Theory-Driven Evaluation for Assessing and Improving Planning, Implementation, and Effectiveness

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Ground Rules of the Workshop

- Share your ideas, experience, and questions with others
- Respect different views and opinions
- Support a pleasantly learning environment

Part I: Basic Concepts and Conceptual Framework

Historical Background

An Alternative to method-driven and black-box evaluation :

- Method-Driven Evaluation

- Black-Box Evaluation
  Intervention ⟶ Outcomes

- Theory-Driven Evaluation
  How? Why?

Literatures on Program Theory and Theory-Driven Evaluations

- **New Directions of Evaluation**
  Bickman (Ed.), 1987, 1990
  Roger, et al., (Eds.) 2000

- **Books**
  Major evaluation text books (chapters on program theory)
  Chen, 1990
  Chen and Rossi, (eds.) 1992
  Chen, 2005
  Donaldson 2007

- **Major evaluation text books have a chapter on theory-driven evaluation**

- **Many articles**

Program Theory (1)

- Bickman (1987): a model of how a program is supposed to work.
- Wholey (1987): identifies program resources, program activities, intended program outcomes, and specifies a chain of causal assumptions linking these components.
- Weiss (1995): a picture of how and why programs work.

Definitions of program theory (2)

Chen (1990): What must be done to achieve the desirable goals, what other important impacts may also be anticipated, and how these goals and impacts would be generated.

Chen (2005): A set of stakeholders' Implicit and explicit assumptions on what actions are required to solve a problem and why the problem will respond to the actions.

Descriptive assumptions (**Change Model)**
Prescriptive assumptions (**Action Model**)

Do stakeholders have a program theory underlying their program?

Do they have a change model? (Why would the intervention affect the outcome?)

- Academic theory (explicit)
- Stakeholder theory (implicit)

Do they have an action model (What actions are needed?)

- Who should be the implementers?
- How to recruit clients?
- How to deliver the intervention?
- etc.

Example of Change Model

- **Stakeholder theory of a HIV Prevention Program for youth**

Inviting HIV+ speakers → **?** → **Safe Sex**

Condom Distribution → **?** → **Safe Sex**

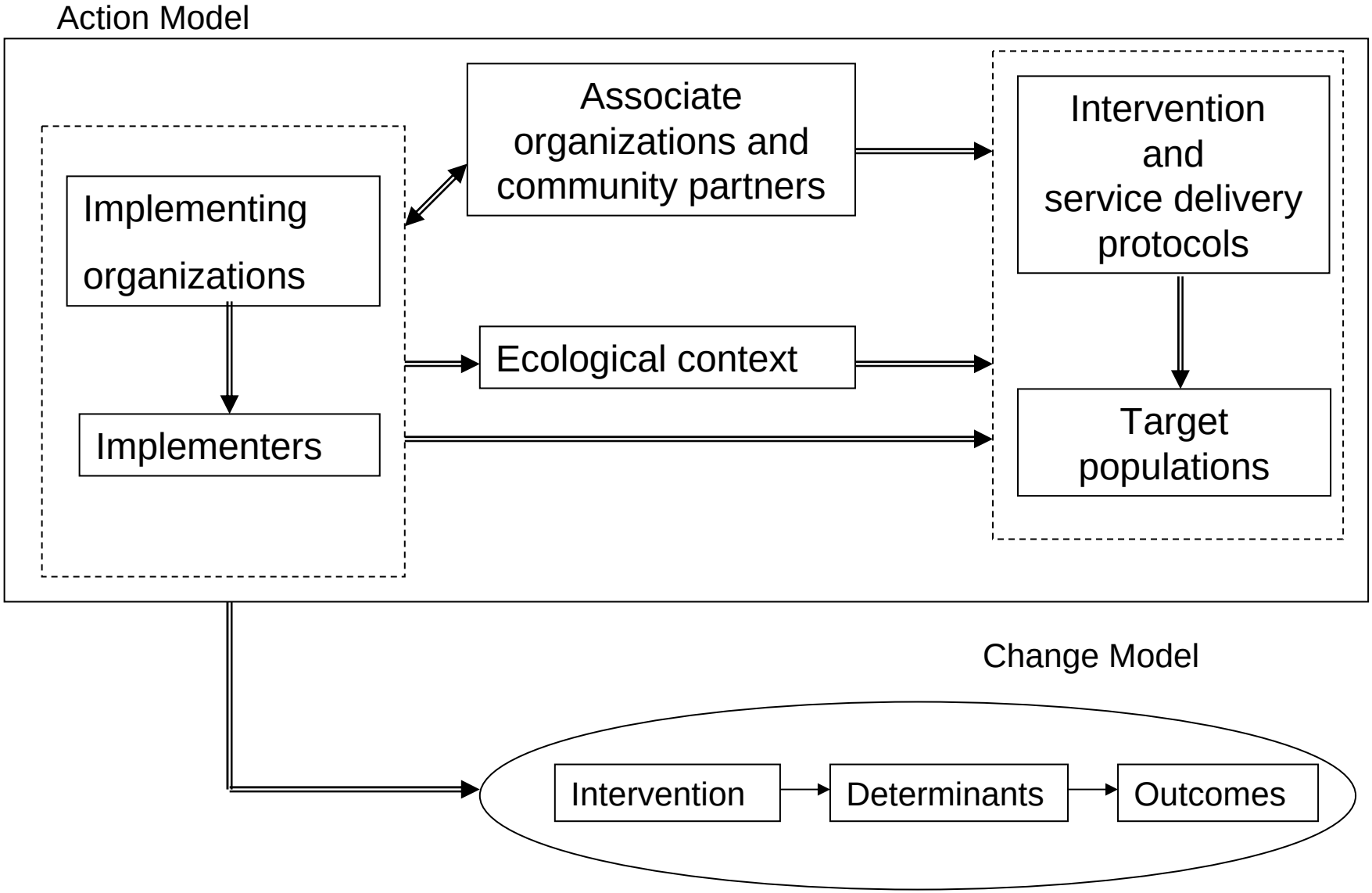
Examples of Stakeholder Theory: Laub et al., 1999

- **Stakeholder theory of a HIV Prevention Program for youth**

Inviting HIV+ speakers → **Youth feel they are not invincible for HIV** → **Safe Sex**

Condom Distribution → **Condom Availability** → **Safe Sex**

PROGRAM THEORY



Theory-Driven Evaluation

- Evaluators facilitate program stakeholders to clarify their program theory. (program theory: stakeholders' implicit and explicit assumptions on what actions are required to solve a social or health problem and how the problem will respond to the actions.)

- The program theory is then used as a framework to guide the design of evaluation design, the selection of research methods, and the collection of data.

Applications of Theory-Driven Evaluation

- **Theory-driven outcome evaluation (change model)**
- **Theory-driven process evaluation (action model)**
- **Theory-driven approach for program planning**

  (action model and change model)

Part II: Theory-Driven Outcome Evaluation

Change Model

Components of a Change Model

– Intervention
– Determinants: Causes of a Problem
Leverages
Intervening variables
Mediators
– Outcomes

Examples of Stakeholder Theory: Laub et al., 1999

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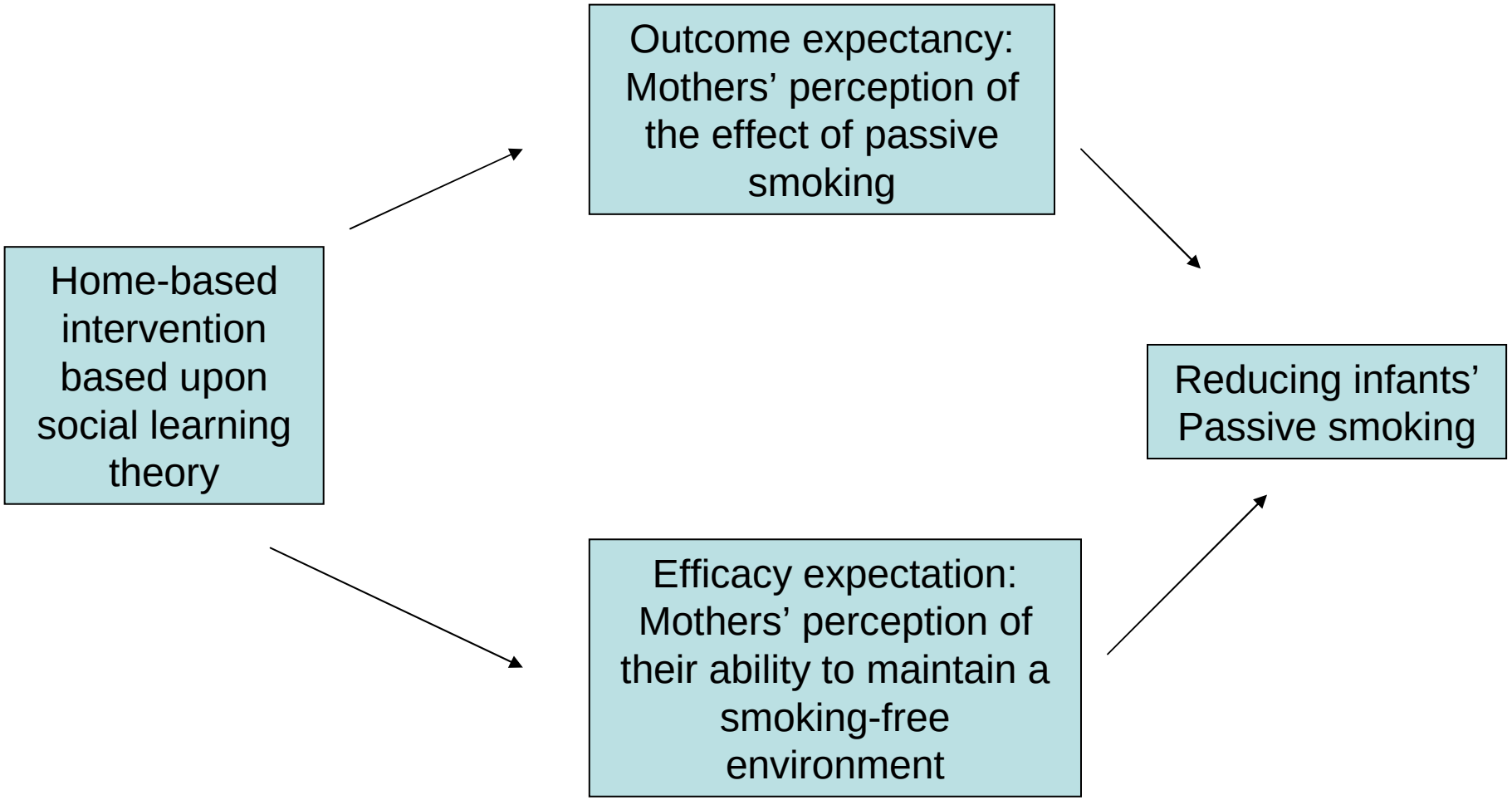
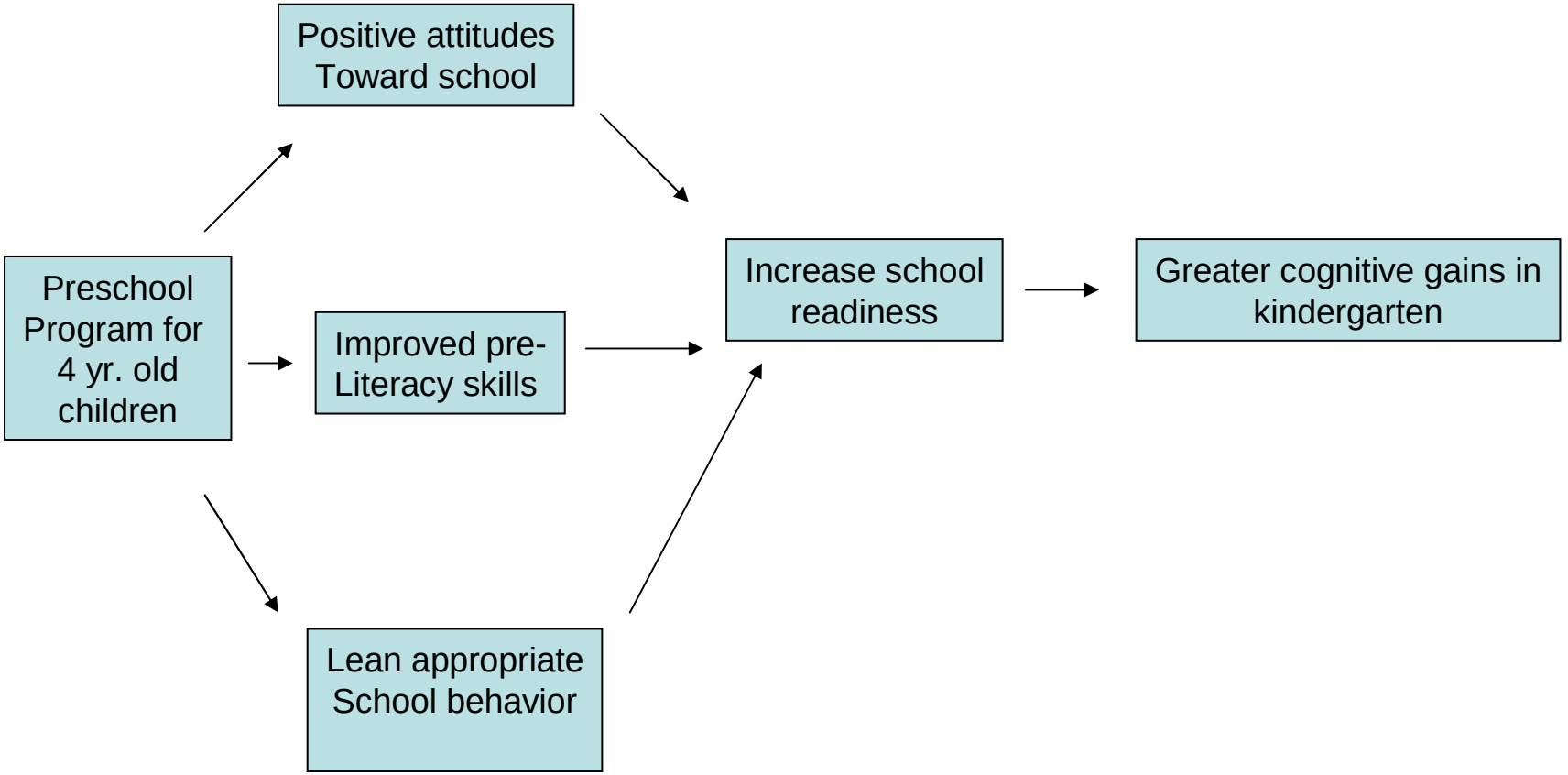
Academic theory based intervention: Stretcher, et al., 1989



Example of Change models



Exercise 1: Academic vs. Stakeholder Theory

- Program goal: Reduce exposure to secondhand smoke among residents of low-income housing project
- Planning group: Stakeholders (NGOs) and professors
- Interventions:

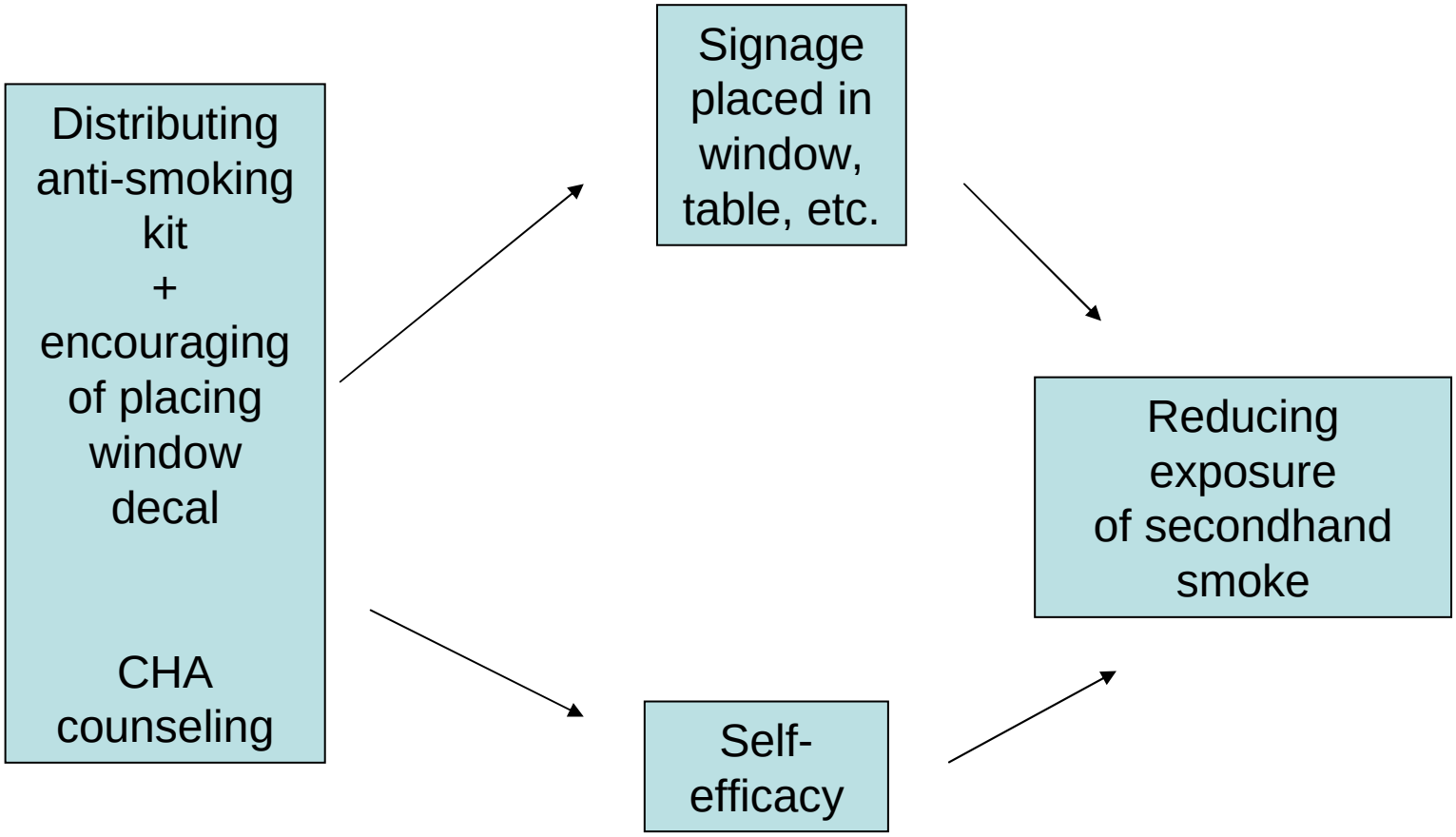
  Professors: Community health advisor (CHA) model

  Stakeholders: Education/signage intervention (Encourage residents to place signage such as window decal: " This is a Smoke-Free Home.")
- Outreach workers: 7 female residents receiving unemployment checks
- Budget: moderate

<u>Exercise questions</u>:

1. Discuss the rationales used by stakeholders and professors for proposing different interventions
2. Discuss the pros and cons of these two types of interventions

Program theory underlying the intervention



Conceptual Facilitation

- Evaluators' role: facilitator
- Principles of facilitation:
  - Respect
  - Fairness
  - Parsimony
  - Stakeholders' ownership

How to clarify stakeholders' change model or program theory (conceptualization facilitation)

- Facilitating stakeholders to clarify their program theory

- Formats
  - Intensive interview
  - Working group meeting

- Theorizing Methods
  - Forward reasoning
  - Backward reasoning
  - Both

Clarifying Stakeholders' Change Model:

1. Clarifying Goals/Outcomes

- **Avoid a goal trap**
  Official goals vs. operative goals
  Ex. Official goals of a prison (rehabilitation?)

- **Stress the measurability**
  Enhancing elderly people's social functioning

- **Stress the plausibility of goals**
  Desirable goals vs. plausible goals
  Ex. The goal of a media program is to
  eliminate racism

- **Issues on intended and unintended outcomes**

  Unintended outcomes: negative
  positive

2. Clarifying Determinants

- Determinants: Causes of a problem, leverages, intervening variables, mediators

- Stakeholders usually make a set of implicit assumptions on determinants when they design an intervention program

Ex. Wife abuse program

Why do husbands abuse their wife?

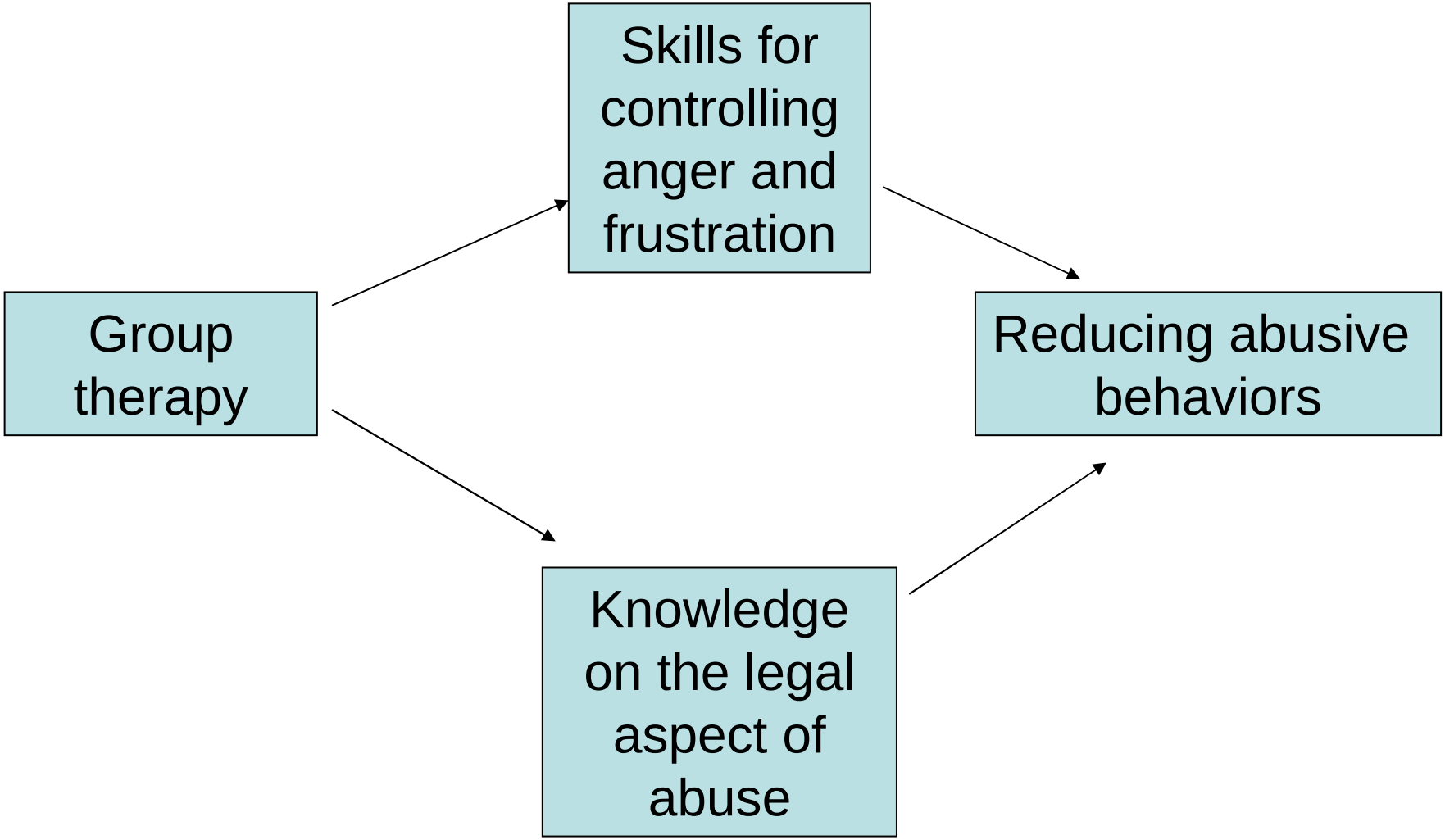
power factors

cultural factors (e.g. rule of thumb)

anger control

criminal justice factors

Stakeholders' change model



3. Clarifying Intervention

- What is the intervention? What are the essential elements?

  Intervention vs. supportive activities?

- Do stakeholder groups agree on the intervention?

Conceptualization Facilitation

Theorizing Methods

- Backward reasoning

  Why?

  Intervention ← Determinants ← Outcomes

- Forward reasoning

  Intervention → Why? → Outcomes

  (Determinants)

- Both

Use a change model to conduct outcome evaluation

- **Clarifying program theory**
  Qualitative methods

- **Measures**
  Find indicators or develop instruments for measuring intervention, determinants, and outcomes

- **Research design**
  Using a rigorous design (i.e., experimental and quasi-experimental design) to provide credible evidence among these components

- **Data collection**
  Quantitative methods

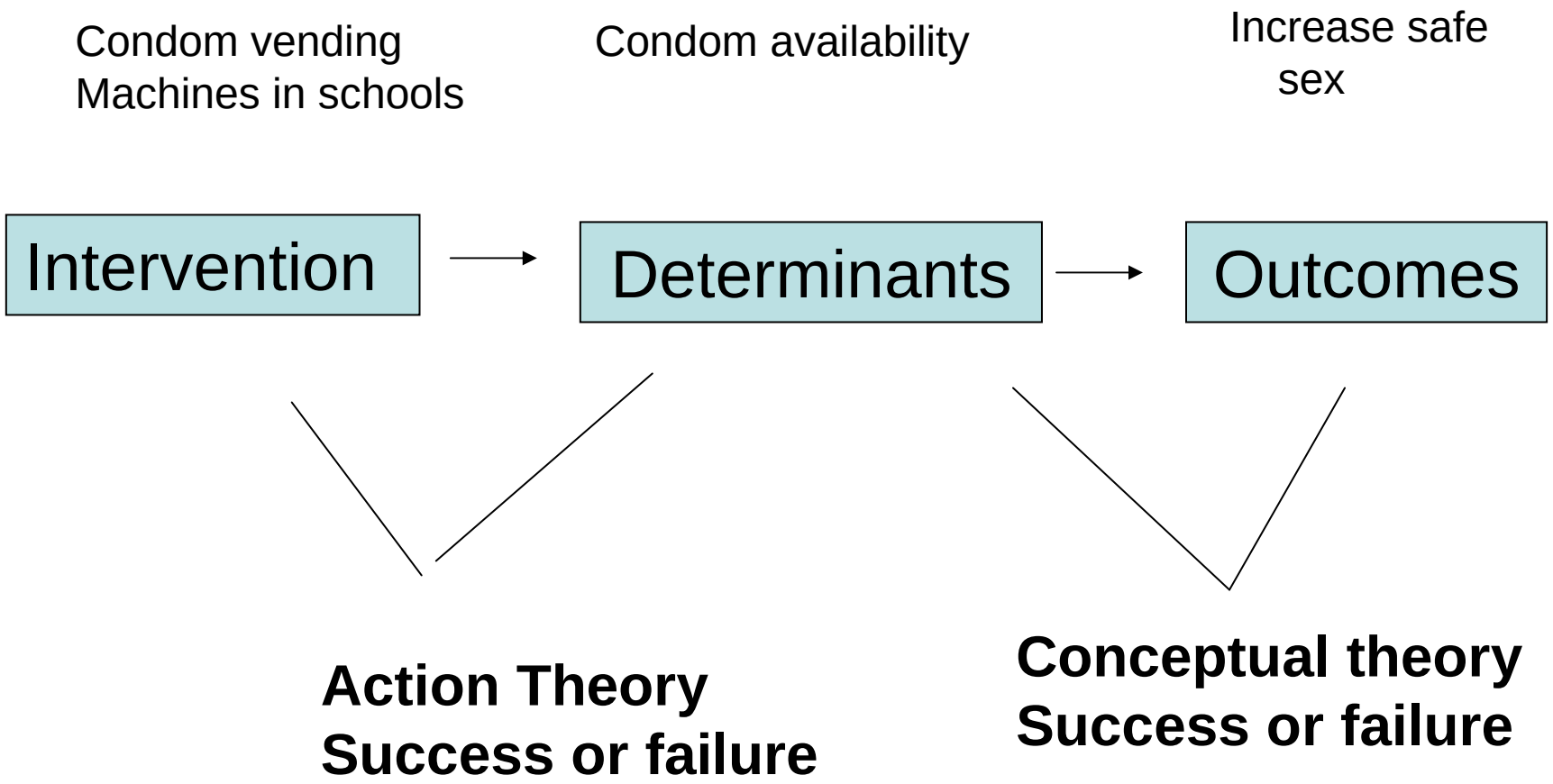
- **Statistical Analysis**
  Path analysis, structural equations model

Advantages to evaluate a change model

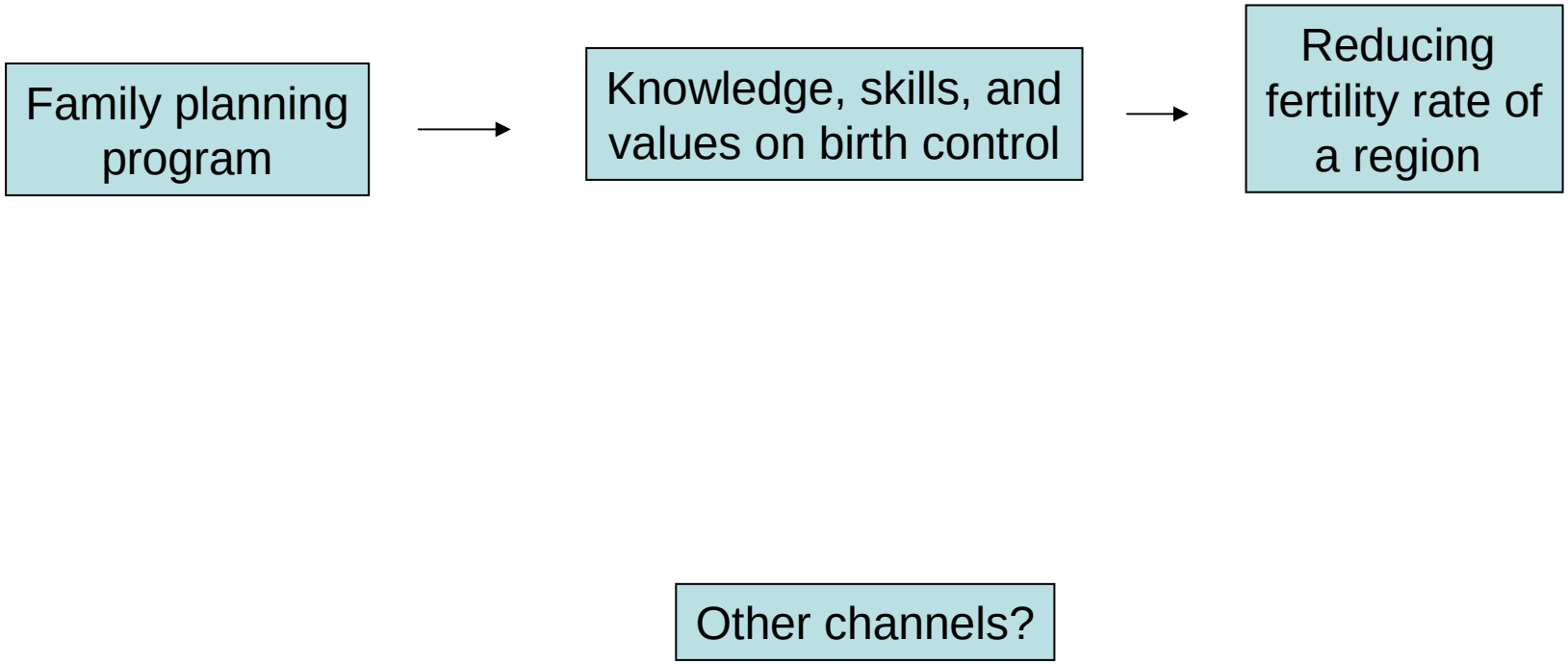
1. Understanding why a program was successful or not

- Action theory: Success or fail
- Conceptual theory: Success or fail

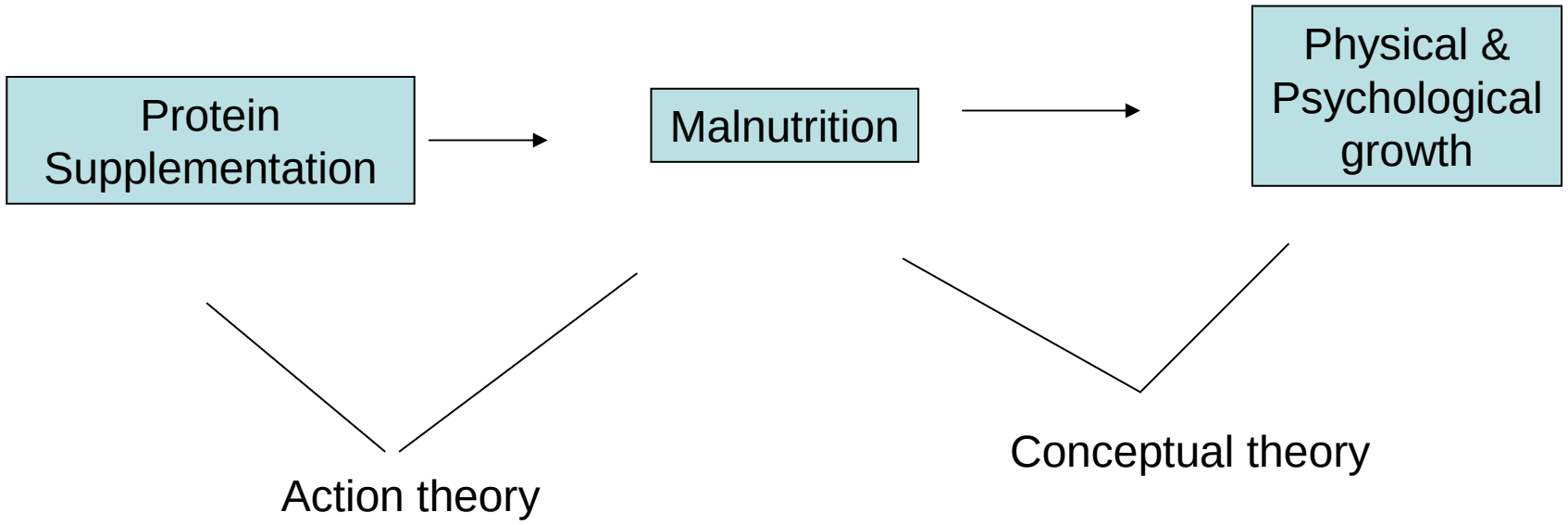
Concepts of Program Success or Failure



2. Enhance construct validity of evaluation



3. Formative feedback on the mediating process for early improvement



Methods Used to Assess a Change Model

Change Model Clarification	**Empirical assessment**
Qualitative methods	**Quantitative methods :**
In-depth interview Working group	**Design**: Experimental, quasi-experimental, pre-experimental designs **Statistical Model**: Path analysis Structural equation model **Qualitative Methods:** optional

Part II: Theory-Driven Approach for Program Planning

Program Theory and Program Planning

- Facilitating stakeholders to clarify their program theory
- Stakeholders want evaluators to help in the planning stage
  - To enhance the soundness of program theory
  - To build a consensus on the program theory among different stakeholder groups before implementation

Consensus issue and the implication of evaluation criteria

Ex. The first Head Start evaluation

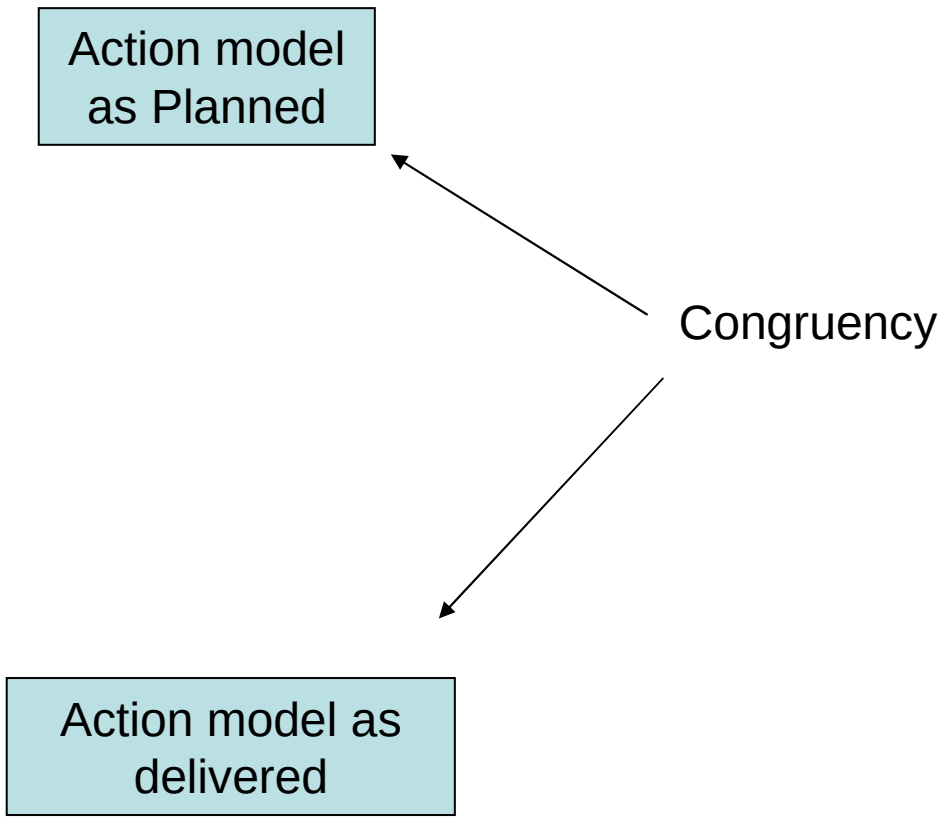
- Evaluators mainly assessed the program by using the following goals proposed by federal government: math and reading scores

  The evaluation results: the program has little effects on math and reading score

- Managers and teachers of the local head start centers: The evaluators evaluate wrong goals.

  Their goals: nutrition, physical and emotional development, dental hygiene, social skills, and parenthood.

Part III: Theory-Driven Process Evaluation


Action model as Planned
Congruency
Action model as delivered

Theory-Driven Process Evaluation

- Clarifying stakeholders' action model
- Applying conceptualization facilitation

  Intensive interview or working group meeting
- Research methods used to collecting data for assessing the actual implementation: mixed methods
- Assessing the congruency between the plan and actual implementation

Issues on Incongruence between plan vs. actual implementation

- Fidelity tradition
- Adaptation tradition

Issue 2: Theory-Driven Evaluations and Mixed Methods

Theory Clarification	**Empirical Assessment**
Qualitative	**Quantitative (Switch)** **Mixed methods for different components (Complementarity)** **Mixed methods for including contextual information (Contextual overlaying)** **Mixed methods for triangulation (Triangulation)**
Quantitative	**Qualitative (Switch)** **Mixed methods, etc.**

Strategies for Conceptualization Facilitation

- Same as those in the change model

Facilitating Stakeholders to Clarify their Action Model

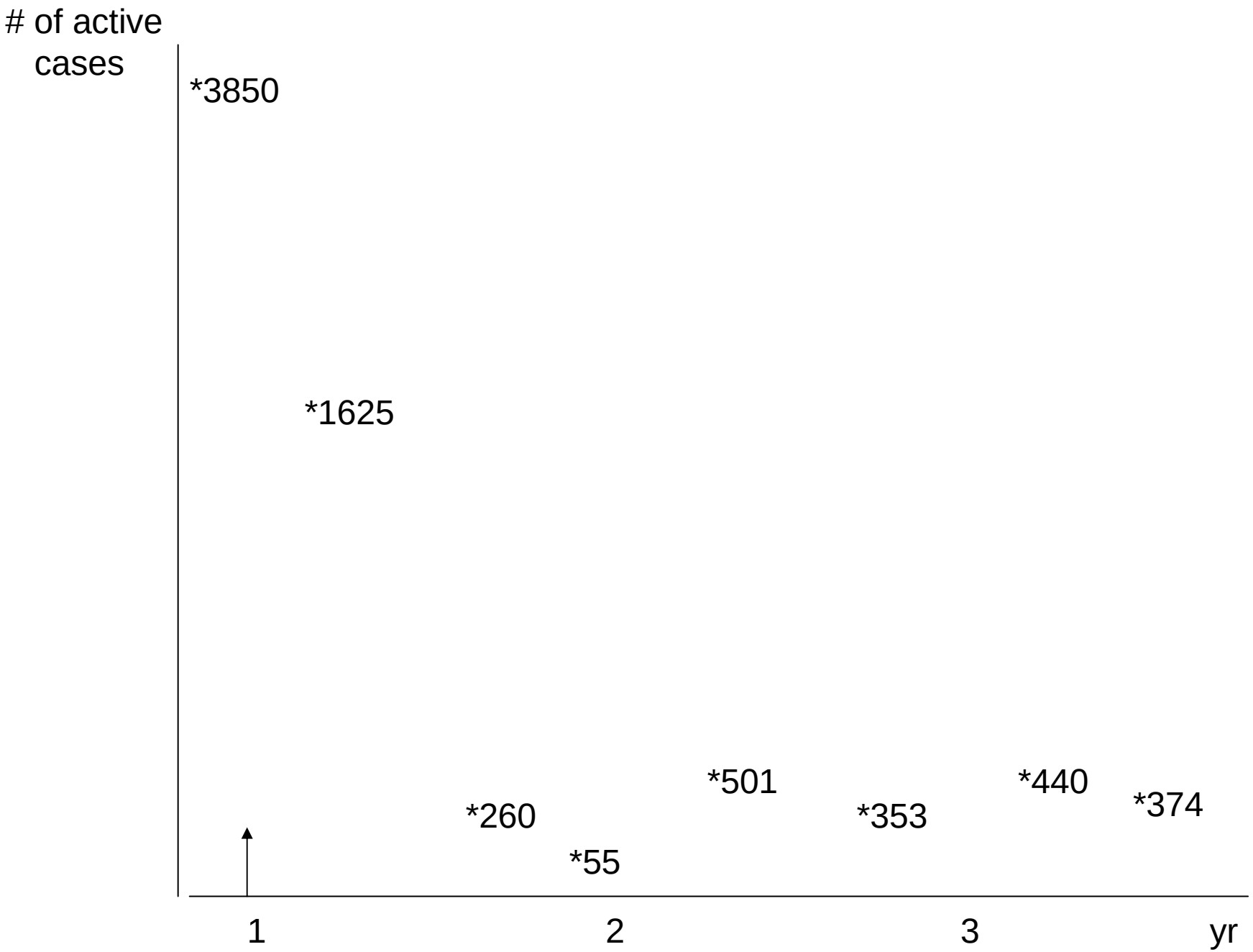
- **Implementing organizations**: Assess, enhance, and ensure its capacities
- **Implementers**: recruit, train, and maintain both competency and commitment
- **Intervention protocol**: Make it available
- **Associate organizations**: Establish collaboration
- **Ecological context**: seek its support
- **Target population**: identify, recruit, screen, serve
- **Goals/Outcomes:** measurability, plausibility

Theory-Driven Process Evaluation

Program components in an action model	Program Plan	Actual implementation	Data (quat. Or qual.)
Target population			
Implementing org.			
Implementers			
Intervention and service delivery protocols			
Associated orgs./ partners			
Ecological support			

Theory-Driven Process Evaluation in Action: Evaluating a School-Based Anti-Drug Abuse Program in Taiwan

- Drug abuse among middle school students had worsened
- The Ministry of Education launched a national anti-drug abuse program to deal with the problem
- Teachers were trained to identify drug abusing students and provide counseling
- Schools were required to file monthly reports on the numbers of active drug abusing students to the ministry


# of active cases
*3850
*1625
*260
*55
*501
*353
*440
*374
1
2
3
yr

Theory-Driven Process Evaluation Application Procedures

- Working group meetings with key officials at the Ministry of Education to develop an action model
- Working group meetings with representatives of teachers to develop their version of the action model
- Synthesized two groups into a combined version for feedback
- Used mixed methods (site visits, survey, participant observation, focus group meetings, interviews, record checking) to collect implementation data

Action Model as Planned vs. as Implemented

Component	Plan	Actual implementation
Target population	All drug abusing students Verified through urinalysis	Easy to reach students Urinalysis was not controlled
Implementers	Competent in delivering the intervention	Inadequately trained

Action Model (cont)

Component	Plan	Actual implementation
Intervention protocol	High quality counseling	Admonishments, threats, encouragements
Service delivery protocol	Compulsory individual counseling	Lacked plan and objectives

Action Model (cont)

Component	Plan	Actual implementation
Implementing Organizations	Every School	Smaller schools not involved
Linking with associate organizations	Effective centralized school system	Communication gap; mistrust between schools and ministry of education

Action Model (cont)

Component	Plan	Actual implementation
Ecological Context		
Micro	Eliminating video game arcades	Video game arcades still exist
Macro	Strong public support	Strong public support

Part IV: Advanced Issues

- Top-down approach and evidence-based intervention

Evidence –Based Interventions (EBIs) and the Top-Down Approach

- EBIs: Interventions proven efficacious by rigorous methods in controlled settings. Rigorous methods usually means randomized controlled trials (RCTs).

- The top-down approach:
  1. Efficacy evaluation (EBIs): Providing strongest evidence of effectuality of an intervention (Maximizing internal validity)
  2. Effectiveness evaluation: Providing evidence that the effectuality is transferable to the real-world (external validity)
  3. Dissemination

Limitations of the EBIs:

1. 1. EBIs are not necessarily to be effective in the real world.

2. EBIs are not relevant to real-world operations.

3. EBIs do not adequately address issues and interests of stakeholders.

4. EBIs Can be implemented by stakeholders with high fidelity in the real-world context.

Limitation #4: Difficulties in implementing EBIs in the real world

- National Cooperative Inner-City Asthma Study (NCICAS): Trained master's level social workers to provide families asthma and psychosocial counseling.

- NCICAS had features of an efficacy evaluation such as:
  -- monetary and child care incentives
  --highly committed counselors,
  --food/refreshments during counseling,
  --frequent contacts with participants,
  --counseling sessions were held at regular hours,
  etc.

Limitation #4: Difficulties in implementing EBI in the real world (continued)

- The Inner-City Asthma Intervention (ICAI): Implementing NCICA as an intervention in the real-world.
- Difficulties in delivering the exact NCICAS in the real world: Many adaptations and changes.

  -Were difficulties to contact and meet with families

  -Held sessions in evenings or weekends

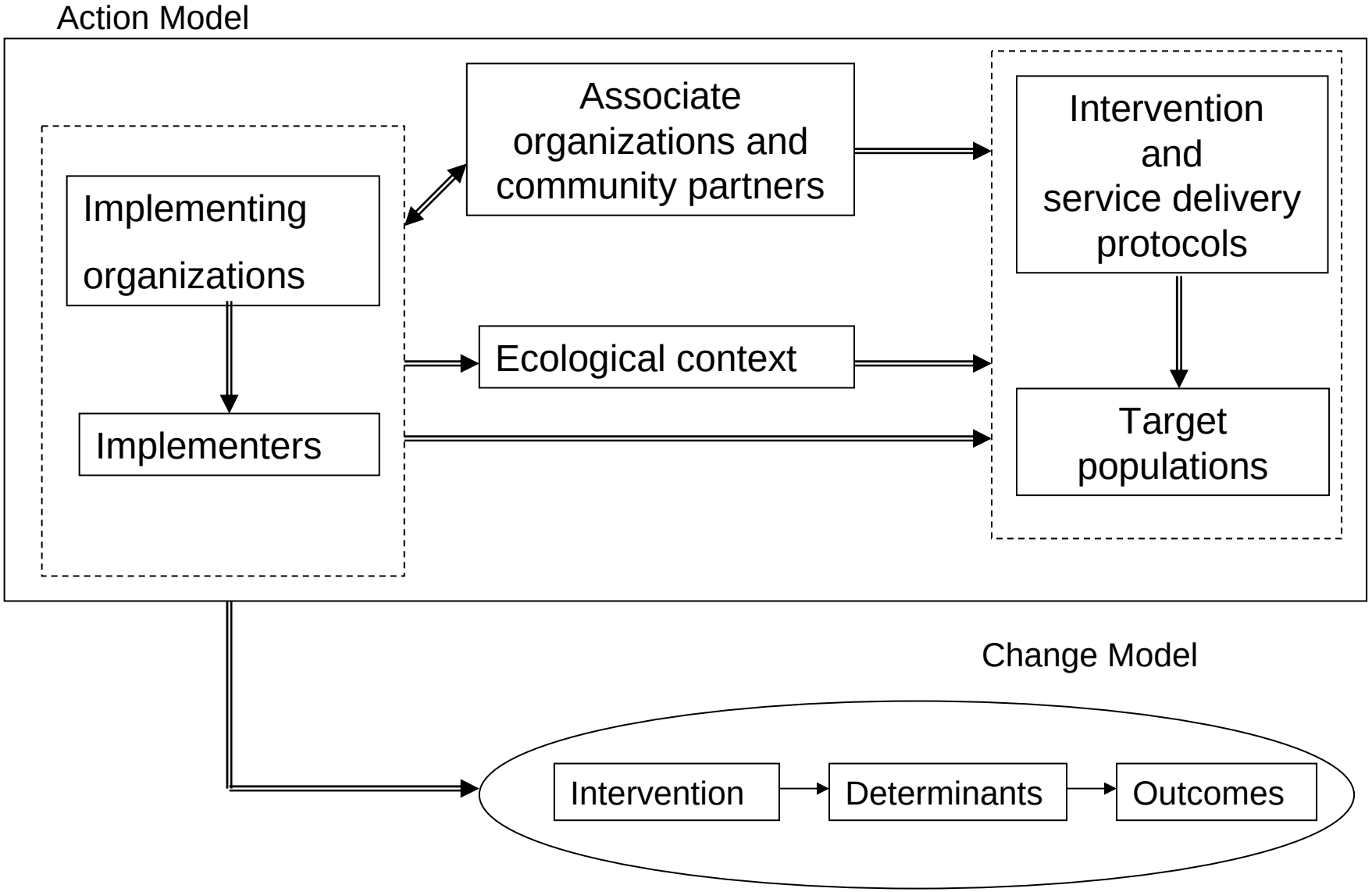
  -Provided no monetary and child care incentives

  -Provided no food/refreshments

  - Had difficulties in retaining social workers

- Only 25% of the children completed the intervention

PROGRAM THEORY



Integrative Validity Model

- Effectual validity : Evidence on an intervention's effectuality
- Viable validity: Evidence on an intervention's viability
- Transferable validity: Evidence on transferability of an intervention's effectiveness and /or viability

* The model is an expansion of the distinction of internal and external validity by Campbell and Stanley's (1963)

An Alternative: Integrative Validity Model and "Bottom-Up" Approach (Continued)

Concept of Viability

Components:

Practical, suitable, affordable, evaluable, and helpful.

An Alternative: Integrative Validity Model and "Bottom-Up" Approach (Continued)

Viability Evaluation

- Assess the extent to which an intervention program is viable in the real world (e.g., practical, suitable, affordable, evaluable, helpful)

- Methodology: Mixed methods (e.g., pretest-posttest, interviews, focus groups, survey)

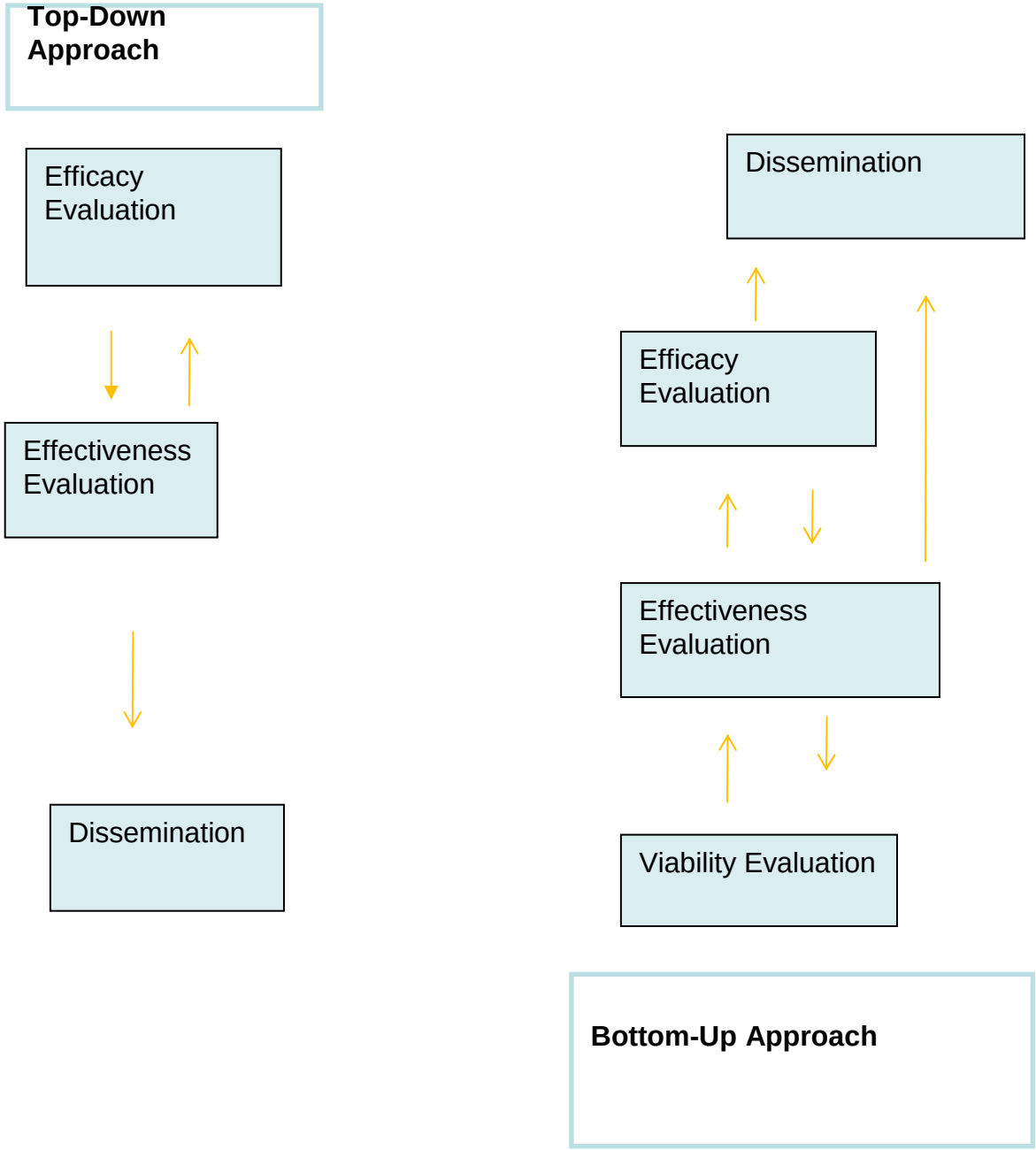
The Bottom-Up Approach

- Start with addressing viable validity (viable evaluation), optimize effectual validity and transferable validity (effectiveness evaluation),

  then maximize effectual validity (efficacy evaluation)

- Only *viable* interventions are worthy of *effectiveness evaluation*

- Only those interventions that are *viable*, *effective*, and *capable of generalization* are worthy of *efficacy evaluation*


Top-Down Approach
Efficacy Evaluation
Effectiveness Evaluation
Dissemination
Dissemination
Efficacy Evaluation
Effectiveness Evaluation
Viability Evaluation
Bottom-Up Approach

Exercise 2: What are the pros and cons of the top-down approach and bottom-up approach?

- Top-down approach

  Pros

  Cons

- Bottom-up approach

  Pros

  Cons

References

- Chen, H.T. 2005. Practical Program Evaluation: assessing and improving program planning, implementation, and effectiveness. Sage.

- Chen, H.T. 1990. Theory-Driven Evaluations. Sage.

References

- Chen HT. 2010. “The bottom-up approach to integrative validity: a new perspective for program evaluation.” Evaluation and Program Planning 33(3): 205–14.

- Chen HT, Donaldson S, Mark M, (Eds.) Advancing Validity in Outcome Evaluation: Theory and Practice. New Directions for Evaluation (forthcoming).

- Chen HT and Garbe, P, “Assessing program outcomes from the bottom-up approach: An innovative perspective to outcome evaluation”, in Chen HT, Donaldson S, Mark M, (Eds.) Advancing Validity in Outcome Evaluation: Theory and Practice. New Directions for Evaluation (forthcoming).