cooperative way that two or more entities work together towards a shared goal. Collaboration among individuals with shared goals in professions such as mental health and education has been studied (Kabler and Genshaft, 1983; Moriarty, 2000; Pugach and Johnson, 1989; Smith, Frey and Tollefson, 2003), as has collaboration within and among individuals in the development of small groups (Tuckman, 1965; Tuckman and Jensen, 1977). Additionally, some researchers have explored the specific nature of successful relationships within school and business partnerships (Ash, 1989; DelPizzo, 1990; Kysiak, 1986; Rockefeller, 1986). However, a comprehensive theory of collaboration within the types of shared organizational efforts (or *strategic alliances*; Gajda, 2004) formed through grant funded initiatives and other public service efforts has not been presented in the literature.

Preliminary models of collaboration within service-oriented strategic alliances have been presented in the literature (Bailey and Koney, 2000, as cited in Gadja, 2004; Gadja, 2004;

Hogue, 1993; Peterson, 1991). These models commonly focus on *stages* of collaboration through which inter-agency initiatives might move. Gadja argues that groups will pass from lower to higher stages of collaboration before they can be effective. These stage theories describe levels of collaboration with the lowest level being little or no collaboration and the highest levels being full collaboration or, ultimately, complete unification. The models differ on the number of stages, the range of levels included, and the definitions of various stages, but they have much in common.

Peterson (1991) proposed three types of agency interaction- cooperation, coordination, and collaboration. Though described by Peterson as distinct states of interactions among agencies and not offered as a strict series of stages, in Gadja's (2004) review of Peterson's model, they are presented as a three point continuum. These categories are differentiated based on the degree of member autonomy associated with each. Hogue (1993) suggested five levels of *community linkage*- networking, cooperation or alliance, coordination or partnership, coalition, and collaboration. The levels differ by purpose, the structure of decision making, and the nature of leadership. Bailey and Koney (2000) offered a model similar to these with four steps, ending with complete unification- cooperation, coordination, collaboration, and coadunation (which means *having grown together*). A five-stage model consistent with previous stage approaches was suggested by Gadja. The *level of integration* model has five ordered steps- networking, cooperating, partnering, merging, and unifying. The steps differ on purpose, tasks and organizational strategies, leadership and decision-making and type and frequency of communication.

Methods

The evaluation of a Midwest school district's implementation of a *Safe Schools, Healthy Students* initiative included the task of measuring levels of collaboration among grant partners. The *Safe School, Healthy Students* Request for Proposals (RFP) viewed collaboration as a necessary ingredient for successful initiatives and it was viewed as a key outcome by grant partners. Our approach to this measurement task was to first define the construct, *collaboration*, through a search of the published literature and through interviews with representatives of various participating grant partners. The literature review is summarized earlier in this paper. Participant interviews revealed that collaboration was perceived as a level of cooperation that involves teamwork, communication and consideration. Grant partners agreed that collaboration was a variety of parties coming together to reach a shared goal.

Next, we identified a model to provide the theoretical validity for any instrumentation we chose or developed. The five stages of Hogue's (1993) Levels of Community Linkage model was chosen as the most relevant framework. In addition to Hogue's levels, it was possible that some partner groups had no interaction with other groups, especially at baseline, and this possibility was reflected in the final instrumentation by allowing respondents to choose "0" to indicate no collaboration whatsoever.

In developing the survey instrument, the detailed descriptions of the Levels of Community Linkage provided by Hogue (1993) and discussed within the context of assessment by

Borden and Perkins (1998, 1999) were combined and shortened to provide simpler definitions for respondents. While the full Hogue model treats collaboration as being represented in three different dimensions (purpose, structure and process) at each of the five levels, for the sake of parsimony, our instrument asked about the five levels only, without the further breakdown into the three different dimensions of collaboration.

Given the definitions of each level, respondents were asked to what extent they collaborate with each other grant partner. Answer options were on a 0 to 5 scale with 0 indicating "no interaction at all" and 5 indicating the collaboration level using Hogue's taxonomy. The instrument is shown as Figure 1. For the purposes of this paper, the name of each group or organization has been replaced with a generic descriptive name.

Data was collected in different ways at different times. During the baseline year, before regular monthly meetings with a stable group of representatives had been established, respondents were asked to fill out a survey at the end of one-on-one interviews that were being conducted as part of the startup evaluation activities. Those available to generate test-retest reliability data were visited a second time about a month later. At the end of the first year, the instrument was administered as part of the monthly grant partner meetings and again at the next meeting to gather test-retest reliability data.

Results

The reliability of the scores produced by the *Levels of Collaboration* survey can be examined in a variety of ways. For measuring change, the primary measurement concern is test-retest reliability or the stability of scores across brief periods of time. A high consistency in responses in the absence of real change is essential for the method to be sensitive enough to detect real change when it occurs. To assess test-retest reliability, we conducted psychometric studies during each of the first two years of administration of the scale in our local evaluation. During the baseline year, two key respondents were asked to respond to the form twice with an intervening time period of one month. On the second administration they were asked to refer to the originally referenced time point to control for any actual collaborative changes that may have occurred during the early weeks of preliminary meetings and planning. Test-retest reliability for the small sample was high. Correlations of stability for the two respondents, each providing 9 pairs of matched scores were .80 and .90 for a mean value of .85. When collaboration data was collected at the start of the second year, test-retest data was collected from nine key respondents. Correlations of stability for respondents ranged from .69 to .97 with a mean reliability coefficient of .87 (SD= .09.)

Data collected with *Levels of Collaboration* scale can be reported quantitatively in a variety of ways depending on the interests of evaluators, grant directors and stakeholders. Collaboration can be reported as the mean level of perceived collaboration across all respondents for all partners, summarized in other meaningful ways, or provided as raw data in a table. Because, by definition, collaboration only exists when two or more parties interact with each other, situations where two partners report different levels of collaboration with each other represent areas for exploration and discussion. In these situations, the assessment becomes formative, not exclusively summative.

Collaboration, though, may best be represented visually. With many entities interacting among themselves, a graphic display of the links has the potential to be more informative than a series of numbers. Cross (2003) presented a simple technique of displaying levels of collaboration between entities which involved using circles to represent partners and lines between the circles to represent collaboration. The characteristic of the line can be varied to represent the level of collaboration- thickness, color, etc. We have adapted that method, adding some additional information, and produced *Collaboration Maps* from the data produced with the *Levels of Collaboration* scale. A sample map is shown as Figure 2. The presence of connecting arrows between circles, and their thickness, indicates that one partner reported a moderate or high level of collaboration with another partner. On the map, collaboration levels reported as 0 or 1 are not represented with lines. This allowed for four *types* (or thicknesses) of lines to be used to represent the variety of levels. The numbers in each circle reflect the number of partners with whom each entity collaborates and the mean level of collaboration across all partners. Size of circles was based on the number of links with other circles. Size criteria and the number of sizes used would depend on the variability across partners. For this data, we used three relative circle sizes- small for one or two links, medium for three to six links, and large for seven links or more. We also used broken or dotted lines for four circles to indicate groups which did not respond to the scale but were used as response objects. In other words, arrows could go toward them, but not come from them.

Though the example shown is complex, with many circles and lines, after one is familiar with the symbols, areas of high and low collaboration become apparent, as do areas of disagreement. The basic format can be adapted easily to emphasize additional or different information. For example, with plenty of space and fewer partners, one can arrange the circles so the distance between them represents levels of collaboration as well. Whatever the method, the map allows for interpretations of collaboration from a variety of perspectives. Change in the number of connecting lines, their thicknesses, and even the number of circles, can represent changes in collaboration across time; this method also allows for a visual representation of *systems change*, an outcome commonly evaluated in school reform initiatives.

Discussion

The *Levels of Collaboration* survey provides definitions of stages of collaboration to respondents. The definitions are consistent with the scholarly literature and theory which supports the assumption of general construct-based validity for the scale. Scores on the scale are meant to represent the *amount* of collaboration between organizations at a given time and scores are intended to be used to reflect change over time. Two specific validity concerns relate to those stated purposes of the assessment.

First, when participants respond to the scale, are they responding on behalf of the entire organization they represent or reflecting only their personal, individual experiences? This is an important question conceptually because the core of collaborative relationships among groups is the collaborative relationships between individuals who are part of those groups.

Gajda (2004) points out that collaboration depends on "positive personal relations and effective emotional connections between partners" (p. 69). In our early use of the instrument, we spoke with respondents about the referents they chose when responding. About half assumed they should report as individuals, the rest reported as representatives of their group or used some combination of roles. We recommend that respondents be sampled from organizations and then be instructed to respond as individuals. In some cases, though, the individual is, essentially, the entire organization, at least in terms of being the only one who interacts with other grant partners. In those cases, the issue of whether they are individuals or representing a group is only of abstract, theoretical interest.

A second concern is whether the instrument can detect change. Evaluators are constantly faced with the expectation that important changes in outcomes will be detected using a given measurement system. The high test-retest reliability of the *Levels of Collaboration* scale indicates a high degree of precision in measurement, suggesting it is an appropriate tool to measure change. When the scale was used in our local evaluation, with just seven representatives on both measurement occasions, a change in mean collaboration of .63 standard deviations was observed between baseline and the end of the first year of grant activities. The mean moved from 1.40 (SD=.55) to 1.71 (SD=.57). Taking into account all respondents, not just those responding on both occasions, the mean level of collaboration moved from 1.50 (SD=.54) to 1.88 (SD=.54). Before the grant initiative began, partners were above the networking level of collaboration and after a year had moved toward the cooperation level. Grant partners have chosen a goal of 2.41 on the scale (somewhere between *cooperation* and *coordination*) and the data generated by the survey can be interpreted as indicating that they are 42% towards their goal. The scale appears to provide meaningful information about change in reported levels of collaboration over time. Without independent studies of the nature of the construct being assessed, however, the validity of the measurement system cannot be fully established. Future exploration of the validity of the instrument should include both qualitative studies to examine the nature of the construct from the perspective of respondents and correlational studies examining the relationships between scores on the *Levels of Collaboration* scale and scores on other collaboration measures and criteria.

Though not offered as a stage in current models, those interested in assessing collaboration might best apply a combination of previous models which includes a foundational stage-*coexistence*, the state of participating agencies before any level of collaboration has begun. This approach yields a seven stage model. This model has intuitive value as it spans the fullest possible range of collaboration from coexistence to coadunation. A path of up to seven stages is presented, covering a point at which entities did not interact at all through a theoretical final step of complete unification. Figure 3 shows the complete continuum of collaboration with the various models that have been proposed historically. Uniform terms are used to label stages, with terminology specific to each model indicated where necessary.

Our experience with the scale in our local evaluation has been that stakeholders, respondents, district administrators, teachers, principals and grant partners find the information useful and persuasive. Even more, the visual representation method, used as feedback, has resulted in grant partners actually identifying collaboration goals and targets which were not part of the

original design. In this context, the scale operates as a formative assessment. In addition, the level of collaboration might well have increased to a small degree because of the interactions and discussions of *Levels of Collaboration* scores themselves. As with many assessment activities in program evaluation, the data collection itself has led to system changes. The large amount of information presented by the graphic technique makes for a powerful reporting tool (and, in the case of our local evaluation could even act as an intervention) and provides a convenient visualization of the dynamics of collaboration.

References

Ash, A.M. (1989). *Interorganizational relations and effectiveness in school-business partnerships.* Unpublished doctoral dissertation, University of Miami.

Bailey, D. and Koney, K. (2000). *Strategic alliances among health and human services organizations: From affiliations to consolidations. (Abridged).* Thousand Oaks, CA: Sage.

Borden, L. and Perkins, D. (1998). Evaluating your collaborative effort. *Program Evaluation Newsletter, 1*, 5. Center for Study and Prevention of Violence.

Borden, L. and Perkins, D. (1999). Assessing your collaboration: A self-evaluation tool. *Journal of Extension, 37,* 2. 67-72.

Center for Mental Health in Schools (2003). Safe Students: Healthy Schools: A collaborative process. *Addressing Barriers to Learning, 8*, 2, 1-7.

Cross, J.E. (2003, April). *Evaluation instruments that measure change, growth and collaboration.* Paper presented at Safe Schools, Healthy Students, Arlington, VA.

DelPizzo, M.T. (1990). *A naturalistic study of the salient themes of a school/business partnership.* Unpublished doctoral dissertation, West Virginia University.

Gajda, R. (2004). Utilizing collaboration theory to evaluate strategic alliances. *American Journal of Evaluation, 25,*1, 65-77.

Hogue, T. (1993). *Community-based collaboration: Community wellness multiplied.* Bend, OR: Chandler Center for Community Leadership. Retrieved April, 21, 2004 from http://crs.uvm.edu/nnco/collab/wellness.html.

Kabler, M. and Genshaft, J. (1983). Structuring decision-making in multidisciplinary teams. *School Psychology Review, 12*, 2, 150-159.

Kysiak, R.C. (1986). Role of the university in public-private partnerships. *Proceedings of the Academy of Political Science, 36*, 2, 47-59.

Moriarty, M.L. (2000). *Attitudes on collaboration in education: A pilot study.* Unpublished manuscript, University of Kansas.

Perkins, T. *Comprehensive Community Initiatives (CCI): A comparison of community implementation plans.* Lincoln, NE: University of Nebraska Public Policy Center. Retrieved October 1, 2003 from http://ppc.unl.edu/reports_publications/csipcommunity_comparison.pdf

Peterson, N.L. (1991). Interagency collaboration under Part H: The key to comprehensive, multidisciplinary, coordinated infant/toddler intervention services. *Journal of Early Intervention, 15,*1,89-105.

Riggan, J.M. (2004, April). *Making a mess of program theory: Evaluating complex, collaborative initiatives.* Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Rockefeller, D. (1986). Ingredients of successful partnerships: New York City case. *Proceedings of the Academy of Political Science, 36*, 2, 122-154.

Smith, S. J., Frey, B.B., and Tollefson, N. (2003). A collaborative cohort approach to teacher education: Modeling inclusive practices. *Action in Teacher Education, 24*(1), 55-61.

Tuckman, B.W. (1965). Developmental sequence in small groups. *Psychological Bulletin, 63*, 6, 384-399.

Tuckman, B.W. and Jensen, M.A.C. (1977). Stages of small group development revisited. *Group and Organizational Studies, 2*, 4, 419-427.
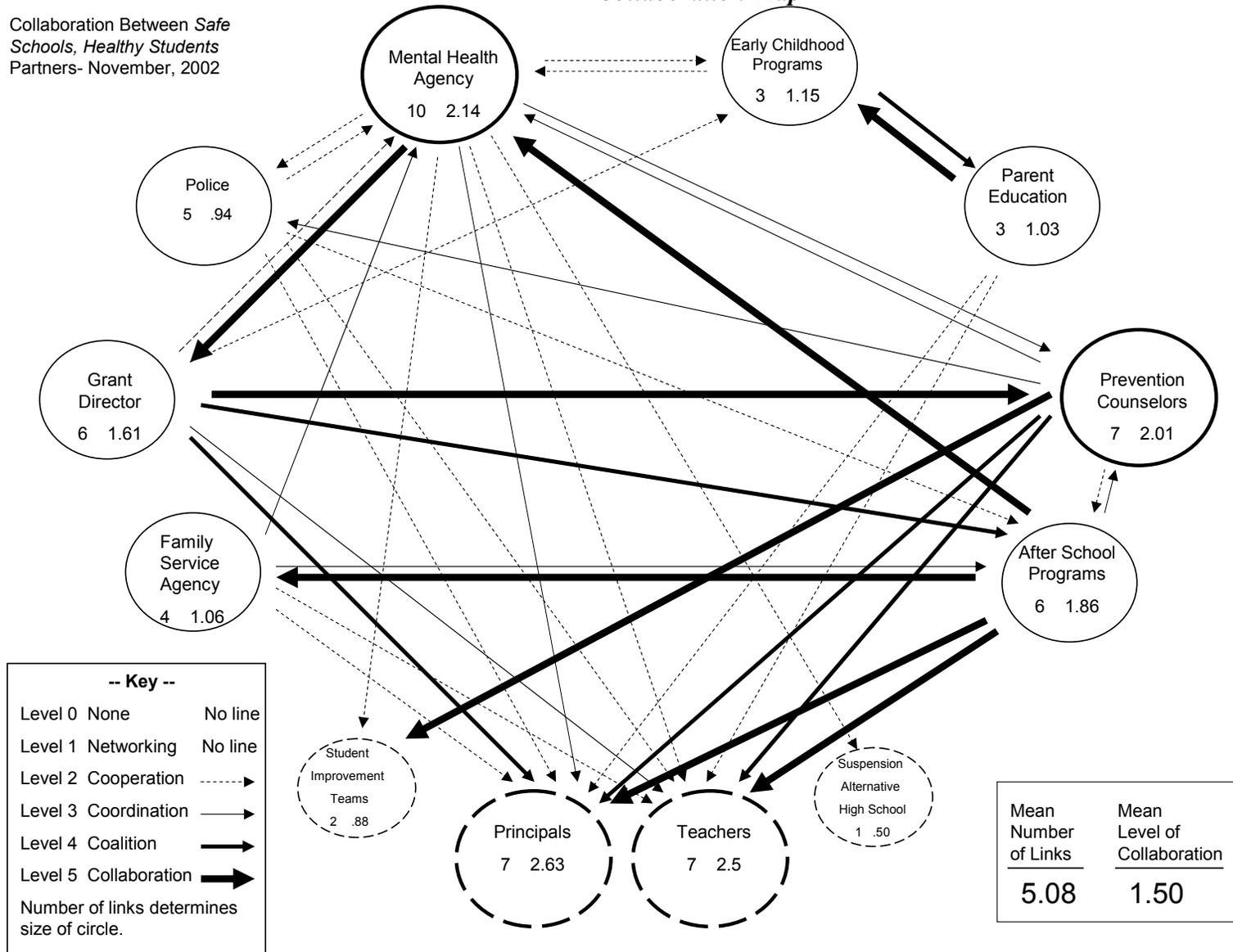
Figure 1.
Levels of Collaboration Scale

This form is designed for those who work in one of the organizations or programs that are partners in the *Safe Schools, Healthy Students* initiative. Please review these descriptions of different levels of collaboration.
- On the response section at the bottom of the page, please circle the name of the organization or group with which you are associated.
- Using the scale provided, please indicate the extent to which you currently interact with each other partner. (Skip your own row.)

	Five Levels of Collaboration and Their Characteristics				
	Networking 1	Cooperation 2	Coordination 3	Coalition 4	Collaboration 5
Relationship Characteristics	-Aware of organization -Loosely defined roles -Little communication -All decisions are made independently	-Provide information to each other - Somewhat defined roles -Formal communication -All decisions are made independently	-Share information and resources -Defined roles -Frequent communication -Some shared decision making	-Share ideas -Share resources -Frequent and prioritized communication -All members have a vote in decision making	-Members belong to one system -Frequent communication is characterized by mutual trust -Consensus is reached on all decisions
Safe Schools, Healthy Students Partners	No Interaction at All	Networking	Cooperation	Coordination	Coalition	Collaboration
Mental Health Agency	0	1	2	3	4	5
Early Childhood Programs	0	1	2	3	4	5
Parent Education Program	0	1	2	3	4	5
School District Prevention Counselors	0	1	2	3	4	5
After School Programs Director	0	1	2	3	4	5
Student Improvement Teams	0	1	2	3	4	5
Principals	0	1	2	3	4	5
Teachers	0	1	2	3	4	5
Police Department	0	1	2	3	4	5

Figure 2.
Collaboration Map

Collaboration Between *Safe Schools, Healthy Students* Partners- November, 2002

Mental Health Agency
10   2.14

Early Childhood Programs
3   1.15

Parent Education
3   1.03

Police
5   .94

Grant Director
6   1.61

Prevention Counselors
7   2.01

Family Service Agency
4   1.06

After School Programs
6   1.86

Student Improvement Teams
2   .88

Principals
7   2.63

Teachers
7   2.5

Suspension Alternative High School
1   .50

-- Key --

Level 0	None	No line
Level 1	Networking	No line
Level 2	Cooperation	---►
Level 3	Coordination	—►
Level 4	Coalition	━►
Level 5	Collaboration	━►

Number of links determines size of circle.

Mean Number of Links	Mean Level of Collaboration
5.08	1.50

Figure 3.
Stage Models of Collaboration

Coexistence	Communication	Cooperation	Coordination	Coalition	Collaboration	Coadunation
		1	2		3	
			Peterson Model (1991)			
	1 "Networking"	2	3	4	5	
		Levels of Community Linkage Model (Hogue, 1993)				
		1	2		3	4
			Bailey and Koney Model (2000)			
	1 "Networking"	2		3 "Partnering"	4 "Merging"	5 "Unifying"
		Levels of Integration Model (Gajda, 2004)				
1	2	3	4	5	6	7
		Seven Stage Model				