

## CASE 1: COGNITIVE BEHAVIORAL THERAPY IN CHICAGO SCHOOLS

Theory of Change and Measuring Outcomes



Young men participate in an activity for the Becoming a Man program in Chicago.  
Photo: Rob Kozloff | University of Chicago

This case study is based on "[Thinking, Fast and Slow? Some Field Experiments to Reduce Crime and Dropout in Chicago](#)" by Heller et. al. (2017), *Quarterly Journal of Economics*.

J-PAL thanks the authors for allowing us to use their paper as a teaching tool.

## KEY VOCABULARY

<b>Hypothesis</b>	A proposed explanation of and for the effects of a given intervention. We can think of this as a claim to be tested. Hypotheses are intended to be made prior to the implementation of the intervention. e.g. <i>Giving textbooks to students will improve student learning.</i>
<b>Theory of Change</b>	Describes a strategy or blueprint for achieving a given long-term goal. The theory of change identifies the preconditions, pathways, and interventions necessary for success.
<b>Logical Framework<sup>1</sup></b>	A management tool used to facilitate the design, execution, and evaluation of an intervention. It involves identifying the inputs, outputs, outcomes, indicators and impact of an intervention. A logical framework is used to establish the causal relationships between these elements and the assumptions and risks that may influence the success and failure of the intervention.
<b>Assumption</b>	A precondition that underpins a theory of change or model. An assumption cannot be directly observed or verified e.g. <i>When students read textbooks, they learn from them.</i>
<b>Input</b>	An activity carried out as part of a program or intervention e.g. <i>Textbooks are given to schools.</i>
<b>Output</b>	A step in the planned implementation of a program or intervention – a.k.a. a direct result in response to the inputs e.g. <i>Students receive textbooks through schools.</i>
<b>Outcome</b>	A change or impact caused by the program that is being evaluated e.g. <i>Increase in student learning levels.</i>
<b>Intermediate Outcomes</b>	Observable changes or impacts caused by the program that are not the ultimate outcome of interest, but necessary along the way to achieving a final outcome e.g. <i>Increase in students who have passing test scores for the semester.</i>
<b>Final Outcomes</b>	Changes or impacts that are of ultimate interest to researchers and/or program implementers; these are often the overall goals of a program e.g. <i>Increase in high school graduation rates.</i>
<b>Indicator</b>	An observable metric used to measure an outcome e.g. <i>Student test scores.</i>
<b>Instrument</b>	The tool used to measure an indicator e.g. <i>A set of test questions</i>

<sup>1</sup> These definitions of hypothesis, theory of change, and logical framework are based on those in Module 5.1: Theory of Change from Glennerster and Takavarasha's *Running Randomized Evaluations*. <http://runningres.com/case-studies>

## LEARNING OBJECTIVE

To better understand measurement and the theory of change concept. Specifically, to understand the importance of theory of change in deciding what research questions to ask, what data to collect, and what outcomes to measure.

## SUBJECTS COVERED

Theory of change, defining a hypothesis, selecting indicators, measuring outcomes, and measuring the impact of a program or policy.

## INTRODUCTION

Violence and crime often have disproportionate harmful effects on young men in low-income settings. Violence, crime, and the root causes of violence and crime can exacerbate risk and uncertainty within communities, limiting safety, prosperity, and quality of life. Systemic factors shape the risks young men face, the choices and tradeoffs they must make, and their way of thinking, reacting, and forming decision-making strategies. While young adults in any context may struggle to develop a positive identity and strategies for responding to stress and threats, those who grow up in low-income or violent settings typically face more challenges and receive less support than their peers who grow up in higher-income or less violent settings.

Violent crime can arise from smaller, non-violent altercations that escalate. Chicago police attributed 75 percent of homicides in the city in 2015 and 2016 to altercations that escalated.<sup>2</sup>

This case study will look at a program aimed at reducing violent crime and improving educational outcomes among male youth in Chicago from low-income households through the use of cognitive behavioral therapy (CBT) in Chicago Public Schools and Juvenile Detention Centers. CBT is a short-term, goal-oriented psychotherapy treatment that takes a hands-on, practical approach to problem solving.<sup>3</sup> Its goal is to introduce skills and change patterns of thinking or behavior, thereby changing the way individuals feel and respond.

*Note: This case study focuses on specific behavioral mechanisms that contribute to violent behavior and escalation, which are the focus of the original study on which this case is based. Because the original study does not focus on societal factors such as race, socioeconomic status, or geographical location or on systemic barriers or inequities, this case similarly does not focus on these factors.*

<sup>2</sup> “How to stop guns, gangs and poverty? Chicago seeks solutions after violent 2016.” *Chicago Tribune*, January 1, 2017.

<sup>3</sup> “Cognitive Behavioral Therapy.” Institute for Quality and Efficiency in Health Care. Last updated September 8, 2016.



## COGNITIVE BEHAVIORAL THERAPY

Cognitive behavioral therapy (CBT) is a comprehensive intervention to reduce self-destructive behaviors by teaching individuals to reflect upon and modify their thought processes, update their perceptions and decisions, and better understand situational factors. Rather than defining and teaching “good” behaviors, or nudging participants towards certain choices, CBT teaches concrete methods for better assessing one’s environment and practicing strategies to first recognize, and then regulate, harmful and automatic behaviors. In the terminology of Daniel Kahneman, humans make “automatic responses” when they “think fast” (System 1 thought) rather than going through reflective, slower responses (“thinking slow,” or System 2 thought.) System 1 “fast” responses can sometimes result in helpful automatic decisions (such as jumping out of the way of a swerving car). However, growing up in a violent neighborhood can shape responses and lead to situations where automatic responses are seen as misbehavior in school and/or pose risks or dangers. CBT guides participants to “think about their thinking” as a way to slow automatic responses and assess whether a response would fit the situation at hand.

Since the 1980s, CBT has been used as a mental health treatment, including as a treatment for depression.<sup>4</sup> Today, policymakers around the world are increasingly interested in adapting CBT interventions to deter criminal and violent behavior. In contrast to policing approaches such as increased enforcement or broad social initiatives such as employment programs, CBT is targeted and short-term, making it a relatively inexpensive and easy-to-implement policy option.

### THE INTERVENTION

In 2009, the non-profit organization Youth Guidance implemented a program called “Becoming a Man” or BAM, which included in-school and after-school programming centered upon cognitive behavioral therapy. BAM enrolled male middle and high school students with low GPAs. On average, these students had missed 6–8 weeks of the school year and approximately one-third had been arrested before.

During the intervention, young men attended CBT sessions with prosocial role models (adults demonstrating positive and helpful behaviors, decision-making processes and actions). The goal was to promote new coping mechanisms and strategies, and to update youths’ perceptions of these tools as socially acceptable alternatives to criminal or violent reactions. The program was run throughout the school year, with participating students spending an hour of class time each week in small group sessions. Additionally, the after-school programming occupied students during high-risk times after school hours.

BAM sessions were structured as weekly check-ins that include reflective, introspective activities as well as immersive, experiential learning exercises like role-playing. One example of an immersive activity is known as “the fist.” Students are paired up and one member of each pair is given a ball. The other student is instructed to get the ball from the first student. The students then switch roles. For many students, the gut reaction is to resort to violence and aggressive behavior in seeking the ball. Following the exercise, facilitators ask whether they had considered simply asking their partner for the ball. Facilitators also asked,

<sup>4</sup> Butler et al. 2006. "The empirical status of cognitive-behavioral therapy: A review of meta-analyses."

“How would you have reacted if asked nicely for the ball?” Often, both partners stated that they would gladly have shared the ball if they had been asked. This helps students close the gap between misperceptions held in their mind and the actual reality of the situation. This also helps them realize that different approaches can lead to greatly improved outcomes. Although this exercise doesn’t tell students the “right” way to respond, it helps them reflect on impulsive and seemingly instinctive approaches. It also guides students to recognize the automatic responses that may be necessary for safety, reputation maintenance, and survival outside of school, and prompts them to recognize that these reactions may not be appropriate in other environments such as school.

## DISCUSSION TOPIC 2

1. We will now discuss how an impact evaluation of this program might be conducted. What is a hypothesis that an impact evaluation of this program would test?

**(Reminder:** A hypothesis is an explanation of and for the desired effects of the intervention. For example, the hypothesis of a different intervention might be “*Giving textbooks to students will improve student learning.*”)

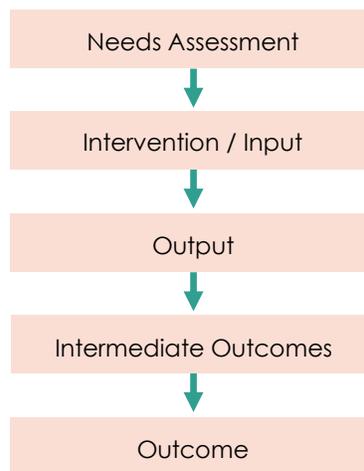
2. What are the intermediate outcomes the training program is seeking to change? (In other words, what are its short-term goals?) What are the final outcomes the program is seeking to change? (In other words, what are its long-term goals?)

## THEORY OF CHANGE

A theory of change (ToC) identifies the causal link between the intervention and the final outcome.

Note on commonly confused terms:

- An **output** is a direct action or fact that is part of a program being implemented as planned. For example: “**student receives textbook.**”
- An **outcome** is a change (a.k.a. effect or impact) in terms of an indicator that you can measure. For example: “**change in students’ reading scores.**”



**Input:** An activity carried out as part of a program or intervention e.g. Textbooks are given to schools.

**Output:** A step in the planned implementation of a program or intervention – a.k.a. a direct result in response to the inputs e.g. Students receive textbooks through schools.

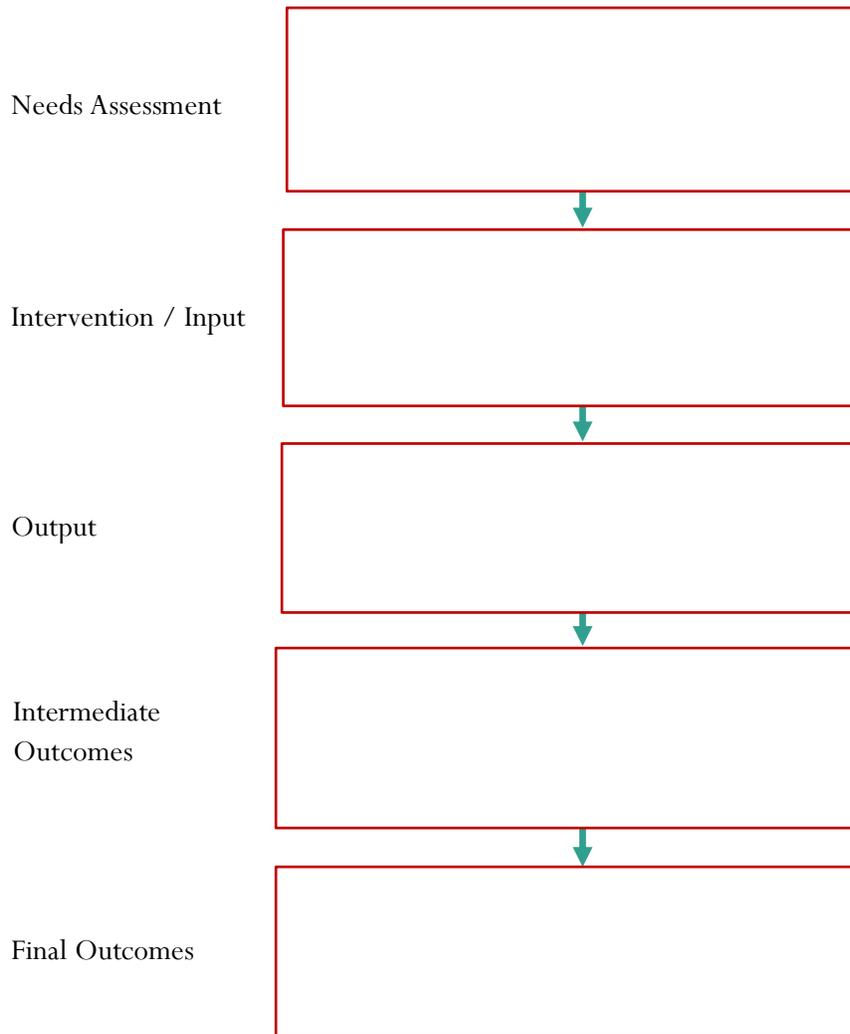
**Outcome:** A change or impact caused by the program that is being evaluated e.g. Increase in student learning levels.

**Intermediate outcomes:** Observable changes or impacts caused by the program that are not the ultimate outcome of interest, but necessary along the way to achieving a final outcome e.g. Increase in students who have passing test scores for the semester.

**Final outcomes:** Changes or impacts that are of ultimate interest to researchers and/or program implementers; these are often the overall goals of a program e.g. Increase in high school graduation rates.

### DISCUSSION TOPIC 3

1. Using the table below, draw out a causal chain (a theory of change) that connects the intervention to your expected intermediate and final outcomes.



2. What are the necessary conditions/assumptions underlying this ToC? What needs to occur or be present for this chain to work?

## MEASUREMENT: INDICATORS AND DATA COLLECTION

The ideal data collection plan measures indicators at every stage of the theory of change. Before deciding which data to collect, you need to:

- Clearly define the inputs, outputs, and outcomes you are targeting
- Identify the ways the intervention is thought to affect the outputs and outcomes

Defining a main hypothesis and theory of change at the beginning of an evaluation is a crucial step that will help you determine what data/information to collect.

For each step of the theory of change, you must identify indicators (what to measure) and instruments (tools for data collection, a.k.a. methods for measurement). If possible, you should also collect data to validate the assumptions underpinning your theory of change.

For every type of data and at every step of measurement, it is important to consider the participants' response process and how this and other factors may affect measurement.

## DISCUSSION TOPIC 4

1. Which indicators would you measure at each step of your theory of change? In other words, what are possible indicators for the inputs, outputs, intermediate outcomes, and final outcome(s)?
  - a. How would you find out whether the BAM intervention itself is operating as planned? (a.k.a. What are indicators for inputs and outputs of the program?)
  - b. How would you measure BAM's intermediate outcomes as described in your theory of change? (a.k.a. What are indicators for intermediate outcomes?)
  - c. What should you measure in order to assess whether the intervention has an impact? (a.k.a. What are indicators for the final outcomes?)

2. How would you collect data for these indicators?
  
3. What challenges might arise during the data collection and measurement processes? For example: In this hypothetical plan for data collection, are survey questions, study protocols, and protocols for the intervention itself clear and easy to comprehend? Are survey questions worded so as to avoid social desirability bias? If not, what might be the effects on survey responses? How might this affect the conclusions researchers draw from the study?

### **INTERPRETING THE RESULTS / DISCUSSION TOPIC 5**

Keep in mind when discussing the questions below that an impact evaluation is not a “thumbs up” or a “thumbs down” about a program – whatever the results are, valuable information can be gained and critical questions should continue to be asked.

1. Imagine that the study finds that there is no impact of BAM on criminal activity or educational outcomes. How do you interpret these results? As a policymaker, how would you react to these results?
  
2. The real study by Heller et al. found that the program reduced the number of violent arrests per youth per year by 20% and had positive effects on educational outcomes as well.<sup>5</sup> How do you interpret these results? As a policymaker, how would you react? What other information might be needed to make a policy decision?
  
3. [Optional – time allowing] Discuss and reflect on how the program’s theory of change provides context for interpreting these results.

<sup>5</sup> Heller et al., 2015, Table V.

## REFERENCES AND FURTHER READING

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