

HOW TO APPLY THE MULTIPHASE OPTIMIZATION STRATEGY (MOST) IN YOUR INTERVENTION DEVELOPMENT RESEARCH

Module 2

**The preparation phase: Laying the foundation for successful
optimization**

Lesson 7: Specifying the optimization objective



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Intervention Optimization Initiative

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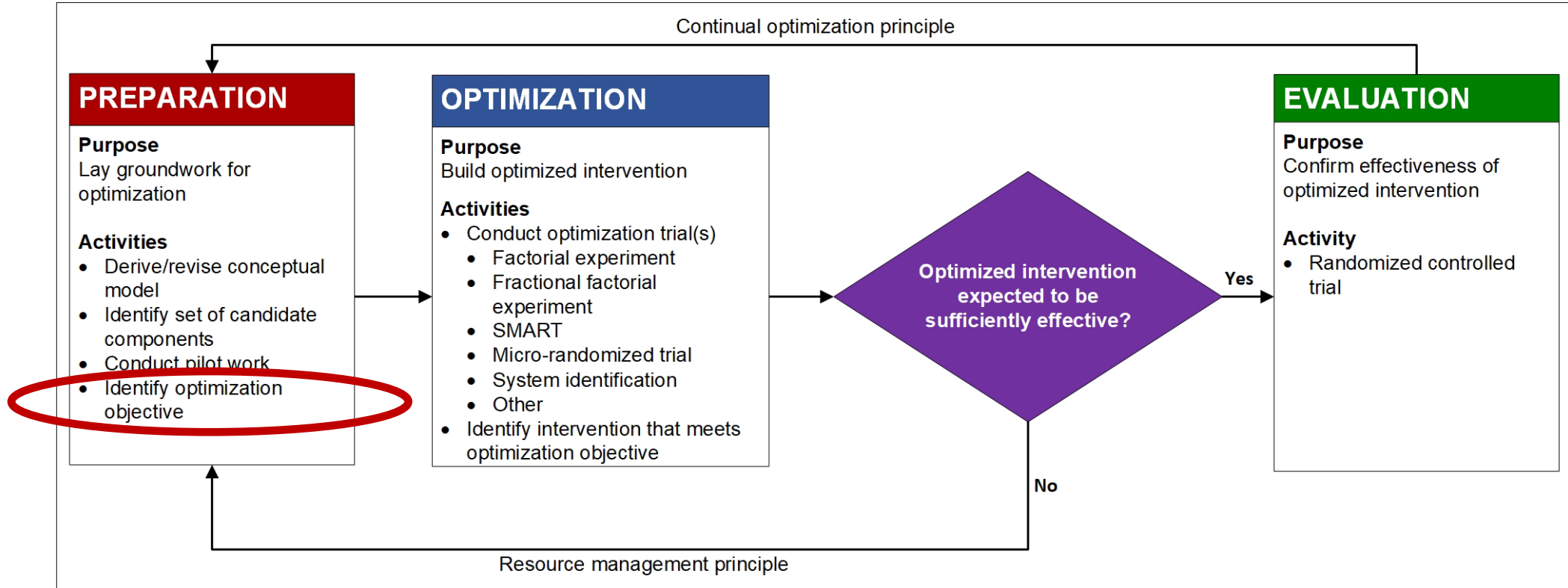
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In the previous lesson you learned how to:

- Define the term pilot study
- Distinguish pilot studies from optimization trials

In this lesson you will learn how to:

- Specify an optimization objective to express what is meant by intervention EASE in a particular study



Flow chart of the three phases of the multiphase optimization strategy (MOST). Rectangle = action. Diamond = decision.

Figure adapted from Collins (2018)

Review: Four desiderata for multicomponent interventions

- Effectiveness
 - The extent to which the intervention does more good than harm (under real-world conditions, Flay (1986))

Review: Four desiderata for multicomponent interventions

- Affordability
 - (also called economy) The extent to which the intervention is effective without exceeding budgetary constraints

Review: Four desiderata for multicomponent interventions

- Scalability
 - The extent to which the intervention can be implemented widely with fidelity

Review: Four desiderata for multicomponent interventions

- Efficiency
 - The extent to which the intervention avoids wasting time, money, or other valuable resources

Intervention *EASE*: A strategic balance of the desiderata for multicomponent interventions

EASE is achieved by
BALANCING

***E*ffectiveness**



AGAINST

***A*ffordability**
***S*calability**
***E*fficiency**

Deciding on your optimization objective*

- The optimization objective expresses your definition of intervention **EASE**
- It's YOUR optimization objective

*called optimization criterion in the Collins (2018) book and other literature on MOST

Deciding on your optimization objective

- The optimization objective expresses YOUR desired balance of intervention effectiveness against affordability, scalability, and efficiency
- YOUR definition of intervention *EASE*

Deciding on your optimization objective

- There may be limitations on important—and finite—resources needed to deliver the intervention
- In fact, there will almost always be some limitations

Deciding on your optimization objective

- There may be limitations on, e.g.
 - Money needed to deliver intervention
 - Staff time needed to deliver intervention
 - Participant time needed to complete the intervention
 - Any other resource or cost

Deciding on your optimization objective

- Or you may not have an upper limit, but want to
 - Make the best use of resources
 - Avoid wasting resources

Deciding on your optimization objective

- Note: Here we are talking about resources required to implement the intervention, NOT resources required to conduct the optimization trial
 - Although the resource management principle says it is important to consider these too!

Deciding on your optimization objective

- It is usually not necessary to conduct a full cost analysis, just to get a sense of what resource considerations are most important and what the upper limits are (if any)
 - e.g. “willingness to pay”

A few examples of possible optimization objectives

- “I want an intervention made up of all active components”
 - i.e. objective is an efficient intervention; cost not an explicit consideration

A few examples of possible optimization objectives

- “I want to select the components that will provide the most effective intervention that can be implemented for less than (say) \$300 per person”
 - i.e., objective is an affordable intervention
 - Many different ways to define affordable

A few examples of possible optimization objectives

- “I want to select the components that will provide the most effective intervention that can be completed in less than 1 hour of staff time”
 - i.e., objective is an intervention that is scalable, at least in this respect

A few examples of possible optimization objectives

- “I want to select the set of components that represents the most cost-effective intervention”

A few examples of possible optimization objectives

- “I want to select the set of components that represents the most cost-effective intervention AND does not exceed an implementation cost of...” (say) “...\$300 per person”

A few examples of possible optimization objectives

- “I want to select the set of components that represents the most time-effective intervention”

Why is it necessary to specify an optimization objective?

- You will need it in the optimization phase

Why is it necessary to specify an optimization objective?

- After you have conducted the optimization trial, you will select the “winning” components from the set of candidate components
- This selection will be based on
 - The results of the optimization trial AND
 - The optimization objective

Suppose these components showed substantial effects in the optimization trial:

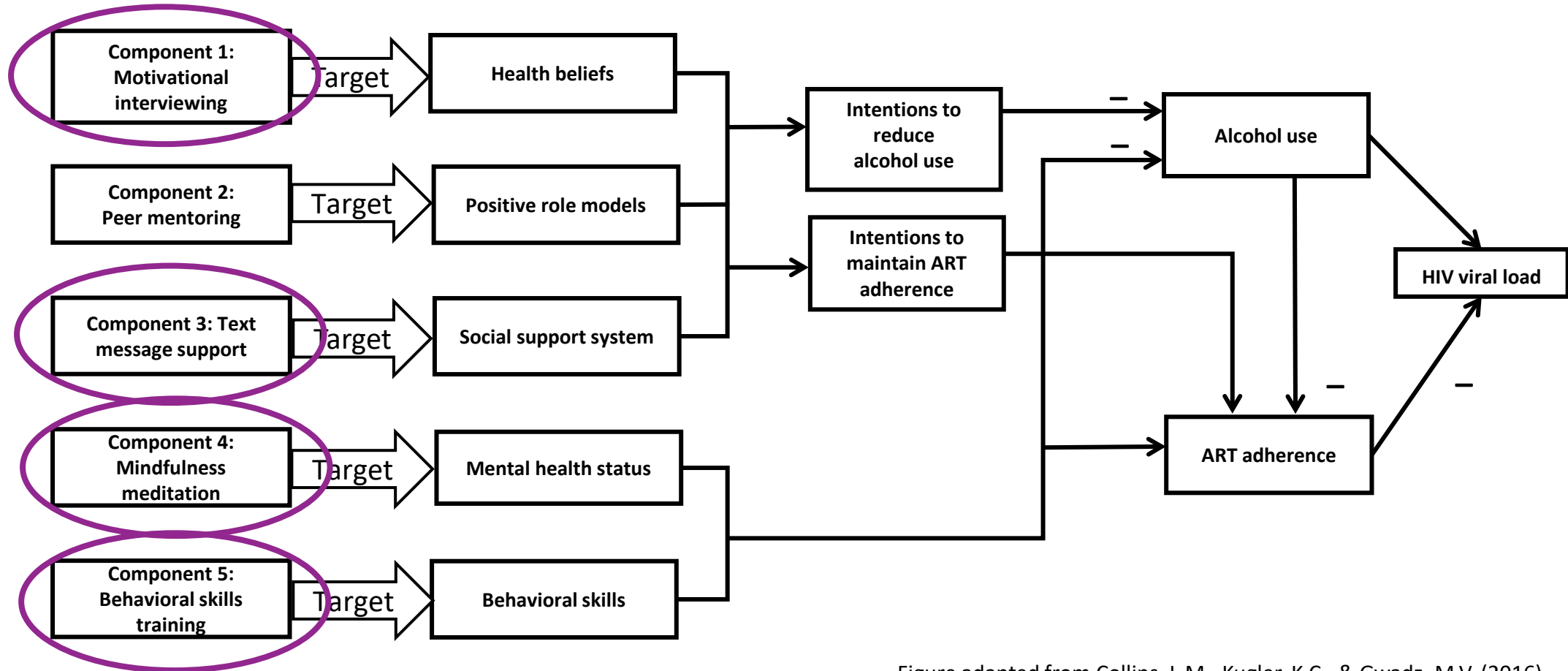


Figure adapted from Collins, L.M., Kugler, K.C., & Gwadz, M.V. (2016)

Role of the optimization objective in decision-making

- Will all four of these components be included in the optimized intervention?
 - If cost IS NOT a consideration: YES
 - If cost IS a consideration: MAYBE, MAYBE NOT

Role of the optimization objective in decision-making

- Suppose “willingness to pay” = $\leq \$300$ per person, and an intervention consisting of the four components costs $> \$300$
- Then you might, e.g., want to use the results of the optimization trial to select the subset of the four that constitutes the most effective intervention that costs $\leq \$300$

Role of the optimization objective in decision-making

- Does this mean omitting one or more effective components?
- POSSIBLY

Why specify the optimization objective during the preparation phase?

- This will help ensure that you collect the data you need (e.g. data on cost or how long it take to implement each component) during the optimization trial
 - And pilot test procedures for collecting cost data if necessary

Can you change the optimization objective later?

- Yes!
- In fact, you can use results from the same optimization trial to optimize for different settings using different optimization objectives appropriate to that setting

Can you change the optimization objective later?

- e.g., consider two different clinics with different resources
 - One can afford to pay \$300 per person to implement the intervention, the other can afford only \$200 per person
 - The components selected for inclusion in the optimized intervention may be different across the two clinics

The concept of immediate scalability

- A scalable intervention is implementable in the intended setting *exactly as evaluated*, i.e. no need for ad hoc modifications

The concept of immediate scalability

- To develop an immediately scalable intervention, during the preparation phase identify stakeholders and find out what are the key constraints
- Then use MOST to optimize an intervention so that it can operate within these constraints

The concept of immediate scalability

- Note the perspective here: Develop an intervention with implementation in mind from the beginning

In this lesson you learned how to:

- Specify an optimization objective to express what is meant by intervention EASE in a particular study

In the next lesson you will

- Review what you have learned in Module 2



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References cited

- Collins, L.M. (2018). *Optimization of Behavioral, Biobehavioral, and Biomedical Interventions: The Multiphase Optimization Strategy (MOST)*. New York: Springer.
- Collins, L.M., Kugler, K.C., & Gwadz, M.V. (2016). Optimization of multicomponent behavioral and biobehavioral interventions for the prevention and treatment of HIV/AIDS. *AIDS and Behavior*, 20, 197-214.