There is nothing more practical than a good theory: Reflections on what our health behavior *theories* can and (potentially) could do for us

Alex Rothman
Department of Psychology
University of Minnesota

Opening Plenary:
Behavioural Interventions: Past, Present and Future

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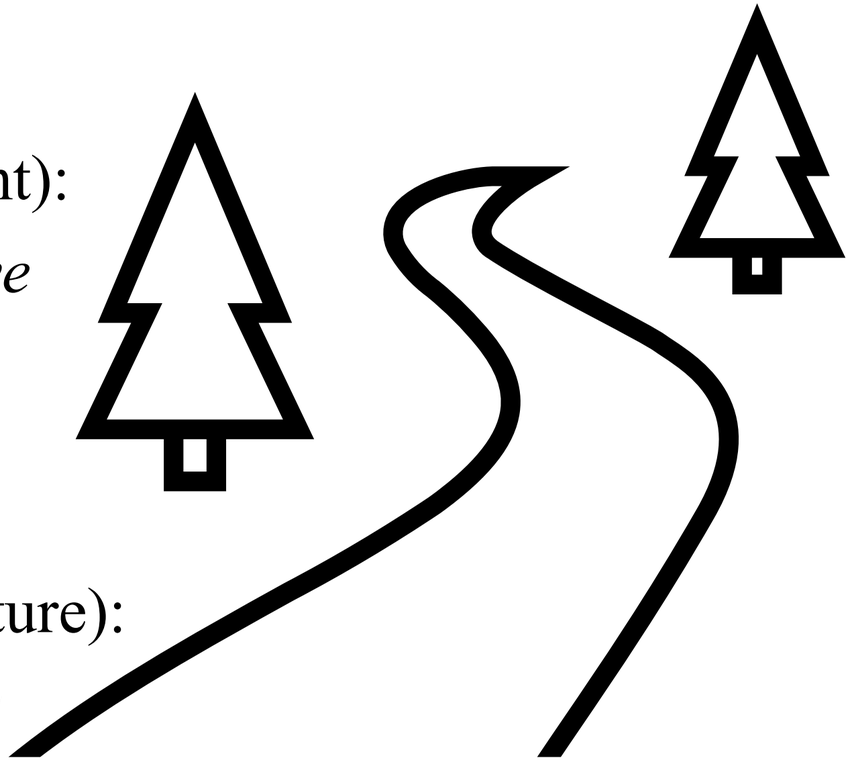
A (Brief) Roadmap



- Where We Are Now and How Did We Get Here? (The Present):
  - *Recognizing our accomplishments (and from where we have come; The Past): Embracing a Mechanistic Approach to Behavior Change*

- Where We Are Headed and How Do We Get There? (The Future):
  - *(Re)Setting our Expectations for Health Behavior Theories*

Illustrative Set of Behavioral Trials:
A (Non-Random) Snapshot of Where We Are Now

JAMA | Original Investigation

An Adaptive Behavioral Intervention for Weight Loss Management
A Randomized Clinical Trial

Bonnie Spring, PhD; Angela F. Pfammatter, PhD; Laura Scanlan, BA; Elyse Daly, BA; Jean Reading, PhD; Sam Battalio, MS; H. Gene McFadden, BA; Don Hedeker, PhD; Juned Siddique, PhD; Inbal Nahum-Shani, PhD

AMERICAN PSYCHOLOGICAL ASSOCIATION | Society for HEALTH PSYCHOLOGY | Health Psychology

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Efficacy of Contextually Tailored Suggestions for Physical Activity: A Micro-randomized Optimization Trial of HeartSteps

Predrag Klasnja, PhD[1,2,✉] • Shawna Smith, PhD[3,4] • Nicholas J. Seewald, MS[5] • Andy Lee, BS[2] • Kelly Hall, BS[5] • Brook Luers, MS[5] • Eric B. Hekler, PhD[6] • Susan A. Murphy, PhD[7]

JAMA Network Open

The Empathetic Refutational Interview to Tackle Vaccine Misconceptions: Four Randomized Experiments

Dawn Holford[1], Philipp Schmid[2, 3, 4], Angelo Fasce[5], and Stephan Lewandowsky[1, 6]

How Did We Get Here?

Original Investigation | Geriatrics

Effect of Intrapersonal and Interpersonal Behavior Change Strategies on Physical Activity Among Older Adults
A Randomized Clinical Trial

MPH, GNP-BC; Beth A. Lewis, PhD; Weihua Guan, PhD; Qi Wang, MS; Shannon M. Hayes, RN, PHN, BSN; lexander J. Rothman, PhD

Successful Op… Treatment … Randomized Controlled Trial Using the Multiphase Optimization Strategy

Steven L. Bernstein, MD*; James Dziura, PhD; June Weiss, MA, MEd; Avis H. Brooks, MA; Ted Miller, PhD; Katrina A. Vickerman, PhD; Lauretta E. Grau, PhD; Michael V. Pantalon, PhD; Lorien Abroms, ScD, MA; Linda M. Collins, PhD; Benjamin Toll, PhD

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Brief Report

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2024, Vol. 43, No. 2, 77–88
https://doi.org/10.1037/hea0001267

Furthering Scientific Inquiry for Weight Loss Maintenance: Assessing the Psychological Processes Impacted by a Low intensity Technology-Assisted Intervention (NULevel Trial)

Keven Joyal-Desmarais, PhD[1] · Alexander J. Rothman, PhD[2] · Elizabeth H. Evans, PhD[3] · Vera Araújo-Soares, PhD[4] · Falko F. Sniehotta, PhD[5,6]

Optimizing Mood Prior to Influenza Vaccination in Older Adults: A Three-Arm Randomized Controlled Trial

Kieran Ayling[1], Michaela Brown[1], Sophie Carlisle[1], Robert Bennett[2], Heather Buchanan[1], Jennifer Dumbleton[3], Christopher Hawkey[3], Katja Hoschler[4], Ruth H. Jack[1], Jonathan Nguyen-Van-Tam[1, 5], Simon Royal[6], David Turner[1, 7], Maria Zambon[3], Lucy Fairclough[7], and Kavita Vedhara[1]

Advancing and Embracing a Mechanistic Approach to Behavior Change:

The Emergence of Frameworks for Mapping links between Strategies, Mechanisms and Outcomes

(Nielsen et al., 2018, *Behavior Therapy and Research*)

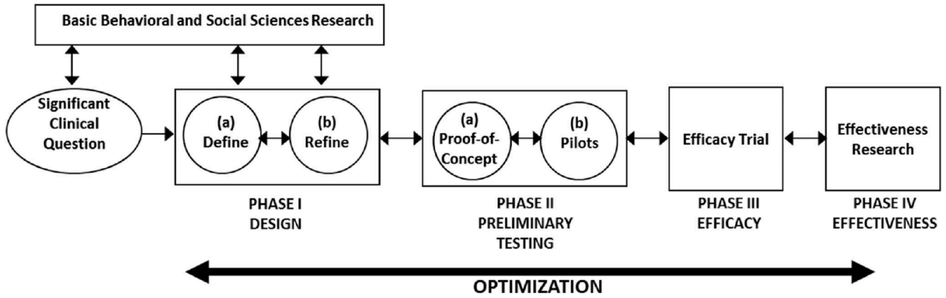
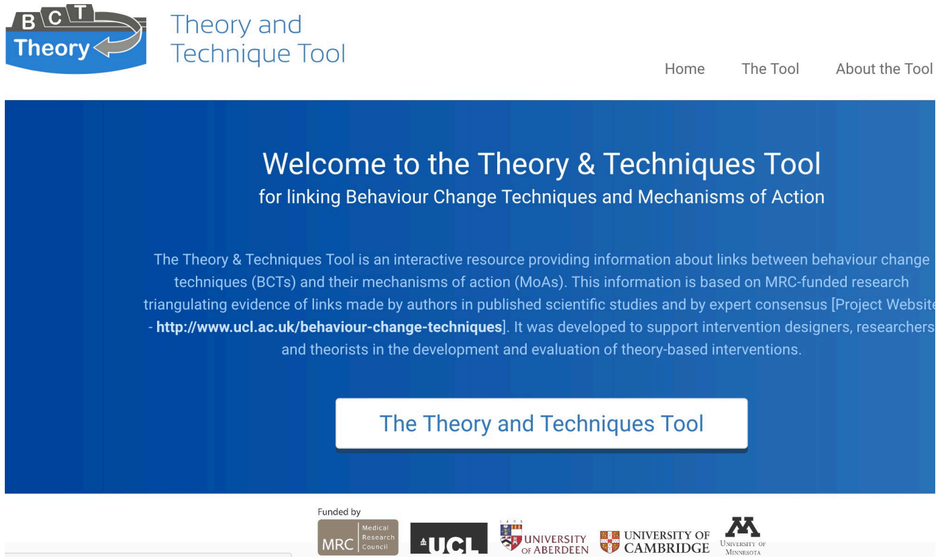


Figure 1. The ORBIT model for behavioral treatment development.

(Czjakowski et al., 2015, *Health Psychology*)



(Johnston et al., 2021; *Translational Behavioral Medicine*)

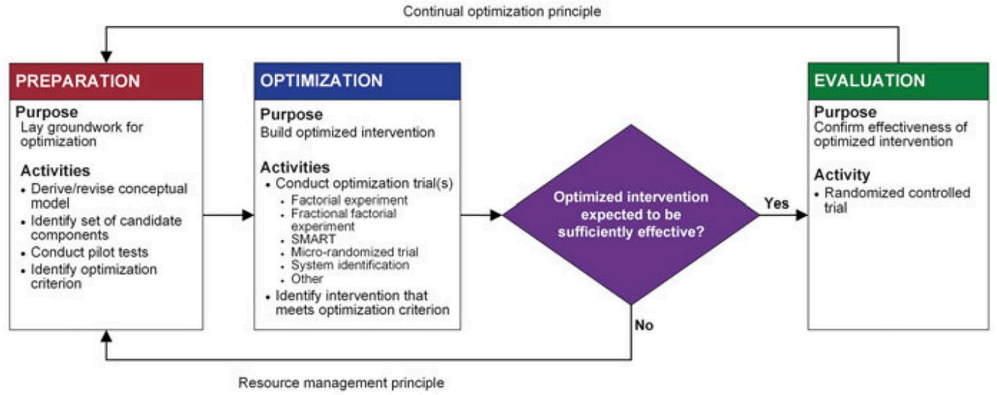


Fig. 1.1 Flow chart of the three phases of the multiphase optimization strategy (MOST)

(Collins, 2018, *Optimization of behavioral, biobehavioral, and biomedical interventions*)

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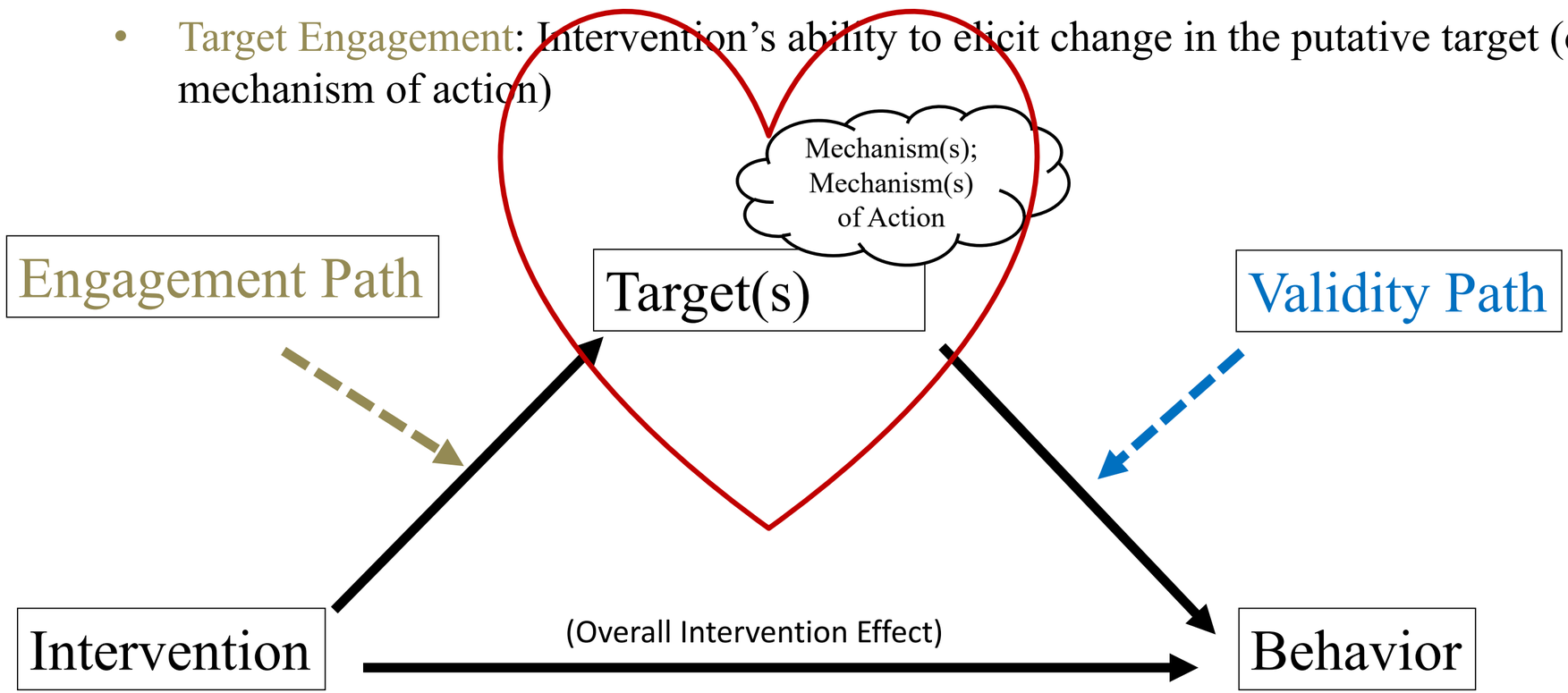
Advancing a Mechanistic Approach to Behavior Change:

A Focus on Targets (Mechanisms)

- *Intervention effects are a function of two change processes:*
  - Target Validity: Target's ability to elicit change in the focal outcome (i.e., behavior change)
  - Target Engagement: Intervention's ability to elicit change in the putative target (or mechanism of action)



(See Nielsen et al., 2018, *Behavior Therapy and Research;* Sheeran, Rothman, & Klein, 2017, *Annual Review of Psychology*)

(For an overview of how to implement EM, see Rothman, Klein, & Sheeran (2020) in *The Handbook of Behavior Change*)

Advancing a Mechanistic Approach to Behavior Change

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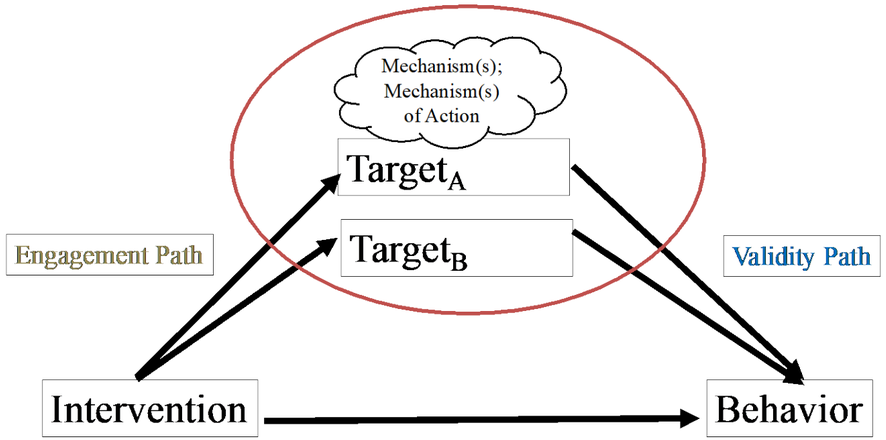

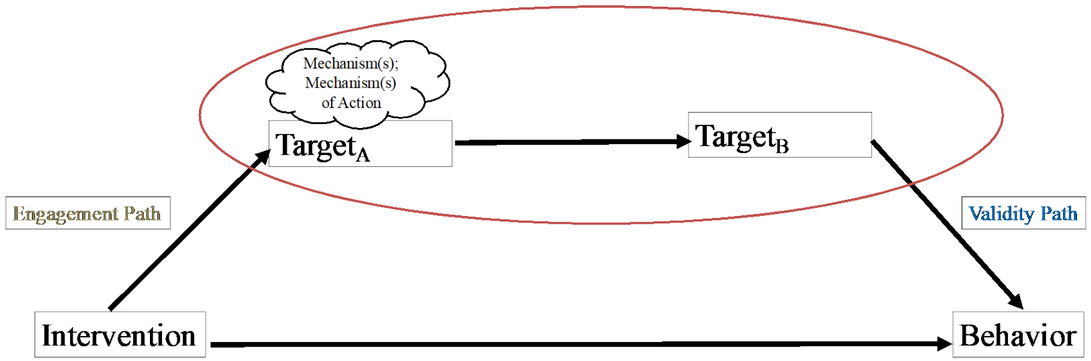

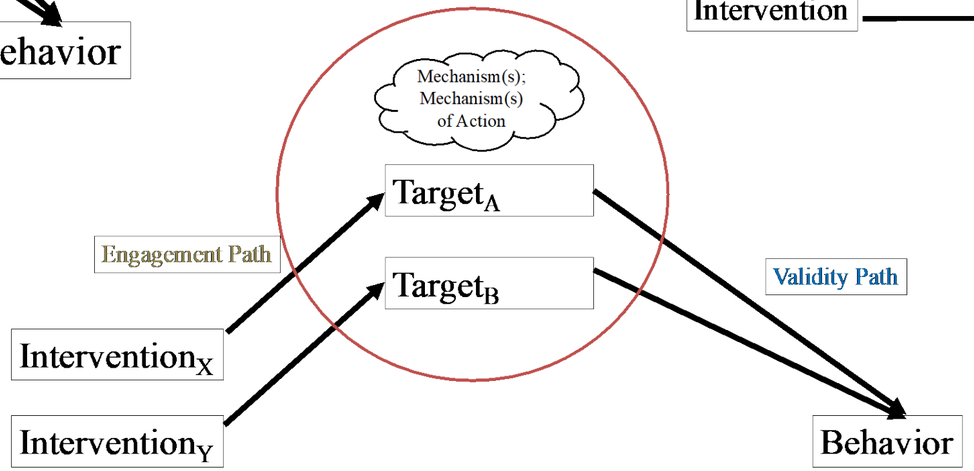

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Advancing a Mechanistic Approach to Behavior Change:

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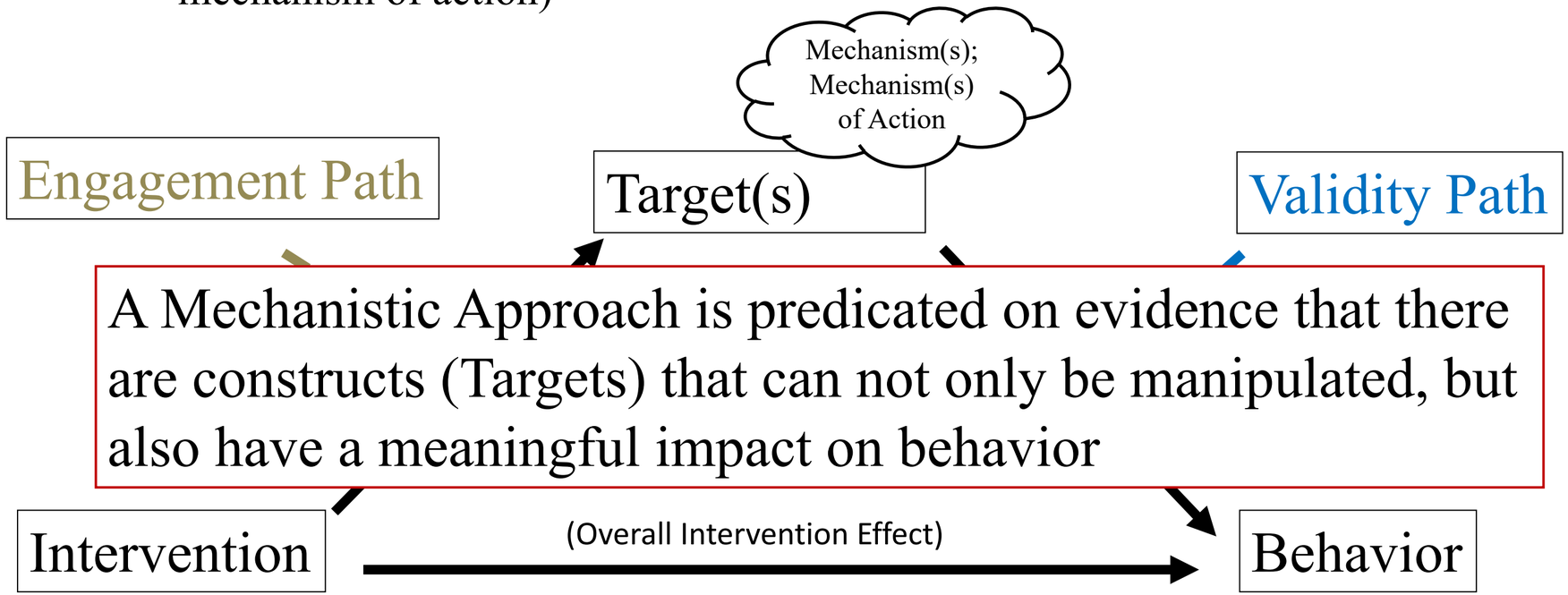
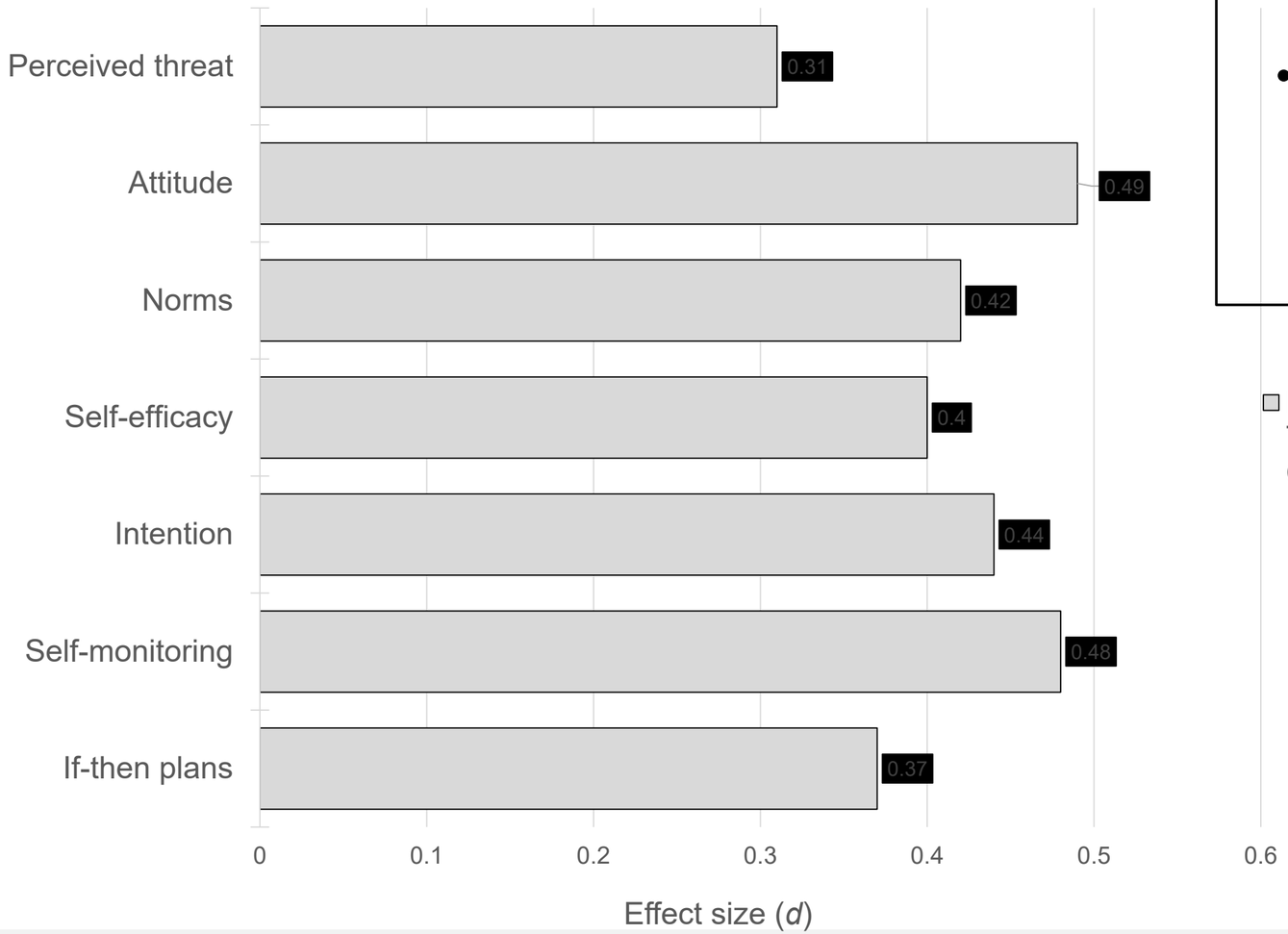


(See Nielsen et al., 2018, *Behavior Therapy and Research;* Sheeran, Rothman, & Klein, 2017, *Annual Review of Psychology*)

(For an overview of how to implement EM, see Rothman, Klein, & Sheeran (2020) in *The Handbook of Behavior Change*)

Effect Sizes for the Impact of Seven Targets on Primary Behavioral Outcomes (concerning diet and physical activity) from Meta-Analyses of ***Experimental Tests of Target Validity***



- *Evidence to support Target Validity*: **YES**.
- Eliciting a significant change in a target leads to changes in behavior (characterized by a small to medium effect size)

(Data from: Adriaanse et al., 2011; Belanger-Gravel et al., 2013; McEwan et al., 2015; Harkin et al., 2016; Dickau & Rhodes, 2012; Sheeran et al., 2014, 2016)

(from Rothman & Sheeran, 2020)

Review Article | Published: 03 May 2024

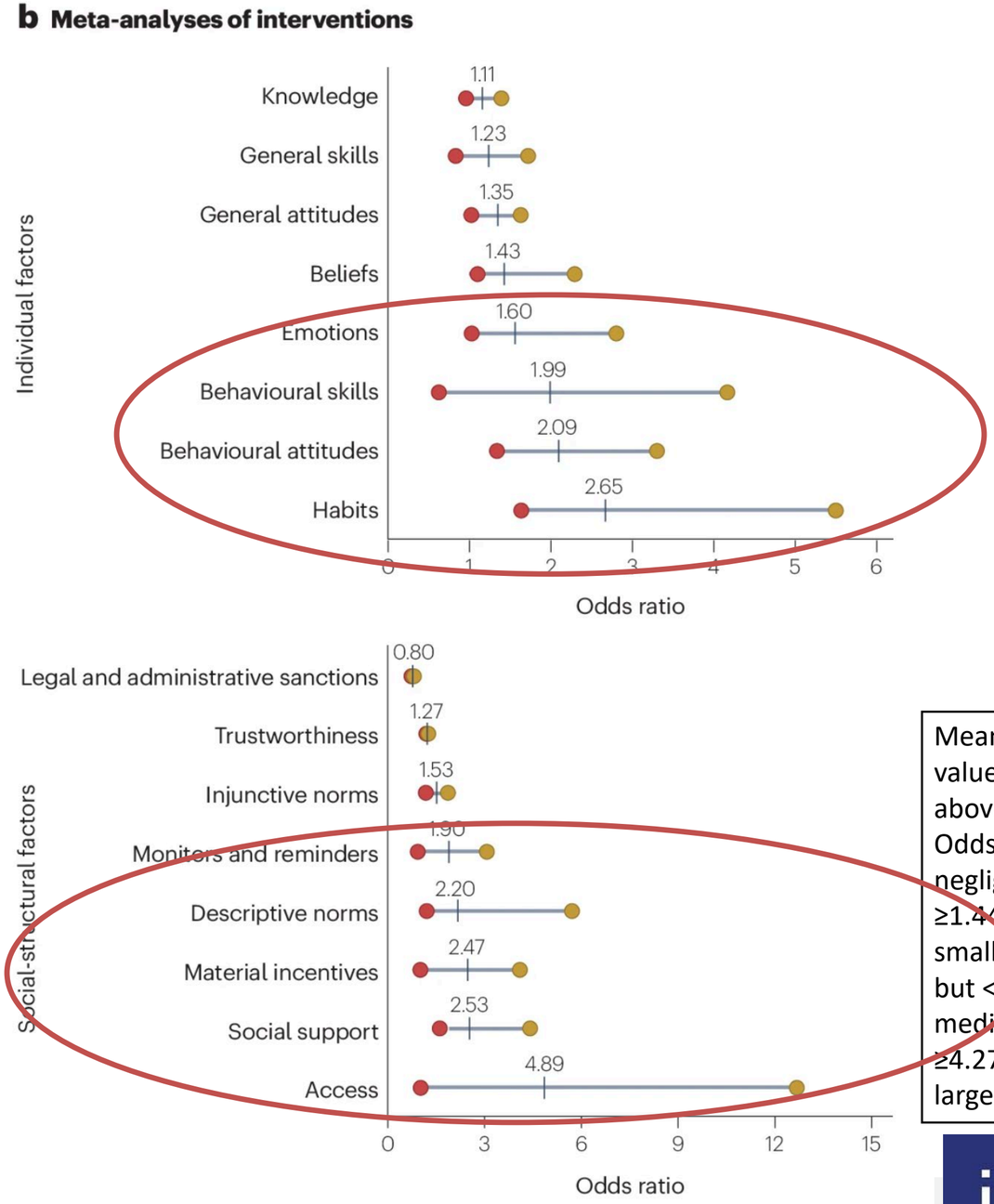
Determinants of behaviour and their efficacy as targets of behavioural change interventions

Dolores Albarracín, Bita Fayaz-Farkhad & Javier A. Granados Samayoa

Nature Reviews Psychology (2024) | Cite this article

- Assessed the impact of behavior change interventions with a focus on a (1) broader class of targets and (2) wider range of behavioral outcomes (i.e., health, environment, workplace, etc.)

Fig. 1: Effect size range in meta-analyses of behaviour change.



Mean odds ratio values are presented above the mean line. Odds ratios <1.44 are negligible, those ≥1.44 but <2.48 are small, those ≥2.48 but <4.27 are medium and those ≥4.27 are considered large

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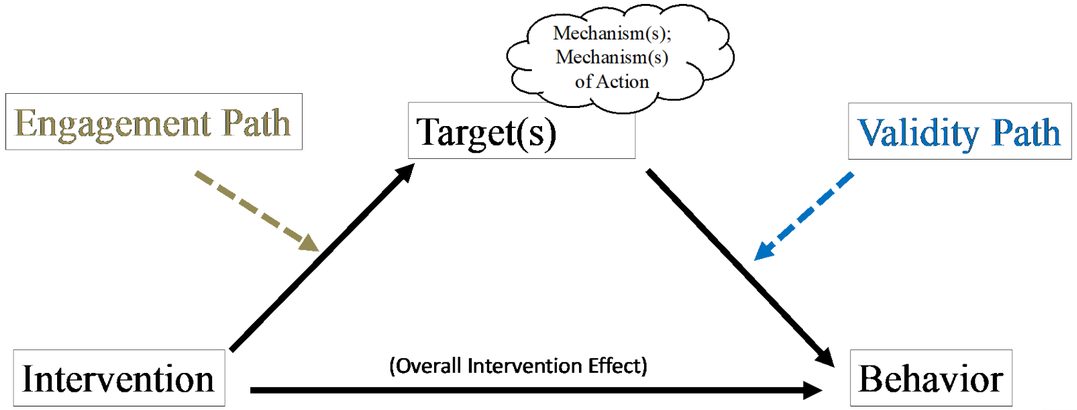
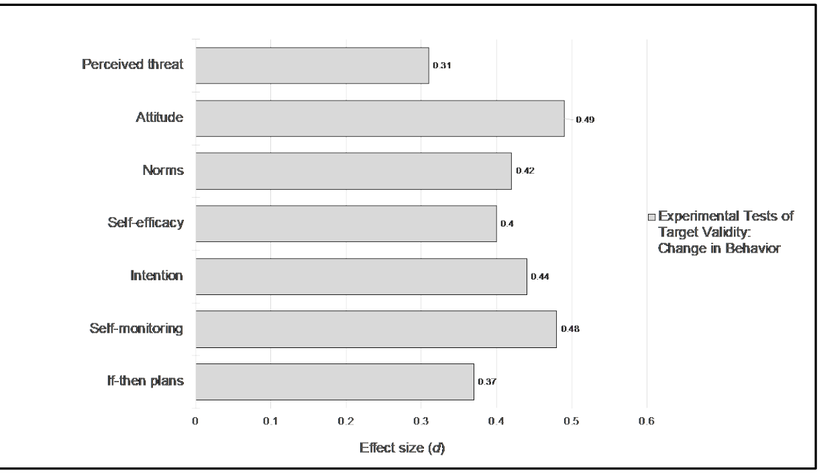
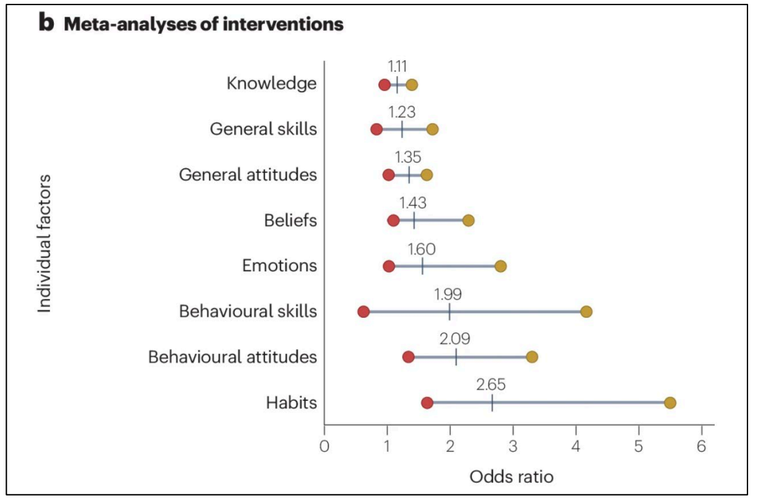
Advancing a Mechanistic Approach to Behavior Change:

A Focus on Targets (Mechanisms)





- The mechanistic approach to behavior change has capitalized on our ability to identify, manipulate, and measure constructs that can serve as intervention targets/mechanisms.



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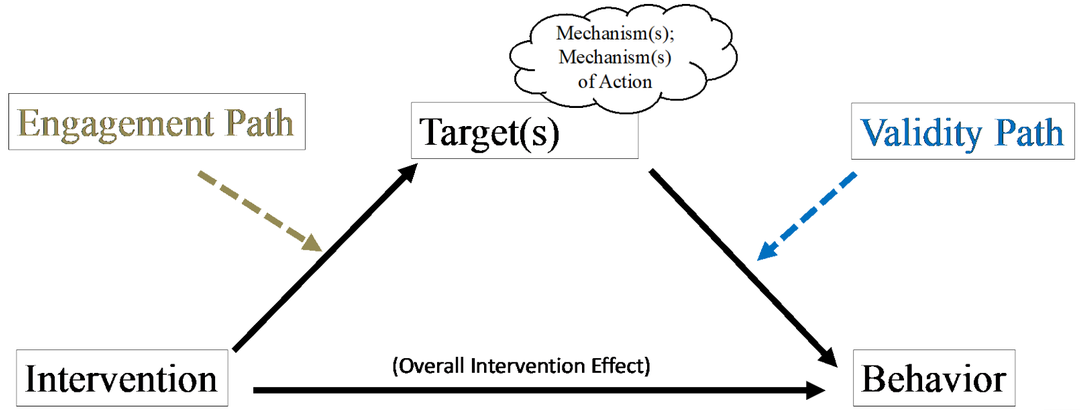
Advancing a Mechanistic Approach to Behavior Change:

A Focus on Targets (Mechanisms)



- Yet, our ability to leverage this mechanistic approach to behavior change is constrained by the state of our health behavior theories.

- ***Why?*** Our theories may identify constructs (e.g., attitudes, norms, efficacy) and specify the relation between constructs or between constructs and behavior *but they do so with remarkably limited detail*.

- This places investigators in a situation in which they know there is value is targeting a given construct, but without knowing how and when to optimize its impact. *It is as if we know where we want to go, but we don't know they best way to get there*.

Mapping Out the Road Forward:

(Re)Setting our Expectations for our Health Behavior Theories

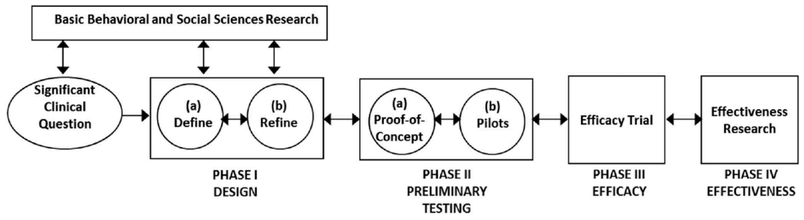
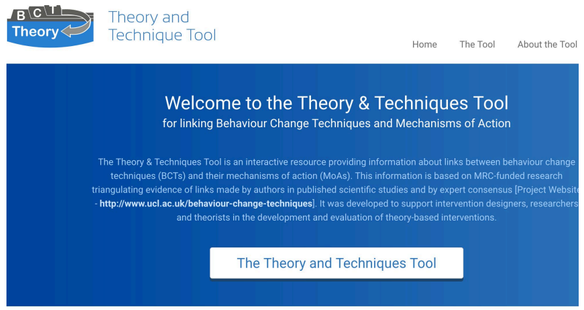


Figure 1. The ORI



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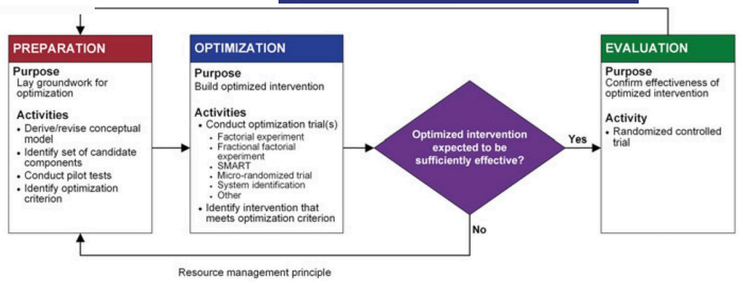

Fig. 1.1 Flow chart of the three phases of the multiphase optimization strategy (MOST)

- Over the past 10-15 years we have seen a remarkable emergence of tools and frameworks to support the design and testing of behavior change interventions.
- To capitalize on these innovations, we need a complementary transformation in our health behavior theories.
- If our theoretical constructs are the mechanisms that sit at the “heart” of behavioral interventions, we need to do a better job of providing investigators with the information they need to optimize how, when, where, and for whom these mechanisms operate.

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Mapping Out the Road Forward:

(Re)Setting our Expectations for our Health Behavior Theories

- Of course, the call for improvements in our health behavior theories is not new (e.g., Sutton, 1998; Weinstein et al., 1998; Noar & Zimmerman, 2005; Riley et al., 2011; Sniehotta et al., 2014).

- And there have been illustrative exemplars about what a re-imagined version of our theories might look like (e.g., Social Cognitive Theory; Riley et al., 2011)

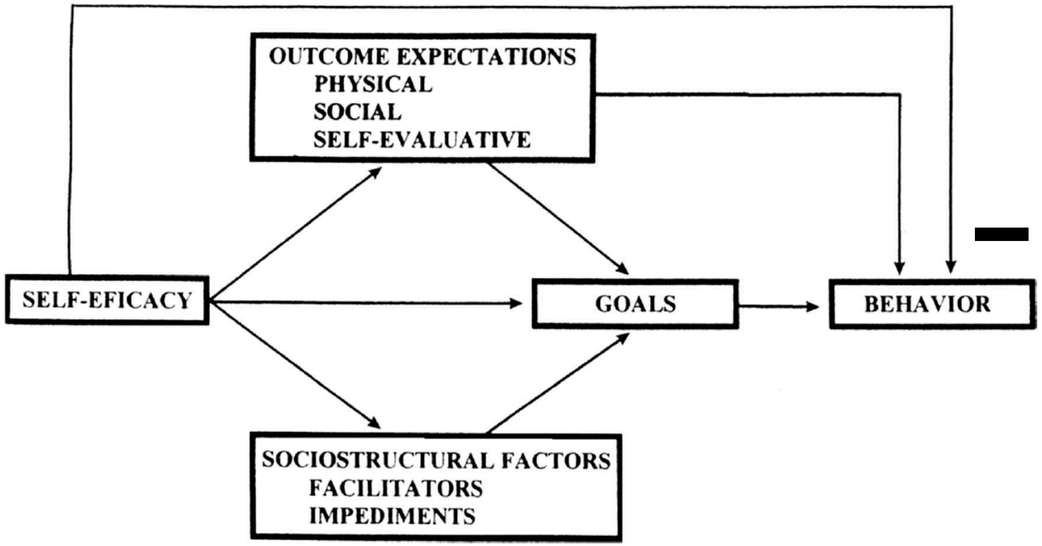

Fig. 1 | Conceptual schematic of SCT from Bandura (2004)

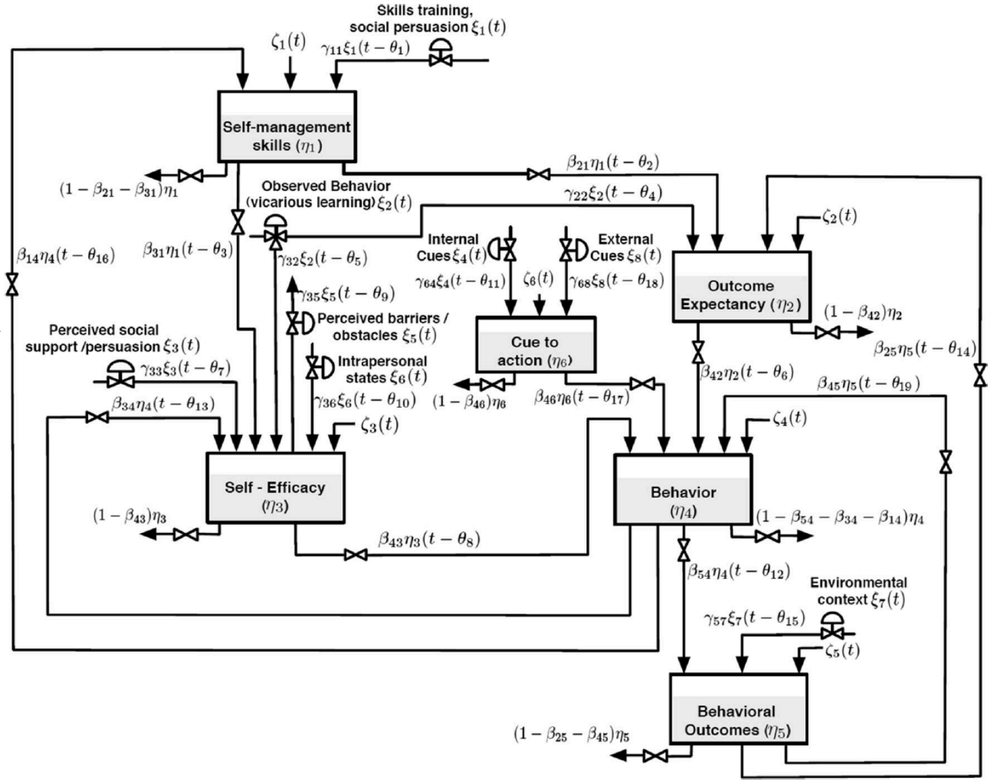

Fig. 2 | Control system model of social cognitive theory

Mapping Out the Road Forward:

(Re)Setting our Expectations for our Health Behavior Theories

What should we expect a health behavior theory to provide?: An Abbreviated (personal) wish list

1. *Greater precision regarding the construct(s) specified*
   I. Across theories we have a mu
   competence; attitudes vs. pro
   differences between construc
   Sheeran et al., 2017; Weinste

From 2022 National Academies Report: *Ontologies in the Behavioral Sciences*

"Progress in the behavioral sciences has been hindered by the use of different terms or descriptions for the same underlying entity or condition *[Jangle Fallacy]*; the use of the same term for different entities or concepts *[Jingle Fallacy]*; the use of different, poorly correlated measures for the same entity and the use of measures whose relationship to the phenomena they are measuring is not well understood."

Mapping Out the Road Forward:
(Re)Setting our Expectations for our Health Behavior Theories

What should we expect a health behavior theory to provide?: An Abbreviated (personal) wish list

1. *Greater precision regarding the construct(s) specified*
    I. Across theories we have a multitude of constructs that appear quite similar (e.g., self-efficacy vs. PBC vs. competence; attitudes vs. pros/cons vs. outcome expectations). Concerns regarding the similarity and differences between constructs are long standing (e.g., Cane et al., 2012; Noar & Zimmerman, 2005; Sheeran et al., 2017; Weinstein, 1993).

    II. What is the conceptual and empirical basis for these distinctions?
        a. Conceptual work: Development of Ontologies (e.g., BICO; Michie et al., 2021; Schenk et al., 2023)
        b. Empirical work: Testing for Jangle Fallacies in measures of feasibility and behavioral evaluation (e.g., Volz, Sheeran, & Rothman, in prep; Volz, Rothman, & Sheeran, in prep)

Mapping Out the Road Forward:
(Re)Setting our Expectations for our Health Behavior Theories

What should we expect a health behavior theory to provide?: An Abbreviated (personal) wish list

1. Greater precision regarding the construct(s) specified
2. *What about a construct should be modified?*
    I. Theories almost exclusively operationalize constructs in terms of their level or value (e.g., favorability of an attitude). Yet, constructs can also differ across features such as their variability or their level of accessibility. Specifying what features of a construct should (and should not) be targeted by intervention strategies is critical.

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Regular Article

OXFORD

Activation Versus Change as a Principle Underlying Intervention Strategies to Promote Health Behaviors

Paschal Sheeran, PhD[1,2] · Jerry Suls, PhD[3] · Angela Bryan, PhD[4] · Linda Cameron, PhD[5] · Rebecca A. Ferrer, PhD[6] · William M. P. Klein, PhD[6] · Alexander J. Rothman, PhD[7]

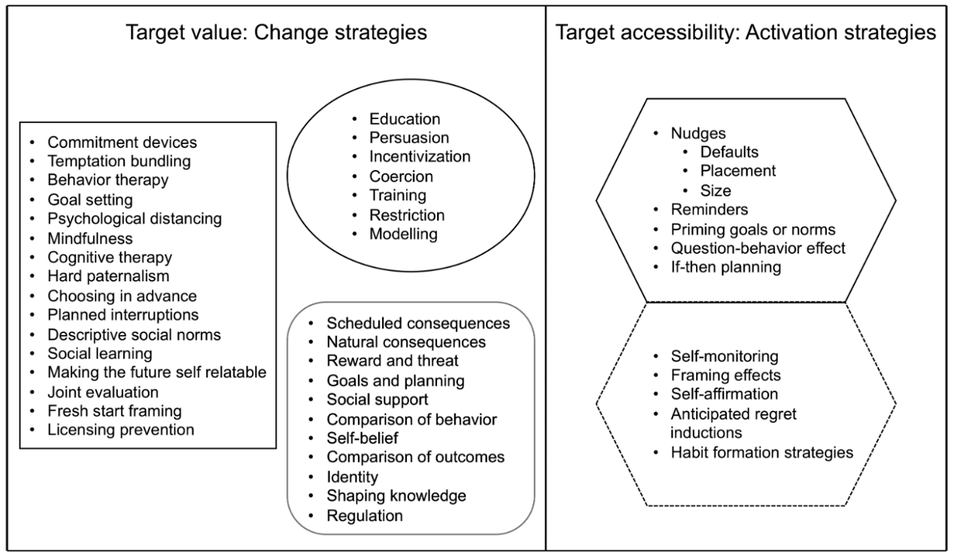

Fig. 2. Intervention strategies modify the value or accessibility of targets via change or activation strategies. *Note.* Change strategies are from Duckworth et al. (2019) [right-angled rectangle], The Behavior Change Wheel (Michie et al., 2011) [oval] and the Behavior Change Technique Taxonomy (v1) (Michie et al., 2013) [rounded rectangle]. Activation strategies [solid and dotted hexagons] come from Duckworth et al. (2019), Michie et al. (2011, 2013), the TIPPME taxonomy (Hollands et al., 2017), and reviews of specific strategies (Finitsis et al., 2014; Gollwitzer & Sheeran, 2006; Harkin et al., 2016; Papies, 2016; Wilding et al., 2016).

Mapping Out the Road Forward:
(Re)Setting our Expectations for our Health Behavior Theories

What should we expect a health behavior theory to provide?: An Abbreviated (personal) wish list

1. Greater precision regarding the construct(s) specified
2. What about a construct should be modified?
3. *What is the "shape" of the relation between constructs/behavior?*
    I. To date, theories primarily operationalize the relation between constructs or between constructs and behavior as linear (and tend to do so implicitly or with limited justification). While many of these relations may prove to be linear, explicitly specifying the shape of these relations (e.g., linear, curvilinear, exponential, hyperbolic, quadratic) will enhance our ability to leverage and test the predicted impact of constructs.

Mapping Out the Road Forward:
(Re)Setting our Expectations for our Health Behavior Theories

What should we expect a health behavior theory to provide?: An Abbreviated (personal) wish list

1. Greater precision regarding the construct(s) specified
2. What about a construct should be modified?
3. What is the "shape" of the relation between constructs/behavior?
4. *Under what conditions (i.e., people, situations, behaviors) do the relations specified in the theory hold?*
    I. To often, our theories fail to explicate the conditions that regulate their operation. Yet, evaluations of our theories and the interventions they guide reveal tremendous heterogeneity in effects; heterogeneity that we struggle to explain (Rothman & Sheeran, 2021).

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The Operating Conditions Framework: Integrating Mechanisms and Moderators in Health Behavior Interventions

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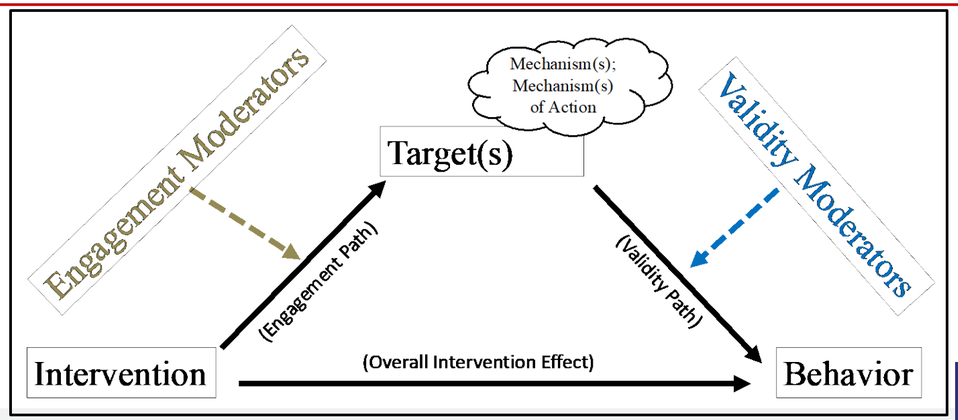
University of North Carolina at Chapel Hill and Lineberger Comprehensive Cancer Center, Chapel Hill, North Carolina



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Looking Back as We Move Forward

International Journal of Behavioral Nutrition and Physical Activity

BioMed Central

Debate

Open Access

"Is there nothing more practical than a good theory?": Why innovations and advances in health behavior change will arise if interventions are used to test and refine theory

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Debate

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How can Health Behavior Theory be made more useful for intervention research?

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