

CREATING LOGIC MODELS USING GROUNDED THEORY: A CASE EXAMPLE DEMONSTRATING A UNIQUE APPROACH TO LOGIC MODEL DEVELOPMENT

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Abstract: This article describes, using a case example, the procedure of creating logic models using grounded theory methodology in the context of process evaluation. There currently exists a dearth of literature on the specifics of how logic models should be created. The authors reduce this gap by detailing an integrated methodology they utilized during their recent evaluation of the Youth Educating About Health (YEAH) program. A number of parallels between grounded theory and logic modelling are first discussed to demonstrate their potential for integration. Then the data collection and analysis procedures are explained with a focus on how the integration between grounded theory and logic modelling was conducted. The completed logic model is then presented and each category is explained in detail. The authors conclude by discussing the lessons they learned from utilizing this integrated methodology. These lessons include the specific benefits this methodology contributes to process evaluation, the added depth of information that grounded theory provides to logic modelling, and the cost- and time-effectiveness of this unique methodology.

Résumé: Le but de cet article est de décrire, par l'entremise d'une étude de cas, le procédé de création des modèles logiques en utilisant

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la méthodologie de théorie à base empirique (grounded theory) dans le contexte de l'évaluation des processus. À présent il existe un manque de détail dans la littérature expliquant comment les modèles logiques devraient être créés. Les auteurs contribuent à combler cette lacune en détaillant une méthodologie intégrée qu'ils ont utilisée pendant l'évaluation récente de Youth Educating About Health (YEAH) — un programme où les jeunes éduquent leurs pairs au sujet de la santé. Plusieurs parallèles entre la théorie à base empirique et les modèles logiques sont d'abord discutés pour démontrer leur potentiel d'intégration. La collecte de données et les procédures d'analyse sont ensuite expliquées en soulignant l'intégration entre la théorie à base empirique et la création de modèles logiques. Le modèle logique complété est ensuite présenté et chaque catégorie expliquée en détail. Les auteurs terminent en discutant les leçons apprises en utilisant cette méthodologie intégrée. Ces leçons comprennent les avantages particuliers que cette méthodologie offre pour l'évaluation des processus, l'approfondissement de l'information que la théorie à base empirique fournit à la formation de modèles logiques, et l'efficacité en termes de coûts et de temps offerte par cette méthodologie unique.

This article will describe, using a case example, the procedure of creating logic models using grounded theory methodology in the context of process evaluation. The logic model is currently gaining popularity as a tool for process evaluation because it is effective for outlining program components, facilitating communication, highlighting outcome measures, and aiding in reaching consensus about key issues (McLaughlin & Jordan, 1999). The logic model possesses these abilities because it provides a concise, visual, concrete structure. However, though the logic model is increasing in popularity, there is a lack of consensus in the literature regarding how it should be constructed (e.g., Conrad, Randolph, Kirby, & Bebout, 1999; Rowan, 2000). The authors contribute to this discussion by presenting a unique method of constructing logic models as products of process evaluation data collection.

HOW LOGIC MODELS ARE CURRENTLY DEVELOPED

In the literature, there is some common agreement about the fundamentals of the logic model — namely that program and evaluation components are represented by boxes and connected with arrows. However, there is no clear agreement regarding how its content and structure should be produced. To produce its content, evalu-

ators have used literature reviews, program documentation reviews, key informant interviews, focus groups, or any combination of these techniques (Conrad et al., 1999). For its structure, evaluators have used an assortment of logic model variations (e.g., Chen, Cato, & Rainford, 1998-99; Julian, 1997; Rush & Ogborne, 1991; Wholey, 1977, as cited in Rush & Ogborne, 1991). But most importantly, there is a dearth of literature on the specifics of how to integrate logic model structure and content. What does exist generally proposes that the collected program or evaluation data (i.e., content) be separated into categories, placed into boxes (i.e., structure), and given directionality via connecting arrows (e.g., McLaughlin & Jordan, 1999).

GROUNDING THEORY AS A TOOL

The goal of grounded theory methodology is to generate theory that is grounded in the experience of those whom the theory represents (Strauss & Corbin, 1998). The process of grounded theory begins with data collection, which can include interviews, focus groups, and other sources of qualitative information (e.g., documentation reviews) (Taylor & Bogdan, 1998). Once the data are collected, three levels of coding are employed during analysis — open, axial, and selective (Strauss & Corbin, 1998).

The purpose of the first level of coding is to develop open coding categories, which involves identifying concepts found in text segments (i.e., words, sentences, or paragraphs). Thus, open coding is essentially conceptualization — abstracting the meaning from the text in a non-interpretive manner. Upon completion, this process can generate a wide range of very general coding categories, which are grounded in the words or experiences of the participants (although the number of codes is subject to the number and type of questions asked, as well as the length and detail of responses). Examples of open coding categories relevant to process evaluation would be “money,” “staff,” and “hours of operation.” The constant comparative method (Glaser, 1965) is also generally used in open coding as the researcher compares incidents applicable to each coding category. While coding incidents that belong in a coding category, the researcher compares them with previous incidents in the same and different groups coded in the same category (Glaser & Strauss, 1967).

In axial and selective coding, open coding categories are transformed into theory. Axial coding also uses the constant comparative method

as units change from comparison of incident with incident to comparison of incidents with properties of categories that result from initial comparisons of incidents (Glaser & Strauss, 1967). For example, the open coding categories “money” and “staff” may be linked by a more abstract category such as salary. Axial coding also involves exploring open coding categories and establishing linkages within them. For example, within the category “staff,” subcategories such as “front-line staff,” “management staff,” and “administrative staff” may be identified as properties of the general category. Selective coding involves the selection of a central category and the integrating and refining of the other categories according to how they relate to this central category. For example, the central category for a program could be “program goal,” and a web of categories would then extend from this central category. After the analysis is complete, a matrix (i.e., diagrammatic representation) is developed and the theory is explained in writing. Finally, the completed matrix and theory are verified with the participants to ensure accuracy.

PARALLELS BETWEEN LOGIC MODELS AND GROUNDED THEORY

There are a number of inherent parallels between logic models and grounded theory that facilitate their integration. The first is that both techniques involve the conceptualization and summation of data. In logic models, the program data are conceptualized as logic model categories; in grounded theory, the participants’ data are conceptualized as open coding categories. The second parallel is that both techniques require the user to demonstrate the relationships between and within these conceptual categories. In logic models, box-and-arrow diagrams are generally used for this purpose; in grounded theory, the axial coding procedure is used, which can involve diagramming similar to that used for logic models. The third main parallel is that the end result of each technique is generally some sort of pictorial representation of the data. In logic models, this pictorial representation is the logic model itself; in grounded theory, it is the matrix. Finally, logic models and grounded theory are both used to tell a story. The logic model is used to tell the story of a program; grounded theory is used to tell the participants’ stories. The method we describe here integrates these two epistemologically distinct approaches within a process evaluation context.

CASE EXAMPLE: YOUTH EDUCATING ABOUT HEALTH (YEAH) EVALUATION

To demonstrate the grounded theory approach to logic model creation, the process evaluation of the Youth Educating About Health (YEAH) program is presented. YEAH is a peer-designed and peer-led youth sexual health education program — backed by two local agencies (Planned Parenthood Regina and Street Culture Kidz Project, Inc.) — that targets youth between the ages of 12 and 25. The director of Planned Parenthood Regina, who obtained a grant from Health Canada to cover its expenses, initiated this program. The original idea presented to Health Canada was a program that would facilitate: (a) youth ownership of sexual health; (b) peer-designed and peer-led education for youth sexual health; and (c) employable skill development for the youth involved in the program. A youth-oriented program facilitator (who was 23 at the time of the evaluation) was hired after the grant was obtained. The facilitator then recruited nine youth; these youth, who formed the YEAH core team, then proceeded to design the program in consultation with the facilitator. Throughout the remainder of the first year of operation, the YEAH team educated themselves on sexual health issues, engaged in team-building activities, networked within the local community, and developed a series of activities for presenting their accumulated sexual health knowledge. A funding condition for the Health Canada grant was to have the program evaluated after one year of operation. Therefore, an evaluation team (i.e., the authors) was approached. Since this was one year following inception of the program, a process evaluation format was considered most appropriate. Process evaluations are particularly useful when a program is new, to provide a starting place for understanding components and delivery of the program and promote insights into the working of the program (Heinz & Grant, in press). Process evaluations have also been shown to be useful for community-based health programs (Cunningham, Michielutte, Dignan, Sharp, & Boxley, 2000).

The goals of our process evaluation were to specify and describe program components and intended recipients, and to document whether the program was being implemented as intended (Scheirer, 1994). The logic model was chosen as an appropriate framework for meeting the first goal because of its ability to make abstract program elements concrete and observable and to articulate the program components and recipients. The logic model was also helpful for meeting the second goal since it has been used by other evaluators to

articulate programs' operating theories, also known as espoused theories (Argyris & Schön, 1974; Cooksy, Gill, & Kelly, 2001). The espoused theory can then be tested in an outcome study by comparing it to program reality, or to the theory-in-use. Scheirer (1994) also states that a process evaluation can be effectively used to analyze the assumptions underlying a program to illuminate the theoretical framework of the program. Ideally, program theory guides an evaluation (Cooksy et al., 2001) by providing an explicit connection to social science theory. However, social science theory has been described as generally irrelevant to program stakeholders. The program director's goal for the program was to empower youth to develop a peer educational program that would address the link between use of alcohol/drugs and sexual activity in youth. This approach is consistent with adolescent empowerment theory (e.g., Chinman & Linney, 1998); however, the conceptual theoretical framework was not clearly articulated in program development. Substance use and sexual risk-taking have been identified in the literature as problematic, and several intervention models for adolescents have been described in the literature (Kim, Crutchfield, Williams, & Hepler, 1998; Milburn, 1995; Rotheram-Borus, Murphy, Coleman, & Swendeman, 2002). These programs are typically implemented on an empirical theoretical base; therefore, one contribution we could make to this new community-based program would be to discover whether the program had components in common with similar interventions and to contribute to the implementation of a more theoretically sound program (Bouffard, Taxman, & Silverman, 2003). A unique aspect of our evaluation is that we did not design the logic model in advance in data collection. Instead, grounded theory was chosen as an appropriate data collection method for this process evaluation because of its ability to produce theory grounded in experience.

METHOD

Data Collection

The first step in the evaluation was to collect the data. The evaluation team came together in a collaborative effort to brainstorm potential interview questions. These questions were refined, and the team selected the questions they felt were most appropriate for the evaluation. It is important to note that the team had not decided to use the logic model in the evaluation at this point; therefore, the logic model framework did not influence the development of the in-

interview questions. However, the questions were guided by general evaluation categories and covered the scope of the YEAH program (see Appendix A: Interview Guide). Interview questions were intended to elicit “grounded” descriptions of program goals and objectives from youth using youth-friendly language.

After gaining approval from the University of Regina Ethics Review Committee, the potential participants were contacted. In total, the program director, the facilitator, and seven of the YEAH core team members were interviewed. The interviews, which were primarily conducted by the first and second authors in space provided by Street Culture Kidz, Inc., began with signing consent forms (and collecting parent consent forms from those participants under 18), as well as administering a demographic information form. Only one of the participants was male (a core team member), and all participants self-identified as being from an ethnic background of Caucasian or Canadian. The ages of the YEAH core team ranged from 15 to 21. All interviews were tape-recorded, took approximately one hour to complete, and followed qualitative interview guidelines (Rubin & Rubin, 1995).

Data Analysis

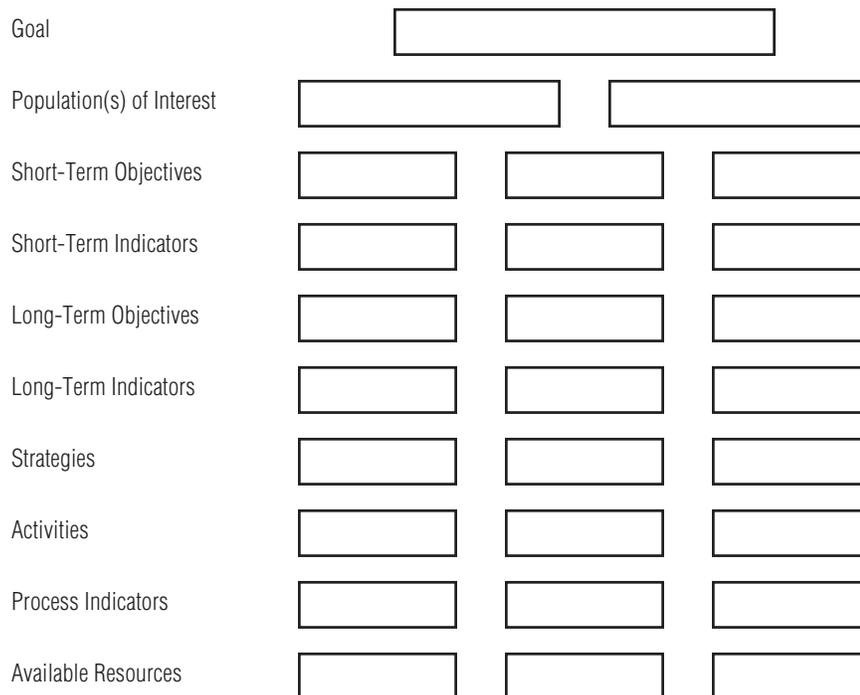
Interview data were transcribed and the transcripts were entered in the qualitative software package NVivo version 6.0 (Richards, 1999). The nodes created in this software are similar to open codes of stage one grounded theory analysis in that they serve as a concept that represents text data (Miles & Huberman, 1994; Strauss & Corbin, 1998). The software program also allows for the creation of “node links,” which are similar to Internet hyperlinks in that they allow the user to jump between node documents at a click of the mouse. This facilitated coding at the next level of analysis and significantly reduced time that would have been spent cutting and pasting.

Once the transcripts were entered into NVivo, standard grounded theory open coding was combined with a logic model structure. The authors used a generic logic model structure — that appears to be the most comprehensive of those presented in the research literature (see Figure 1) — to conduct an initial open coding step (University of Toronto, 2001). This added step is where the integration between these two techniques began. Essentially it involved an organizational reformatting of the transcripts in that the transcripts were broadly coded according to the logic model categories, thus creating “new

documents.” In other words, a node was created for each logic model category and then the transcripts were coded using these nodes; for text data that did not apply to these logic model nodes, new nodes were created. At the completion of this step, ten “logic model documents” and eleven smaller “other documents” were available.

Although this initial, additional, open coding step may seem contrary to the inherent nature of grounded theory (i.e., it is supposed to be inductive with no superimposed categories), there are a number of reasons why its inductive process was not constrained. First, the employed logic model structure generally covered the scope of possible responses because the questions were focused on a program — a specific domain that the logic model represents. In other words, it was easy to broadly organize a large majority of the data into logic

Figure 1
Generic Program Logic Model



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model categories since the chosen categories were broad enough in scope. Second, this initial organizing step was conducted flexibly; if some data did not easily fit under a logic model category, they were not “forced” in any way. A new node was simply created to allow for further analysis and possible integration deeper into the analysis process. Finally, this initial step was organizational, not interpretive. In other words, this step was not an in-depth coding procedure; it was simply a reframing of the transcripts into logic model and other documents — a procedure that was relatively easy to accomplish since the interview questions were specific to the program and the selected logic model categories were broad enough in scope.

Once the transcripts were reorganized into new documents, the second open coding step began — using these new documents — in the manner one would normally expect with this technique. This open coding step involved conceptualizing and categorizing the text data in each document, thus creating new open coding nodes and node documents. The constant comparative method continued to be used during this open coding step; that is, each incident was compared to other incidents in each category (Glaser & Strauss, 1967). In each new document, NVivo indicates which original transcript text sections are from; therefore, the constant comparative method could be utilized with a focus on both the original transcript text sections and the new documents as a whole.

Use of the computer software also enhanced the ability to objectively compare incidents at this stage of coding, a process that usually relies on the researcher’s memory (Glaser & Strauss, 1967). The logic model categories provided abstract conceptual categories that were indicated in the data. We did not merely code data into these previously selected categories, but found that the new categories that emerged from data analysis could be seen as properties of the logic model categories (i.e., conceptual elements of the logic model categories). This allowed for a richer and more grounded understanding of the logic model categories.

The integration of grounded theory and logic models began to solidify around axial and selective coding. Axial coding primarily involved determining the theoretical relationships between and within the open coding categories. Due to the initial open coding step, however, the relationships between and within logic model categories were also being assessed while conducting the axial coding process. These logic model category relationships were being assessed be-

cause the codes within each new “logic model document” were already housed within the logic model category which that document represented; therefore, as each document’s codes were linked, so too were the relationships between and within logic model categories.

The axial coding stage was also where the “other documents” were integrated into the developing theory. Until this point in the analysis, it was not clear how these sections would fit in the logic model structure and, therefore, they were coded separately. However, after the first levels of analysis had taken place, it became more apparent as to how they would fit. For example, “like best” was one of these other documents; it contained data regarding what the participants liked best about the YEAH program. During the initial coding process, it was not clear if this data would fit under any of the logic model categories. Later in the analysis, it was realized that sections of this document belonged under a number of categories, including activities, process indicators, and available resources. The higher level of abstraction provided by axial coding was necessary to determine how this information contributed to the developing theory.

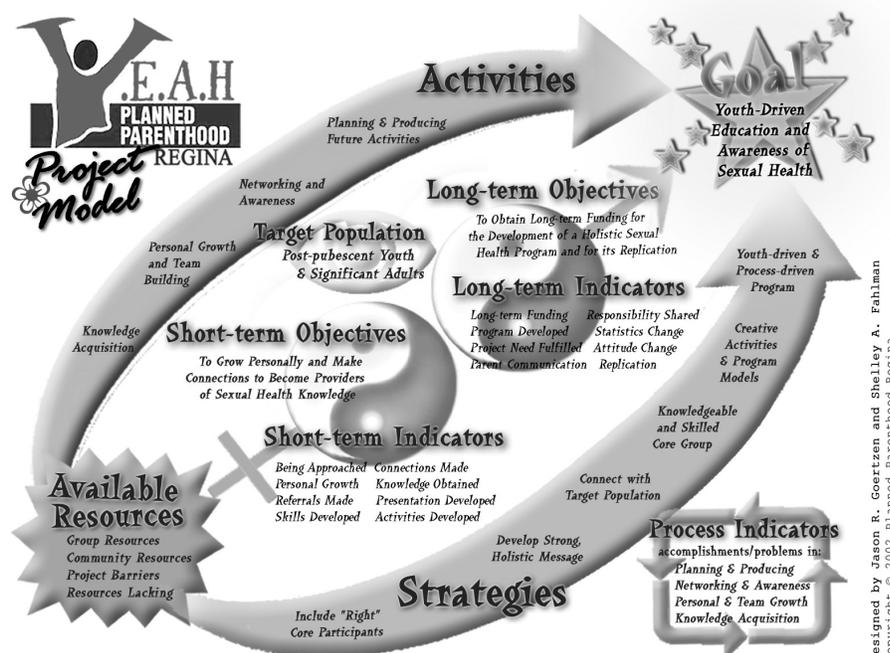
Once axial coding was completed, the selective coding process began. This process began with the selection of a central category while determining the relationship of the other categories to this central category. It also involved a further refining of the existing categories and their relationships where deemed necessary. The central category was selected from among the logic model categories for two reasons: (a) the coding within each logic model category (i.e., each new logic model document) was all inherently related to that category due to the initial open coding step; therefore, as a *central* category, at the highest level of abstraction, the logic model categories were the best option; and (b) the central category from the grounded theory analysis would then also be the central category on the logic model.

As the other grounded theory categories were being related to the central category, the logic model was being produced. The process started with the central category. The other logic model categories were then added according to how they were related to the central category and each other; this process was guided by the refined coding categories and their pattern of interrelationships determined at the axial stage. Next, the refined, selective coding categories within each logic model category were used to describe their respective logic model category. Finally, the grounded theory matrix, which was in fact the logic model, was depicted. And thus the logic model structure was filled by the grounded theory content.

RESULTS AND VERIFICATION

The logic model that resulted from this new integrated methodology was a combination of the logic model categories, visual metaphors depicting the relationships between these categories, and grounded theory content — taken from the selective level of coding — representing each category. In total, 10 logic model categories, corresponding visual metaphors, and grounded theory summaries formed the final logic model (see Figure 2). The evaluation team also kept in mind that the majority of the primary stakeholders interested in this logic model were adolescents; therefore, an effort was made to make the logic model creative and engaging so that the YEAH core team would find it interesting and useful. Upon completion, the logic model was presented to the YEAH group. This presentation was considered of particular importance because it was intended to verify the accuracy of the logic model and elicit potential changes.

Figure 2
YEAH Program Logic Model



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Goal

The goal of the YEAH program, as determined at the selective coding stage, was: “Youth-driven education and awareness of sexual health.” Content was added to the logic model to describe the logic model category “Goal,” and a large, golden star was used as a visual metaphor. The star, content, and category name were placed in the top right-hand corner of the logic model and the rest of the model was targeted toward them. All of these decisions were made to emphasize the importance of the YEAH team’s effort to shoot for this goal. The content in the “Goal” category was discovered in the evaluation to be an accurate and engaging representation of the YEAH team’s goal. The YEAH group found this visual representation a concrete example of their program’s goal. This result was important for the evaluation team because, until the time of the evaluation, the YEAH team intuitively knew where they were headed, but were lacking a clear, concrete vision.

Coding within the “Goal” category began with seven open codes. These codes described the goal of the group as articulated in the qualitative interviews and included: “increased comfort level for discussing sexual health,” “risk reduction,” “education of youth,” “better decision-making by youth,” “youth-driven education about sexual health,” “education about sexual health in general,” and “increased awareness about sexual health in general.” These open codes were integrated into three primary coding categories at the axial stage: “education,” “awareness,” and “youth-driven.” There were broad overlaps between the Education and Awareness axial categories due to the fact that education and awareness were both described as being essential for such outcomes as better decision-making, risk reduction, and educating youth. Therefore, these two concepts formed the core of the selective coding product, while preserving the importance of the youth-driven nature of the YEAH program.

Available Resources

The evaluation team decided to place the “Available Resources” directly across from “Goal” on the logic model. Just as “Goal” represented the final outcome for the YEAH team, “Available Resources” represented the starting point. While “Goal” represented where the logic model was moving towards, “Available Resources” represented where the logic model was moving from. These two categories were the balance points for the logic model. A purple “explosion” was cho-

sen as a visual metaphor to appeal to the youth group and indicate how the rest of the YEAH program flowed out of its available resources.

Coding within the “Available Resources” category began with 17 grounded theory open codes. These codes included such resources as “word of mouth,” “youth-community partnerships,” and “some parental support.” However, it also included resources that were lacking, such as “lacking sustainable funding,” “lack of males in core team,” and “lack of cultural diversity in core team.” At the axial coding stage, the 17 open codes were integrated into four primary categories: Group resources (i.e., YEAH core team); community resources (i.e., links made between YEAH and the community); resources lacking; and barriers to growth (e.g., resistance to program by some parents). At the selective coding stage, it was determined that no further coding was needed because these four categories provided an adequate summary for the logic model category; they also described the data in a comprehensive manner. Therefore, the four categories were added under “Available Resources” on the logic model.

Activities

The logic model category “Activities” included all of the codes for the various activities the YEAH team had conducted at the time of the evaluation. For the YEAH team, these activities — and thus this category in general — were one of the primary means of getting from their available resources to achieving their goal. Therefore, “Activities” was depicted as an arrow stretching from “Available Resources” to “Goal.” However, “Activities” was also conceptually related to the rest of the logic model categories in a variety of ways (e.g., activities were developed for the target population, as well as to fulfill short-term objectives). Therefore, “Activities” was also depicted as one of the “arms” that “embraced” these other categories. This category was particularly helpful to the YEAH team. They had been operating without a clear sense of their accomplishments for the first year. Seeing their activities displayed in this way gave the team a feeling of accomplishment and pride.

For “Activities,” coding began with 18 open codes. These codes included such activities as “developing presentations,” “making community connections,” and “attending relevant workshops.” At the axial coding stage, these 18 codes were integrated into four primary

categories: “planning and producing future program activities”; “networking and awareness”; “personal growth and team building”; and “knowledge acquisition.” Again, it was determined that no further coding was needed at the selective coding stage because these four categories provided an adequate summary for “Activities”; they also described their respective data in a comprehensive manner. Therefore, the four categories were added under “Activities.”

Strategies

The other arm embracing the majority of the logic model categories was “Strategies.” “Activities” represented *what* the YEAH group was engaged in and “Strategies” represented *how* they were conducting these activities to achieve the best results. The participants identified both of these categories as being key components for achieving their goal. As the other “arm,” “Strategies” was depicted as a second arrow connecting “Available Resources” to “Goal”; however, while the arrow representing “Activities” was depicted atop the other categories, the arrow representing “Strategies” was depicted below them so that, together, these “arms” completed their embrace.

Coding for this category began with 23 open codes. These codes included such strategies as “seeking to include parents (e.g., in focus groups or workshops),” “including core team members who have experience with sexual health issues,” and “building a knowledgeable and cohesive core team.” At the axial coding stage, these strategies were integrated in six main categories: “developing a strong, holistic message to be presented in a casual and open manner”; “seeking to connect with all post-pubescent youth and significant adults, including parents and resistant groups through any available means”; “seeking to include the ‘right’ core team participants, including those with experience and more males, as well as tracking drop-outs to find out why”; “building a youth-driven and process-driven program that empowers youth to promote sexual health”; “building a knowledgeable and skilled core group of youth leaders through regular meetings that encourage equal participation and sharing of skills and knowledge”; and “developing creative activities and program models to maintain group focus and facilitate the group’s overall message.” It was again believed that no refining of these categories was needed at the selective coding stage; therefore, they were included on the logic model under “Strategies.”

Process Indicators

Process indicators are measures to determine the effectiveness of activities. During the initial open coding step, any data that could serve as a measurable variable related to the YEAH team's activities were broadly coded into the process indicators category. Coding the new document for "Process Indicators" produced 37 open codes. These codes included such indicators as "raising parental awareness," "expanding core team knowledge," and "connecting with community resources." As the process indicators were indicators of the YEAH core team's activities, it was no surprise that they could be integrated, at the axial coding stage, into categories directly related to the axial categories generated for "Activities." The axial coding categories generated for "Process Indicators" were: "planning and producing accomplishments"; "planning and producing problems"; "networking and awareness accomplishments"; "networking and awareness problems"; "personal growth and team-building accomplishments"; "personal growth and team-building problems"; "knowledge acquisition accomplishments"; and "knowledge acquisition problems." These categories were considered not to need further refining and were included on the logic model under "Process Indicators," which was depicted as a rectangular box with arrows circling around.

Target Population

The population of interest was determined to be "post-pubescent youth (i.e., 12 to 25) and significant adults (e.g., teachers and parents)." These target population criteria were derived from 14 open coding categories such as "early teens," "high school youth," "teachers," and "up to 21." At the axial coding stage, these open coding categories were integrated into five primary categories: "significant adults," "elementary-aged youth," "high school-aged youth," "emerging adults," and "non-gender specific" (i.e., an equal focus on targeting males and females). At the selective coding stage, these axial categories were further integrated into the final description of the target population. This final description was then added to the logic model under "Target Population," which was depicted as an eye to indicate that the YEAH group was mindful of "keeping an eye" and "focusing" on their target population.

Short-Term Objectives

In one respect, the YEAH team's path from "Available Resources" to "Goal" includes a series of activities and strategies. This path is fairly concrete and direct. However, another, concurrent, path between the beginnings and outcome of the YEAH program is from "Short-term Objectives" to "Long-term Objectives." This path is more abstract and indirect; as a result, the logic model representation of this series of objectives was very beneficial to the YEAH team. Also, demonstrating that certain activities and strategies were targeted toward short-term objectives and that other activities and strategies were targeted toward long-term objectives helped the YEAH team to obtain a concrete understanding of the progression of their program.

Specifically, short-term objectives for the YEAH team were focused around personal growth and networking with the community in order to prepare for becoming providers of sexual health knowledge. Coding within this category began with 8 open codes. These codes included such objectives as "developing a presentation," "networking," and "obtaining sexual health knowledge." At the axial stage, these codes were integrated into three primary categories: "making connections," "personal growth," and "planning and presenting." At the selective coding stage, the YEAH team's short-term objectives were summarized as "growing personally and making connections to become providers of sexual health knowledge." This description was included under "Short-term Objectives" on the logic model.

It is important to note that this logic model category was depicted as one quarter of an important visual metaphor. This metaphor began with two yin yang symbols, which were chosen due to their popularity amongst today's youth. One of these yin yangs was then converted into the female symbol and the other was converted into the male symbol. The converted symbols were then rotated and joined to create a pathway from "Available Resources" to "Goal." This pathway was symbolic of the YEAH group's understanding that sexual health should involve a balance between genders and that one gender should not be expected to take on sole responsibility.

Short-Term Indicators

To determine the YEAH group's success at meeting their short-term objectives, short-term indicators were identified. At the initial open-

coding stage, data that appeared likely to serve as short-term indicators were broadly coded into this logic model category. The second open-coding stage then elicited 10 open codes from within this category. These codes included such indicators as “number of referrals made to Planned Parenthood,” “number of connections made with community partners,” and “personal growth of YEAH team members.” At the axial coding stage, the open coding categories were refined slightly, which resulted in 8 axial categories. However, as each indicator was targeted toward measuring a specific objective, detailed integration was neither necessary nor appropriate. Therefore, when the indicators were determined to be sufficiently refined, they were added to the logic model under “Short-term Indicators.” This logic model category was depicted as the complement to “Short-term Objectives” within the first yin yang, visually indicating that these two categories were intimately related.

Long-Term Objectives

The second path from “Available Resources” to “Goal” proceeds from “Short-term Indicators” to “Long-term Objectives.” For the YEAH team, long-term objectives were focused around obtaining long-term funding for the program and developing a holistic sexual health program, which could then be replicated in other cities. Coding within “Long-term Objectives” began with 12 open codes. These codes included such objectives as: “gender equality for sexual health responsibility,” “obtaining long-term funding,” and “changing youth and adult attitudes towards sexual health.” At the axial coding stage, these open codes were integrated into two primary categories: “developing a sexual health program for post-pubescent youth and significant adults,” and “obtaining long-term funding to develop the sexual health program and promote replication in other communities.” At the selective coding stage, these two axial codes were integrated into the summary that appears under “Long-term Objectives” on the logic model. This logic model category is depicted as the first half of the second yin yang.

Long-Term Indicators

In order to give the YEAH group the necessary resources for monitoring and measuring their future success at meeting their long-term objectives, long-term indicators were identified. Any data that appeared able to serve as long-term indicators were broadly coded

into this category during the initial open coding stage. During the second open coding stage, eight open codes were developed. Like the short-term indicators' codes, no refining was deemed necessary for the long-term indicators' codes. This decision was reached because each indicator was specifically targeted to an objective; since integration would result in the loss of the ability to measure individual objectives, integrating the long-term indicators' codes was not deemed appropriate. Therefore, they were simply added to the logic model under "Long-term Objectives." This logic model category was depicted as the second half of the second yin yang, thus completing the second path from "Available Resources" to "Goal."

Verification

In order to verify the accuracy of the completed logic model, the authors presented it to the YEAH core group, program director, program facilitator, and a funding representative from Health Canada. First, each logic model category was described individually. Then anonymous sample quotes were read to provide examples of data within that category. Finally, a request was made for feedback on each category from the stakeholders.

Surprisingly, the stakeholders unanimously voiced their approval of each logic model category and the logic model in general. Despite the authors' best efforts to obtain suggestions for improvements on the logic model, the stakeholders could think of none. It was this resounding approval of the logic model — the first time the stakeholders saw it — that prompted the authors to believe that this integrated methodology is indeed an effective procedure for logic model development. A large copy of the logic model is posted in the Planned Parenthood office, and the YEAH group continues to use it to guide the development of their program.

LESSONS LEARNED

In conducting the YEAH evaluation, a successful new method of creating logic models was developed that we have named the *Grounded Theory Based Logic Model*. There are a few specific reasons why this integrated methodology was so effective and useful. First, this method was used to meet our two goals for this process evaluation. Because a complete description of program components is the foundation for assessing programs, we were able to meet our first goal by providing

this description to the YEAH team in the form of a logic model that is grounded in participants' experience (Scheirer, 1994). We found, as other evaluators have, that this method of process evaluation is useful for small community-based agencies to help them describe new, fledgling programs in detail (Cunningham et al., 2000). The description of program components, and so on also helped the program director and stakeholders make adjustments which correspond to the needs of the program's recipients (Heinz & Grant, in press). Similar to other evaluators, we found that documentation of program components provided by this process evaluation also could be used for program modification (i.e., inclusion of more gender and ethnic diversity, for example, in this case) (Cunningham et al., 2000).

We also met our second goal and discovered that the program was indeed being implemented as intended. That is, the YEAH team was operating consistent with the Adolescent Empowerment Theory described by Chinman and Linney (1998), which incorporates traditional empowerment theory, developmental theory, role theory, and bonding/social control theory. As the team engaged in the Adolescent Empowerment Cycle, they designed and developed a peer-led educational program that incorporates substance abuse prevention and sexual health awareness. We found that empowerment among the team facilitated development of youth-relevant curriculum and empowered them to deliver this curriculum in a youth-friendly style to their peers. Future evaluation inquiry of this program will be guided by the Adolescent Empowerment Theory (Chinman & Linney, 1998).

This finding was important because, prior to the process evaluation, the YEAH program lacked a theoretical foundation. Furthermore, the YEAH team only had an abstract sense of their goals and accomplishments. Using this method provided both a theoretical framework (grounded theory) and a concrete representation of this theory (logic model). In short, this methodology allowed the evaluation team to present the YEAH team with a concrete model that summarized their progress-to-date, provided a theoretical base, and outlined future directions. We learned that this method may be particularly useful for community-based organizations that implement programs based on intuition and prior successes, yet lack a solid conceptual theoretical framework to guide future outcome or impact evaluation. Providing this process evaluation data will facilitate outcome evaluation design with more precise measures (Bouffard et al., 2003).

Second, grounded theory provided *added value* to the logic model. Our method differed from the standard logic model evaluation method because we did not rely on program documents or other pre-existing sources to construct a logic model to evaluate the YEAH program. The logic model was constructed as a product of data collection, which differed from the ways in which it is usually used. However, the logic model provided concepts and categories during analysis that provided structure for the final evaluation matrix. The qualitative interviews used for grounded theory provided a depth of information that may not have been accessible from focus groups. These one-on-one interviews also eliminated the group dynamics that could have occurred had focus groups been used. The flexibility expected of researchers using grounded theory allowed us to develop a logic model that was more creative than the usual boxes and arrows and was more visually appealing to the youth program participants. Using grounded theory also enabled us to understand the individual context and experience of each YEAH member and to integrate these data into a representative theory. The logic model was successfully used here to tell a story about the program (McLaughlin & Jordan, 1999); grounded theory enriched this story by also telling the participants' stories.

Finally, this integrated methodology was cost- and time-effective. Two student research assistants were employed over a three-month period on a casual basis. They were paid approximately \$3000 from the Health Canada grant that supports the YEAH program. With the guidance of the evaluation team, these research assistants collected and analyzed the data, created the logic model, and presented the model to the YEAH program's primary stakeholders. However, it should be noted that they had access to the NVivo software program — which significantly reduced the time necessary for analyzing the data — and also had experience using grounded theory, which reduced the time necessary for training.

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Appendix A Interview Guide

Individual Background Questions

1. How did you first hear about the project?
2. Why did you choose to get involved in this project? What was attractive to you?

Intervention Goals/Outcomes

3. What do you want to change as a result of this project? (What do you hope will be changed?)
4. What do you want to be the results of this project?
5. Who is your "target" population? Who do you want to reach? (gender, age?)
6. What do you think the message is you are giving?

Process Measures/Activities to Date

7. What did you (your group) put on the P.A.T.H. (Positive Attention to Tomorrow's Hope)?
8. What activities have you done so far?
9. What's worked and what hasn't worked? Why did that work?
10. What do you like best? What do you like least?
11. Are there other people who should be involved in the group? Do you have any ideas on how you could include them?
12. Do you feel you have a say in what goes on in this project?
13. Have other kids approached you for information? Who have you referred to Planned Parenthood (e.g., friends)?

Process Measures/Growth of Participant and Group

14. What have you, personally, gotten out of this project?
15. Have you changed/developed/grown from your participation in any ways?
16. What have you learned?
17. So far, has anything happened that you didn't expect as a result of this project?

Future Scanning

18. Do you think this project could be done in another community?
19. Will you take what you've learned here with you?

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