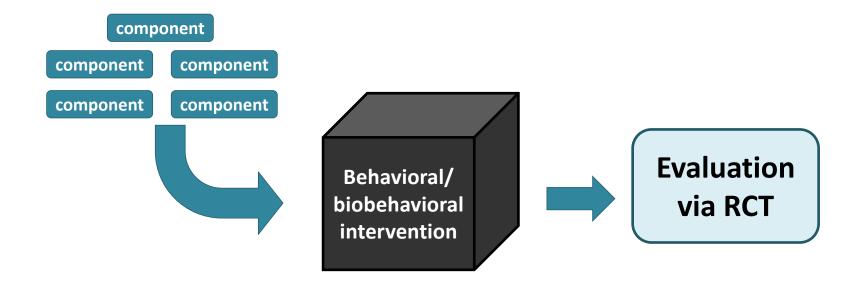
ibtn international behavioural trials network

An Overview of Design of Optimization Trials

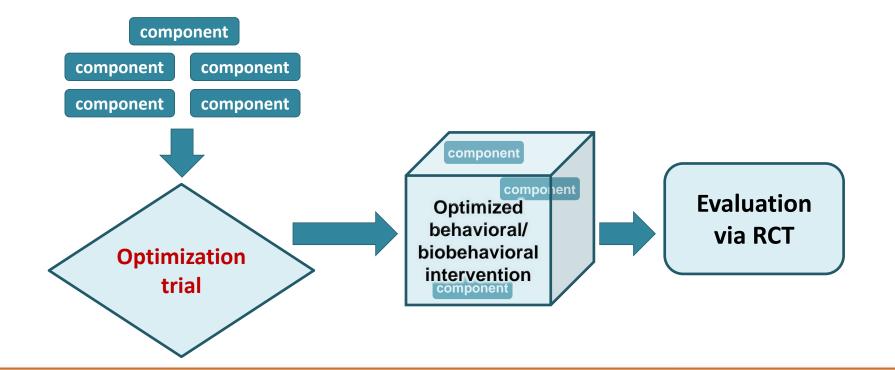
Linda M. Collins The Pennsylvania State University, USA



Classical treatment package approach



Multiphase optimization strategy (MOST)



Why conduct an optimization trial?



- You might want to develop an intervention that...
 - ...is not only effective, but also efficient, economical, and scalable
 - ...is made up of components that demonstrate a detectable effect
 - ...has been engineered to meet a particular criterion
- You might want to gain a sense of which components work for whom

ومتحديد والمحاجر المتاريخ والمتقالين والمتعاري أعرار ومعروفا التقارين والتقاري والمتحد

والمحمد والمحاج المحاجب والمحاجب والمحاجب والمحاجب والمحاجب والمحاجب والمحاجب والمحاجب والمحاجب



What is wrong with evaluating a treatment package via an RCT?

Absolutely nothing!

والمستوجب ويستجربهم والمترج والمتناقص والمنتقل والمعرف أعرار ومعرجها التقاري فالتقامين والأقالي

المحمد ومحمد المتحد فالمعالية والمراجع والمراجع والمتحال والمحمد المحمد والمحمد المحمد والمحمد والمحم

Some differences between optimization and evaluation trials



An optimization trial

- Application: Developing an optimized intervention
- Purpose: Assess individual effect of components, and whether they interact
- Experimental design: Many possibilities (usually not RCT)

An evaluation trial

- Application: Evaluating an intervention
- Purpose: Assess whether intervention *as a package* outperforms comparison condition
- Experimental design: RCT

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ووجاليه بالتكري ويتهجون أورائه

How do you select the design of an optimization trial?



- First, what kind of intervention are you optimizing?
 - Traditional fixed intervention



How do you select the design of an optimization trial?



- First, what kind of intervention are you optimizing?
 - Adaptive intervention
 - Matched
 - Time-varying; these range in intensity
 - Low-intensity
 - High-intensity up to just-in-time adaptive interventions

ومستوجب ويستوجب المترجب أأننا والمتناقص والمترك والمحر أبرأ ومحمد وتناكرا المتكافية ومناقلا المتر

والمستحد والمستحد والمستحد والمناجع والمراجع والمتحد والمتحد والمستحد والمحد والمحد والمحد والمحد والمحد

How do you select the design of an optimization trial?

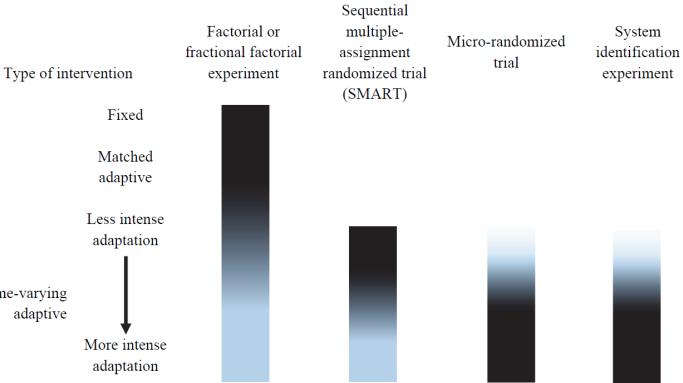


- Second, use resource management principle
 - What do you need to find out?
 - What resources do you have to conduct the optimization trial?
 - Then, select design that will provide most information for resources available

أأترج والمتبالين التنجيب أمراز ومعمرها اللاعة

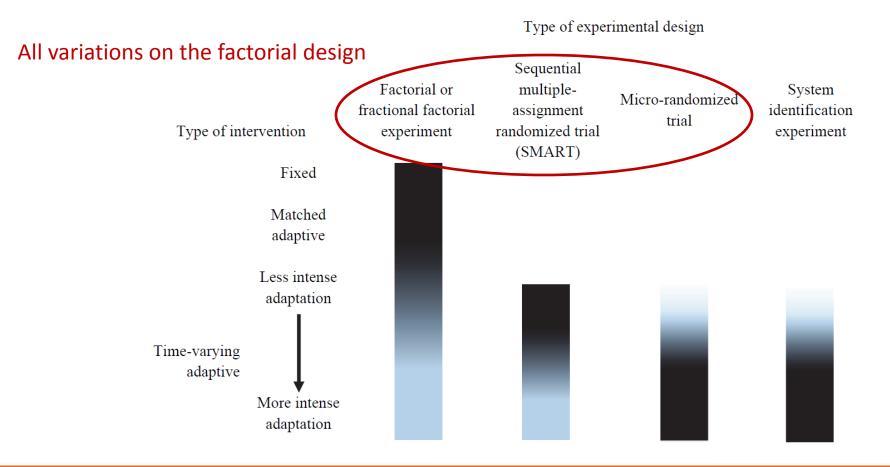
Likely relevance of various types of experimental designs for optimization of different types of interventions

Type of experimental design



Time-varying

Likely relevance of various types of experimental designs for optimization of different types of interventions



Experimental conditions in a 2⁴ factorial experiment

Experimental condition	Factor A	Factor B	Factor C	Factor D
1	Off	Off	Off	Off
2	Off	Off	Off	On
3	Off	Off	On	Off
4	Off	Off	On	On
5	Off	On	Off	Off
6	Off	On	Off	On
7	Off	On	On	Off
8	Off	On	On	On
9	On	Off	Off	Off
10	On	Off	Off	On
11	On	Off	On	Off
12	On	Off	On	On
13	On	On	Off	Off
14	On	On	Off	On
15	On	On	On	Off
16	On	On	On	On

Example of choosing an experimental design: Comparison of options

Comparison of Features of Design Alternatives for Hypothetical Optimization Trial Examining 5 Components						
Design	Number of Subjects Needed to Maintain Power ≥ .8 (d = .3)	Number of Experimental Conditions	Interactions			
Individual Experiments	1,760	10	None can be estimated			
Comparative Treatment	1,056	6	None can be estimated			
Factorial (complete)	352	32	All can be estimated			
Factorial (fractional)	352	16	Some can be estimated			

ويستعملهم الباطر والمتكرك والمتنا التنابي والمتحدين أبعر أحصيه ومناباته المتحدي فالمتحد والمتح

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Some take-home points

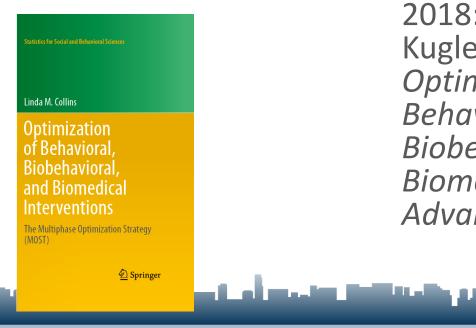


- MOST is a framework for optimization <u>and</u> evaluation
- Optimization and evaluation are both valuable BUT DIFFERENT
- Optimization trials are NOT pilot studies
- Optimization trials are feasible
- Factorial designs are often an economical approach
- There is a world of experimental designs out there

أتريج والمتناكين وتنجيب أمرا ومحمد وتالكينا

Books – both available for FREE download via SpringerLink

Available now



 Available sometime Fall 2018: Collins, L.M. & Kugler, K.C. (in press). Optimization of Behavioral, Biobehavioral, and **Biomedical Interventions:** Advanced Topics.

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والمحمد المحمد فالمحاصب والشروي والمحمد المحمد والمحمد



http://methodology.psu.edu

