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 2: The conceptual model: Best practices

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In the previous lesson you learned how to:

- Define the term conceptual model
- Describe the critical role of the conceptual model in MOST

In this lesson you will learn how to:

- Explain best practices for development of a conceptual model, including
  - The role of theory and empirical findings
  - The level of specificity needed
  - The importance of forward engineering
  - How to deal with participant heterogeneity

The role of theory and empirical findings

- Conceptual model should be explicitly theory-based
  - May be informed by more than one theory, if different theories apply to different aspects of the model.
- Directly informed by peer-reviewed empirical literature (where possible)

What if I am working in an area that does not yet have much published theory or empirical work?

- You still need a conceptual model.
  - In fact, a well-thought-out conceptual model is probably particularly important under these circumstances!
  - It is up to YOU to develop one.

What if I am working in an area that does not yet have much published theory or empirical work?

- Where there is currently little theory or peer-reviewed empirical literature the model may be informed by
  - Unpublished literature
  - Conference presentations
  - Secondary data analyses
  - Clinical experience

The level of specificity needed: Extremely high

- Clearly describe the process to be intervened on by including
  - Key outcome variables
  - Hypothesized causal processes
  - Mediators within causal processes
  - Sometimes, key moderators of causal processes

The level of specificity needed: Extremely high

- Should express how the candidate intervention components are expected to affect the causal process
- Mediators are important
  - Which components target which mediators

The importance of forward engineering

- “Forward engineering is the process of building from a high-level model or concept to build in complexities and lower-level details.”
  - Technopedia, 2021

The importance of forward engineering

- START with theory and empirical research and develop a causal model of the process…
- …THEN create a list of components that each target one or more causal factors
- Causal factors will be mediators in the conceptual model

The importance of forward engineering

- Don’t reverse-engineer the conceptual model!
- Don’t start by brainstorming a list of components then justify via expanding the conceptual model.
  - Why not?

The importance of forward engineering

- You could overlook important components
- You could include one or more components that do not target any of the causal factors
- This approach is not a good basis for continual optimization

The importance of forward engineering

- The one exception: If you are optimizing
  - an existing intervention
  - where the components have already been selected and
  - there is not yet a conceptual model

How to deal with participant heterogeneity

- Intervention may be aimed at a subgroup of people
- Conceptual model should clearly specify this

How to deal with participant heterogeneity

- May be hypothesized that different subgroups of people will benefit from different approaches to intervention, e.g.
  - Low vs. high health literacy
  - Different cultural subgroups

How to deal with participant heterogeneity

- May be hypothesized that different approaches to intervention will be needed at different times
  - Different stages of development (e.g., pre-pubertal and adolescent)
  - Different points in a time-varying process (e.g., a chronic relapsing disorder such as addiction to nicotine)

How to deal with participant heterogeneity

- May be hypothesized that different approaches to intervention will be needed at different times
- If so, you could consider an adaptive intervention

How to deal with participant heterogeneity

- An adaptive intervention specifies which components or component levels are targeted to which
  - Subgroups
  - Stages of development
  - Points in a time-varying process

How to deal with participant heterogeneity

- Conceptual model provides the foundation for dealing with participant heterogeneity via an adaptive intervention

- Alternative to adaptive intervention: robust intervention

In this lesson you learned how to:

- Explain best practices for development of a conceptual model, including
  - The role of theory and empirical findings
  - The level of specificity needed
  - The importance of forward engineering
  - How to deal with participant heterogeneity

In the next lesson you will learn how to:

- Create the causal part of a conceptual model
- Use the causal part of the conceptual model to help identify what intervention components are needed

References cited

- Technopedia (2021). Forward engineering. https://www.techopedia.com/definition/19445/forward-engineering. Downloaded May 19, 2021.