

# Conceptualizing and Measuring Collaboration in the Context of Early Childhood Care and Education



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# Conceptualizing and Measuring Collaboration in the Context of Early Childhood Care and Education

## Overview

Despite the fact that many early childhood initiatives depend on the collaboration of multiple organizations and stakeholders, little is known about what makes for successful collaboration within the field of early care and education. In May of 2010, a working meeting was convened by the Office of Planning, Research and Evaluation to begin to address this issue. This brief builds on work that began during that meeting and extended in the years that followed, particularly work identifying the key components of collaborations and developing a logic model for measuring collaboration in an early childhood context. The first section of this brief presents the logic model, explains its core components, and highlights these components by mapping them onto a hypothetical example of collaboration in early care and education. The next section of the brief shares the results from an extensive review of existing measures of collaboration. Thirty-two measures were found. The last section of the brief describes key measurement considerations and offers some discussion of future directions for collaboration research in the field of early care and education.

## Introduction

At the local, state and national levels, there is increasing emphasis on coordination and collaboration across early care and education sectors to provide consistent, high-quality services to meet the needs of families with young children. From early interventionists, who help identify children who need additional supports for optimal development, to early childhood educators, who ensure continuity in children's early care and education, to state-level agencies that ensure the coordination of education and health services, each level of service requires the successful partnership of several entities to achieve a common goal. Coordination across early care and education programs, and service integration across these and other social service programs, may have fiscal benefits (associated with more efficient spending across programs) as well as benefits for providers, children, and families. Though collaboration is well studied in fields such as health, public policy, and public administration, in the early childhood field, little is known about what makes for successful and productive collaborations.

In May of 2010 the Office of Planning, Research and Evaluation, Administration for Children and Families, Department of Health and Human Services (OPRE/ACF/HHS) convened a working meeting in Washington, DC that included collaboration research experts, state administrators, and federal agency staff. The meeting, entitled *Collaborations in Early Child Care and Education: Establishing a Framework for a Research Agenda*, focused on state-level collaborations in early education, particularly collaborations among child care, Head Start, pre-kindergarten (pre-K), early intervention, and early childhood special education. The meeting focused on the process of collaborating, defined by Gray (1989) as "a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible." The goal of the working meeting was to discuss and develop a framework for exploring collaborations in early childhood care and education (Office of Planning Research and Evaluation, 2010). During the meeting, experts described what collaborations in early care and education look like and what research had, until that time, revealed about collaborations within state-level early childhood systems. Researchers and policymakers also discussed the gaps in collaboration research and proposed ideas to cover these missing pieces.

***"Collaboration is a process through which parties who see different aspects of a problem explore their differences and search for solutions that go beyond their own limited vision of what is possible."***

This brief presents work on the conceptualization and measurement of collaboration that is an outgrowth of the May 2010 meeting sponsored by OPRE. The authors aim to lay a foundation for further research involving collaborations in early care and education by identifying key components of collaboration and spurring the development and use of measures of collaboration in the early childhood field. First, the brief describes a conceptual framework for research in the form of a state-level collaboration logic model, which depicts the key components of collaboration. Using this logic model as a guide, we then identify extant measures of collaboration created for use in a wide variety of fields that could operationalize each component of the logic model; evaluate the strengths and weaknesses of these measures; and explore how these measures may be informative for the development of new measures of collaboration for the early childhood field. The ultimate goal of this work is to explore and support improvements in the collaboration process in the context of early care and education, which, in turn, may produce better outcomes for early childhood programs and systems, and the children and families they serve.

## Developing a Logic Model of Collaborative Processes in Early Care and Education

One of the major themes to emerge from the 2010 meeting of experts was the lack of research identifying the components of collaboration to inform our understanding of collaborative processes. Experts at the meeting expressed the need to develop a logic model as an important step in articulating components of a framework for collaboration research. A logic model is a graphic planning tool that can help define the relationships among the elements of a complex initiative, such as the establishment and functioning of a state-level early childhood collaboration. It articulates a theory of change<sup>1</sup> by showing the pathways between the initiative's activities and the initiative's desired outcomes. Thus, the logic model acts as a roadmap for researchers and members of a collaborative to see the components of the collaboration and understand how the components build on one another to reach the collaboration's ultimate goal.

*The logic model acts as a roadmap for researchers and practitioners to see the components of the collaboration and understand how the components build on one another to reach the collaborative's ultimate goal.*

The building blocks of logic models include the resources the initiative will bring to bear (inputs), the activities and/or processes the initiative will undertake toward the goal (activities and/or processes), immediate and longer-term outcomes that an initiative is aiming to produce (outcomes), and the linkages building toward this set of outcomes. Logic models do not prove that the inputs, activities or processes *caused* the outcomes. They are not a substitute for evaluation. As evidence from the activities that instantiate the associations in the logic model accumulates, it is possible to demonstrate that the outcomes are *consistent* with what the logic model anticipates.

Following the May 2010 meeting, OPRE commissioned subject matter experts to develop the full collaboration logic model (Hicks, Smith, & Sowa, October, 2010). Darrin Hicks, Barbara J. Smith, and Jessica Sowa relied on both the discussion from the meeting and a wide range of literature to develop this logic model using a “theory of change” approach (Halle, Darling Churchill, Blasberg, Simkin, & Chrisler, October, 2010). As depicted in Figure 1, the logic model encompasses five components that represent early care and education collaborations: 1) inputs to collaboration, 2) collaborative processes, 3) state-level outcomes, 4) service-level outcomes, and 5) child and family outcomes.

<sup>1</sup> A theory of change defines all the building blocks needed to achieve a certain long-term goal. See <http://www.theoryofchange.org/what-is-theory-of-change/#1> for more detail.

Figure 1: Logic Model for State-Level Collaborations<sup>2</sup>

A: Inputs to Collaboration	B: Process Components	C: Collaborative Outcomes—State Level	D: Collaborative Outcomes—Service Level	E: Collaborative Outcomes—Family and Child Level
<p>Stakeholder Inputs—Organizational time and resource commitment to the collaboration; sending a powerful agent (see definition); level of commitment to the collaborative mission (e.g. buy-in, ownership, stewardship)</p> <p>Design Components—Correct number and representation of stakeholders, clear decision-making rules, delineated roles and responsibilities, (including such roles as manager to provide administrative support, facilitator, and entrepreneur who is championing the collaborative effort), clear meeting design, and explicated purpose for the collaboration</p>	<ul style="list-style-type: none"> <li>• Norms</li> <li>• Inclusion</li> <li>• Authenticity</li> <li>• Equality</li> <li>• Problem Focus</li> <li>• Support</li> <li>• Identification</li> <li>• Facilitation</li> <li>• Generative Purpose</li> </ul>	<ul style="list-style-type: none"> <li>• Changes to understandings of the policy problem—policy learning, shared problem definitions, consensus around key data elements</li> <li>• Reduced fragmentation</li> <li>• Improved relationships and trust between the stakeholders</li> <li>• Increased collaborative activity—for stakeholders and for the policy field</li> <li>• Increased adaptive capacity for stakeholders</li> <li>• Access to new resources—for stakeholders and for the policy field</li> <li>• Increased political will</li> <li>• Explicit goals of the collaboration achieved</li> <li>• Changes to stakeholder organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Shared professional knowledge in the field</li> <li>• Shared problem definition and shared goals and desired outcomes</li> <li>• Improved quality of services provided, including higher quality staff</li> <li>• Improved consistency in care delivery</li> <li>• Improved care infrastructure in a community—service coordination</li> <li>• Better communication with the state level; establishment of a feedback loop from service delivery level</li> </ul>	<ul style="list-style-type: none"> <li>• Improved outcomes for children—better status re service, improved child well-being</li> <li>• Improved outcomes for families—stability, improved family well-being</li> <li>• Improved ability to track outcomes for children and families</li> </ul>
<p>Moderators of Collaboration →</p>				

Hicks and colleagues (2010, p. 2-5) provide the following definitions of the components of collaborations:

**Inputs to collaboration** include the design features required in the initial construction of the collaboration. These features include **stakeholder inputs** – what is required from each stakeholder<sup>3</sup>– and **design components** – initial design features that enable a collaborative to achieve its purpose. These include: roles and responsibilities of collaborative members, facilitation and management of the collaboration (i.e., making sure the collaborative effort and processes run smoothly), clear decision-making rules, an entrepreneur driving the process (i.e., a stakeholder who has taken up the purpose of the collaborative effort and is integral in driving the process toward its successful conclusion), workable number of stakeholders, clear design of the meetings (e.g., agenda, clear schedule), and explicated purpose.

<sup>2</sup>Hicks, D., Smith, B., & Sowa, J. E. (October, 2010). *Collaboration in early care and education: Establishing a framework for a research agenda - logic model*. Paper presented at the annual meeting for the Child Care Policy Research Consortium, Washington, DC.

**Process components** are features that arise through the operation of the collaborative, and indicate whether a quality process has been undertaken. Process components include stakeholder perceptions around: **norms** that shape interactions among stakeholders; **inclusion** of stakeholders who represent a wide variety of viewpoints and interests; **authenticity** of the authority to make decisions (and not that the process is simply legitimating previously-made decisions); **equality** in stakeholders' opportunities to influence the decision-making process; **problem focus**, which is the perception that the collaborative was convened to solve a real problem (and not simply for political appeasement); **support**, or adequate support and resources (financial, information, administrative) to make meaningful decisions; **identification**, which is that stakeholders share a common identity and members of the collaborative are willing to balance the interests of their home organizations with those of the collaborative; **facilitation** of the collaborative process to make it operate smoothly and move toward desired outcomes; and **generative purpose**, which is how stakeholders come to understand the purpose of the collaboration and how that shapes their actions.

The final three pieces of the logic model are **outcomes** at three levels: the state level, the program or service level, and the individual family or child level. Outcomes at the state level may include changes in understanding of the policy problem or changes in funding. Outcomes at the service delivery level include shared problem definitions and goals across the community that encompasses the collaboration and more specific outcomes, such as improving access and increasing the number of children and families served. The last piece of the logic model is outcomes at the family and child level, which will depend largely on the target of the collaboration. For example, if the goal of the collaboration is to increase the number of children attending higher quality center-based care, then outcomes at this level might include changes in capacity for center-based care and an increased number of newly enrolled children in centers. If, however, the goal of the collaboration is to streamline the application process for multiple early childhood services, such as Head Start and early care and education subsidies, then outcomes might include increased enrollment in Head Start or child care subsidies (as family-level outcomes) and increased cognitive, linguistic, and/or social-emotional well-being (as child-level outcomes). (See Text Box 3 for a detailed example of a state-level collaborative in the field of early care and education.)

The logic model presented here represents the key inputs, processes, and outcomes believed to underlie collaborative endeavors in the field of early care and education. This logic model was developed, in part, to spur research examining the relationships amongst the underlying components. By aligning research methods with the components of the logic model, future researchers will be able to explore whether or not these processes operate as expected.

### ***Illustration of a State-Level Collaboration***

*Ms. Smith was a new member of the professional development team in her state's department of education. After reviewing the state's professional development program for early childhood educators, she noted that one of the team's biggest challenges was aligning professional development training courses with the domains in the state's new early learning guidelines. In fact, she was surprised to discover that only half of the early learning guidelines were covered by the available courses. In addition, most courses were introductory and did not provide advanced training content for more experienced staff. Ms. Smith set a goal to have all professional development offerings align with the state's new early learning guidelines and meet the professional development needs of all early childhood educators.*

<sup>3</sup> Stakeholders are representatives of organizations, institutions or agencies who contribute to the collaborative process (e.g., members of the collaborative team) or support the collaboration in some way (e.g., administrators who provide resource support to the collaboration).

Ms. Smith decided to establish a committee to explore ways professional development offerings could address the needs of staff working across all programs. Other members of the department and early childhood leaders working on professional development at the state level agreed this was a critical issue (**problem focus**). She sought guidance from stakeholders on a committee membership selection process representing early education programs, training organizations, higher education, professional associations, and the Department of Education working on preschool guidelines (**inclusion**). Her invitation to possible members explained the idea behind creating the committee and the need to think collectively about the issue (**stakeholder inputs**). She also noted that members would serve as representatives of their respective programs and their support was invaluable to the success of this initiative (**design components**).

The committee wanted to ensure that the collaboration would be productive. At its initial meeting, the committee came to a consensus regarding its goal, each participant's role and responsibilities, and a procedure for semi-monthly meetings, including the distribution of an agenda and a clear goal for each meeting (**design components**). The first three months were dedicated to reviewing the new early learning standards and discussing each program's professional development needs and the supports and barriers they face.

During the fourth month, Ms. Smith decided to dedicate a meeting to reflect on the organizational structure of the committee, identify clear goals of the committee (**generative purpose**), and develop a timeline to accomplish committee goals. First, recognizing that decision-making would be critical to accomplishing its goals, the committee developed a voting process and acknowledged that each member would hold equal voting weight (**norms and equality**). Second, the committee agreed to write a report on recommended strategies to link professional development course offerings to each of the learning domains (**e.g., science, creative arts, math**) needed for all children (**authenticity**). The strategies would include the development of a series of courses that would provide beginner, intermediate, and advanced training in each learning domain (**service-delivery outcomes**). Members also agreed to track outcomes, which would include communication of the committee's proposed changes to program governing bodies, adaptation of professional development guidelines, dedication of resources, development of new professional development courses, and teacher enrollment (**state-level outcomes**). They also decided to track changes in teaching quality and children's learning at the program and state level (**service-delivery and child outcomes**). Lastly, the committee developed a timeline of milestones to accomplish its goals.

## Brief Review of Extant Measures of Collaboration

Building on the logic model for early care and education collaborations outlined above, we conducted a multidisciplinary scan of available measures that might capture the specific components of collaboration. In our review of measures of collaboration, we focused on the inputs and process components of the logic model rather than outcomes because these components are more likely to be common across multiple settings (e.g., norms and problem solving are likely found in collaborations across different settings, including education, health care, business, etc). Conversely, the outcomes of collaborations will likely vary across settings and systems. For example, the stated outcomes of a collaboration in early childhood education are likely different from those in healthcare. Moreover, a state-level collaboration is likely to emphasize different outcomes than a program-level collaboration. We searched for measures in the following fields: early care and education, health care, public administration/public policy, and psychology. The search engines and article databases we used included PubMed, ERIC, PsycINFO, and Research Connections. We used a variety of collaboration terms in our search.<sup>i</sup>

We limited our search by restricting it to measures that were published in 2000 or later; measures that were used for research and evaluation rather than those used only for technical assistance; and measures that assessed inputs to collaboration and/or the process components of collaboration. Both articles and books were included in the search. Finally, four content experts (Don Forsyth, Scott Reeves, Diane Schilder, and Jessica Sowa) were consulted to ensure that the search for collaboration measures across these disparate fields was comprehensive and thorough. The four experts also provided measures of collaboration that may not have been captured in our electronic search methodology.

Below, we summarize information from the review of extant collaboration measures as they relate to the components of the logic model for early care and education collaboration. We follow this by considering the practical uses of these measures in research and evaluation of early care and education collaborations. Specifically, we consider psychometric and analytic issues in the use of measures of collaboration.

**Patterns and Trends in Measures of Collaboration.** A total of 32 measures of collaborations were identified (see Appendix A for a short list of the measures; a longer, detailed table that provides information on each of the measures as it relates to the core components of collaboration as articulated in the collaboration logic model is offered in a supplementary online resource to this brief). Of the 32 measures, only one is directly from the field of early care and education, the Process Quality Rating Scale (Hicks & Larson, n.d.).<sup>4</sup> Fifteen measures are in health care, five in public policy/public administration, three in psychology, and eight in some other field (e.g., community programming). Below, we examine the measures that assess the inputs and process components of collaboration, and the average number of items per measure.<sup>5</sup>

*Inputs to collaboration.* As Table 1 below shows, we found 19 measures assess organizational time and resource commitment to the collaboration, and 18 measures assess level of commitment to the collaborative mission. Examples of items include: “does the organization currently have committed and active members?” (Bright, 1998) and “broad-based membership includes community leaders, professionals, and grass-roots organizers representing target population”(Butterfoss, 1994). In contrast, only 10 measures have at least one item assessing sending a powerful agent, meaning that the representatives participating in the collaborative have the power to make decisions (e.g., “those who are in positions of power or authority are willing to go along with our decisions or recommendations;” OMNI Institute, 1992). In regards to design components, about half the measures have at least one item assessing: correct number and representation of stakeholders (17 measures; e.g., “the team depends on members with varying roles to implement specific activities”; Mellin et al., 2010); clear decision-making rules (14 measures; e.g., “has the board established a process for obtaining staff input for board decision making?”; Bright, 1998); delineated roles and responsibilities (15 measures; e.g., “the team makes distinctions among the roles and responsibilities of each member”; Mellin et al., 2010); or an explicated purpose for the collaboration (16 measures; e.g., “we have concrete measurable goals to judge the success of our collaboration”; OMNI Institute, 1992). Only 9 measures have at least one item assessing a clear meeting design (e.g., “background materials needed for meetings are prepared and distributed in advance of meetings”; Kenney and Sofaer, 2000).

<sup>4</sup> The Process Quality Rating Scale includes the Process Quality-Authenticity subscale (Hicks, Larson, Nelson, Olds, & Johnston, 2008).

<sup>5</sup> Of the 32 measures found in our review, only 20 measures listed individual items that were included. If a measure that listed individual items had at least one item that addressed a component of the logic model, we included it in our count. Additional measures were included in the counts noted in our analysis if the sub-scale names reflected that these constructs were covered by those sub-scales.

**Process components.** More than half the measures have one or more items assessing: equality (22 measures; e.g., “all partner organizations have to agree before a decision is made about the goals and activities of the collaboration”; Thomson, Perry, & Miller, 2009), support (19 measures; e.g., “are the organization’s resources sufficient to achieve its goal?”; Bright, 1998), inclusion (18 measures; e.g., “please rate the total effectiveness of your partnership’s leadership in fostering respect, trust, inclusiveness, and openness in the partnership”; Weiss, Anderson, & Lasker, 2002), or identification (18 measures; e.g., “the people involved in the process usually are focused on broader goals, rather than individual agendas”; Hicks & Larson, n.d.). Only about one-third of the measures have one or more items assessing: norms (11 measures; e.g., “our group has set ground rules and norms about how we will work together”; OMNI Institute, 1992), authenticity (11 measures; e.g., “often decisions are made in advance and simply confirmed by the process”; Hicks et al., 2008), problem focus (9 measures; e.g., “our collaborative effort was started because certain individuals wanted to do something about this issue”; OMNI Institute, 1992), facilitation (11 items; e.g., “your organization relies on standard operating procedures created by partner organizations to coordinate each other’s activities in the collaboration”; Thomson, Perry, & Miller, 2009) or generative purpose (9 items; e.g., “mission statement in writing”; Butterfoss, 1994).

**Inclusion of logic model inputs to collaboration and process components.** Ten of the 33 measures cover half or more of each of the elements of stakeholder inputs (at least 2 of the 3 inputs), design components (at least 3 of the 5 components), and process components (at least 5 of the 9 components). Furthermore, though the number of measures covering each component varies across components, on average each component is only covered by one or two items per measure.

In summary, most inputs to collaboration and process components are generally captured by existing measures of collaboration. Furthermore, a substantial number of the measures (10) cover half or more of these inputs/process components. It is important to note, however, that while measures cover many aspects of collaboration, each component is usually covered by just a few items, meaning some key dimensions of these constructs might not be captured by all of the existing items. For example, “clear meeting design” is covered, on average, by a single item per measure. There are, however, many possible metrics for determining whether there is a clear meeting design. Even though, on average, measures are targeting all of the constructs of inputs to and processes of collaboration, each individual measure is not necessarily covering all constructs, and the measures as a whole might be missing important details about the quality of inputs or processes. Only a thorough, item-by-item examination of these measures would permit such an analysis of the quality of coverage.

**Psychometric Considerations.** As important as individual items are, the usefulness of any measure relies largely on how well it performs as a whole. Scientists turn to two psychometric properties in particular to assess how measures perform: reliability<sup>6</sup> and validity<sup>7</sup> (Halle, Zaslow, Wessel, Moodie, & Darling-Churchill, 2011). The information on reliability and validity in the existing measures of collaboration is not comprehensive.

<sup>6</sup>Reliability refers to the stability of the measure’s scores over time, across settings, or across raters. Reliability is usually assessed by examining how different measurement items are associated to each other (internal consistency), by having different respondents complete the same measure (inter-rater reliability), or by administering the measure to the same respondent at different time points (test-retest reliability). For practitioner-friendly definitions of these different types of reliability, please see the Glossary of Terms in Understanding and Choosing Assessments and Developmental Screeners for Young Children Ages 3-5: Profiles of Selected Measures (available at [http://www.acf.hhs.gov/sites/default/files/opre/screeners\\_final.pdf](http://www.acf.hhs.gov/sites/default/files/opre/screeners_final.pdf)).

<sup>7</sup>Validity refers to the accuracy of a measure to capture the concept it is attempting to measure. In this case, validity refers to a measure’s ability to actually measure different aspects of collaboration. Validity can be measured in a variety of ways, with some of the most common including: examining to what extent the measure includes well-known aspects of the concept being measured (content/face validity), examining whether items relate to each other in such a way that they appear to yield subscale scores reflecting a single construct (e.g., is there a group of items that appears to reflect design components; construct validity), or comparing a new measure to an existing measure either at the same time point (criterion/convergent validity) or at a later time point (predictive validity). Note, however, that this last strategy may be difficult to perform with collaboration measures due to the lack of well-established measures. For practitioner-friendly definitions of these different types of validity, please see the Glossary of Terms in Understanding and Choosing Assessments and Developmental Screeners for Young Children Ages 3-5: Profiles of Selected Measures (available at [http://www.acf.hhs.gov/sites/default/files/opre/screeners\\_final.pdf](http://www.acf.hhs.gov/sites/default/files/opre/screeners_final.pdf)).

Only about half (16) of the 32 measures report reliability information, and most of these only report on internal consistency. While important, internal consistency alone provides a one-dimensional view of reliability that could be enriched with additional types of reliability such as test-retest reliability or inter-rater reliability. Only 16 of the 32 measures reported validity information. The following types of validity are reported by one or more measures: criterion/predictive validity, construct validity (including factor analyses), content/face validity, and convergent validity. In summary, about half of the measures on collaboration report reliability or validity information, suggesting that the field may still be developing in terms of psychometric measurement. Please see Appendix A for more information on the reliability and validity of each measure.

**Reliability and validity are important features to consider when selecting measures for research or practice purposes. Reliability ensures that when people use a measure to collect information, they are producing consistent information across different circumstances or settings, different time points, and different data collectors. This way, people can collect information using the tool without violating the measure's integrity. Validity ensures that the measure is, in fact, measuring the construct it was designed to measure.**

**Table 1. Crosswalk between Collaboration Measures and Logic Model Components**

Logic Model Components	Number of Measures that Include Each Component	Average Number of Items per Measure
<b>Inputs to Collaboration</b>	<b>26</b>	<b>4</b>
<i>Stakeholder Inputs</i>	22	2.5
<b>Organizational time and resource commitment to the collaboration</b>	<b>19</b>	<b>2</b>
<b>Sending a powerful agent</b>	<b>10</b>	<b>1.5</b>
<b>Level of commitment to the collaborative mission</b>	<b>18</b>	<b>1.5</b>
<i>Design Components</i>	26	2.5
<b>Correct number and representation of stakeholders</b>	<b>17</b>	<b>1</b>
<b>Clear decision-making rules</b>	<b>14</b>	<b>1</b>
<b>Delineated roles and responsibilities</b>	<b>15</b>	<b>2</b>
<b>Clear meeting design</b>	<b>9</b>	<b>1</b>
<b>Explicated purpose for the collaboration</b>	<b>16</b>	<b>1.5</b>
<b>Process Components</b>	<b>26</b>	<b>4</b>
<i>Norms</i>	11	1.5
<i>Inclusion</i>	18	1
<i>Authenticity</i>	11	1
<i>Equality</i>	22	1
<i>Problem focus</i>	9	1.5
<i>Support</i>	19	2.5
<i>Identification</i>	18	2
<i>Facilitation</i>	11	2.5
<i>Generative Purpose</i>	9	1.5

**Reliability.** The measurement of collaboration differs from measurement of other constructs in early care and education because the respondents' perceptions are not just observations, but are part of the phenomenon. In most other constructs in early care and education, respondents are rating an easily observable phenomenon, for example, a respondent or clinician assessing an individual's level of attention or performance on a task, and this measurement is being compared to the same respondents' rating over time (e.g., test-retest reliability) or across raters (e.g., inter-rater reliability). The fact that respondents' perceptions are part of the phenomenon raises interesting questions regarding inter-rater reliability. What is meant by high or low inter-rater reliability when all respondents belong to the same collaborative? Does high inter-rater reliability mean that respondents are in agreement about how the collaborative is operating? Does low inter-rater reliability mean not only that different stakeholders have different perceptions about how the collaborative is operating, but also that the quality of collaboration is low?

In measuring collaboration, a useful descriptive statistic to include may be the inter-rater reliability among a group of stakeholders in the same collaborative. In this instance, inter-rater reliability may be less a psychometric descriptor of the measure itself, and more a measure of an aspect of the actual collaborative process being measured—agreement among stakeholders regarding how well the collaborative is operating. In addition, it would be interesting to compare inter-rater reliability within members of the same level within a collaborative. For example, how do all center directors compare in their score of the collaborative, or how do all teachers compare? These results may highlight differences in how the collaborative functions across members with different responsibilities.

**Validity.** Another unique issue to collaborations is that in some instances the boundaries of the collaborative, meaning exactly who or what entities constitute the membership of the collaborative, are not clear. Even if the members are clearly known, if the collaborative is large, then all the members in the collaborative may not be equally salient in each respondent's mind. In this case, measurement validity becomes an issue because each stakeholder of a collaborative may have in mind a slightly different subset of members of the collaborative (either because membership is not clear or because only certain stakeholders are salient) as they complete their ratings. For example, in 2005 the state of Maryland decided to place all early care and education programs under the jurisdiction of the Maryland State Department of Education. The goal of this change was to facilitate collaboration between different sectors and improve continuity of early childhood services across the early childhood years (e.g., early childhood education, special needs assessments, early intervention programs). In this instance, salience of the collaborative and who was included in its membership may have been less clear to individuals within the disparate agencies prior to the 2005 decision to consolidate programs within the Maryland State Department of Education. Prior to this change, it is possible that certain members of the collaborative would have had different amounts of exposure to other members, such as child care providers having contact with special needs specialists, and consequently the information they provided about the collaborative on a measure of that collaboration might have resulted in very different ratings or information. After the change, salience of who was included in the collaborative would be heightened and facilitated by the physical relocation of staff to be essentially under "one roof" or jurisdiction. This change may have resulted in disparate members of the collaborative having ratings that are much more aligned once they had a similar understanding of the constitution of the collaboration and its mission. In sum, if the goal of the measure is to pinpoint specific strengths and weaknesses of the collaborative process, then the measure may not be valid if each stakeholder is inadvertently rating a slightly different subset of members of the same collaborative.

Not only is each respondent potentially rating a slightly different subset of members, which members are in those subsets remains unknown to the person doing the measurement. This is an issue distinct from inter-rater reliability, which assesses the degree to which raters agree when rating one entity, because the challenge is that the raters may each be inadvertently rating their own vision of this entity, which may differ across raters. Therefore, prior to measuring a collaboration, it would be helpful to assess whether the boundaries of the collaborative are clear. If these boundaries are not clear, then it would be ideal to first assess whether the precise purposes for measuring collaboration require that every member is rating the same subset of collaborative members. If so, then a system could be implemented to ensure that prior to completing the measure, membership of the collaborative is reviewed by all members.

**Analytic Considerations for Research.** When conducting research on collaborations, the goal of the research will have important implications for selection of measures and analytic strategies. If, for example, a researcher is interested in better understanding what states are doing in terms of specific collaborative efforts (e.g., developing comprehensive professional development systems), then the researcher would choose measures that provide information on the inputs and process components of interest and conduct descriptive analyses (e.g., computing average scores). Investigators might also want to collect qualitative data, through interviews or focus groups to understand stakeholders' perceptions of the success of the collaborative effort. If, however, a researcher is interested in better understanding the components of these collaborative efforts that are most effective in leading to the desired outcomes (e.g., high-quality instruction), then the researcher would select measures that assess not only inputs and process components, but also outcomes. Thus, the research question has important implications for design (i.e., examining one or multiple elements of the logic model) and data analysis. The nature of collaboration – the grouping of individuals into units for analysis – adds an additional degree of complexity to the research process and requires careful consideration.

In summary, the measurement of collaboration has room to grow in terms of psychometric analysis. Specifically, inter-rater reliability could be a uniquely informative and useful statistic for describing the quality of a collaboration due to the fact that respondents' perceptions are part of the phenomenon. Furthermore, knowledge or saliency regarding exactly who belongs to a collaborative may vary from rater to rater within the same collaborative, affecting the validity of the collaboration measure. Finally, measurement selection and data analysis should reflect the design and goals of the study.

## Discussion and Future Directions

Collaborations among service providers are becoming increasingly pervasive in early care and education systems at both the state and local levels. Research exploring collaboration in early care and education, however, is still nascent and could benefit from the development of a well-defined model on which to base research studies. The logic model presented in this brief represents an important step toward providing researchers with a comprehensive framework that can serve as a roadmap for future collaboration research and evaluation. In general, more research is needed to explore the nature of collaborations within the early care and education setting. For example, future research could further explore the nature of collaborations by identifying critical features of collaboration specific to the early care and education context, the interrelations among the features of collaboration, and the link between these features and collaboration-level outcomes, state-level outcomes, and child- or family-level outcomes.

Although the logic model was based on a review of the literature indicating that the included components are important for collaborations, additional research is needed to verify these key components and determine their predictive power in an early childhood context (Halle et al., 2010, October). Currently, information on reliability and validity for extant measures of collaboration is not comprehensive. Unless more work is done to explore predictive validity, there will be no way of knowing whether collaborations are providing the opportunity to create better outcomes for children.

Suitable measures that capture the components of the logic model are necessary for this research. Although the intent of our review of existing measures was not to create a comprehensive compendium of measures, the review did provide a multidisciplinary look at collaborative processes in the hopes of providing a foundation for future research in early care and education settings. The literature search revealed a total of 32 extant collaboration measures, only one of which was developed for the early childhood field. An analysis comparing the measures' items to the logic model revealed that although the majority of measures included some measurement of inputs to collaboration and process components, not all the components within these categories were always included. Furthermore, the quality of the measurement of those components is not fully understood at this time. The next step will be to look more deeply and critically at existing collaboration measures to determine their adequacy in capturing the components of collaboration inputs and process components, as outlined in the conceptual model of collaboration (see Figure 1). Measures that cover all or most inputs and process components of collaboration could then be used to pinpoint the specific strengths and weaknesses

### ***Future Directions for Research Concerning Collaborations in Early Care and Education Settings***

- ***Further research on the nature of collaborations.*** *The logic model presented in this brief is intended to help researchers better understand the nature and functioning of collaborations in the context of early care and education. Future research could further explore the nature of collaborations by identifying critical features of collaboration specific to the early care and education context, the interrelations among the features of collaboration, and the link between these features and collaboration-level outcomes, state-level outcomes, and child- or family-level outcomes.*
- ***Further work on psychometric properties of collaboration measures.*** *The lack of psychometric information makes it difficult to know how well extant measures capture collaboration, how particular measures compare to other measures of collaboration, or how collaboration measures relate to outcomes.*
- ***Thorough examination of existing measures at the item level.*** *Although this brief examines which constructs identified in the logic model are covered by each extant measure and how many items per measure cover each construct, a more thorough examination of each measure's items can yield useful information regarding what level of detail measures use to examine each construct. The depth and quality of items is as important as the quantity of items to the usefulness of the measure.*
- ***Adaptation of measures for use in early care and education settings.*** *Given that only one of the 32 measures we found had been created for use in early childhood settings, extensive work is needed before other measures may be used in this field. As explained above, psychometric documentation is essential before there is wide use of these measures. Exploratory studies extending these measures specifically to early childhood settings may also provide useful insight.*
- ***Sociometric network analyses of collaboration groups.*** *Sometimes all members of a collaborative are not as salient to members who might be reporting on the functioning of a collaborative. A sociometric network analysis is one way to determine who are the more central versus more peripheral members of a collaborative. Sociometric network analysis methodology may be useful in the future study of collaborations in early care and education settings.*

of a collaborative, and shed light on which components are working well versus which components are weak or altogether missing. This will enable researchers and practitioners alike to observe whether certain components are more important than others; at present, no one measure captures all of the core components of collaboration processes, making this work challenging.

Given the limited number of measures that can be used to examine collaborations, particularly in the field of early childhood, many of the implications for future research revolve around measurement development. Some measures of collaboration are intended to be quite general and can be easily adapted, so a natural first step would be to adapt one of the existing measures for use in the field of early childhood. Because most existing measures on collaboration have not been used in the field of early childhood, the adaptation of an existing measure would necessitate additional psychometric work on that measure. This could include conducting research on inter-rater reliability, test-retest reliability, factor analyses on sub-scales of the measure, and concurrent validity on data collected in an early childhood context. Many of the measures that were included in this review lack information about reliability and validity, making this an important area for future work, particularly as those measures are adapted for use in early childhood settings. Researchers are encouraged to collect information to assess reliability and validity of any measure they choose to use. As mentioned in the section on psychometric considerations, special attention should be paid to inter-rater reliability of respondents within the same collaborative. It should be calculated and carefully interpreted as an additional measure of the collaborative process (for example, in measuring consistency of stakeholder perceptions of the collaborative process).

Another issue discussed as a psychometric consideration is the fact that precisely who the stakeholders are within a collaborative may not always be clear, or only some stakeholders in a collaborative may be salient for some respondents. This might not be a problem, depending on the purpose of measuring collaboration, but is something to be mindful of—that the notion of the “collaborative” may conjure up different stakeholders for each respondent, even when they are rating the same collaborative. A potential next step could be to explore additional analytic techniques such as network analysis or sociometric analysis to determine who are the more central versus more peripheral members of a collaborative.

This brief is an important first step in establishing a framework for studying collaboration, identifying existing measures, exploring psychometric issues relating to measuring collaboration, and identifying avenues for future work. The development of new measures of collaboration with sound psychometric properties to be used in the early childhood field will create many options for future collaboration research in the field of early care and education. The logic model presented in this brief may guide future research exploring exactly how collaborations in early childhood settings affect children’s outcomes.

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## Appendix A Compendium of Measures

Measure Name	Citation	Number of Items
Professional Working Relationships	Adams, A., Bond, S., & Arber, S. (1995). Development and validation of scales to measure organizational features of acute hospital wards. <i>International Journal of Nursing Studies</i> , 32(6), 612-627.	26
The Wilder Collaboration Factors Inventory	Amherst H. Wilder Foundation. (2001). <i>The Wilder Collaboration Factors Inventory</i> . Saint Paul, MN: Author.	40
Team Climate Inventory	Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: Development and validation of the team climate inventory. <i>Journal of Organizational Behavior</i> , 19(3), 235-258.	61
Untitled	Ansari, W. E., & Phillips, C. J. (2001). Interprofessional collaboration: A stakeholder approach to evaluation of voluntary participation in a community partnership. <i>Journal of Interprofessional Cares</i> , 15(4), 351-368.	33
Collaborative Practice Scales	<p>Baggs, J. G. &amp; Ryan, S. A. (1990). Intensive care unit nurse-physician collaboration and nurse satisfaction. <i>Nursing Economics</i>, 8(6), 386-392.</p> <p>This article uses this scale, and the original citation for the scale is: Weiss, S. J., &amp; Davis, H. P. (1985). Validity and reliability of the collaborative practice scales. <i>Nursing Research</i>, 34, 299-305.</p> <p>The original work is not available.</p>	Not available from this source
Collaboration and Satisfaction About Care Decisions	Baggs, J.G. (1994). Development of an Instrument to measure collaboration and satisfaction about care decisions. <i>Journal of Advanced Nursing</i> , 20, 176-182.	7
The Collaborative Member Survey	Barile, J. P., Darnell, A. J., Erickson, S. W., & Weaver, S. R. (2012). Multilevel measurement of dimensions of collaborative functioning in a network of collaboratives that promote child and family well-being. <i>American Journal of Community Psychology</i> , 49, 270-282.	56
Community School Assessment Checklist	Blank, M. J., & Langford, B. H. (2000). <i>Strengthening partnerships: Community School Assessment Checklist</i> . Washington, DC: Coalition for Community Schools and The Finance Project.	9

Measure Name	Citation	Number of Items
Collaboration Checklist	Borden, L. M., & Perkins, D. F. (1999). Assessing your collaboration: A self-evaluation tool. <i>Journal of Extension</i> , 37. Retrieved from <a href="http://www.joe.org">http://www.joe.org</a> .	12
Community Organizational Assessment Tool	Bright, R. D. (1998). <i>Community Organizational Assessment Tool</i> . Madison, WI: University of Wisconsin-Extension, Family Living Programs.	23
Index of Interdisciplinary Collaboration	Bronstein, L. R. (2002). Index of Interdisciplinary Collaboration. <i>Social Work Research</i> , 26(2), 113-1232	42
The Coalition Effectiveness Inventory (CEI)	Butterfoss, F. D. (1994). <i>The Coalition Effectiveness Inventory</i> . Columbia, South Carolina: Center for Pediatric Research, Center for Health Promotion, South Carolina Department of Health and Environmental Care.	75
Partnership Self-Assessment Tool	Center for the Advancement of Collaborative Strategies in Health. (n.d.). Partnership Self-Assessment Tool. Retrieved from <a href="http://cacsh.org">http://cacsh.org</a>	67
Partnership Self-Assessment Tool	Cramm, J. M., Strating, M. M. H., & Nieboer, A. P. (2011). Development and validation of a short version of the Partnership Self-Assessment Tool (PSAT) among professionals in Dutch disease-management partnerships. <i>BMC</i> , 4, 224-332.	29
Coalition Web-Based Self-Report Questionnaire	Feinberg, M. E., Gomez, B. J., Puddy, R. W., & Greenberg, M. T. (2008). Evaluation and community prevention coalitions: Validation of an integrated web-based/technical assistance consultant model. <i>Health Education &amp; Behavior</i> , 35(1), 9-21.	Wave 1: 60 Wave 2: 66
Strategic Alliance Formative Assessment Rubric (SAFAR)	Gajda, R. (2006). Safe schools through strategic alliances: How assessment of collaboration enhances school violence prevention and response. <i>Journal of School Violence</i> , 5(1), 63-80.  Gajda, R. (2004). Utilizing collaboration theory to evaluate strategic alliances. <i>American Journal of Evaluation</i> , 25(1), 65-77.	Not available from this source
Meeting Effectiveness Inventory	Goodman, R. M., Wandersman, A., Chinman, M., Imm, P., & Morrissey, E. (1996). An ecological assessment of community-based interventions for prevention and health promotion: Approaches to measuring community coalitions. <i>American Journal of Community Psychology</i> , 24(1), 33-61.	10

Measure Name	Citation	Number of Items
Untitled	Hays, C. E., Hays, S. P., DeVille, J. O., & Mulhall, P. F. (2000). Capacity for effectiveness: the relationship between coalition structure and community impact. <i>Evaluation and Program Planning, 23</i> , 373–379.	6
Process Quality Rating Scale	Hicks, D., & Larson, C., (n.d.). The Process Quality Rating Scale.  Used in the Early Childhood Councils of Colorado.	20
Untitled	Kegler, M. C., & Swan, D. W. (2011). An initial attempt at operationalizing and testing the community coalition action theory. <i>Health Education &amp; Behavior, 38</i> (3), 261-270.	Not available from this source
Untitled	Kegler, M. C., Steckler, A., McLeroy, K., & Malek, S. H. (1998). Factors that contribute to effective community health promotion coalitions: A study of 10 Project ASSIST coalitions in North Carolina. <i>Health Education &amp; Behaviors, 25</i> (3), 338-353.	55
Coalition Self-Assessment Survey	Kenney, R., & Sofaer, S. (2000). <i>Allies against asthma: Coalition Self-Assessment Survey</i> . New York, New York: School of Public Affairs, Baruch College, City University of New York.	41
Index of Interprofessional Team Collaboration for Expanded School Mental Health (IITC-ESMH)	Mellin, E. A., Bronstein, L., Anderson-Butcher, D., Amorose, A. J., Ball, A., & Green, J. (2010). Measuring interprofessional team collaboration in expanded school mental health: Model refinement and scale development. <i>Journal of Interprofessional Care, 24</i> (5), 514-523.	26
Collaboration Practice Assessment Tool (CPAT)	Office of Interprofessional Education and Practice, Queen's University. (2009). <i>Collaboration Practice Assessment Tool</i> . Kingston, Ontario, Canada: Author.	56
Working Together Scale	OMNI Institute (1992). <i>Working Together: A Profile of Collaboration</i> . Denver, CO: Author.	40
The Pacific Regional Cancer Coalition Partner Assessment Survey	Sy, A. U., Heckert, K. A., Buenconsejo-Lum, L., Hedson, J., Tamang, S., & Palatox, N. (2011). An assessment of the Pacific Regional Cancer Coalition: Outcomes and implications of a regional coalition internal and external assessment. <i>Hawaii Medical Journal, 70</i> (11), 47-53.	44

Measure Name	Citation	Number of Items
The Pacific Regional Cancer Coalition Self-Assessment Survey	Sy, A. U., Heckert, K. A., Buenconsejo-Lum, L., Hedson, J., Tamang, S., & Palafox, N. (2011). An assessment of the Pacific Regional Cancer Coalition: Outcomes and implications of a regional coalition internal and external assessment. <i>Hawaii Medical Journal</i> , 70(11), 47-53.	47
Untitled	The Center for Prevention Research and Development, Institute of Government and Public Affairs, University of Illinois (1999). <i>Building coalition effectiveness for sustainability: An evaluation rubric</i> . Champaign, IL: Author.	35
Untitled	Thomson, A. M., Perry, J. L., & Miller, T. K. (2008). Linking collaboration processes and outcomes: Foundations for advancing empirical theory. In L. B. Bingham & R. O’Leary (Eds.), <i>Big ideas in collaborative public management</i> (pp. 97-120). Armonk, NY: ME Sharpe Publishers.	17
Untitled	Thomson, A. M., Perry, J. L., & Miller, T. K. (2009). Conceptualizing and measuring collaboration. <i>Journal of Public and Administration Research and Theory</i> , 19(1), 23-56.	56
Coalition Self-Assessment Tool	Underage Drinking Enforcement Training Center, Pacific Institute for Research and Evaluation. (n.d.). <i>Coalition Self-Assessment Tool</i> . Calverton, MD: Author.	77
Untitled	Weiss, E. S., Anderson, R. M., & Lasker, R. D. (2002). Making the most of collaboration: exploring the relationship between partnership synergy and partnership functioning. <i>Health Education and Behavior</i> , 29(6), 683–698.	45

### Endnotes

<sup>i</sup> The search terms we used included the following: collab (which captures “collaboration,” “collaborate,” and “collaborative”), norms, inclusion, authenticity, equality, problem focus, support, identification, facilitation, generative purpose, measure, assessment, scale, survey, checklist, inventory, tool, community coalition, systems initiative, community collab, sustainable collab, collab partnership, interagency partnership, systems building, collab public management, strategic alliances, collab cooperation, service integration, transformational leadership, interprofessional, interdisciplinary, partnership, coalition, systems change, comprehensive community initiative, networks, team work, and group. The search terms were combined using a system of Boolean operators (“and”/”or”) to identify the maximum number of measures that fit our criteria.