Despite advances in hearing technology, hearing aid use remains suboptimal among adults with hearing impairment. In the United States, recent estimates suggest that only one-third of adults aged 70 years and older who are potential hearing aid candidates use hearing aids. These rates are similar to those reported in the United Kingdom and Australia, indicating the need to develop more effective interventions to promote hearing aid use. Notably, there is a common view that interventions guided by a theoretical understanding of hearing aid use, including its barriers and enablers, increases the likelihood of them being effective. For example, the Medical Research Council’s guidance for developing and evaluating complex interventions recommends that theory be identified and incorporated into the design of complex interventions. Much research has been conducted to improve our understanding of suboptimal hearing aid use, investigating associations between hearing aid use and variables such as the degree of hearing impairment and disability, bilateral versus unilateral fitting, attitudinal beliefs, device cost and management, and family support, but only a small proportion has explicitly drawn on theory.

WHAT IS THEORY & WHY IS IT USEFUL?

Theory is defined as “a set of concepts and/or statements which specify how phenomena relate to each other. Theory provides an organizing description of a system that accounts for what is known, and explains and predicts phenomena.” Health behavior theory has the potential to decrease the time needed for intervention development and maximize intervention effectiveness by allowing us to unpack the black box of interventions. In particular, theory can help us identify barriers and enablers to behavior change (i.e., behavioral determinants), necessary intervention components, and mechanisms of action that can help explain how an intervention results, or is intended to result, in change.

APPLYING THEORY TO INTERVENTIONS

Theories and models of behavior change are abundant, with a 2015 review identifying 83. The commonly used theories, in general and in audiology research, are the Transtheoretical Model of Change and Health Belief Model. In their review, Davis, et al., found that most theories are described without the detail and precision required for testing and advancing theory; some have also been found to have limited predictive validity. Many theories overlap and most are not comprehensive, suggesting that integrating theories into frameworks that incorporate core entities derived from multiple theories of behavior change is likely to increase the usefulness and usability of theory in intervention design and evaluation. An example of such a framework is the Behavior Change Wheel incorporating the COM-B model of behavior.

BEHAVIOR CHANGE WHEEL & COM-B MODEL

The Behavior Change Wheel is based on the synthesis of 19 frameworks of behavior change. The COM-B model of behavior is at the hub of the Behavior Change Wheel, and represents behavior as an interaction between three necessary conditions: capability, opportunity, and motivation. Capability refers to the psychological or physical ability to carry out the behavior (e.g., knowledge, skills); opportunity refers to the physical and social environment in which the behavior occurs (e.g., social norms); and motivation refers to reflective and automatic processes that influence behavior (e.g., habitual processes, emotional responses). By way of example, barriers
and enablers to hearing aid use that were identified in a recent systematic review relate to capability (i.e., knowledge), opportunity (i.e., family support, financial resources, appointment convenience), and motivation (i.e., realistic expectations, self-efficacy, and stigma of hearing devices).

The first rim of the wheel consists of nine intervention functions: education, persuasion, incentivization, coercion, training, restriction, environmental restructuring, modeling, and enablement. The outer rim of the wheel consists of seven policy options: communication/marketing, guidelines, fiscal measures, regulation, legislation, environment/social planning, and service provision. In the intervention design, the COM-B model is used as a framework for identifying what needs to change (in terms of capability, opportunity, and motivation) to bring about change in the target behavior. This analysis provides a systematic method for selecting the intervention functions and policy options most likely to be effective given the nature of the behavior in its context.

Intervention functions are broad strategies made up of many behavior change techniques (BCTs), which refer to the potentially active ingredients of the intervention, such as action planning, feedback on behavior, instruction on how to perform the behavior, and prompts and cues. Ninety-three BCTs have been identified in the literature and organized into 16 groupings within a behavior change technique taxonomy. The selection of behavior change techniques reflects the aspects of capability, opportunity, and/or motivation that need to be addressed for the target behavior to occur.

IMPROVE HEARING AID USE

Hearing aid use involves several behaviors, each of which can involve the person with hearing impairment, their family and friends, the audiologist, hearing aid manufacturer, the voluntary sector, and the wider health system. These behaviors can either facilitate or compete with each other, within and between individuals. To select the behavioral target or targets likely to lead to the most change, several criteria need to be considered. These include: (1) the likely impact of the behavior change; (2) how easy it is to bring about change with the resources available; and (3) spillover/generalizability to other behaviors and people. Once the target behaviors have been identified, the barriers and enablers need to be considered; these will likely differ depending on the context so it is important that the COM-B model of behavior be applied to analyzing the context in which you intend to intervene.

Barker and colleagues prioritized the following behaviors as key to improving hearing aid use among adults:

1. Provision of realistic information on the benefits of hearing aid use and negative consequences of non-use;
2. Provision of prompts or triggers; and
3. Development of a plan for using aid(s) that promotes habit formation.

Barker and colleagues identified barriers and enablers to each of these behaviors, relating to capability, opportunity, and/or motivation, as indicated below:

1. Information provision requires change in physical opportunity—audiologists did not have access to information on the benefits of hearing aid use that was suitable for patients.
2. The provision of prompts or triggers requires changes in physical opportunity, as well as psychological capability—audiologists did not have access to cue cards and may not know why or how to discuss prompts.
3. The development of a behavioral plan is considered most novel and requires changes in psychological capability, physical and social opportunity, and reflective and automatic motivation. Audiologists considered that they needed to understand why and how to develop a behavioral plan, have access to a planning template that can be incorporated into the electronic patient record, more time to engage with patients to develop the behavioral plan, support from colleagues, and advice on how to incorporate the plan into existing routines.

These findings formed the basis of the development of I-PLAN, which incorporated a number of BCTs that were systematically chosen to address each of the COM-B components. These included five BCTs (among others) not typically used within audiological practice: prompts/cues (targeting physical opportunity and automatic motivation), problem-solving (targeting automatic and reflective motivation), habit formation (targeting psychological capability and automatic motivation), restructuring the social environment (targeting social opportunity), and punishment (targeting automatic motivation). As a result of applying the Behavior Change Wheel and the COM-B model to the development of I-PLAN, Barker et al. were able to generate a theory-based logic model for its implementation and evaluation, representing how the intervention was likely to achieve an impact (Fig. 2).
Hearing aid use is only one of many behaviors that can be targeted in adult hearing health care. For example, researchers have applied the COM-B model and Behavior Change Wheel to the use of smartphone-assisted listening devices and the use of an ICF-based e-intake tool. These tools have considerable potential for health care professionals and researchers seeking to understand and enable change in the wide range of behaviors that underpin improved outcomes for adults with hearing impairment and their families.

Reference for this article can be found at http://bit.ly/HJcurrent.