
CONTRIBUTED PAPERS

Self-Determination Theory: Motivation and Hearing Aid Adoption

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Frequently, people seeking help for their hearing loss are asked to make a decision about whether or not they wish to adopt hearing aids. Both audiological and non-audiological factors often form the basis of this decision, but it has been difficult to predict which of these factors and to what extent they might influence individual decisions. Client motivation is thought to drive personal decision-making in hearing rehabilitation, yet this area of research in audiology has received limited attention. This paper introduces a theory of motivation; Self-Determination Theory (SDT), which it is argued can be applied to hearing rehabilitation to help understand how decisions are made to adopt hearing aids. Specifically, the key components of SDT are described, past audiological literature is contextualized within the SDT framework, and SDT is explored as a useful theoretical tool for analyzing the role of motivation in hearing rehabilitation. To better understand how motivation may affect hearing aid adoption, future research directions and practical applications are discussed.

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Not every adult with hearing impairment seeks help for their hearing loss (Duijvestijn et al., 2003; Hartley, Roachtchina, Newall, Golding, & Mitchell, 2010; Hickson & Worrall, 2003; van den Brink, Wit, Kempen, & van Heuvelen, 1996). Among those people who do seek help for their hearing (“help-seekers”) many do not adopt hearing aids (Garstecki & Erler, 1998; Helvik, Wennberg, Jacobsen, & Hallberg, 2008; Humes, Wilson, & Humes, 2003). It is therefore of interest to find out why help-seekers decide to adopt or not adopt hearing aids when presented with this option. This information would be beneficial not only for individual clients who face important personal decisions, but also for practitioners and third party funders who have an interest in ensuring clients receive suitable assistance for their hearing.

The decision of a help-seeker to agree to get hearing aids is often denoted as “uptake” in audiological literature (e.g., Knudsen, Öberg, Nielsen, Naylor, & Kramer, 2010), and is referred to in this paper as *hearing aid adoption*. Hearing aid adoption ideally involves a collaborative decision-making process (Laplante-Lévesque, Hickson, & Worrall, 2010) that sets the course of future rehabilitation for the help-seeker and is a process influenced by a combination of factors. Audiological factors such as the severity of hearing impairment and speech recognition scores, and non-audiological factors such as self-reported hearing problems, affordability of hearing aids, patient age, and the support of significant others, might all influence hearing aid adoption (see Knudsen et al., 2010, and Meyer & Hickson, 2012, for reviews of the literature). However, despite taking these factors into consideration, predicting individual client decisions has proven difficult. To illustrate this point, studies by Meister, Walger, Brehmer, von Wedel, and von Wedel (2008) and Laplante-Lévesque, Hickson, and Worrall (2011) both found that about one-quarter of research participants had eventually embarked on a form of hearing rehabilitation that was different from their initial stated intention.

Exploring what motivates help-seekers to attend the clinic, and then once in the clinic what factors affect this behavior, might improve understanding of hearing aid adoption. In other domains of health care, motivation is regarded as crucial to understanding what directs client behavior towards or away from a specific treatment (Ryan, Patrick, Deci, & Williams, 2008). Psychological theories of motivation (Bandura, 1977; Deci & Ryan, 1985; Prochaska & Di Clemente, 1986) have been incorporated into various health treatment approaches to address reasons behind client motivation (Ryan, Lynch, Vansteenkiste, & Deci, 2011).

Indeed, client motivation is recognized as a key factor influencing the decision to adopt or not adopt hearing aids (Kochkin, 2007). Surprisingly, however, relatively little research has explored the relationships between motivation and hearing aid adoption. Hickson (2006) pointed out that past audiological research had investigated motivation only superficially, with the result that few conclusions could be drawn about the relationships between motivation and aspects of hearing rehabilitation. Although more recent audiological literature has explored the relevance of motivation to decisions such as hearing aid adoption in much greater detail (Laplante-Lévesque, Hickson, & Worrall, 2012; Saunders, Chisolm, & Wallhagen, 2012), further research to investigate the applicability of motivation theories to hearing rehabilitation is warranted (Saunders et al., 2012).

This situation presents an opportunity for audiologists to develop practical applications derived from motivation theories to help understand clinical decisions such as hearing aid adoption, and to facilitate successful rehabilitation in their clients. This paper reports on the potential application of one of these theories, Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000), which might usefully describe the attitudinal and behavioural processes that influences help-seekers' decisions. SDT has been selected for further investigation because its framework might help practitioners ascertain a client's motivation for considering hearing aid adoption, as well as help them recognize the conditions that will influence motivation.

This article aims to describe the essential components of SDT and to provide a context for understanding motivation in hearing rehabilitation by reviewing past audiological literature from an SDT perspective. Practical application of the theory to hearing rehabilitation also is discussed. This article contends that classifying client motivation using SDT might help establish what relationships (if any) exist between motivation and decision-making of help-seekers. Counselling techniques aligned with SDT also are described. Finally, future research directions are offered to suggest how SDT might be used to better understand help-seekers' motivations prior to hearing aid fitting, and to explore the effects such a rehabilitation approach might have on hearing aid adoption. The historical perspectives of motivation provided in the following section offer a broad context from which motivation is considered in this paper.

Motivation: A Brief History

What compels people to behave in different ways? Human behavior is the result of a complex system of innate biological and evolutionary processes, and is influenced by the person's social, cultural, behavioral and situational life experiences. In his pioneering text, psychologist William James (1890) described behavior as instinctual and mechanistic, driven by biological processes. Human behavior, however, was observed by early theorists, such as Dodson (1917; 1932), to adapt with environmental influences as people modified behavior to avoid pain or seek reward. From the premise that behavior is influenced both by instinctual drives and outside influences, Hull (1943) and Maslow (1943) sought to explain human learning and motivation as a function of environment, interacting with individuals' hierarchies of drives and needs. These approaches to motivation influenced the behaviorist school of thought, of which Skinner (1953) is the most prominent proponent. Skinner (1953) argued all human behavior could be explained as purposeful responses to external influences: that is, behavior was conditioned and reinforced by previous experiences, and learning was based on imitation, repetition, rewards, and punishment.

Whereas these early theories of motivation demonstrated it is possible to generalize how people might behave under certain conditions, the theories did not account for less predictable behavior such as creativity, irrationality, or spontaneity (Chomsky, 1959). This realization spawned a range of approaches to motivation that acknowledged the importance of cognition, alongside the biological and reflexive processes, as drivers of behavior. Cognitive theories of motivation in psychology have sought to identify and understand (a) how external and internal conditions might result in a particular behavior (e.g., Atkinson, 1964; Deci, 1971; Festinger, 1957), (b) how people learn (e.g., Bandura, 1977; White, 1959;), and (c) how people make decisions (e.g., Brehm & Cole, 1966; Heider, 1958; Hiroto & Seligman, 1975). Many of these early theories helped form the basis of contemporary theories of motivation applied in organizational psychology (e.g., Steers, Mowday, & Shapiro, 2004), positive psychology (e.g., Seligman & Csikszentmihalyi, 2000), education (e.g., Paris & Paris, 2001) and health (e.g., Rachman, 1997). Researchers in neuropsychology also have sought to explain motivation as related to executive brain functions, such as decision-making and impulse control (e.g., Chan, Shum, Touloupoulou, & Chen, 2008; Posner & Peterson, 1990). It is clear from this variety of perspectives that underlying human drives and instincts implicitly contribute to motivation, but that

environmental factors result in substantial individual variation in human behavior. For this reason, most cognitive theories of motivation primarily focus on the social and cultural influences that potentially affect the initiation and maintenance of purposeful behavior when practical intervention strategies are developed (Ryan & Deci, 2008).

The potential benefits of applying cognitive approaches to motivation extend to health care as practitioners seek to provide services to clients whose behavior might contribute significantly to the success or failure of treatment (Ryan et al., 2008; Schroeder, 2007). A range of motivation theories might be applied in health care for this purpose, such as the health belief model (Rosenstock, 1966), social cognitive theory (Bandura, 1977), or the transtheoretical model of intentional behavior change (stages-of-change; Prochaska & Di Clemente, 1986). Although individual theories offer specific constructs that guide the treatment approach (Nigg, Allegrante, & Ory, 2002), evidence-based research does not yet favor one model over another (Nieuwenhuijsen, Zemper, Miner, & Epstein, 2006). In addition, not all theories explore the influence of environmental contexts on specific motivational processes (Nieuwenhuijsen et al., 2006). One prominent theory, Stages of Change, classifies client attitude into stages of increasing readiness to accept and undergo treatment, and provides practitioners with a framework to assist clients with behavior change. Five discrete stages of change are described: pre-contemplation (lack of awareness of a problem); contemplation (realization that there is a problem and giving consideration to the effect treatment might have); preparation (an intention to act upon the problem); action (participation in treatment and rehabilitation); and maintenance (acceptance of treatment and continuation of behavior). The pragmatic approach offered by Stages of Change has seen the model used across many health fields, and a recent body of work in hearing rehabilitation encourages clinical application of its principles (Babeu, Kricos, & Lesner, 2004; Clark, 2010; Laplante-Lévesque et al., 2012; Milstein & Weinstein, 2002;).

In Stages of Change theory, behavior change is characterized as an internalization process. However, questions remain about what environmental conditions might facilitate or hinder this internalization process, and also about what types of motivating factors might prompt behavior change. SDT endeavors to provide answers to these questions, and it regards the conditions that affect motivation as crucial to understanding both internalization and maintaining internalized behavior. As explained in the following section, the SDT framework

describes how the type of motivation, and the conditions that affect motivation, might have a bearing on client attitude towards treatment.

Self-Determination Theory Overview

SDT is a broad-ranging psychological theory of motivation that has been applied across many fields including education, and sports, and health (see Deci & Ryan, 2008, for an overview). This theory differentiates among types of motivation (intrinsic, extrinsic, and amotivation), and does so by classifying the different reasons people give for acting in regulation styles: internal, external, or impersonal. Further distinctions are made among a variety of external regulation styles. Classifying regulation styles in this way can represent the extent to which a person’s behavior is internalized. Also important to SDT are the conditions that might affect motivation – autonomy, competence and relatedness. Figure 1 illustrates the SDT model of motivation: the conditions that might affect motivation – autonomy, competence and relatedness – are shown as factors that contribute to whether people act for internal, external or impersonal reasons (i.e., “regulation style”). Different regulation styles, including a variety of external forms of regulation, are visually represented along a continuum of internalization, which shows the extent to which an action is internally or externally driven. This information then helps classify motivation type.

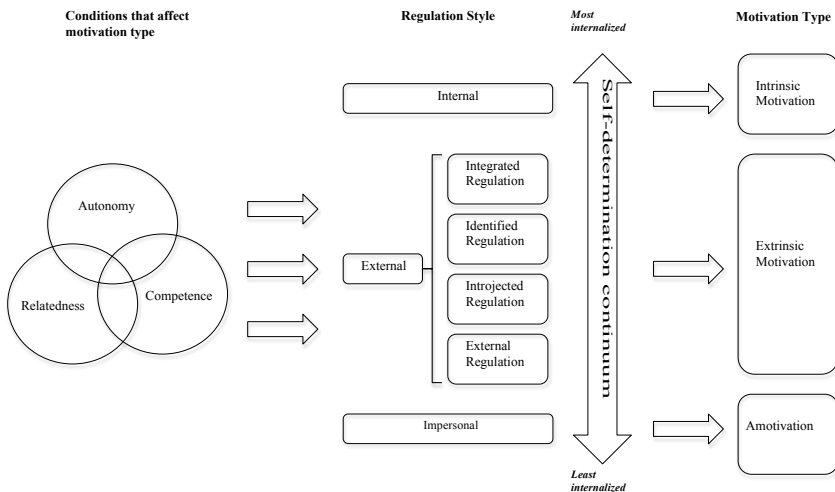


Figure 1. The self-determination theory model of motivation, showing conditions that affect motivation, regulation style, the self-determination continuum, and motivation type.

Motivation Type: Intrinsic, Extrinsic and Amotivation

Theories of motivation commonly distinguish between intrinsic and extrinsic motivation. Motivation that stems from an inherent enjoyment of an activity is termed intrinsic. Intrinsically motivated people give an activity their full attention and involvement, and derive satisfaction from the activity itself. On the other hand, people might be motivated towards an activity for reasons external to them, such as to please others, avoid a threat, or seek a reward. SDT refers to this as extrinsic motivation. SDT proposes that people are more likely to persist with and be successful in an activity if they have internalized the need to take action and are intrinsically motivated (Deci & Ryan, 1991; Ryan et al., 2008). By contrast, amotivation, or lack of motivation, occurs if an activity is not valued, where there is self-perceived incompetence, or if there is no intention of completing an activity.

Notwithstanding the distinctions among intrinsic and extrinsic motivation and amotivation, SDT considers motivation to be both dynamic and responsive to the broad range of personal activities and experiences of daily life. Many of these daily activities might be governed by particular “expected” behaviors or principles, or by externally driven constraints that might not be inherently enjoyable or satisfying. People might be motivated to wash the dishes, for instance, not because the activity is inherently enjoyable, but because they recognize the importance of a clean kitchen for themselves and the rest of the household. By contrast, motivation to wash the dishes might only be present because someone else insists they be done.

According to SDT, the variety of ways that people might respond to any activity can be scaled according to the sense of control felt towards decisions and action. This is often designated “perceived locus of causality” in SDT literature (Ryan & Connell, 1989), but in this paper is denoted “regulation style.” SDT delineates regulation styles along a “self-determination continuum” (see Figure 1), which illustrates the relationship between different regulation styles and the degree of internalization perceived towards decision-making (Ryan & Connell). To accurately represent the variety of regulation styles along this continuum, SDT further describes four distinct regulation styles that are classified according to the extent an extrinsically motivated activity has been internalized. Progressing from least to most internalized, these regulation styles are external regulation (i.e., acting to avoid punishment or gain reward), introjected regulation (i.e., an internal sense

of guilt or obligation), identified regulation (i.e., acting with recognition of the activity's value), and integrated regulation (i.e., alignment with personal beliefs). The SDT literature also describes these styles of regulation as autonomous (for more internalized forms) or controlled (for less internalized forms).

As an example, people who take medication because they recognize its value to personal health (identified regulation) are extrinsically motivated, as are people who take medication because they wish to please their doctor (introjected regulation). Both examples imply that action is taken for reasons external to the individual, rather than an inherent perception of the benefit of the activity. However, they pose distinctly different regulation styles that illustrate differences in the degree of internalization of the need to take medication.

Given that less internalized regulation styles, such as external or introjected regulation, might warrant behavior change intervention in health settings (Ryan et al., 2008), it is of interest to explore the conditions that might facilitate or hinder the internalization process. Three such conditions are identified in SDT, and these are described in the following section.

Conditions That Affect Motivation Type

The three conditions that potentially affect the internalization process are: (a) the need for autonomy, or a sense of control and affirmation of personal choices and actions (De Charms, 1968; Deci & Ryan, 1985; Ryan et al., 2011); (b) the need for competence, or the capacity to master things (Bandura, 1977; Locke, 1968; Markland, Ryan, Tobin, & Rollnick, 2005; White, 1959); and (c) the need for relatedness, or a sense of belonging and community (Baumeister & Leary, 1995; Markland & Tobin, 2010). Fulfilment of these three needs enables internalization (Deci & Ryan, 2000; Ryan et al., 2008), and SDT research in health has shown that treatment outcomes are improved when the needs for autonomy, competence, and relatedness are met, whereas they might be undermined when there are barriers to meeting them (Ryan et al.). The next section sets out research that illustrates how autonomy, competence and relatedness affect internalization.

Autonomy. Autonomy, is experienced when people perceive their behavior to be compatible with their beliefs. SDT predicts that actions or decisions made autonomously will help enable intrinsic motivation, and in health care environments, will result in greater likelihood of successful long-term adherence to treatment. In a recent review of counselling, psychotherapy, and behavior change theories and practice, Ryan et al. (2011) concluded that support for client

autonomy is a universal theme through different clinical approaches, which reinforces the importance of fulfilling this need. Williams et al. (2009) evaluated longitudinal data from 2973 diabetes patients by administering questionnaires that measured a range of factors such as support for autonomous decision-making from their practitioner (referred to as “autonomy support”), regulation style towards recommended treatment (in this study, self-managed medication adherence), and quality of life. Two years after receiving services, patient data relating to medication adherence was cross-checked against initial questionnaire responses. The authors found that autonomy support was positively associated with self-managed medication adherence, which in turn was associated with greater perceived competence, quality of life, and physiological outcomes. The benefits of autonomy support also have been reported in physical activity intervention uptake research (Chatzisarantis, Hagger, Kamarova, & Kawabata, 2012), and dental health (Münster Halvari, Halvari, Björnebekk, & Deci, 2012). These findings highlight the importance of autonomous decision-making in health.

Competence. As with autonomy, developing a sense of competence helps facilitate internalization. In SDT, conditions that encourage a personal sense of accomplishment from mastering a new task (White, 1959), and the confidence that comes with self-efficacy (Bandura, 1977), bring about competence and help enrich intrinsic motivation (Deci, 1972; Deci & Ryan, 2000). By contrast, failure at a task might result in disengagement and require the need for support, reassurance, or rationalisation (White, 1959).

One clinical strategy that fosters competence is collaborative goal-setting (e.g., Siegert & Taylor, 2004). Goal-setting is recognized as central to health rehabilitation (Levack, Dean, Siegert, & McPherson, 2006), and is a clinical process that helps provide structure to the rehabilitation program and builds client confidence to achieve specific outcomes. Both the content of goals and the processes used to achieve those goals are considered by SDT to be important to understanding how people regulate their behavior (Deci & Ryan, 2000). When goals are unrealistic and a client’s rehabilitation expectations do not converge with practitioner expectations (being either too high or too low), treatment might not be optimized (Constantino, Arnkoff, Glass, Ametrano, & Smith, 2011). In such scenarios, providing information about the benefits and disadvantages of future rehabilitation and personal reflection on expectations and beliefs might be useful strategies to build competence (Markland et al., 2005). Interactions between the client and practitioner that foster competence suggest that a strong client-

practitioner relationship is necessary for successful rehabilitation and developing intrinsic motivation. The importance of client-practitioner relatedness is therefore recognized by SDT as a third condition that might influence motivation type.

Relatedness. Relatedness signifies a person's need to belong and to relate to others (see Baumeister & Leary, 1995, for a review), and is important for achieving internalized types of motivation (Ryan & LaGuardia, 2000). In a study that investigated relationships between relatedness and well-being among nursing home residents, Kasser and Ryan (1999) found that a greater quality or depth of relatedness between residents and their social supports significantly predicted positive well-being and life satisfaction.

Although social relatedness is clearly important to personal well-being and intrinsic motivation, SDT also considers the client-practitioner relationship to be of value. Williams, Frankel, Campbell and Deci (2000), in a comparison of relationship-centred versus physician-centred primary care physicians, found patients of relationship-centred physicians had higher satisfaction and better adherence to treatment than the physician-centred cohort.

From these findings it seems clear that the internalization process necessary to achieve and maintain positive health outcomes is made easier when the needs for autonomy, competence, and relatedness are fulfilled (Deci & Ryan, 2000). A substantial body of health research supports the use of the SDT framework to facilitate behavior change (Ng et al., 2012), and applying the theory to audiological practice might help practitioners better understand the type of motivation as well as the regulation styles and the conditions that govern client decision-making. In the following section, motivation type, regulation style, and the conditions that affect motivation type are examined in audiological literature, and findings are interpreted from an SDT perspective.

SDT and Hearing Rehabilitation Overview

Audiological research that focuses on motivation is not extensive. Although SDT has been considered in a review of social-emotional challenges faced by children with mild to moderate hearing impairment in the classroom (Dalton, 2011), to date there does not appear to be any research that uses the SDT model to investigate the influence of motivation on hearing aid adoption in an adult population. However, interpreting past audiological literature from an SDT perspective supports the potential use of the SDT framework. Table 1, which provides examples of a range of stereotypical attitudes towards hearing aid

Table 1

Examples of a range of comments made towards hearing aid adoption, using the SDT classification of motivation type and regulation style, organized according to the extent of internalization

Motivation Type	Regulation Style	Observation	Illustrative Example
Intrinsic Motivation	Highly Internal	Inherent enjoyment and satisfaction	"I really enjoy the idea of wearing hearing aids and want to wear them all the time, day and night."
Extrinsic Motivation	Internal Integrated Regulation	Alignment with personal beliefs	"I expect I will hear better with hearing aids in, and once they're in, I will probably forget they're there."
Extrinsic Motivation	Somewhat Internal Identified Regulation	Value recognition	"It is important to wear hearing aids because I will hear television better, and hearing television is important to me."
Extrinsic Motivation	Somewhat External Introjected Regulation	Felt sense of guilt or obligation	"My family is making me get hearing aids so I suppose I should get them for their sake."
Extrinsic Motivation	External External Regulation	Avoidance of punishment / gain reward	"If I don't get hearing aids my family will be angry with me." "I'm getting the hearing aids for free so I may as well have them."
Amotivation	Impersonal	Unintentional / unvalued / uncontrolled	"You can fit me with hearing aids if you want, but I'm not interested in them; they won't be of any use to me."

specific points along the self-determination continuum.

In this section, motivation type is examined within audiological literature, with particular consideration given to literature that explores the influence of motivation type on hearing aid adoption. This is followed by an exploration of

literature that identifies how the conditions that affect motivation (autonomy, competence, and relatedness) might affect hearing aid adoption.

Hearing Rehabilitation and Motivation Type: Extrinsic, Intrinsic, and Amotivation

Clients seeking help for their hearing for the first time might give a wide variety of personal reasons for adopting or not adopting hearing aids (e.g., Kochkin, 2007; Meyer & Hickson, 2012). Classifying these reasons according to motivation type, however, might require further client questioning to better understand the underlying rationale for the decision. The decision whether to adopt hearing aids or not might vary considerably in its relative level of internalization, and Table 1 provides examples of a range of attitudes/comments about hearing aid adoption filtered through the SDT classification. Although the influence of motivation type on hearing aid adoption has not been comprehensively investigated, it is recognized that motivation type might affect specific aspects of hearing rehabilitation. For example, Wong, Hickson and McPherson (2009), in their study that investigated consumer satisfaction with hearing aids, described factors known to influence satisfaction as intrinsic (e.g., self-motivation, positive attitudes to rehabilitation), and extrinsic (e.g., hearing aid type, hearing aid sound quality), although they did not explore these factors from a motivational perspective as part of their research.

Despite intrinsic and extrinsic motivation receiving limited attention in audiological research, other variables that might reflect motivation type have been explored. One such variable is the source of motivation to attend hearing rehabilitation sessions. Self-motivation to attend might imply internalizing a need and hence intrinsic motivation towards hearing rehabilitation, as the decision to seek help was personally endorsed. Motivation from others to attend might suggest less internalization, and consequently extrinsic forms of motivation towards help-seeking behavior. According to SDT's prediction that intrinsic motivation is linked with successful treatment, it follows that the source of motivation could predict hearing rehabilitation success. In their study that investigated factors associated with hearing aid fitting outcome in 52 adults seeking help for their hearing for the first time, Hickson, Timm, Worrall, and Bishop, (1999) found no significant relationship between motivation source (self-motivated versus motivated by others) and hearing aid use, although self-motivated subjects did report greater satisfaction with hearing aids three to nine months following fitting. Wilson and Stevens (2003), in a study of 140 first time hearing help-seekers, of

which 47 reported self-motivation to attend and 93 reported being motivated by others, did not find a relationship between motivation source and hearing aid use or satisfaction. Relationships between motivation source and hearing aid adoption were not tested. Together, these findings suggest there is no clear evidence that motivation source was related to hours of hearing aid use post-fitting, which signifies that motivation source might not sufficiently measure motivation type. In addition, the studies in this area reported on hearing aid outcomes rather than hearing aid adoption *per se*, which is the focus of this paper.

A second variable that might be associated with motivation type is self-reported hearing problems. Self-reported hearing problems, which have strong positive associations with hearing aid adoption (Knudsen et al., 2010; Meyer & Hickson, 2012; Palmer, Solodar, Hurley, Byrne, & Williams, 2009), imply that a person has acknowledged and internalized his/her hearing problem via the act of self-reporting. If hearing problems are self-reported, a person's decision to adopt hearing aids might be intrinsically motivated. In a related study, Humes et al. (2003), investigated differences among three groups of participants matched for age, severity of hearing loss, and gender. The groups were: (a) 26 participants who did not adopt hearing aids initially; (b) 24 participants who adopted hearing aids but subsequently returned them; and (c) 26 participants who adopted hearing aids and continued to use them. They administered a series of measures including the Hearing Handicap Inventory for the Elderly (HHIE; Ventry & Weinstein, 1982) and the Communication Profile for the Hearing Impaired (CPHI; Demorest & Erdman, 1987), and reported that people who did not adopt hearing aids were less self-accepting of hearing impairment than those who did adopt hearing aids. Although the sample size was small, this relationship might signify lesser internalization of need in those who do not adopt hearing aids compared with those who do. Further research to investigate whether or not self-reported hearing problems sufficiently represent internalization would be beneficial to help draw conclusions about the effect of motivation type on hearing aid adoption.

Although there appears to be limited research evidence about the specific effect of motivation type on hearing aid adoption, audiological literature suggests the conditions that affect motivation might influence the decision to adopt hearing aids. The following section identifies how autonomy, competence, and relatedness might affect aspects of hearing rehabilitation such as hearing aid adoption. In particular, literature that promotes clinical strategies to help facilitate these three needs is described.

Hearing Rehabilitation and the Conditions That Affect Motivation: Autonomy, Competence, and Relatedness

According to SDT, intrinsic motivation is facilitated when support for autonomy, competence, and relatedness is provided, whereas it might be undermined if these conditions are not supported. This section explores the evidence of the effects of autonomy, competence, and relatedness on hearing rehabilitation, and in particular hearing aid adoption. Each of these three conditions is discussed in turn.

Autonomy. Although autonomy has not been specifically investigated in audiological research, recent work advocates for practitioners to provide autonomy support to foster effective rehabilitation decision-making in clients. Clinical strategies such as shared decision-making (Laplante-Lévesque et al., 2010) infer that a client's sense of autonomy in rehabilitation decisions is important in effective decision-making, because it promotes active client involvement in the rehabilitation process, and it encourages client choice. According to SDT, shared decision-making would be a strategy that encourages autonomy support and facilitates intrinsic motivation (Ryan & Connell, 1989).

In their 2011 and 2012 papers, Laplante-Lévesque, Hickson and Worrall used shared decision-making to explore factors thought to predict help-seekers' rehabilitation decisions, choice of rehabilitation option, and outcome. A sample of 153 first time help-seekers was presented with three intervention options using a "decision aid": hearing aids, communication programs, and no intervention. Participants were administered a range of questionnaires at the start of the study and outcomes were measured three months following rehabilitation. Among other factors, the authors found greater self-reported hearing disability predicted the increased likelihood of adopting hearing aids. This corroborates the reviews of Knudsen et al. (2010) and Meyer and Hickson (2012). In a study that used the Stages of Change measure and the University of Rhode Island Change Assessment (URICA; McConaughy, Prochaska, & Velicer, 1983), Laplante-Lévesque et al. (2012) found higher contemplation scores (i.e., greater realization of a problem) predicted increased adoption of both hearing aids and communication programs compared with no intervention being adopted. Lower pre-contemplation scores (i.e., lower lack of awareness) and/or higher action scores (i.e., greater participation in rehabilitation) predicted successful rehabilitation outcome.

Together, these findings illustrate that internalization might affect rehabilitation decisions such as hearing aid adoption, and provides empirical support for using Stages of Change in hearing rehabilitation, originally advocated by Babeu et al. (2004). However, as Stages of Change theory does not incorporate an analysis of conditions such as autonomy support that influence motivation type, it might remain uncertain to what extent autonomy support facilitates the internalization process in hearing rehabilitation. Further research to quantify the relationships between autonomy support and hearing aid adoption, and to develop practical measures of autonomy support in hearing rehabilitation, might be warranted.

Competence. Along with autonomy support, the audiology literature acknowledges the need for client-perceived competence. In their review of theoretical models of health behavior thought to be applicable to audiological practice, Noh, Gagné and Kaspar (1994) reported that people with low self-efficacy might be less likely to adopt hearing aids if they believe they are less capable of succeeding. Such a scenario suggests that competence might have a direct influence on the decision to adopt hearing aids. Although the presence of hearing impairment itself might contribute to low self-efficacy (Kramer, Kapteyn, Kuik, & Deeg, 2002), high communication self-efficacy during rehabilitation decision-making has been found to reduce the likelihood of hearing aid adoption (Cox, Alexander, & Gray, 2005; Laplante-Lévesque et al., 2012). This finding suggests that people who perceive competence towards everyday communication might be more likely to employ strategies other than using hearing aids to manage life with hearing impairment. Different aspects of self-efficacy might therefore influence hearing aid adoption in different ways.

Competence also is promoted through a second body of literature investigating the use of goal-setting. Goal-setting provides structure to the rehabilitation process (Jennings, 2009; McKenna, 1987), and fosters competence through its collaborative self-report process. This enables clients to recognize individual activity limitations and participation restrictions (Cox, 2003), which might be important to internalizing need. Additionally, goal-setting is often integrated into the initial interview and counseling process, which can help build client-practitioner rapport (Dillon, James, & Ginis, 1997). It also might assist with managing expectations and stigma towards hearing impairment and hearing aids, which are two factors that are often seen as barriers to successful rehabilitation (Saunders, Lewis, & Forsline, 2009; Wallhagen, 2009). However, the internal processes that clients employ to attain goals, which are important to SDT, might

not necessarily be captured through traditional goal-setting approaches in hearing rehabilitation, but rather through the counseling process itself.

Relatedness. Addressing the social and emotional isolation that hearing impairment can bring is especially important in hearing rehabilitation, and though hearing aids themselves might help improve quality of life (Mulrow et al., 1990), relatedness to others also is crucial. For example, in a study that investigated relationship satisfaction of 66 couples where one partner was hearing impaired, Anderson and Noble (2005) found that higher relationship satisfaction was evident when people did not attribute causes of communication breakdown to the character of their partner with hearing impairment. By contrast, low relationship satisfaction was associated with partners who attributed communication breakdown more personally. Spousal support also is a central theme in accepting hearing impairment. In a qualitative study that explored quality of life and well-being of spouses of hearing impaired people, Scarinci, Worrall and Hickson (2008) found that the partners' acceptance of his/her spouse's hearing impairment reduced the impact of hearing impairment in their everyday lives. This relationship reinforces the importance of relatedness to internalization.

The importance of relatedness to hearing rehabilitation also is seen in studies that examined help-seeking behavior. For example, Duijvestijn et al. (2003), in a study that investigated factors that affected help-seeking behavior of 1419 hearing impaired people aged 55 years or older, reported that pressure from others to attend clinical services led to increased help-seeking. In addition, van den Brink et al. (1996) found that people who did not seek help for their hearing also had support from significant others for this decision. Although neither Duijvestijn et al. nor van den Brink et al. specifically reported the influence of significant others on hearing aid adoption or non-adoption, both studies demonstrated the potential importance of significant others' views for hearing help-seeking.

Based on these findings, relatedness to significant others appears to be an important influence on client motivation in hearing rehabilitation decisions. In addition, SDT recognizes the value of relatedness between the client and practitioner to help enable internalized forms of motivation. Studies of hearing rehabilitation outcomes report clients to be mostly satisfied or very satisfied with their practitioners (Hickson, Clutterbuck, & Khan, 2010; Uriarte, Denzin, Dunstan, Sellars, & Hickson, 2005). However, there is little research to explain

how client-practitioner relatedness might influence hearing aid adoption (Knudsen et al., 2010).

From the literature explored in this section, there appears to be recognition that internalization, and therefore motivation type, influences the decision to adopt hearing aids. As SDT differentiates motivation type along a continuum of internalization by classifying regulation style (Figure 1), further research to classify hearing help-seekers' regulation style might therefore contribute to a broader understanding of the specific effects of internalization on rehabilitation decisions such as hearing aid adoption. The conditions that affect motivation type – autonomy, competence, and relatedness – also might influence hearing aid adoption. However, the extent of influence of these conditions might not be completely understood. In the following section, two clinical applications of SDT to quantify the effects of autonomy, competence, and relatedness are suggested: measuring motivation type and regulation style, and using motivational interviewing.

Clinical Applications

Measuring Motivation

Although self-report measures are commonplace in hearing rehabilitation (Noble, 2006), there appears to be no audiological tool that specifically measures motivation. Stages of change tools such as the University of Rhode Island Change Assessment (URICA; McConaughy et al., 1983) can help predict relationships between internalization, hearing aid adoption, and rehabilitation outcome (Laplante-Lévesque et al., 2012), but are not designed to measure autonomy, competence, or relatedness, which SDT considers necessary to understand what affects internalization. Laplante-Lévesque et al. also suggested the 24-item URICA might be too long a questionnaire for practical use. Clark (2010), in an article that explored motivational engagement for hearing help, introduced clinical tools designed to assist practitioners to engage clients with rehabilitation decisions. These tools, developed by the Ida Institute, (Ida Institute, 2011), promote a client-centred approach to internalization and behavior change and can offer practitioners insight into the internalization process and how it might be used to determine suitable intervention for a client. However, the empirical effects of these tools on internalization have not yet been reported in a population of hearing help-seekers.

In order to subjectively measure motivation type, regulation style, and the conditions that affect motivation, SDT health research has used three questionnaires: (1) the Treatment Self-Regulation Questionnaire (TSRQ; Levesque et al., 2007; Ryan & Connell, 1989; Levesque et al., 2007); (2) the Perceived Competence Scale (PCS; Williams, Freedman, & Deci, 1998); and (3) the Health Care Climate Questionnaire (HCCQ; Williams et al., 2006; Williams, Grow, Freedman, Ryan, & Deci, 1996).

The Treatment Self-Regulation Questionnaire (TSRQ) is a 19-item questionnaire that measures internal and external regulation style by questioning the reasons for help-seeking. TSRQ items are classified as internal (e.g., *I am thinking about getting treatment because I like the challenge of pursuing something new and interesting. Or I am thinking about getting treatment because I personally believe that doing so is the best thing for me.*), or external (e.g., *I am thinking about getting treatment because I think other people would be upset with me if I didn't. Or I am thinking about getting treatment because I'd feel guilty if I didn't do something about it.*). Responses are recorded on a 7-point Likert-style response scale that ranges from *1 Strongly Disagree* to *7 Strongly Agree*, and internal and external subscale scores are obtained by averaging the responses to each item. Classification of internal and external regulation style enables measuring the extent to which the reason for seeking help has been internalized, which in turn helps classify motivation type.

The Perceived Competence Scale (PCS) is a 4-item tool that examines a person's perceptions of competence to perform a task (e.g., *I feel confident in my ability to manage my treatment needs.*). The PCS uses a 7-point Likert-style response scale ranging from *1 Not At All True* to *7 Very True*, and responses to each item are averaged to determine the competence score. Measuring perceived competence helps identify the effect of this variable on motivation type, and can be used to recognize and address any barriers of competence that might impede internalization.

The Health Care Climate Questionnaire (HCCQ) is a 15-item questionnaire that uses a 7-point Likert-style response scale ranging from *1 Strongly Disagree* to *7 Strongly Agree*. It measures client perceptions of the client-practitioner relationship (relatedness), as well as how "autonomy-supportive" the practitioner was for the duration of treatment, by including items such as *I feel that my practitioner has provided me choices and options and My practitioner listens*

to how I would like to do things. Scores for each item are averaged to obtain an overall HCCQ score. Measuring autonomy support can help represent the effect of the client-practitioner relationship on motivation.

Taken together, the TSRQ, PCS, and HCCQ provide self-report data that help classify motivation type, regulation style, and each of the three conditions that affect motivation type. In addition, they are designed such that they can be applied across domains in fields as diverse as smoking cessation (Williams et al., 2011), diabetes management (Williams et al., 2009), exercise (Edmunds, Ntoumanis, & Duda, 2007), and addiction control (Zeldman, Ryan, & Fiscella, 2004). In each instance, the questions have been tailored to the particular field while maintaining the integrity of the questionnaire. Levesque et al. (2007), for example, applied the TSRQ across three different health fields (smoking, diet, and exercise) and found it was a reliable and valid measure of regulation style for all three fields. As such, there is potential benefit for their use in hearing rehabilitation to increase understanding of the factors that influence motivation.

In spite of this potential benefit, it might be unrealistic to expect practitioners to administer separate questionnaires about autonomy, competence, and relatedness, given clinical time constraints. It could be argued that administering a small number of direct questions about client motivation, such as: *On a scale of 1 to 10 how ready are you to obtain hearing aids?*, or *On a scale of 1 to 10 how confident are you in your ability to use and get benefit from hearing aids?*, might offer greater appeal to practitioners than using separate questionnaires to measure the conditions that influence motivation. However, given the potential value of exploring the relationships between reasons for attendance and motivation type, further work to validate and refine the TSRQ, PCS and HCCQ for practical clinical use would be of benefit. Research to test the efficacy of these questionnaires for understanding hearing aid adoption is currently underway. Along with self-report measures such as these, the discussions that follow such questions also are of importance to facilitate decision-making, and the following section describes a counseling strategy employed for this purpose.

Motivational Interviewing

The second clinical application of SDT is motivational interviewing (Miller, 1983). Motivational interviewing is a counselling approach that provides the means to effectively engage patients in rehabilitation (Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). It was first promoted by Miller (1983) as a strategy to

aid health behavior change for alcoholism, and has subsequently been introduced to a range of health fields including hearing rehabilitation (Beck, Harvey, & Schum, 2007). Miller and Rollnick (2002) identify four areas important to successful motivational interviewing: expression of empathy; development of discrepancy (to highlight the pros and cons of patient behavior and to progress patients' understanding of differences between current and "ideal" behavior); rolling with resistance (acknowledging rather than countering a patient's negative perceptions); and support for self-efficacy (the belief a patient has for success). Researchers who used SDT recognized that these motivational interviewing techniques were closely aligned with the attributes of practitioners who provide autonomy support. Autonomy-supportive practitioners are those who recognize and suggest a rationale for behavior; acknowledge the importance of a person's freedom of choice for behavior; and identify and accept the presence of internal conflict (Deci, Eghrari, Patrick, & Leone, 1994). In their discussion paper, Markland et al. (2005) proposed integrating SDT and motivational interviewing to provide a more formal structured approach to motivational interviewing and to clarify the dynamic aspects of SDT. More recently, motivational interviewing has been emphasized as complementary to a range of behavior change approaches (Miller & Rose, 2009), and measurable benefits of motivational interviewing have emerged (Moyers, Martin, Houck, Christopher, & Tonigan, 2009). Exploring the use of motivational interviewing in the hearing rehabilitation setting might help establish specific aspects of the client-practitioner relationship that most affect hearing aid adoption.

Future Directions

This review has highlighted the importance of motivation to clinical practice in hearing rehabilitation, and has introduced SDT as a means to gain an appreciation of the ways motivation might affect hearing aid adoption. Whereas hearing aid adoption has been given primary focus in this review, other components of hearing rehabilitation, such as fitting outcome, also might be affected by motivation. Some people who adopt hearing aids might end up not wearing them if they are not motivated, or if they exhibit externally regulated styles of behavior. Therefore, this paper argues that it is critical for practitioners to identify the type of motivation, and the regulation styles that inform motivation type, at the time a person agrees to adopt hearing aids, in order to address potential barriers to

successful rehabilitation. In addition, recognizing that autonomy, competence, and relatedness can influence motivation type might help practitioners better understand client decision-making towards hearing aid adoption.

Motivating people seeking hearing services is an area that has not been widely researched. Motivation is thought to drive personal clinical decision-making, yet it is often difficult to predict which factors might influence individual decisions such as hearing aid adoption. Research that tests the efficacy of SDT in hearing rehabilitation might help predict the role of motivation in hearing aid adoption. There also is an opportunity to quantify the benefits of motivational interviewing to hearing rehabilitation when using the SDT framework.

Conclusion

Whether to adopt hearing aids is a decision often faced by people seeking help for their hearing, and motivation is likely to play a key role in this decision. Practitioners might better understand hearing aid adoption decisions by classifying motivation type and regulation style, and by recognizing the conditions that affect motivation. Through the use of counselling approaches such as motivational interviewing, practitioners might engender internalized forms of motivation in clients by providing autonomy support, encouraging competence, and developing strong client-practitioner relatedness. The use of SDT might therefore facilitate a better understanding of the role motivation plays in hearing aid adoption, which in turn might reduce instances of inappropriately providing hearing aids, as well as empowering practitioners to tailor rehabilitation to more effectively meet the needs of individual clients.

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