

# Theory-driven evaluation: Conceptual framework, application and advancement

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## 1 Introduction

There is an impressive amount of literature on theory-driven evaluation published in the past few decades. The literature devoted to this topic includes four volumes of *New Directions for Evaluation* (Bickman 1987, 1990; Rogers, Hasci, Petrosino, & Huebner 2000; Wholey 1987), several books (Chen 1990, 2005; Chen/Rossi 1992; (Connell, Kubisch, Schorr, & Weiss 1995; Fulbright-Anderson, Kubisch, & Connell 1998; Pawson & Tilly 1997) and numerous articles published in various journals (see recent review by (Coryn, Noakes, Westine, & Schoter 2011; Hansen & Vedung 2010). Furthermore, major evaluation textbooks (Patton 1997; Posavac & Carey 2007; Rossi, Lipsey, & Freeman 2004; Weiss 1998) have a chapter(s) introducing the concepts, methodology, and usefulness of theory-driven evaluation. The purpose of this chapter is to discuss the conceptual framework, applications, and new developments of theory-driven evaluation for facilitating further advancement.

## 2 Conceptual Framework of Program Theory

The tenet of theory-driven evaluation is that the design and application of evaluation needs to be guided by a conceptual framework called program theory (Chen 1990, 2005). Program theory is defined as a set of explicit or implicit assumptions by stakeholders about what action is required to solve a social, educational or health problem and why the problem will respond to this action. The purpose of theory-driven evaluation is not only to assess whether an intervention works or does not work, but also how and why it does so. The information is essential for stakeholders to improve their existing or future programs.

Theory-driven evaluation is sharply different from another type of evaluation, called black-box evaluation. Black-box evaluation mainly assesses whether an intervention has an impact on outcomes. It does not interest in the transformation process between the intervention and outcomes. Similarly, theory-driven

evaluation is also different from method-driven evaluation. Method-driven evaluation uses a research method as a basis for conducting an evaluation. According to method-driven evaluation proposes the design of an evaluation is mainly guided by the predetermined research steps required by a particular method, quantitative, qualitative, or mixed. Unlike method-driven evaluation views evaluation mainly atheoretical, methodological activities, Method-driven evaluation tends to ignore stakeholders' view and concern in evaluation.

As a basis for designing theory-driven evaluation, program theory is a systematic configuration of stakeholders' prescriptive assumptions and descriptive assumptions underlying programs, whether explicit or implicit (Chen 1990, 2005). Descriptive assumptions, called change model, deal with what causal processes are expected to happen to attain program goals. Prescriptive assumptions, called action model, deal with what actions must be taken in a program in order to produce desirable changes. Theory-driven evaluation uses the action model and change model to address contextual factors and planning and implementation issues that are greatly interested to stakeholders.

*Change Model:* A change model describes the causal process generated by the program. The elements of a change model consist of the following three elements:

*Goals and Outcomes:* Goals reflect the desire to fulfill unmet needs, as with poor health, inadequate education, or poverty. Outcomes are the concrete, measurable aspects of these goals.

*Determinants:* To reach goals, programs require a focus, which will clarify the lines their design should follow. More specifically, each program must identify a leverage or mechanism upon which it can develop a treatment or intervention to meet a need. That leverage or mechanism is variously called the determinant or the intervening variable.

*Intervention or Treatment:* Intervention or treatment comprises any activity (ies) in a program that aims directly at changing a determinant. It is, in other words, the agent(s) of change within the program.

*Action Model:* An action model is a systematic plan for arranging staff, resources, settings, and support organizations to reach a target group and deliver intervention services. The action model consists of the following elements.

*Implementing Organization: Assess, Enhance, and Ensure Its Capabilities:* A program relies on an organization to allocate resources, to coordinate activities, and to recruit, train, and supervise implementers and other staff. How well a program is implemented may be related to how well this organization is structured. Initially, it is important to ensure that the implementing organization has the capacity to implement the program.

*Program Implementers: Recruit, Train, Maintain Both Competency and Commitment:* Program implementers are the people responsible for delivering services to clients: counselors, case managers, outreach workers, school teachers, health experts, and social workers. The implementers' qualifications and competency, commitment, enthusiasm, and other attributes can directly affect the quality of service delivery.

*Peer Organizations/Community Partners: Establish Collaborations:* Programs often may benefit from, or even require, cooperation or collaboration between their implementing organizations and other organizations. If linkage or partnership with these useful groups is not properly established, implementation of such programs may be hindered.

*Intervention and Service Delivery Protocols:* Intervention protocol is a curriculum or prospectus stating the exact nature, content, and activities of an intervention – in other words, the details of its orienting perspective and its operating procedures. Service delivery protocol, in contrast, refers to the particular steps to be taken to deliver the intervention in the field.

*Ecological Context: Seek Its Support:* Some programs have a special need for contextual support, meaning the involvement of a supportive environment in the program's work. Both microlevel contextual support and macrolevel contextual support can be crucial to a program's success. Microlevel contextual support comprises social, psychological, and material supports clients need to allow their continued participation in intervention programs. In addition to microlevel contextual support, program designers should consider the macrolevel context of a program, that is, community norms, cultures, and political and economic processes. These, too, have the ability to facilitate a program's success.

*Target Population: Identify, Recruit, Screen, Serve:* In the target group element, crucial assumptions at work include the presence of validly established eligibility criteria; the feasibility of reaching and effectively serving a target group; and the willingness of potential clients to become committed to, or cooperative with, or at least agreeable to joining the program. Relationships among the components are illustrated in Figure 1.

Figure 1: The Conceptual Framework of Program Theory

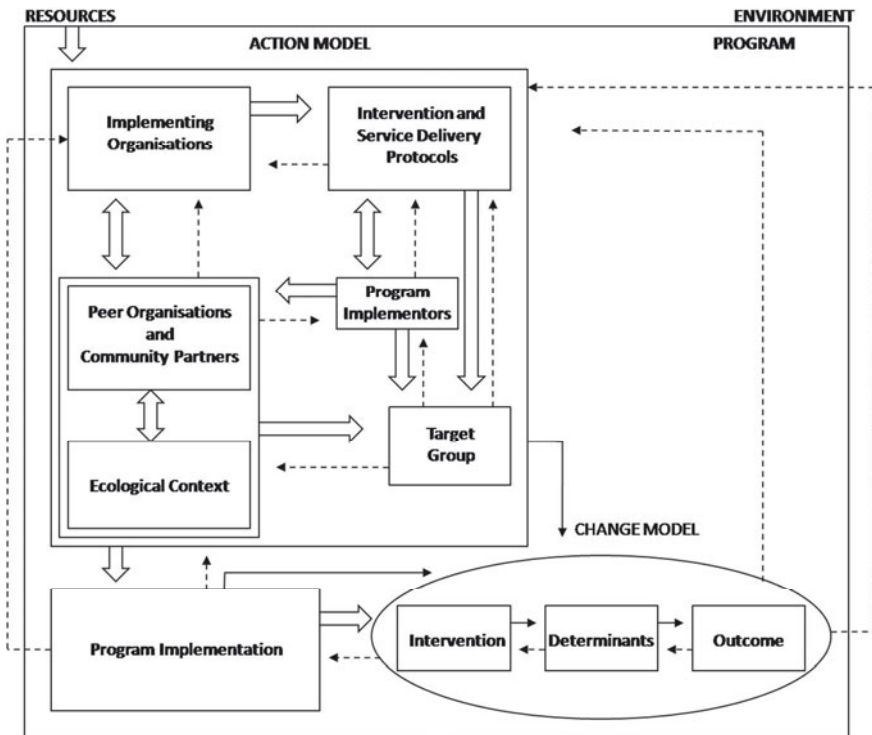


Figure 1 indicates that the action model must be implemented appropriately to activate the „transformation“ process in the change model. For a program to be effective its action model must be sound and its change model plausible; its implementation is then also likely to be doing well. Figure 1 also illustrates evaluation feedback as represented in dotted arrows. Information from implementation can be used to improve the planning or the development of the action model. Similarly, information from the change model can be used to improve the implementation process and the action model. This conceptual framework of program theory should be useful to evaluators charged with designing an evaluation that produces accurate information about the dynamics leading to program success or program failure.

### 3 Examples of Theory-Driven Evaluation

#### 3.1 Example of Theory-Driven Process Evaluation

Comprehensive theory-driven process evaluation is associated with certain strategies and approaches from the taxonomy. Two evaluations are discussed here to show some of the possible functions of this kind of evaluation.

##### 3.1.1 Evaluating an Anti-Drug Abuse Program.

One comprehensive, theory-driven process evaluation that closely mirrors this handbook's conceptual framework of program theory is an evaluation of a large anti-drug abuse program for middle school students in Taiwan (Chen 1997). The program asked teachers to identify drug-abusing students and provide them with counseling services. A small group of top officials within Taiwan's Ministry of Education had designed the program; under the nation's centralized education system, the Ministry of Education approved appointments and salaries of teachers and administrators. When the program began in January 1991, 3,850 students had been identified as active drug abusers. That number declined sharply, plunging 96 %, to 154 students by June 1991.

The program's huge success led to a theory-driven process evaluation being conducted to examine how the program had been implemented. Hopes were that this program's example could foster the smooth implementation of other programs. The anti-drug abuse program featured a documentary program plan, but it was incomplete in comparison to the action model or program plan illustrated in Figure 1. Acting as facilitators, evaluators convened separate focus group meetings with top officials of the education ministry and with teacher representatives to obtain the information needed to complete the program plan. (The separate meetings acknowledged teachers' tendency to be silent in the presence of top officials, who have much more power than teachers do.) Evaluators played the role of facilitators and consultants, helping these key stakeholders develop their program theory. The final version of the program plan ultimately used for evaluation had been agreed to by both groups; the plan is presented on the left side of Table 1.

Table 1: The Spring Sun Program: normative versus actual

<i>Program domains/ dimensions</i>	<i>Normative</i>	<i>Actual</i>
<i>Goal/outcome</i>	Reduction of student drug use to be verified through urinalysis	Reduction of drug use, but urinalysis collection environment not controlled
<i>Treatment</i>	Primary: provide quality counseling to abusers Secondary: basic drug education	Primary: counseling mainly involved use of threats, admonishment, and/or encouragement not to use Secondary: basic drug education
<i>Implementation Environment</i>		
Target group	All drug abusing students	Only those drug abusing students who were easy to reach
Implementors	Teachers provided with adequate drug treatment training and information	Teachers lacked adequate drug treatment skills and information
Mode of delivery	Compulsory individual counseling	Compulsory individual counseling; but with problems such as lack of plan, format and objective
Implementing organisation	All schools that can adequately implement the program	Smaller schools had difficulties implementing the program
Inter-organisational procedures	Effective centralized school system	Communication gap, mistrust between Ministry of Education and the schools
Micro-context	Eliminate video game arcades	Video game arcades still exist
Macro-context	Strong public support	Strong public support, but problematic education system (elitism)

The program plan entailed mixing research methods – both quantitative and qualitative – to collect data. For example, quantitative methods were applied to rate teachers' satisfaction with a workshop on drug counseling skills sponsored

by the education ministry, whereas qualitative methods were used to probe contextual issues of the teachers' opinions of the workshop. The right side of Table 1 displays empirical findings for the program's real-world implementation; comparison of the program theory to the implementation reveals large discrepancies. The program had been carried out, but the quality of services and the system of implementation were far from being impressive. The discrepancies between plan and implementation resulted from a lack of appropriate counseling training, the overburdening of teachers with counseling work with no change to their usual teaching responsibilities, and lack of communication as well as mistrust between an authoritarian ministry and the teachers. The evaluation results created doubt about how a program without strong implementation achieved a 96 % decrease in drug abuse in schools.

### 3.2 *Examples of Theory-Driven Outcome Evaluation*

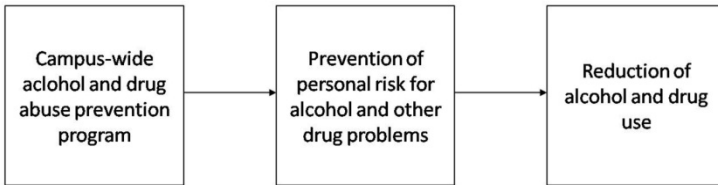
Two basic models of intervening mechanism evaluation predominate in the discipline: linear and dynamic.

#### 3.2.1 The Linear Model

The linear model is currently a very popular application of intervening mechanism evaluation. Linear models assume that the causal relationships among interventions, determinants, and outcomes are unidirectional: intervention affects determinant, and determinant then affects outcome. No reciprocal relationships operate among the variables. In linear models, the number and sequence of the determinants under study determine the model's form. The following causal diagrams illustrate the common linear model forms.

*One-Determinant Model.* This model, represented by Figure 2, contains a single determinant and is the fundamental model for intervening mechanism evaluation.

Figure 2: An example of a one-determinant model

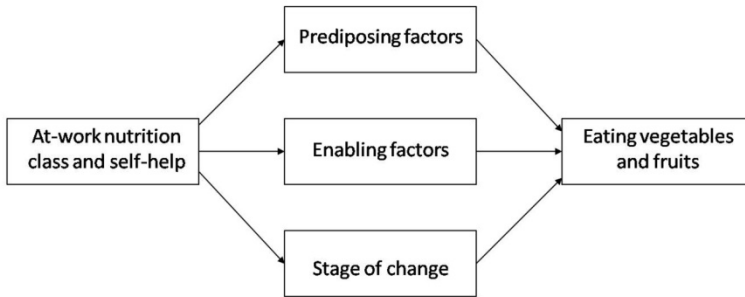


The one-determinant model is illustrated here by an evaluation of an alcohol and drug abuse prevention program at a college (Miller, Toscova, Miller, & Sanchez 2000). The intervention consisted of multiple components: print media, videotapes, speakers, referral services, and development of self-control. The determinant was perception of risk, and the outcome was a reduction in alcohol and drug use among the students on the campus where the program was established. As predicted, the data showed that after the interventions, there was heightened awareness on campus of the risks of substance abuse, which in turn reduced alcohol and drug use there. The one-determinant model is relatively easy to construct.

*Multiple-Determinant Model, No Sequential Order.* Another common linear model is the model with two or more determinants, each affected by the intervention or affecting the outcome, but in no particular sequence. A workplace nutrition program provides an example of the multiple-determinant model (Kristal, Glanz, Tilley, & Li 2000). The intervention featured at-work nutrition classes and self-help. The stakeholders and evaluators selected three determinants: predisposing factors (skills, knowledge, belief in diet-disease relationship), enabling factors (social support, perceived norms, availability of healthful foods) and stage of change (action and maintenance stages being subsequent to the intervention). The outcome variable was dietary change (eating vegetables and fruits). The model of this program is illustrated in Figure 3.



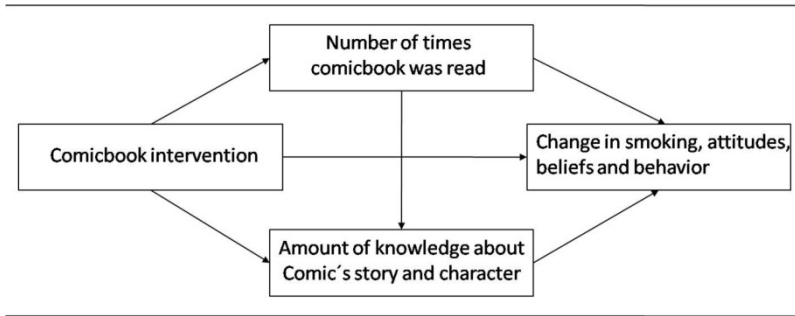
*Figure 3:* Workplace nutrition program as a multiple determinant. No sequential order.



Kristal and colleagues found that the intervention did enhance predisposing factors as well as the likelihood of entering and remaining in the subsequent stages of change. They also found that the intervention did not affect enabling factors. The program was failing because the intervention was failing to activate one of the three determinants.

*Multiple-Determinant Model With Sequential Order.* The model containing two or more determinants aligned in a causal order is a multiple-determinant model with a sequential order. That is, certain determinants affect others in a particular sequential order. An example of this kind of linear model is found in an evaluation of a school-based antismoking campaign (Chen, Quane, & Garland 1988). The intervention contained components such as an antismoking comic book, discussions of the health messages the comic book delivered, and parental notification about the intervention program. The determinants of the model, in sequence, were the number of times the comic book was read, and knowledge of the comic book's story and characters. The sequential order indicates that repeated reading of the comic book changed the extent of knowledge about the plot and characters. The sequence is illustrated in Figure 4.

Figure 4: Antismoking program as a multiple-determinant with sequential order model



The outcome to be measured was change in attitudes, beliefs, and behaviors related to smoking. The evaluation determined that the distribution of the comic book affected the number of times the comic book was read, which in turn affected knowledge of its content. However, neither of these determinants was shown to affect students' smoking-related attitudes, beliefs, or behaviors.

*The Dynamic Model.* The dynamic model of intervening mechanism evaluation assumes that multidirectional, reciprocal causal relationships exist among intervention, determinant, and outcome. The relationship between determinant and outcome, especially, is reciprocal rather than one-way: The determinant affects the outcome, and the outcome also affects the determinant. A hypothetical educational program illustrates the model well. The project's focus was to equip parents with skills and strategies to assist their children with homework; homework had been chosen as a determinant of primary students' school performance. The model made clear, however, that the relationship between parental involvement and student performance need not be linear. Parents becoming more involved in a child's schoolwork might improve the child's performance, and then seeing the improved performance, parents perhaps might feel gratified, stimulating their willingness to devote time and effort to remaining involved in the child's education. This form of the dynamic model is represented in Figure 5.



<http://www.springer.com/978-3-531-18306-0>

Evaluation von Programmen und Projekten für eine demokratische Kultur

Strobl, R.; Lobermeier, O.; Heitmeyer, W. (Hrsg.)

2012, VI, 229 S. 25 Abb., Softcover

ISBN: 978-3-531-18306-0