FOUR

THEORY: A DRIVER OF BEHAVIORAL INTERVENTION RESEARCH

... there is nothing so practical as a good theory.
—Lewin (1951, p. 169)

Theory is one of the key drivers of behavioral intervention research. Nevertheless, its role in the development, evaluation, and implementation phases of a behavioral intervention is not clearly understood or fully recognized. Unfortunately, theory continues to be undervalued and underutilized and to receive little attention in the planning and publication of behavioral intervention research (Glanz & Bishop, 2010; The Improved Clinical Effectiveness through Behavioural Research Group [ICEBeRG], 2006).

The importance of theory in guiding intervention development, evaluation, and implementation should not be underestimated. The explicit use of theory can help to identify the treatment components and delivery characteristics of an intervention; to appraise the selection of outcome measures and an understanding of how and why desired outcomes are achieved; to inform as to the replication potential of a proven intervention; and to shed light as to why implementation is successful or not. Theories can also help to explain why some people actively engage in an intervention and others do not, thus informing intervention design and the selection of strategies for enhancing the delivery of an intervention to boost its effects for targeted individuals.

Interventions that are atheoretical or derived without a conceptual foundation do not advance an understanding of behavior change, how and why particular outcomes from an intervention are achieved, or how and why the implementation of the intervention is effective. Interventions that are grounded in a theory or conceptual framework tend to be more effective than those lacking one (Glanz & Bishop, 2010). Using theory also greatly enhances the potential for replication by helping to identify the essential components of an intervention that must be maintained and the most effective mechanisms for its implementation (Glanz & Bishop, 2010; ICEBeRG, 2006).

Our goal in this chapter is to examine the role of theory in behavioral intervention research. We first define theory and examine its specific and differential roles in each phase of the pipeline (Chapter 2). Through exemplars, we articulate the linkage of theoretical frameworks to treatment components and intervention delivery characteristics. Then we examine principles for selecting a theory/conceptual framework and the key challenges in using theories.
WHAT IS THEORY?

So, what is theory? Theory has been variably defined. For our purposes, we draw upon Kerlinger's definition of theory in his classic textbook, *Foundations of Behavioral Research* (1986), as it is comprehensive and useful. Kerlinger defines theory as a set of interrelated constructs, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining or predicting phenomena. (p. 9).

In this definition, theory refers to a systematic way of understanding events, behaviors, and/or situations. It reflects a set of interrelated concepts, definitions, and propositions that explain or predict events and situations by specifying relationships among variables. Thus, the purpose of theory is to provide a roadmap or pathway among constructs, definitions, and propositions as well as their relationships to promote an understanding of the phenomenon of interest and to enable prediction of outcomes (DePoy & Gitlin, 2013). Simply put, the purpose of theory is to explain and predict events.

Theories differ with regard to scope and levels of abstraction and specificity and are often categorized into one of three levels, although there is not necessarily consensus on this nor which theories should be included in each of the levels. At the broadest level there are “grand theories,” which function at a very high level of abstraction. This level of theory focuses mostly on social structure and social processes such as how financial strain affects psychosocial well-being.

Grand theories typically lack operational definitions or clarity as to the relationships among their propositions and constructs and are used to understand or encompass an entire field. Examples include critical theory or structuralism or Orem’s self-care deficit theory (Bengtson, Burgess, & Parrott, 1997; Dowd, 1988; Taylor, Geden, Isaramalai, & Wongvatanyu, 2000).

In contrast, “midrange” theories can be derived from a grand theory and are less abstract. Midrange theories are composed of operationally defined propositions and constructs that are testable. This level of theory is the most useful for behavioral intervention research, and some of the most commonly used are described in Table 4.1.

Finally, “micro” level theories can be specific to particular populations, fields, or phenomena and have the narrowest scope and level of abstraction. Also referred to as “practice- or situation-specific” theories, they are useful in clinical situations or the study of small-scale structures. They typically focus on the individual level and/or social interactions, with symbolic interactionism, social phenomenology, and exchange theory as prime examples.

Regardless of level, a well-developed theory is one which yields testable hypotheses and has some empirical evidence to support its value. Although theories may be rooted in distinct philosophical traditions and categorized variably, that is not our concern here. Our approach is practical. For the purposes of this chapter, we use the terms “theory,” “conceptual frameworks,” and “models” interchangeably and view each as working tools for advancing behavioral interventions. We also do not differentiate between levels of theories (macro, mid, or micro). Our message
purposes, we draw
ulations, fields, or
2. Health Action Process
1. Health Belief
1. Health Belief
![Table 4.1 Examples of Select Theories Commonly Used in Behavioral Intervention Research](text)

<table>
<thead>
<tr>
<th>Theory</th>
<th>Brief Explanation of Model</th>
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<tr>
<td>Health Belief Model (HBM) (Rosenstock, 1974)</td>
<td>People will be motivated to avoid a health threat if they believe they are at risk (“perceived susceptibility”) for the disease/condition and if they deem it serious (“perceived severity”). These two necessary conditions—perceived susceptibility and perceived severity—converge to describe “perceived threat,” the central construct of HBM. Perceived threat is also influenced by “cues to action,” which are environmental stimuli such as advertisement campaigns and relatives or friends who have the disease; cues to action extend this individual-level theory into an ecological perspective. An individual’s decision to engage in health behaviors is further influenced by the counterbalance between “perceived barriers” and “perceived benefits.” The HBM comprises all of these factors, moderated by demographic characteristics. In 1988, Rosenstock and colleagues added to the model an additional construct—“self-efficacy”—to capture individual perceptions of confidence to perform a behavior. HAPA theorizes that intention to change is the most potent predictor of whether an individual will actually change his or her undesirable behavior to a more desirable one. Within this framework, HAPA proposes two stages of motivation: (1) “preintentional motivation” and (2) “postintentional volition.” Preintentional processes (e.g., outcome expectancies, risk perception, action self-efficacy) result in the emergence of intention, whereas postintentional processes (e.g., maintenance self-efficacy, planning) result in the actual behavior being enacted. An individual will engage in a health behavior if he or she has the intention to do so. Intention is composed of two main elements: “attitudes” and “subjective norms.” Attitudes are operationalized as the belief that one’s behavior will result in positive health outcomes (“behavioral beliefs”) and is also dependent on the degree to which one values these positive health outcomes (“evaluation”). Subjective norms are operationalized as the appraisal of whether others will approve or disapprove of one’s behavior (“normative beliefs”) and whether or not the individual is affected by these normative beliefs (“motivation to comply”). TPB is incremental to TRA with the addition of the construct “perceived behavioral control.” Perceived behavioral control is conceptualized as the degree to which an individual perceives a specific behavior as either easy or difficult to enact. Life-Span Theory of Control suggests that threats to, or actual losses in the ability to, control important outcomes may activate individuals to use strategies to buffer threats and losses. To the extent that control-oriented behavioral and cognitive strategies are used that are directed toward attaining valued goals, threats to, or actual losses of, control may be minimized and positive affect enhanced.</td>
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is simple: Interventions must be built upon theoretical and/or conceptual foundations. Theory/conceptual frameworks structure each phase of design, evaluation, and implementation of an intervention; as such, different theories/frameworks may be drawn upon and utilized depending upon phase, specific research questions being addressed, and the focus or objectives of a behavioral intervention.

DEDUCTIVE REASONING APPROACH

The use of theory in the context of behavioral intervention research reflects a deductive approach. That is, a theory is specified a priori to the formal evaluation of an intervention, and testable hypotheses are derived that articulate one or more pathways by which the intervention may have its desired effects. The hypotheses reflect the expected relationships between two or more concepts of the theory that can be evaluated and indicate what is expected to be observed on the basis of the principles of the theory (DePoy & Gitlin, 2015). It is important to point out that the outcomes of intervention research can also inform or refine theories or models of behavior. That is, the use of theory in intervention work reflects in part a test of the theory itself or its specific tenets, which in turn can prove, disprove, or advance the theoretical tenets.

The deductive use of theory in behavioral intervention research is in contrast to an inductive approach. A ground-up, generative, or inductive approach is used mostly for theory development or refinement and involves constructing or building theory using primarily qualitative methodologies.

An example of the utility of a conceptual framework in structuring an intervention and deriving specific hypotheses is illustrated by Rovner and colleagues’ (2012) intervention to reduce cognitive decline in persons with a medical diagnosis of mild cognitive impairment (MCI-MD).

We based this trial on the Disablement Process Model, which is a sociomedical model that describes how medical diseases affect functioning in specific body systems and lead to disability. The model posits that disability is part of a complex relationship between health conditions and contextual (i.e., environmental and personal) factors. In this model, a MCI-MD, as a possible preclinical AD state, reflects a physiologic dysfunction that results in diminished memory and initiative (disability), where environmental factors (i.e., activity participation) may “speed up” or “slow down” this core pathway. We propose to increase activity levels and thereby “slow down” progression to disability. (Rovner et al., 2012, p. 714)

As illustrated, this deductive, a priori use of a framework leads investigators to identify a target for the intervention (e.g., in the previous case, activity level) and the selection of expected outcomes (e.g., slower progression of memory loss).

ROLE OF THEORY ALONG THE PIPELINE

The specific role of theory in informing an intervention and its development depends upon the phase of the intervention along the pipeline. Figure 4.1 illustrates
Figure 4.1  Role of theory in development, evaluation, and implementation phases.
the changing role of theory and the specific questions that a theory addresses at each phase of advancing an intervention.

Development Phases

As discussed in Chapter 2, the development phases refer to the initial efforts to identify an intervention idea and advance its characteristics and components. This includes: the period of discovery; Phase I, feasibility; and Phase II, proof of concept. In this early phase, theory helps to answer why an intervention should work. It also helps to guide the selection of treatment components, treatment outcomes, and approach to delivering the intervention.

Why an Intervention May Work

As an example, let's say one is designing an intervention to address family burdens associated with caring for persons with dementia. A common approach used in caregiving research is the classic stress process model (Pearlin, Mullan, Semple, & Skaff, 1990) to understand family caregiver burden. Briefly, this model suggests that burden is an outcome of a particular pathway that involves the caregivers’ initial appraisals of whether the external demands of caregiving pose a potential threat to themselves and if so, whether they have sufficient coping mechanisms to manage effectively. If caregivers perceive external demands as threatening and their coping resources as inadequate, the model suggests that caregivers will experience burden. Consequently, the appraisal of stress may contribute to negative emotional, physiological, and behavioral responses that place caregivers at increased risk for poor health and psychiatric symptoms.

Applied to the context of an intervention, the model suggests that changing caregivers' cognitive appraisals from their situation and instructing in positive coping mechanisms may reduce burden. The target of such an intervention is therefore the caregivers' cognitions. Intervention activities may include instruction in cognitive reframing and effective coping techniques. A reduction in burden would be explained via the pathway outlined by the stress process model; that is, the intervention is hypothesized to have its effect on caregiver burden by changing cognition or how caregivers appraise their situation and their emotional coping style.

Alternately, let's say one uses a different iteration of the stress process model. The National Institutes of Health resources for Enhancing Alzheimer's Health (REACH II) initiatives, for example, developed a variant of this model, which recognized objective factors in the care environment such as the lack of social resources or behavioral symptoms of persons with dementia (Schulz, Gallagher-Thompson, Haley, & Czaja, 2000). As shown in Figure 4.2, the inclusion of objective indicators of burden in the conceptual model leads to a different intervention approach. The expanded REACH stress process model suggests that multiple factors contribute to burden along the explicated pathways. Figure 4.2 thus suggests that to boost intervention impact, each of these factors should be targeted. REACH II therefore tested a multicomponent intervention that addressed five areas of caregiver risks for burden. These components and their associated activities included caregiver depression through the provision of education and mood management techniques including pleasant event activities; caregiver burden through the provision of...
Figure 4.2 Role of theory in guiding treatment components and specific activities of the REACH II intervention.

Education, instruction in stress reduction techniques, and specific skills to manage problem behaviors; self-care and healthy behaviors through the provision of education, helping caregivers track self-care practices; social support by providing opportunities to participate in tele-education and support sessions; and addressing problem behaviors through a structured problem-solving and brainstorming approach to identify specific strategies. As illustrated, even a seemingly small change to a conceptual model alters the intervention focus, its treatment components, and delivery characteristics.

Yet another example of the role of theory in intervention development is the Get Busy Get Better (GBGB) program designed to address depressive symptoms in older African Americans (Gitlin et al., 2012). This multicomponent intervention draws upon several complementary theoretical approaches. First, it uses a broad social ecological model of depression. This model suggests that situational factors (e.g., financial, housing, or health concerns) may provide low levels of positive reinforcement and minimal control, thus negatively impinging upon mood.

Second, GBGB draws upon behavioral theories of depression, which suggest that depressed affect is the consequence of environmental contingencies that decrease healthy responses within one's behavioral repertoire and increase avoidance of aversive stimuli (Hopko, Lejuez, Ruggiero, & Eifert, 2003). Behavioral theories further suggest that becoming activated can help individuals break the behavior–mood cycle by moving a person from avoidance to action (Hopko et al., 2003).

On the basis of these complementary frameworks, GBGB was designed to involve five conceptually linked components as shown in Figure 4.3: care management...
involving a comprehensive assessment to identify unmet needs; referrals and linkages to minimize situational or environmental stressors; education about depression symptoms and specific actions for self-management to enhance cognitive and behavioral self-awareness; instruction in stress reduction techniques to provide immediate relief from stressful situations; and behavioral activation by identifying a valued activity goal and specific steps to achieve it. The working hypothesis based on these conceptual frameworks is that treatment components operate in tandem such that each is necessary to bring about reductions in depression. This is a testable hypothesis that can be examined through mediation analyses in an evaluation phase, as discussed later.

Here is yet another example of how theory informs hypothesis generation, choice of treatment components, delivery characteristics and outcomes, and in turn the link to anticipated underlying mechanisms of an intervention designed to reduce maternal gestational diabetes mellitus (GDM) and delivery of a large for gestational age (LGA) infant.

The protocol presented here describes a complex behavioral intervention comprising dietary and physical activity changes which we have developed with the aim of improving glycemic control in obese pregnant women. The intervention is based on established control theory with elements of social cognitive theory. The primary hypothesis being tested is that an antenatal intervention package of low glycemic dietary advice combined with advice on increased physical activity will reduce the incidence of maternal GDM and LGA infants. A secondary hypothesis is that the intervention will reduce the risk of obesity in the child. (Briley et al., 2014, p. 3)
Selecting Delivery Characteristics

Thus far we have discussed how theory/conceptual frameworks frame an intervention, inform the targets of an intervention (e.g., cognition, behavior, social and/or physical environments) and provide an understanding as to why an intervention should work. However, theory can do even more at the development phases—it can help guide selection of delivery characteristics or the approach to delivering the intervention.

The specific approach to intervening or delivering an intervention may assume various forms depending upon the theoretical lens that is applied, practical considerations, and the empirical evidence as to what constitutes effective approaches. Chapter 5 examines delivery characteristics in depth. However, here our focus is on specifically the role of theory in informing the selection of delivery characteristics.

In our first example discussed earlier of a caregiver intervention to address burden through cognitive reframing, different delivery strategies could be employed on the basis of the theoretical lens that is adopted. For instance, adult learning theories emphasize situational-based and practice-oriented learning techniques. This could involve face-to-face sessions and learning through doing, which would be in contrast to a didactic and/or prescriptive approach. Alternatively, behavior change theories emphasize the role of peer-based and group-learning situations, suggesting the value of imparting new coping strategies through group meetings and exercises and peer-led programs.

The delivery characteristics of the REACH II intervention were shaped by several principles from adult-learning theories. These included: activities need to occur within the context in which the education and new skills would be applied or actually used; repeated exposure to new information and skills is needed for their integration into daily care routines; and education and skills are best offered and subsequently adopted when perceived as needed. Thus, the intervention was subsequently delivered in the home, activities were adjusted to areas of most concern to caregivers, and education was reinforced through the use of a telephone computer system (Belle et al., 2006). This illustrates the link of theory, models, and principles to the design of treatment components and delivery characteristics.

To illustrate these points further, we use, as an example, an intervention that is designed to reduce behavioral symptoms in persons with dementia through a nonpharmacologic approach. Behavioral symptoms, such as repetitive vocalizations, agitation, aggressiveness, wandering, rejection of care, and restlessness, are almost universal in dementia and can be troublesome to persons with dementia and their caregivers. Pharmacological approaches do not address the most troublesome behaviors, and their risks, including mortality, may cause more harm than the benefit derived (Gitlin, Kales, & Lyketsos, 2012).

Nonpharmacologic approaches conceptualize behavioral symptoms as, in large part, expressions of unmet needs (e.g., repetitive vocalizations for auditory stimulation); inadvertently reinforced behavior in the face of an environmental trigger (e.g., the patient learns that screaming attracts increased attention); and/or consequences of a mismatch between the environment and the patient's ability to process and act upon cues, expectations, and demands (Algase et al., 1996; Cohen-Mansfield, 2001). These approaches involve modifying cognitions, behaviors, environments, or precipitating events that may contribute to disturbances, or involve
using compensatory strategies to reduce for persons with dementia their increased vulnerability to their environment (Kales, Gitlin, & Lyketsos, 2015). More specifically, one conceptual model, the Progressively Lowered Stress Threshold (PLST), proposes that, with disease progression, individuals with dementia experience increasing vulnerability and a lower threshold to stress and external stimuli (Hall & Buckwalter, 1987). One source of stress for persons with dementia is the complexity of routine activities of living and interactions with caregivers (formal and informal), which become increasingly challenging as the day progresses (Hall & Buckwalter, 1987). PLST suggests that, by minimizing environmental demands that exceed the functional capacity of an individual and by regulating activity and stimulation levels throughout the day, agitation can be reduced. Complementing this framework is the Competence–Environmental Press Model (CEPM; Lawton & Nahemow, 1973), which suggests that there are optimal combinations of environmental circumstances or conditions and personal competencies that result in the highest possible functioning for individuals. Obtaining the just-right-fit between an individual’s capabilities and external demands of environments/activities results in adaptive, positive behaviors; alternately, environments/activities that are too demanding or understimulating may result in behavioral symptoms such as agitation or passivity in individuals with dementia. Similar to PLST, the CEPM suggests that environments/activities can be modified to fit any level of cognitive functioning and individual competencies in order to optimize quality of life. Both frameworks suggest that behaviors can be reduced or managed by modifying contributing factors that place too much demand or press on the individual with dementia. Such factors may include the physical environment (e.g., auditory and visual distractions), the social environment (e.g., communication style of informal/formal caregivers), or factors that are modifiable but which are internal to the individual themselves (e.g., discomfort, pain, fatigue).

Thus, to recapitulate, frameworks such as the Unmet Needs Model, the Progressively Lowered Stress Threshold Process Model, or CEPM inform why nonpharmacologic approaches may effectively prevent, minimize, or manage troublesome behavioral symptoms. The stress process models described earlier in this chapter inform how minimizing an objective stressor such as behavioral symptoms may lower caregiver burden. So we now have a strong theoretical basis for a nonpharmacologic intervention and how it may impact both persons with dementia and family caregivers.

However, use of nonpharmacologic strategies for persons at the moderate to severe stage of dementia is totally dependent upon the willingness and ability of family caregivers to effectively implement them. Families may be so overwhelmed by the care situation that they are unable to use nonpharmacologic strategies although their use may be of potential help to them. Some caregivers may be more “ready” than others to learn about and enact strategies that require behavioral change on their part (e.g., employing different communication strategies or rearranging the physical environment), and their readiness may affect participation in and the benefits derived from the intervention for the person with dementia. Now we need a theory or conceptual framework to understand how to effectively engage families in the intervention process.

To this end, we can draw upon the Transtheoretical Model (TTM) (Prochaska, DiClemente, & Norcross, 1992). TTM has been widely used in behavior change
interventions including smoking cessation, exercise, and other healthy lifestyle programs. The model suggests that to change and adopt new behaviors is complex and involves five incremental stages. These include precontemplation in which individuals do not consider changing their behavior, nor are they aware of the consequences of their behavior. Applied to caregivers, those at this stage may view behavioral symptoms of dementia as intentional and be unaware how their communications contribute to these symptoms. In contemplation, individuals are aware a problem exists and may begin to consider how to address the problem. At this stage, caregivers may understand behavioral symptoms as a disease consequence but not recognize the consequences of their own behaviors. The preparation stage is characterized by intention to take action and a positive orientation to behavior change; caregivers at this stage are ready to develop an action plan such as seeking information or learning about nonpharmacologic strategies. When behavior is consistently modified, individuals are considered to be in the action stage such as a caregiver who actively uses effective communication strategies. Maintenance occurs when the desired behavioral change is sustained for 6 months or more (Prochaska et al., 1992).

TTM can help inform effective approaches for intervening with families as illustrated in Figure 4.4. Families with an initially low level of readiness may require more education about dementia and behavioral symptoms than those at a high level of readiness. Similarly, those at a low level of readiness may need more time in the intervention. The interventionist may need to proceed slowly so as to not overwhelm the caregivers and to move them to a higher level of readiness in which they are willing and able to implement effective nonpharmacologic strategies. Thus, in this case example, the construct of readiness based in TTM can help inform how to tailor and deliver information and the pace of the intervention (Gitlin & Rose, 2014).

### Evaluation Phases

Theory informs the evaluation phases (Phase III—efficacy; and Phase IV—effectiveness) of an intervention somewhat differently than we have discussed thus far (Figure 4.1). At this stage of an intervention's development, theory provides a basis for understanding the underlying mechanisms of action or how the intervention might result in positive outcomes. It also guides an understanding as to why and whether some groups or individuals may benefit from the intervention more than others (Gitlin et al., 2000).

More specifically, if an intervention is proven to be efficacious, then it is necessary to understand why and examine the pathways by which positive results have been achieved. Mediation and moderation analyses are typically the statistical approaches that are employed for these purposes. The specific hypotheses tested and variables selected for these analytic models must be informed by the theory or theories that underlie the intervention. As suggested earlier, the analyses in turn serve as a validation of the theory or theories and related hypotheses that frame the intervention. These analytic strategies help to examine the relationships among constructs and concepts of a theory and either verify, modify, refine, or refute them.
Figure 4.4 Use of behavioral change framework to guide delivery of an intervention.
In the earlier examples using the stress process models, one could evaluate whether an intervention reduces caregiver burden by mitigating an objective stressor such as the problem behaviors of persons with dementia. Similarly, one could test whether improving social support reduces burden. Mediation analyses could be used to test the independent and joint contributions of multiple mechanisms such as improving social support and reducing problem behaviors (Roth, Mittelman, Clay, Madan, & Haley, 2005).

The GBGB program was tested in an efficacy trial with 208 older African Americans. The Phase III trial demonstrated that the intervention group had reduced depressive symptoms and improved daily function and quality of life compared to a wait-list control group at 4 months. Furthermore, after receiving the intervention, the delayed treatment group similarly benefited (Gitlin et al., 2013). The social ecological model would suggest that multiple pathways were responsible for these outcomes. Behavioral activation theories would suggest that becoming behaviorally activated was the primary pathway in which depression reductions were achieved, although the other treatment components are necessary and support activation.

Mediation analyses confirmed that changes in depressive symptoms were achieved through multiple pathways and not exclusively through activation. The reduction of stress, the improvement of depression knowledge, use of self-management techniques, and activation, all variables linked to the applied broad theoretical framework of the intervention (Figure 4.3), were jointly responsible for the significant reductions in depressive symptomatology. That is, activation was not the only mechanism by which depression was reduced (Gitlin, Roth, & Huang, 2014). These findings support the theoretical models and suggest that a condition for engaging in behavioral activation is that immediate environmental stressors must be addressed in concert with helping people achieve behavioral change. The findings also have important implications for GBGB’s translation and implementation into real-world settings. They suggest that all treatment components must be delivered in order to achieve positive benefits.

Furthermore, as the intervention was tailored to individual needs, differences in outcomes by demographic subgroups were not expected. This was shown to be the case through moderation analyses, which revealed that all participants benefited similarly as hypothesized; that is, men and women, those living alone or with others, and those with greater financial distress or without financial difficulties improved equally (Szanton, Thorpe, & Gitlin, 2014). This finding supports the notion that tailoring to the needs and personal behavioral goals of participants seems to be effective and an important delivery characteristic of this intervention.

To summarize, as the examples in this section demonstrate, theory at the evaluative phases can help guide selection of outcomes measures, explain mechanisms by which observed changes are achieved, and identify who may have benefited more or less and why.

Implementation Phases

Theory has still yet another role in the implementation phases of behavioral intervention research (Phase V—translation/implementation; Phase VI—diffusion/dissemination; Phase VII—sustainability). In these latter phases, theory informs an
understanding of specific implementation processes such as the contextual barriers to, and supports of the adoption of, a proven intervention within settings and by interventionists and end users. Specifically, theory helps identify what components of the intervention could be modified or eliminated, the immutable elements or aspects that cannot be changed, organizational and contextual features impinging on implementation, and strategies for streamlining the intervention to enhance implementation potential. Using theory to identify and sort through contributory organizational or contextual characteristics is essential at this phase.

An exemplar is the use of Normalization Process Theory (NPT) to understand the potential of GBGB to be implemented in senior centers and other community-based agencies (May et al., 2009). This particular theory identifies four factors that can inform implementation potential: Briefly, these are “coherence” or whether an intervention is easy to describe and understand; “cognitive participation” or whether users consider it a good idea; “collective work” or how the program affects agency staff; and “reflexive monitoring” or how users of the program will perceive it.

As to the first factor, GBGB demonstrated high coherence: Staff and older African American participants alike understood and recognized the program and its benefits. As supporting positive mental health is the expressed mission of senior centers, GBGB fits within their organizational goals. With regard to cognitive participation, initially care managers responsible for screening for depressive symptoms did not value using a systematic screening tool and believed that their own appraisals were sufficient. However, through training, ongoing use, and supervisory support, care managers learned that their judgments were often incorrect and that screening afforded a more systematic and accurate approach to depression detection. Similarly, initially interventionists believed that they already practiced many of the elements of GBGB and therefore the intervention was not necessarily novel to them. This is a common reaction to behavioral interventions. However, with training and use, interventionists were able to differentiate GBGB from their own traditional mental health practices and became invested in the program. Older African American participants in the program found it highly valuable and perceived the program worthy of their investment of time and energy.

The third NPT factor, “collective work,” presents as the most challenging for GBGB. As most senior centers or community-based agencies do not have the capacity to engage in depression care, GBGB would require a change in work practices and flow. Staff training and employment of skilled professionals would be critical to implement GBGB, and this may be difficult for agencies with limited budgets and staffing.

The fourth consideration, “reflexive monitoring,” suggests that the value of GBGB was perceived positively by both interventionists and participants alike. Thus, NPT suggests two potential areas that present as critical challenges when implementing GBGB in real-world settings: accounting for and helping agencies adjust their workflow and payment mechanisms; and tweaking training efforts so that interventionists come to understand the benefits of the program sooner rather than later (Gitlin, Harris, McCoy, Hess, & Hauck, in press).

As specific theories have been developed to understand ways to embed evidence-based interventions in practice settings, Chapter 19 provides a more in-depth discussion of the role of theory in the implementation phase and specific theories that help to guide implementation processes.
SELECTING A THEORY OR CONCEPTUAL FRAMEWORK

There is not an agreed upon set of criteria, operational guidance, recipe, or step-by-step approach for selecting theories or conceptual frameworks to guide intervention development, evaluation, or their wide-scale implementation (French et al., 2012). However, we recommend several actions be taken. First, it is important to identify the specific phase along the pipeline that reflects the level of the intervention's development. Placement along the pipeline helps to anchor the specific research questions that will be asked and thus the role of the theory/conceptual framework (e.g., see Figure 4.1). Second, a literature review should be conducted to identify the ways in which the targeted problem area has been previously addressed, including the theories employed to understand it. Also, a literature review should be used to consider the empirical evidence as to how and why the problem area occurs, which may in turn help to suggest an appropriate theoretical framework for proceeding with an intervention. Third, selecting a theory/conceptual framework at any phase along the pipeline will depend upon one's intent, preferred approach to understanding and explaining phenomenon, and the target of change. As to the latter, different theories are needed depending upon whether the target of the intervention is at the individual (behavioral, cognitive, affective, knowledge), interpersonal, community, organization, or at the policy level (National Cancer Institute, 2005). Minimally, the theory or conceptual framework that is ultimately selected should be well developed and have some supportive empirical evidence for its basic tenets.

The Medical Research Council also recommends applying several self-reflective questions to guide theory selection (www.mrc.ac.uk/complexinterventionsguidance). These include what follows: Are you clear about what you are trying to do? What outcome are you aiming for? How will you bring about change? Does your intervention have a coherent theoretical basis? Have you used theory systematically to develop the intervention? These are essential questions that can guide theory selection.

The Improved Clinical Effectiveness through Behavioural Research Group (ICEBeRG) (2006) has identified six factors to consider when selecting a theory for implementation science. These include determining the origins of the theory (e.g., is there evidence to support its basic tenets?); examining the concepts of the theory and their interrelationships; evaluating the consistency of the theory (e.g., is there a logical structure?); considering the extent to which generalizations can be made on the basis of the theory and whether there is parsimony (e.g., can the theory be stated simply and clearly?); determining if the theory can generate testable hypotheses; and evaluating its utility (e.g., whether the theory is helpful in understanding or predicting outcomes).

COMMONLY USED THEORIES IN BEHAVIORAL INTERVENTION RESEARCH

As we have suggested, there is not a singular theory or conceptual framework that dominates behavioral intervention research or which is appropriate for use by all behavioral intervention studies. However, most effective public health and health promotion interventions tend to embrace or begin with an ecological perspective at the broadest level as shown with the earlier GBGB example (Glanz & Bishop, 2010;
Explanatory theories as to why behaviors occur and change theories to suggest best ways to influence behavior change are also very useful within the ecological perspective. Some of the most common theories framing behavioral intervention research include Social Learning Theory; Theory of Reasoned Action; Health Belief Model; Social Cognitive Theory; self-efficacy; Theory of Planned Behavior; and TTM of Stages of Behavior Change (Glanz & Bishop, 2010), and these are described in more detail in Table 4.1. Also, as shown by Table 4.1, theories are not static; they evolve and are refined over time as new data emerge that necessitate incremental changes to the tenets of the theory/model. For example, the Health Belief Model was originally proposed in 1974 (Rosenstock, 1974), but in 1988, it was expanded to include the construct of self-efficacy (Rosenstock, Strecher, & Becker, 1988).

Further, Heckhausen and colleagues originally proposed the Life-Span Theory of Control in 1995, but in 2010, they presented an expanded version of the theory, the Motivational Theory of Life-Span Development on the basis of theoretical advancements and empirical research on goal engagement/disengagement (Heckhausen & Schulz, 1995; Heckhausen, Wrosch, & Schulz, 2010). The Life-Span Theory of Control sought to explain the processes by which individuals choose goals to optimize control. Their more recent theoretical work integrates this and other related models to provide a more comprehensive framework for understanding personal agency throughout the life span.

Similarly, the Theory of Planned Behavior extended the Theory of Reasoned Action by adding the construct of “perceived behavioral control,” conceptualized as the degree to which an individual perceives a specific behavior as either easy or difficult to enact (Ajzen & Fishbein, 1980; Ajzen & Madden, 1986). Thus, theories are not static. Rather, they change and advance over time as hypotheses are tested and new data emerge that support or refute the propositions, relationships, constructs, and concepts suggested by a theory.

Table 4.1 is not an inclusive list nor should it be construed that these are the only theories to consider or use in behavioral intervention research. Rather, the table represents a starting point for considering ways to inform intervention development and evaluation.

**USING MORE THAN ONE THEORY**

As there are typically multiple determinants of health and behaviors, an intervention may need to be informed by more than one theory. This is particularly the case for complex health and psychosocial problems in which no single action alone may have a positive effect. Rather, a multicomponent approach informed by one or more theories may be more effective. As multiple pathways may need to be targeted to bring about the expected changes, one theoretical framework may complement another and together explain the different conduits by which the intervention has its impact. Similarly, if the intervention targets a dyad, let’s say a caregiver and the person receiving care, different theories may be needed to articulate the specific pathways by which outcomes are achieved for each party, such as the example of an intervention targeting the behavioral symptoms of persons with dementia. These points are illustrated in the examples described earlier.
Furthermore, multiple theories may be necessary if an intervention is multimodal. A multimodal intervention includes treatment components that intervene through different mechanisms of action. For example, an intervention designed to enhance cognitive abilities by impacting physiological reserve through a physical exercise program and cognitive reserve through a cognitive training program would require multiple theories to understand these distinct potential pathways.

The challenge in using more than one theory is to logically and systematically link them coherently (Michie & Prestwich, 2010). Here is an example of how investigators integrated different frameworks to form a strong rationale for an intervention designed to reduce risk for HIV and sexually transmitted diseases (STDs).

The theoretical framework for the Eban HIV/STD Risk Reduction Intervention integrates components of social cognitive theory (SCT) and an Afrocentric paradigm into a relationship-oriented ecological framework that addresses multilevel risk and protective factors associated with HIV/STD risk reduction among African American HIV-serodiscordant couples. SCT informed the factors in the ecological model that are referred to as ontogenic- or personal-level and micro- or interpersonal-level factors. These SCT tenets are designed to build individual’s and couples’ self-efficacy, behavioral skills, and positive outcome expectancies with respect to HIV/STDs prevention. SCT behavior change strategies implemented in sessions include guided practice with rewards, modeling of behavioral skills (e.g., condom use) and communication and negotiation skills, and problem solving and decision-making.

The intervention design incorporates an Afrocentric paradigm by organizing session content around discussions of one or more of the 7 principles of Nguzo Saba, which are aimed at addressing community-level or macro-structural-level factors. Through the use of these principles, African American couples learn to link the practice of safer sex to enhancement of cultural and gender pride and to an overall more positive way of living based on a healthy balance between self-protection and peer/community support. (NIMH Multisite HIV/STD Prevention Trial for African American Couples Group, 2008, pp. S16–S17)

Locher et al. (2011) also clearly explain how two theoretical approaches are used complementarily to inform the Behavioral Nutrition Intervention for Community Elders (B-NICE).

The B-NICE study was guided by the theoretical approaches of the Ecological Model (EM) and Social Cognitive Theory (SCT). These theories are especially useful in combination with one another because they emphasize the reciprocal relationship that exists between individual behavior and the social environment; moreover, both have been recommended as particularly well-suited for addressing the problem of poor nutritional health in home-bound older adults. Specifically, we used an EM in designing particular components of the intervention and SCT in developing the manner in which the intervention was implemented. (Locher et al., 2011, p. 3)

Most behavioral interventions will require the use of more than one theoretical framework. To effectively use more than one theory, a clear explication of the link between theories and how each contributes to the intervention design is central.
CHALLENGES USING THEORY

Although using theory is essential to the development, testing, and implementation of an intervention, there are challenges. First, it may be difficult to find a theoretical base for a particular intervention approach. Some theories of interest may lack a strong empirical foundation. Applying theory to an identified problem area may not be straightforward. This is particularly the case for theories that are not well fleshed out or which do not have empirical support.

Second, a theory may suggest what needs to be changed, but not specifically how to induce change. As discussed earlier, the stress process model provides an understanding of what needs to be changed (e.g., cognition, external stressors) but not how to change it; augmenting it with the TTM can help inform the specific strategies to use when delivering an intervention to support desired changes.

A third challenge is that prevailing behavior change and health behavior theories tend to explain behavioral intentions or motivation, but they do not necessarily explain or predict actual behavior or behavior change. Other theories may need to be called upon to fill the gap between intention and actual behavior.

Yet another challenge is that many journals, particularly medical, do not encourage or support discussion of the theory base for an intervention. The theory base for an intervention is not even mentioned in the Consolidated Standards of Reporting Trials checklist that is used as a guide for reporting intervention work (see Chapter 24 for a discussion on publishing; see www.consort-statement.org/ for checklist of items). Most publications reporting the outcomes of a behavioral intervention study do not describe a theoretical foundation for the intervention. If a theoretical basis for the intervention is mentioned, it is done so briefly, often making it difficult to decipher connections between treatment components, measures, and outcomes. Thus, it is often difficult to understand how theory informs a published intervention as there is not an expectation that this needs to be articulated. As such, the role of theory and its importance tends to be minimized, and the replication potential of an intervention is potentially and inadvertently diminished.

Finally, a theory may not work. This may be due to various reasons: the choice of theory may not be appropriate or may not adequately explain the phenomenon of interest; the theory may lack clearly defined and testable relationships; the intervention informed by the theory may have been poorly developed and/or implemented (see Chapter 12 on fidelity); or the lack of significance may reflect a measurement error (see Chapter 14; ICEBeRG, 2006). If a theory does not work, it is important to determine the reasons why this might be the case. This can in turn lead to a refinement of the original theory, refutation of the theory, or modification of the intervention and measures to align better with theory.

CONCLUSION

In this chapter, we have shown that theory addresses three broad essential questions in behavioral intervention research: why the intervention should work (development phases), how the intervention does work (evaluation phases), and how the intervention works in real settings (implementation phases). Without a theory base,
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