

## PRE-MEASUREMENT TRIANGULATION: CONSIDERATIONS FOR PROGRAM EVALUATION IN HUMAN SERVICE ENTERPRISES

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**Abstract:** The concept of incorporating multiple perspectives in measurement is a foundation of program evaluation in human service enterprises, but can place significant challenges on the feasibility and interpretation of projects. This article reviews triangulation methodologies and proposes a new approach to triangulation. It argues that, in order to address some of the burdens associated with triangulation in human services program evaluation, the simple notion of pre-measurement triangulation through the use of communitric measurement theory may present an effective option. An example of such a tool is provided, along with a discussion regarding the utility and limitations of these strategies.

**Résumé :** Le concept d'intégration de perspectives multiples en prise de mesure est un fondement de l'évaluation des programmes de services sociaux, mais il pose également des défis importants en matière de faisabilité et d'interprétation des projets. Les méthodes de triangulation sont discutées, et une nouvelle approche est présentée. La triangulation pré-mesure en se servant de la théorie de la mesure communimétrique peut s'avérer une alternative efficace pour répondre à certains des défis soulevés par les méthodes de triangulation dans l'évaluation de programmes de services sociaux. Un exemple d'un tel outil est fourni, accompagné d'une discussion de son utilisation. Les limites de ces stratégies sont également présentées.

■ The concept of triangulation has long been used in fields such as geometry and surveying, wherein it is widely accepted that a greater number of viewpoints lends to greater accuracy in measurement. This concept of triangulation has migrated into the field of social science research and has translated more theoretically into

utilizing two or more measurement procedures or sources in order to best measure a construct or phenomenon. Triangulation in social science research dates back to the mid 1950s and is consistent with a shift in the prevailing epistemological perspective (Moran-Ellis et al., 2006). Originally, phenomena were thought to be best understood if data from two or more methodologies were brought together and converged in their findings. If the measurement methodologies were found to be divergent in their findings, it would be concluded that the measurement methodologies were flawed. A shift in this epistemological approach was seen when triangulation was conceptualized to provide varying views of different dimensions of a complex phenomenon (e.g., Greene, Caracelli, & Graham, 1989). That is, if divergent findings were found, they were understood as representing different aspects of a complex phenomenon, or as generating complementary findings, versus being seen as flaws in the measurement procedures (Moran-Ellis et al., 2006).

The advantages of triangulation within a research study or program evaluation are numerous. Most notably, single-method studies suffer the potential for significant biases if the single operation is inadvertently or adversely affected by threats to the validity of measurement (Campbell & Fiske, 1959). For example, evaluations using exclusively self-report can be completely invalidated by sampling or hypothesis guessing or other types of threats to the validity of the information. Thus, overcoming the potential bias of a single-method study is one of the strongest arguments for the use of triangulation in all types of social science research. Triangulation increases the validity and reliability of the findings and increases overall confidence in the study results (Jick, 1979; Redfern & Norman, 1994). Although it is generally necessary to incorporate some form of triangulation when designing an evaluation framework, several limitations may inhibit the full and proper application of the principles of triangulation.

The main limitations concern time and cost resources (Begley, 1996b). Obtaining information from multiple informants or multiple methods/operations can become expensive. Moreover, when multiple informants provide measurement information about the same construct, there are no clear guidelines on how to analyze and interpret sometimes redundant, sometimes disparate information. A lack of literature that formally describes how to build triangulation strategies into a research framework has also been noted as a limitation to successful triangulation (Farmer, Robinson, Elliot, & Eyles, 2006; Sands & Roer-Strier, 2006).

A number of factors are occurring simultaneously that all serve to increase the importance of measurement in human service enterprises. Of greatest impact is the increasing investment in program evaluation by the Government of Canada, as is evidenced by the enhancement in expenditures on evaluation efforts (Segsworth, 2005). In healthcare, there is a growing pressure to measure and monitor the outcomes of interventions. Across all sectors, accountability is seen as an important system management tool, but since you can't manage what you don't measure, accountability always implies a measurement approach. Triangulation offers a number of unique challenges for universal measurement applications in human services research.

The present article will provide a brief review of triangulation methodologies proposed in the social science literature to date, and outline some of the major commonalities and challenges found across the different strategies. It will argue that some forms of triangulation, specifically those involving the measurement of similar constructs across different informants as seen in the majority of program evaluation studies, may occur prior to the application of measurement. This may help to reduce both time and cost resources associated with attempting to secure reliable, valid, and relevant measurement, and to simplify the analytic complexity of attempting to analyze disparate cross-informant findings. In order to overcome some of the challenges involved in traditional triangulation strategies, a shift from psychometric theory to communimetric measurement theory is necessary. An introduction and overview of this measurement strategy is provided, and a description of how communimetric measures can be used in pre-measurement triangulation is discussed. The article concludes with an in-depth example of a communimetric measure used in the child behavioural health system, and describes its uses and implications as a pre-measurement triangulation tool and its application in program evaluation.

## HISTORY OF TRIANGULATION

Prior to the 1950s, unimethod experimentation was often termed single operationalism, and was the dominant method by which social science research was conducted. In the middle of the last century, greater awareness of the limitations of single perspectives created pressure from social constructionists who were beginning to question the validity of any one measurement to understand social phenomena (e.g., Cook, 1985). From a social constructionist framework, all perspectives are inherently different and equally "correct" (Kuhn,

1962). As the recognition that single-method research studies may be methodologically flawed and, therefore, lead to erroneous claims, the inclusion of two or more methodologies simultaneously to understand a phenomenon began to gain impetus. Campbell and Fiske (1959) are credited with being the first to show how to utilize a “multitrait-multimethod matrix” to validate their view of a certain underlying personality trait. They posited that use of this multimethod strategy was imperative to achieve both reliable and valid results, and to ensure that the results found were attributable to the phenomenon itself and not to methodological artifact. Accordingly, Campbell and Fiske (1959) defined this strategy as “multiple operationalism,” and are widely recognized as the first social science researchers to define this concept.

Several years later, it was Webb, Campbell, Schwartz, and Sechrest (1966) who coined the actual term “triangulation.” They furthered the work of Campbell and Fiske (1959) by more thoroughly describing the process of multiple operationalism to encompass the use of two or more independent measurement processes to confirm a proposition. They contend that if several measurement processes, each containing their unique error, formulate complementary findings, then a greater level of confidence may be placed in the results obtained. In other words, triangulation across methods and informants provides what might be considered an instantaneous form of replication or refutation.

Although the denotation of the word triangulation appears in these earlier works, it was several years before the term was accurately outlined. Most notably, Denzin (1978) was the first to operationalize the term triangulation by defining four distinct types: data, investigator, theoretical, and methodological (see Table 1). He defines *data triangulation* as occurring when multiple data sources are used to validate a particular finding, and further notes that data triangulation is made up of three subtypes: time, space, and person. *Investigator triangulation* is defined as two or more skilled researchers examining the data separately. The third type is described as *theoretical triangulation*, and refers to the use of all possible theoretical perspectives as the framework of the study. The fourth and final category of triangulation defined by Denzin (1978) is *methodological triangulation*, and refers to two or more research methodologies being used to investigate a particular phenomenon. Denzin (1978) further describes two subtypes: *across-method triangulation*, which is defined as using two or more different research methodologies to answer the same research ques-

tions (e.g., using a combination of qualitative and quantitative data), and *within-method triangulation*, which is defined as combining two or more similar research methodologies to answer the same question (e.g., using two types of surveys to tap into the same phenomenon).

In later years, Morse (1991) proposed two differing subtypes of methodological triangulation, which he labeled simultaneous and sequential triangulation. He defined *simultaneous triangulation* as using two different methods simultaneously at the data analysis stage, and he outlined *sequential triangulation* as occurring when the approaches are completely independent and inform one another. Finally, a fifth category of triangulation was later added to the four existing types by Kimchi, Polivka, and Stevenson (1991), and was named *unit of analysis triangulation*. This type of triangulation refers to incorporating two or more different types of statistical analysis to the same data set for the purposes of validation. Together, the four types proposed by Denzin (1978) and the fifth category proposed by Kimchi et al. (1991) make up the five categories of triangulation that are most widely used in social science research. It should be noted that several other types of triangulation have recently been proposed, but to date remain relatively less common in comparison to the five categories previously described. These are *interdisciplinary* (Janesick, 1994), *communication skills* (Begley, 1996a), *conceptual* (Foster, 1997), and *collaborative* (Tobin & Begley, 2002) triangulation, which have all been proposed as further classifications.

Table 1 summarizes the various types of triangulation that have been proposed in the literature during the last half-century. A closer look at the different types reveals three evident trends. One pattern concerns the evolution of two larger categories of approaches. The types contained in the first grouping, which we will refer to as *informant triangulation processes*, appear similar based on their use of various applications on one unit of data, allowing for one type of data to be validated across applications. For example, both data and investigator triangulation appear to fit, as they similarly contain one unit of data that is examined across either time, space, person, or investigator. Triangulation within this grouping seeks to create data that can be compared against one another. Meanwhile, the second grouping, which we will refer to as *multimethod triangulation strategies*, tends to apply one type of application to various units of data, resulting in different types of data by means of one application. For example, theoretical triangulation would be considered part of this grouping, as it would view the data from two theoretical points of view, thus resulting in

different data pieces being extracted based on the theoretical perspective in use. Data gathered using these methods of triangulation appear complementary versus comparative.

**Table 1**  
**Description of Various Forms of Triangulation**

<i>Type of triangulation</i>	<i>Author (date)</i>	<i>Definition</i>
Data	Denzin (1978)	Use of multiple data sources to validate findings
Time	Denzin (1978)	Collect data on same phenomenon at different time points
Space	Denzin (1978)	Collect data on same phenomenon from different sites
Person	Denzin (1978)	Collect data on same phenomenon from different people
Investigator	Denzin (1978)	Use of two or more skilled researchers to examine data separately
Theoretical	Denzin (1978)	Use of two or more theoretical perspectives as framework of study
Methodological	Denzin (1978)	Use of two or more methodologies to investigate a certain phenomenon
Across-method	Denzin (1978)	Use of two or more different methodologies (e.g., quantitative and qualitative data)
Within-method	Denzin (1978)	Use of two or more similar methodologies (e.g., two forms of quantitative data sources)
Simultaneous	Morse (1991)	Use of two or more different methodologies simultaneously at the data analysis stage
Sequential	Morse (1991)	Use of two or more methodologies independently, with intention of one method informing the other
Unit of analysis	Kimchi, Polivka & Stevenson (1991)	Use of two or more different types of statistical analyses
Interdisciplinary	Janesick (1994)	Using two or more different types of disciplines
Communication	Begley (1996)	Use of two or more types of communication (e.g., verbal and nonverbal)
Conceptual	Foster (1997)	Use of two or more points of view as framework of study
Collaborative	Tobin & Begley (2002)	Cooperative research process with all parties sharing same goals

Also evident from Table 1 is that several of the named forms of triangulation appear to be functionally synonymous or, at minimum, very overlapping. For instance, both investigator (Denzin, 1978) and interdisciplinary (Janesick, 1994) triangulation seem overlapping, as interdisciplinary triangulation could be achieved via triangulation over multiple investigators from varying disciplines. Similarly, theoretical and conceptual triangulation and multiple and collaborative triangulation may appear to share many of the same underlying concepts.

A universal characteristic of all strategies described in Table 1 is that the triangulation process occurs predominantly after measurement has taken place, requiring the integration of various measurement processes after the data have been collected. That is, the majority of the triangulation strategies described above incorporate post-measurement triangulation and, as such, naturally gain an added layer of complexity and cost while attempting to integrate the information. Further, different types of triangulation present different challenges. Perhaps the least challenging form of triangulation involves multimethod approaches. While each additional measure requires time and cost, these measures are not redundant. Thus measuring both post-discharge functional status and stability of post-discharge placement represents non-redundant triangulation on an outcome from a hospital episode.

The biggest analytic challenges come from triangulation methods that are redundant but involve different informants. One complication of this challenge is incomplete or missing data. For example, if information is collected from three sources, each with an 80% response rate, it is possible to have an overall response rate anywhere from a high of 80% to a low of 51% of cases with a response (e.g., of cases that have measures from all three sources). Further, it is possible that different sources are more knowledgeable in different cases. For example, a relatively low correlation is reported on versions of the Child Behavior Checklist between parent, youth, therapist, and teacher ratings (Achenbach & Rescorla, 2001). It is quite possible that in some circumstances the youth is the best informant, where in other circumstances it may be the parent. In still other circumstances, the therapist or teacher might be the best informed respondent. When evaluators analyze information from multiple sources, they are forced to treat all information from any single source as equivalent. In this approach, there is no ability to differentiate information based on the credibility of a source—for example, all teachers are treated as equally accurate regardless of their level of knowledge of or contact with the youth. Pre-measurement triangulation is proposed as a solution to this challenge.

## TRIANGULATION FOR PROGRAM EVALUATION IN HUMAN SERVICE ENTERPRISES

The type of triangulation that seems most pertinent to evaluation in the field of human service enterprises is consistent with informant triangulation processes, and differs from program evaluation in other

fields, as it usually requires consensus across different informants involved in the service being provided. The largest methodological drawbacks associated with the use of triangulation for program evaluation in this field are the time, costs, and analytic complexity associated with triangulating informants by measuring multiple perspectives. More specifically, by using the criteria set out by many forms of triangulation, one must accrue either a financial or time-related cost, as one must employ an additional person, place, researchers' time, or measure in order to successfully collect the appropriate data from multiple methods and/or informants. Drawbacks associated with triangulating post-measurement appear to resound regardless of type of triangulation.

Program evaluation in human service enterprises requires the measurement of various relevant constructs relating to the services being rendered from the multiple parties involved in the program. As there are a number of service providers, managers, and individuals involved in the care of those requiring contact with human service enterprises, evaluation of the service itself requires measuring various constructs across various people. This measurement process seems uniquely complex as it involves triangulating information from different sources that undoubtedly speak different languages, represent different disciplines, and manage various aspects of the service. It usually translates into needing to measure across service providers their opinions on how the service is affecting the individual from different angles, and then attempting to triangulate or make sense of the various types of data.

As described above, triangulation across informants introduces a significant analytic challenge. When agreement is observed across informants, the analysis is simple. Measurements from each informant perspective can be treated as replications, and one would expect the same findings regardless of the perspective analyzed. However, when there is little or no agreement between informant perspectives, there are no clear guidelines to inform the analytic approach. In these cases, the evaluator/researcher is left to explain the inconsistency of findings across perspectives on a post hoc basis. This can become further complicated if the informant perspectives sometimes agree and sometimes do not agree within the same data set—the data set is then left with an enormous amount of noise that can make interpretation impossible.

In order to negate some of the burdens associated with triangulation without sacrificing the importance of multiple perspectives in the

measurement of complex phenomena, the simple notion of triangulating information prior to measurement—what is labelled here as “pre-measurement triangulation”—may present a viable option. In order to perform this proposed type of triangulation, it is necessary to shift from traditional psychometric theory of measurement to that of communication theory, or communimetrics (Lyons, 2009).

## COMMUNIMETRICS

The theory of communimetrics holds that the primary role of measurement in human service enterprises is to communicate. The role of communication in measurement is not new. In his classic text, Nunally (1976) listed communication as a key objective of measurement in science. However, Nunally was referring to communication among scientists to facilitate replication. Unlike scientific measurement, effective measurement in human service enterprises requires a much broader understanding of communication to include that which occurs between recipients and providers, between direct service staff and supervisors, within programs and across systems, as well as between researchers and evaluators. Thus, the standards of communication in measurement are much more complicated in human service enterprises, and therefore measurement designs should optimize the communication value of measures.

The notion that measurement is communication within human service enterprises shifts important aspects of this activity away from the domain of scientists and into the domain of managers. Such a shift requires substantial simplification in order for individuals without scientific training to utilize measurement processes. In considering the implications of this shift in priorities for measurement, it is useful to consider the evolution of communication theories. Communication is a field that has been extant for about half a century. During the evolution of this field, theories of communication have shifted from transmission theories to constitutive theories (Deetz, 1994). Transmission theory dates back to British Empiricists and is a linear view that information begins at point A and moves to point B. A person has a thought, articulates it, a second person hears it and interprets it. In other words, communication is the transmission of information from one point to another. More recently, communication theorists have increasingly held transmission theories to be inadequate to explain complex communication processes (Carey, 1989). Alternative theories have been proposed that posit that communication is less a process of transmitted information and more a process of creating

shared meaning—a constitutive process (e.g., Deetz, 1994; Pearce, 1989). These constitutive theories fit perfectly within the goals of human service enterprises—to establish a shared vision of the needs of people served, and to monitor the impact of interventions on these needs over time.

The concept of creating and measuring a shared meaning can be understood as engaging in a pre-measurement triangulation process. If the multiple parties involved in the human service enterprise participate in the creation of a measurement for that service, then the value of triangulation is preserved—multiple perspectives are represented. But since only one measure results, the burden, expense, and analytic complexity of both analysis and interpretation is dramatically simplified. This simplification makes the use of data from these measures far more widely accessible to individuals who may not be sufficiently sophisticated in statistics or program evaluation to analyze, report, and interpret data collected using traditional triangulation strategies.

Optimal guidelines regarding the creation of a pre-measurement triangulation process comes from work with group decision-making and consensus development. Human service enterprises often rely on the judgement of their team members in order to successfully render the service being offered. Thus, good communication and decision-making within these teams is critical. Group decision-making within these fields involves multiple parties with a variety of different skill levels and expertise. Not only does the information need to be communicated across a number of different service providers and stakeholders involved in human service enterprises, it is also advantageous if the information can be communicated to all relevant parties in easily interpretable and understandable terms.

## GROUP DECISION-MAKING

Decision-making tasks in human service enterprises are often allocated to groups rather than individuals primarily because of the general notion that pooling expertise will lead to greater decision quality (van Ginkel & van Knippenberg, 2009). Specifically in the field of human services enterprises, there is an increasing surge of multidisciplinary teams being used to make decisions that inform both treatment plans and program evaluation endeavours (Houghton, Simon, Aquino, & Goldberg, 2000; Kerr & Tindale, 2004). Early research on group decision-making involved social research paradigms using hidden profile situations (Stasser & Titus, 1985, 1987) and was

based on the assumption that decision-making in groups was solely driven by cooperative motives. Recent work has shown that earlier studies might have overlooked another strong social motive that may exist amongst group members, namely competition. Competitive goals may include wanting to achieve a higher personal status, proving competence, or wanting to take the credit for a successful group decision, and may result in a tendency to withhold vital information necessary for making a superior quality decision, or in a failure to integrate the information of others into decisions (Darnon, Butera, & Harackiewicz, 2007; De Dreu, Beersma, Stroebe, & Euwema, 2006; De Dreu & Carnevale, 2003; Scholten, van Knippenberg, Nijstad, & De Dreu, 2007; Steinel & De Dreu, 2004; Toma & Butera, 2009; Winquist & Larson, 1998). Regardless, all end products of competitive motives undoubtedly affect strategic choices made by groups.

The biases that accompany group decision-making introduce yet another challenge to the industry of program evaluation in the human services enterprise, because the field depends so greatly on information provided by all team members involved. This is why a measurement process focused on the shared vision of the system—the specific needs of the people served—offers the best opportunity to move group functioning away from a competition-based process toward a collaborative process. In order for program evaluation to be successful in any human service enterprise, it is required that program managers measure various dimensions of the individuals who are receiving the service. This is usually accomplished by capturing information from the multiple service providers involved and then analyzing each perspective separately. Integration can only occur at the interpretation of findings. This process can be both cost- and labour-intensive, and allows for the introduction of single and/or group decision-making biases depending on the manner in which the team operates.

## ROLE OF COMMUNIMETRICS IN GROUP DECISION-MAKING

The design of the communimetric approach is uniquely suited for team decision-making measurement. Communimetric measurement can be viewed as an information integration, whereby multiple inputs are combined to generate or create a singular measurement process (Lyons, 2009). A unique aspect of a communimetric tool is that multiple parties are involved in its creation. That is, in order to generate tailored items for a communimetric tool that is specific to a certain setting, the perspectives of all those involved in the system of care are incorporated. This allows for the triangulation of various

viewpoints in the design and creation of the measurement tool. The contribution of each team member can then be conceptualized as a measurement input, and the output of the team can similarly be seen as a measurement. Communimetric measures function well as outputs of team processes, wherein the team is generally engaged in constitutive communication.

Similarly, the shift of the measurement process toward the meaning-making value of the measurement changes the focus of the measurement process. Instead of paying attention to the specific measurement procedure, focus is instead diverted to the observation of an individual. The construction of the measure is all about ensuring that the observation is replicable (i.e., high reliability) and accurate (i.e., high validity). When you consider a constitutive perspective, the focus shifts away from the procedure used to observe (i.e., the inputs of the process), to the procedures used to share the results of the measurement process—to communicate—the output of the measurement process (Lyons, 2009).

The role of pre-measurement triangulation by means of the use of a communimetric tool presents an option for overcoming the biases found in single and group decision-making. Specifically, pooling relevant information and perspectives of all interested parties in order to create the measurement tool allows for the incorporation of multiple perspectives prior to the need to make a decision. Thus, when it comes time to make a group decision, the necessary information will automatically be available through the use of the measurement process. The incorporation of a communimetric tool allows for an increase in communication and a decrease in bias amongst group members, as well as reducing the opportunity for competitive motives to exist. This undoubtedly allows for more reliable and valid data to be created and incorporated into evaluation efforts. Further, it eliminates the need for the evaluator to treat every representative of each perspective as a separate data source and a replication of all other members of that perspective.

#### AN EXAMPLE OF PRE-MEASUREMENT TRIANGULATION: A LOOK AT THE CANS

The idea of a communimetric measurement of the shared vision requires a methodology that allows various parties to participate in the creation of the measure. A widely used communimetric measure in child and youth behavioural services is the Child and Adolescent

Needs and Strengths (CANS; Lyons, 2004, 2009), used here as an example of how a communimetric measure can be instrumental to pre-measurement triangulation processes and for program evaluation in human service enterprises. The CANS has been adapted for several service settings—for example, there is a specific form for general mental health programs (CANS-MH), another for autism programs (CANS-ASP), and even specific versions for multiple service systems within a specific jurisdiction (e.g., CANS for Indiana Comprehensive Multisystem Assessment). An adult version of this measure, the Adults Needs and Strengths Assessment (Lyons, 1999), has also been widely used in other human service settings involving adults.

The development of the CANS was driven by a series of focus groups with partners in the child/youth serving system that first led to the creation of the Childhood Severity of Psychiatric Illness measure (Lyons, Howard, O'Mahoney, & Lish, 1997) and then to the CANS. Focus groups with a variety of professionals and individuals allowed for great discussion and debate as to which aspects of child/youth mental health needed to be incorporated into a measure in order for service providers to be able to actively capture the needs and strengths of the individuals in the service. Following from communimetric theory, the concept of the CANS was built on the idea of creating action-oriented items that reflect key concepts that people in the child/youth serving system should capture in order to be effective. For this reason, multiple versions of the CANS exist, as different information might be useful with different populations (e.g., children and youth with autism spectrum or children and youth involved in youth justice). The structure of individual items remains identical across versions; but different systems can select which items accurately reflect their information needs for creating a shared vision of the specific setting in which they operate. This tailoring allows for multiple perspectives to be involved at the onset of a measurement process, and simultaneously creates a shared meaning. Further, this procedure allows for and automatically translates into pre-measurement triangulation.

The CANS is a clinician-completed questionnaire, which serves to assist with rating the needs and strengths of children who interact with behavioural health human service enterprises. It is made up of 6 individual domains (Problem Presentation, Risk Behaviours, Functioning, Child Safety, Family/Caregiver Needs and Strengths, and Strengths), each containing anywhere from 4 to 12 items. The utility of this measure is threefold in that it assists with individual service planning, monitoring of outcomes, and quality improvement initiatives. The CANS was developed as a communimetric tool—a measure

that uses a rating scale to promote communication across a program—rather than a traditional psychometric scale. Using this type of scale allows for a more comprehensive value of the measurement scale, and it is parsimonious in design in that it does not require scoring in order to be useful in communicating its results to all involved, including the patient and family. The CANS uses a four-level rating structure, with each item containing anchored definitions designed to translate into action levels according to the following design.

For needs:

0. No evidence
1. Watchful waiting/prevention
2. Action
3. Immediate/intensive action

For strengths:

0. Centrepiece strength
1. Strength that can be used in planning
2. Strength has been identified—must be built
3. No strength identified

The CANS is also a useful tool for performance measurement systems and for outcomes evaluations, as it allows for an examination of outcomes via two methods. First, subscale scores can be derived for the various domains that are captured by the measure; a look at how these subscale scores change over time provides insight into the outcomes of individuals receiving a specific service or treatment. The second method in which this measure is useful in managing outcomes and for informing program evaluation endeavours is by using the individual ratings to examine the severity of each of the items over time. That is, items that are initially rated a “2” or “3” are considered in the actionable range and are monitored over time to determine the percentage of respondents who move to a non-actionable rating of “0” or “1” (the reverse is observed for strength ratings).

Table 2 presents the six key characteristics of a communimetric measurement process as it is distinguished from a traditional psychometric approach. Several of these characteristics are critical to understanding its role as a measure that triangulates prior to the measurement process. The first two characteristics are designed to ensure that the measurement process is meaningful to all participants. Each individual item assesses something that matters to the planning process, and the rating level assigned to each item translates immediately into action.

The third key characteristic is important for pre-measurement triangulation processes. Communimetric measures are designed for use in a framework that makes human service enterprises about the people served. The person served is the shared vision of the enterprise. For example, in the case of the CANS, the shared vision is the child and family served. So, if interventions are in place (e.g., in detention, taking psychotropic medication), the measure reflects the need, not the fact that in the present circumstances the need is being met. This characteristic is unique to communimetrics and fundamental to its utility as a pre-measurement triangulation strategy.

The fourth and fifth characteristics—that culture and development are considered prior to establishing action levels, and that items are descriptive rather than cause-effect judgements—allow for greater levels of consensus across disparate perspectives. This undoubtedly adds value to the triangulation process. Finally, the flexibility with regard to the period of observation is also critical. A good example is the person who drinks and drives, crashes a car, and ends up in hospital for 90 days in a coma. Let's say you want to measure that person's needs for planning post-hospital care. Under no circumstance would you say "He/she has been clean and sober for 90 days. I'm not worried about that drinking." Of course you would not; rather, you would do your measurement based on the person's needs prior to the coma, as that would be the best reflection of how you would need to intervene on his/her behalf.

**Table 2**  
**Six Key Characteristics of a Communimetric Measure**

<i>Item</i>	<i>Characteristics</i>
1	Each item is selected for inclusion in the measure because it might directly inform the planning process. Each item has the potential to lead the planning team down different pathways or services or interventions.
2	The levels of each item are designed to translate immediately into action levels.
3	It is about the individual, not the individual in service, so if interventions that mask needs are in place, the need is described, not the fact that the need is currently being met through active intervention.
4	One must consider culture and development prior to establishing the action levels.
5	Items are generally descriptive—they avoid issues of cause and effect to the extent possible.
6	There is a 30-day window of observation unless otherwise specified, but one can override that observation period if it is in the best interests of the person served.

The fact that a communimetric tool is a “thinking” approach to measurement makes it quite different than traditional psychometric approaches or observation approaches that attempt to achieve reliability through formalizing the measurement operations. In human service enterprises, this formalization of the measurement operation simply results in artificiality of the measure, which damages the perceived utility of the measurement to those who have to complete it. It is exactly this flexibility and focus on action that allows the communimetric measurement approach to be reliable and valid in field operations, as it creates a meaningful representation of the shared vision of the human service enterprise. In turn, this meaningfulness creates the ability to use this measurement approach after triangulation. The value of triangulation remains respected, but the triangulation procedure occurs prior to the application of the measurement.

In order to clarify the structure of a communimetric measure, two example items from the CANS are provided—one need and one strength item (see Table 3). While the action levels provide the structure of the items, definitions of the construct that correspond to different action levels are provided as anchored definitions and are presented in a manual that accompanies the measure (retrieved from <<http://praedfoundation.org>>).

Substantial reliability and validity information now exists on the CANS (Lyons, 2009). Certification is required prior to use, ensuring a training reliability of 0.70 or higher. More than 100,000 professionals have been trained and certified in the CANS worldwide, with an average training reliability above 0.80 (intraclass correlation coefficient). Annual recertification is required to ensure against reliability decay. Additionally, item reliability has been established (Anderson, Lyons, Giles, Price, & Estes, 2002). Validity for the CANS has been demonstrated in a variety of ways. The CANS is correlated with measures of overlapping constructs (Lyons, 2009). The CANS has demonstrated relationships with service utilization and is able to predict outcomes of various program types (Leon, Lyons, & Uziel-Miller, 2000; Lyons, 2009; Lyons, Woltman, Martinovich, & Hancock, 2009; McIntosh, Lyons, Weiner, & Jordan, 2010). The CANS has been demonstrated to be sensitive to change, and changes on the CANS that represent both good and bad outcomes have been validated through their relationship with measurements of outcomes using different methods (Lyons, 2009; Lyons, Griffin, Jenuwine, Shasha, & Quintenz, 2003; Lyons et al., 1997). Utility validity is a specific form of validity proposed within the communimetrics theory, and is useful for the measure within the context of its implementation. The use penetration of the CANS often

nears 100% in many applications, and supports its utility to those who are requested to complete it (Lyons, 2009).

Using the example of the CANS, we can see how pre-measurement triangulation can be advantageous in that it allows for all parties to communicate their perspectives and expertise in creation of the tool. The weighting of the potential differential value of different perspectives is left to the people most knowledgeable about the cli-

**Table 3**  
**Example Items on the CANS-MH Representing a Needs and Strength Item**

Needs item description	
DEPRESSION/ANXIETY: Symptoms included in this dimension are depressed mood, social withdrawal, anxious mood, sleep disturbances, weight/eating disturbances, and loss of motivation. This dimension can be used to rate symptoms of the following psychiatric disorders as specified in the <i>DSM-IV</i> : depression (unipolar, dysthymia, NOS), bipolar, generalized anxiety, and phobias.	
0	This rating is given to a child with no emotional problems. No evidence of depression or anxiety.
1	This rating is given to a child with mild emotional problems. Brief duration of depression, irritability, or impairment of peer, family, or academic function that does not lead to gross avoidance behaviour. This level is used to rate either a mild phobia or anxiety problem, or a level of symptom that is below the threshold for the other listed disorders.
2	This rating is given to a child with a moderate level of emotional disturbance. This could include major conversion symptoms, frequent anxiety attacks, obsessions, rituals, flashbacks, hypervigilance, depression, or school avoidance. This level is used to rate children who meet the criteria for an affective disorder listed above.
3	This rating is given to a child with a severe level of emotional disturbance. This would include a child who stays at home or in bed all day due to anxiety or depression or one whose emotional symptoms prevent any participation in school, friendship groups, or family life. More severe forms of anxiety or depressive diagnoses would be coded here. This level is used to indicate an extreme case of one of the disorders listed above.
Strength item description	
INTERPERSONAL: This rating refers to the interpersonal skills of the child or youth with both peers and adults.	
0	Significant interpersonal strengths. Child is seen as well liked by others and has significant ability to form and maintain positive relationships with both peers and adults. Individual has multiple close friends and is friendly with others.
1	Moderate level of interpersonal strengths. Child has formed positive interpersonal relationships with peers and/or other non-caregivers. Child may have one friend, if that friendship is a healthy "best friendship" model.
2	Mild level of interpersonal strengths. Child has some social skills that facilitate positive relationships with peers and adults but may not have any current relationships, but has a history of making and maintaining healthy friendships with others.
3	This level indicates a child with no known interpersonal strengths. Child currently does not have any friends nor has he/she had any friends in the past. Child does not have positive relationships with adults.

ent, including but not limited to the person him/herself. Thus, when assessment via a measurement tool is requested, triangulation of expert and personal opinions has already occurred. The use of the tool then allows for one measurement point that already incorporates the views of multiple parties, thus decreasing the need for triangulation at a later stage and increasing the integrity of the data. This method also enhances group decision-making, as the information that is necessary to make the appropriate treatment decision will already be available, thus decreasing the chance for competitive motives and potential biases to exist.

Within the field of program evaluation, the utility of this tool in enhancing the evaluation methods being used should be clearly apparent, and mostly refer to performance measurement systems and outcomes evaluation in these types of settings. The type of outcome data being produced involves the use of only one measurement tool that already incorporates the voice or expertise of the many parties involved. Thus, the data are more easily analyzed and interpreted by program managers who might lack specific statistical or evaluation expertise. An additional benefit of this methodology is that triangulation has already occurred; thus the need to incorporate another point of view or data point in order to increase the richness of the data being analyzed is eliminated. This leads to a decrease in cost, time, and labour, as the pre-measurement triangulation process deals effectively with the need to incorporate multiple perspectives.

## LIMITATIONS

Of course, pre-measurement triangulation through the use of a communimetric measurement approach has limitations. It is always possible that someone who completes the measure fails to actually involve others in its production. This problem is reduced by making the measure an active part of the intervention itself and ensuring that all parties expect to see it and participate in its creation. Transparency is key to reliability in field settings, and the same is true for pre-measurement triangulation. Using the measure in supervision also helps minimize this risk.

It is also possible that users with different perspectives cannot come to an agreement. Although this phenomenon does happen, it has been our experience that it is uncommon. The CANS was used more than one million times worldwide in 2009, and the anecdotal experience of those using it suggest that significant contention arises in no more than 1% of cases. However, when disagreements are not resolvable, the

“1” rating (indicating watchful waiting/prevention) is recommended, so that the parties can monitor the need and see over time who has the more accurate perspective.

Communimetric measures also do not provide a framework for measuring all phenomena. Gender, age, ethnicity, and other demographic variables are important and must be measured separately. Service use and costs are also different measurement processes. Communimetric measures are designed predominantly for the measurement of characteristics of humans, although organizations (of humans) could also be assessed using this measurement approach.

## CONCLUSIONS

Triangulation methodologies have found their way into social science and performance measurement practices dating back approximately 50 years (e.g., Campbell & Fiske, 1959). The use of these methodologies to increase the validity and reliability of measurement has been shown to be beneficial across all sectors, yet it requires the additional procurement of either time or cost factors (Begley, 1996b). Within the field of evaluation these limitations are especially salient, as the measurement practices tend to be carried out by program managers rather than traditional researchers or scientists who are well schooled in appropriate triangulation methodologies. The shift to a communimetric rather than psychometric paradigm in evaluation alleviates some of these concerns. The use of a communimetric tool to inform all performance measurement practices allows not only for the use of a single measurement, but also eliminates the need for specific triangulation efforts to be incorporated into the overall evaluation framework, which undoubtedly reduces complexity, time, and costs.

Pre-measurement triangulation is an innovative method with which triangulation can occur without the disadvantages associated with traditional triangulation practices. Triangulation occurs before measurement, thus reducing the need to amalgamate measurement efforts post hoc. It allows for multiple perspectives to be incorporated at a pre-measurement stage. Thus, this type of triangulation carries all of the benefits associated with triangulation—multiple perspectives are preserved—but without the additional time, complexity, or costs in attempting to triangulate after measurement has occurred.

Further, the primary function of a communimetric tool is to enhance communication, which is deemed especially important in human service enterprises. The use of these types of measures within an evalu-

ation framework not only simplifies the measurement capture, but it also enhances communication across service providers, managers, patients, and families. This unique attribute alone increases both the clinical and the measurement utility of these tools. Similarly, use of pre-measurement triangulation measures decreases biases involved in group decision-making, as all relevant information necessary for clinical and evaluative matters are present prior to measurement taking place. This is indeed an asset for the field of human service enterprises, as the usual practice is to have a number of service providers and experts participating in the care of an individual.

Pre-measurement triangulation using a communimetric measure represents a valid method in which to triangulate information, and has an accompanying benefit of enhancing communication and decreasing evaluation complexities. Measures designed for this purpose have shown excellent reliability and validity and have unmatched utility validity (Lyons, 2009). It requires a shift from traditional psychometric measurement theories and practices, but alongside this shift are multiple advantageous factors that are a product of communimetric theory and practices. Communimetric triangulation presents one of the first pre-measurement triangulation approaches, and adds to the existing list of triangulation techniques that have been outlined to date. As there is increasing pressure to measure accountability in human service enterprises, pre-measurement triangulation provides a unique solution to creating a shared meaning while preserving the quality of what is being measured.

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