

Knowledge Dissemination and Utilization in Gerontology: An Organizing Framework

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Purpose: Enabling valuable research findings to be used by the field requires a strategic approach to dissemination and utilization rather than simply making constituencies aware of the information. This article describes a conceptual framework for the dissemination and utilization of information, along with examples of its use by the Boston University Roybal Center for Enhancement of Late Life Function.

Design and Methods: The framework identifies dissemination/utilization goals of exposure, experience, expertise, and embedding ("4 E") and relates each goal to strategies targeted for specific users.

Results and Implications: The Boston University center exposed the field to information through presentations, print- and Web-based information, provided consumers and family members with new findings through motivational videotapes, developed expertise-level training programs, and embedded the new findings within organizations and systems. The 4 E framework can translate critical research outcomes into useful information to assist the field to better care and support available for individuals in late life.

Key Words: *Information dissemination, Information utilization, Conceptual framework, Roybal Center, Fear of falling, Muscle strengthening, Late Life Function and Disability Instrument*

Introduction

Despite an emphasis by the National Institute on Aging on the timely dissemination of relevant health information to professionals in gerontology and the public (Pocinki, Shure, & McCormick-Pickett, 1993), such dissemination tends to be slow and difficult (Prohaska, Peters, & Warren, 2000). The difficulties in getting relevant findings out to the field have been recognized across various specialties and disciplines. The American Geriatrics Society, for example, has recommended improved dissemination of new research findings in geriatrics to surgical and medical specialties in order to overcome widespread deficiencies in knowledge of the principles of good geriatric care among specialists (Interdisciplinary Leadership Group of the American Geriatrics Society, 2000). The field of mental health has also lamented the fact that evidence-based strategies have not reached the field at a widespread level (Corrigan, Steiner, McCracken, Blaser, & Barr, 2001).

The Edward R. Roybal Centers for Research on Applied Gerontology were established to encourage the translation and application of existing basic knowledge about cognitive, behavioral, and psychosocial aging to a wide range of important practical problems facing older persons. The methods used to disseminate new findings and outcomes were decided by the individual Roybal Centers themselves. The goal of this article is to present a systematic approach to knowledge dissemination and utilization. We present the approach by describing a conceptual framework designed to help researchers and others clearly match a learning strategy with a specific dissemination or utilization goal and a specific information audience. Last, we provide examples of its use by Boston University's Roybal Center projects.

Knowledge Dissemination and Utilization

Many of the problems that challenge knowledge dissemination and utilization were identified in the 1960s, 1970s, and 1980s and have changed little over

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the past decades (National Advisory Health Council, 1999). Three common problems have challenged the effective transfer of research findings to the field. The first problem is that the goals of dissemination are confused with the goals of knowledge utilization. The dissemination of knowledge is not synonymous with the utilization of knowledge. Knowledge *dissemination* is the fairly simple process of communicating new findings and outcomes to the field (Rogers, 1983). Knowledge *utilization* is a more complex process of applying the knowledge that is disseminated. Difficulties arise when researchers use dissemination methods (e.g., speaking at conferences, publishing research findings) to reach utilization goals (e.g., adoption of a new evidence-based technique into clinical practice). The lack of clarity about the match between the methods used and the expected outcome has been one of the reasons cited for the gap between health behavior research and community-based health promotion practice (Altman, 1995; Morrissey et al., 1997).

The second problem related to the effective transfer of research findings is that most dissemination practices are not organized or planned to achieve comprehensive impact. This is due to several factors. For example, dissemination practices tend to be the least funded activity within research grants (Shepherd, 1982). Also, most researchers' career advancement is influenced by limited dissemination criteria such as the number of publications in peer-reviewed journals (Prohaska et al., 2000) and major presentations made at professional meetings.

The third problem is that most dissemination and utilization efforts are still based on a mechanistic linear conception of dissemination as a process of simply "getting the word out." Dissemination approaches have traditionally been drawn from the agricultural extension model, based on the idea that people will use good ideas and products (e.g., new types of seed corn or erosion control strategies) if only they have access to information about them. The Agricultural Extension Service, established in 1914, was created to show farmers what science offered agriculture. The key mechanism for inserting science into agriculture was through technology transfer, best done through demonstrations and the practice of early adopters, who would in turn show their "laggard" neighbors how farming was scientifically done. The focus was on disseminating a limited number of commodities, which had the science behind them to increase productivity (Flora, 1996). Consequently, traditional dissemination approaches have focused on the content of the message, the "commodity" (e.g., research results, implications) as well as the medium in which the message was delivered (e.g., word of mouth/early adopters, articles, popular media; National Center for the Dissemination of Disability Research [NCDDR], 1996).

Research over the past 10 years has concluded, however, that knowledge is not a "thing"—a static

inert object to be sent and received. Disseminating new findings or information involves communicating through "certain channels over time among members of a social system" (Rogers, 1995). It requires an analysis of the communicator and the user because knowledge itself is a fluid set of understandings shaped both by those who originate it and by those who receive it (Hutchinson & Huberman, 1993).

Even the agricultural extension system proved to be much less effective when the outcomes to be disseminated moved away from agricultural production technology into areas calling for attitudinal or behavioral changes (NCDDR, 1996). The early agricultural extension model strengthened its ability to get the word out by adding technicians to demonstrate the use and desirability of the idea or product. However, more was needed to effect attitudinal or behavior change. These changes are often required when the innovative technique or new finding challenges previously held beliefs or practices. For example, many older people and clinicians, in fact, previously held the view that physical activity and exercise in late life was dangerous and something that should be avoided. Inactivity was believed to be the best and safest approach in old age. The introduction of physical activity counseling into clinical practice and the adoption of exercise programs by older persons required extensive attitudinal change on the part of both groups. Clinicians and older persons had to be educated as to the importance and safety and documented benefits of late-life exercise before they would adopt them into their normal routines.

Creating attitudinal or behavior change requires a learning framework that focuses on the intended users of research as the most critical element in the process (NCDDR, 1996; Rogers, 1995). Maintaining the change requires methods that promote changes not only in the information users, but also in organizational and systemic structures (e.g., legislative, funding, and sociopolitical features; Bower & Gask, 2002; Orleans, 2000). If the goal of our efforts is to maximize the utilization of research findings, we believe the field of gerontology would benefit from moving beyond a scattershot approach to the transfer of knowledge. The framework presented in this article allows the field both to better target its dissemination and utilization methods to specific users and also to increase the comprehensiveness of its dissemination and utilization approach by helping to generate new strategies.

The Conceptual Framework: Exposure, Experience, Expertise, and Embedding

Table 1 presents a summary of the strategies, goals, and examples targeted to the learning needs of specific users. This framework is an adaptation of categories first used to describe varying intensities

Table 1. Summary of Knowledge Dissemination and Utilization Framework: Exposure, Experience, Expertise, and Embedding

Strategy	Exposure	Experience	Expertise	Embedding
Goal	Increased knowledge	Increased knowledge and positive attitudes	Increased competence	Increased utilization over time
Target Population				
Researchers	Articles, seminars, E-mail; web-based information	Mentorship	Internships, manuals	Ongoing availability of experts, ongoing research funding
Providers Administrators	Conferences, popular media, electronic user groups	Videos, internships, program visits	Manuals, training programs	Programmatic, systems-level technical assistance, organizational development, ongoing supervision, advocacy
Consumers/Families	Popular media, community lectures, Web-sites	Role models	Manuals, training programs	Ongoing support meetings, feedback tools

of training methods (M. R. Cohen, 1985; Farkas & Anthony, 2001). The strategies can be categorized as *exposure, experience, expertise, and embedding*. The strategies have a specific learning goal (i.e., increased knowledge, increased knowledge and positive attitudes, increased competence, increased utilization of the information over time). In gerontology, the most likely users of information are researchers, providers, or administrators and consumers. Researchers are obviously users critical to the ongoing development of the scientific knowledge within the field (Prohaska et al., 2000). Providers and administrators, for the most part, will put the implications of the new research knowledge into practice (Sheperd, 1982). Consumers and their families may benefit the most from the new knowledge and are increasingly being asked to take responsibility for the application of innovations (Pocinki et al., 1993).

Exposure strategies are those knowledge dissemination methods that focus on the goal of increased knowledge. These include the traditional, more passive methods of dissemination (e.g., journal or popular articles, conferences, or lectures (Rogers, 1983) as well as newer methods based on an active, information-seeking paradigm better suited to a recognition of the fluid nature of information needs (Paisley, 1993).

Researchers using *exposure* methods in an information-seeking model look for ways to increase the interactive nature of communication; that is, helping users to explore, learn, decide, or confirm information rather than just reading it. Dissemination via electronic means has become a critical information dissemination tool in gerontology (Ellis, Jankowski, Jasper, & Abdul, 1996), as well as in other fields, in this desire to increase interaction with target users. Methods such as Web sites, electronic

bulletin boards, and E-mail help to overcome some of the common barriers to effective dissemination (Moran, 1999). Electronic media can overcome the traditional time delays for researchers associated with journal publication schedules (Backer, Liberman, & Kuehnel 1986; Morrissey et al., 1997; Portnoy, Anderson, & Erickson, 1989) and for providers because of their tendency not to read or understand professional journals (Norris & Larsen, 1976; Orlandi, Landers, Weston, & Haley, 1990; Roberts-Gray & Gray, 1983). The instantaneous accessibility of information and the characteristics of the electronic media itself result in text that is less dense, easier to read, and readily available. Because of the flexibility and interactivity of the electronic media, information can be more easily shaped and matched to meet the needs of different users.

The choice of a specific *exposure* method or channel of communication depends largely on the characteristics of the targeted user. Researchers tend to be located in academic institutions or research institutions that value information appearing in peer-reviewed journals, publications, and scientific conferences (Prohaska et al., 2000; Shepherd, 1982). Providers and administrators typically avoid research literature. Early studies demonstrated that clinical psychologists, for example, read only two to four research articles per month, if that (H. L. Cohen, 1979). Rather than read journals, they tend to seek out new information presented in an interactive format. These can include conferences or presentations; articles mentioned in the popular press, radio, or television (Paisley, 1993); or the exchange of information with other providers or administrators, often about whether the promise of the innovation has been met in practice (Burdine & McLeroy, 1992). Last, dissemination research has suggested that most individuals, including older

adults and their families, are more likely to pay attention to information disseminated to them by those in positions of trust and authority whom they find credible (e.g., family physicians, professors) or from "near peers" (e.g., other credible elders; Rogers, 1995) as well as information in a medium that is easy to read (e.g., Internet sites, bulletins). Many consumers and family members, for example, are not comfortable with the electronic media, however, and consequently are best reached through more traditional channels such as newsletters or magazine articles.

Experience strategies are those knowledge utilization methods that focus on the goal of increased positive attitudes towards the new knowledge as well as increased knowledge. Negative attitudes have been attributed to difficulties ranging from perceived inability to increase functioning in late life (e.g., Lachman, Weaver, Bandura, Elliot, & Lewkowicz, 1992) to instituting innovations in practice (Backer et al., 1986; Corrigan et al., 2001; Good, Berenbaum, & Nisenson, 2000; Shepherd, 1982). *Experience* strategies help the targeted user to get ready to use an innovation or new information (NCDDR, 1996). The *experience* strategy for researchers may involve mentoring young researchers in order to engage them in developing new studies in gerontology. The mentorship may provide the young researcher with new information and knowledge but, more important, speaks to the emotional and psychological factors inherent in contemplating a change or developing a commitment to research in this field (Farkas, Sullivan-Soydan, & Gagne, 2001; Prochaska, DiClemente, and Norcross, 1992). *Experience* strategies for providers or administrators may include observing programs or demonstrations of the innovations (Backer et al., 1986) or watching an inspirational video designed to create a positive emotional shift or openness to the research findings and outcomes. Consumers may respond best and become "ready" for the change suggested by the new information when given the opportunity to meet other peers who have already made the suggested change. Role modeling and the opportunity to discuss the changes with peers can inculcate a sense of hopefulness about the possibility of change that is not present when users are simply provided with new information (M. R. Cohen, Forbess, & Farkas, 2001; Farkas et al., 2001).

Expertise strategies are those knowledge utilization methods that focus on the goal of increased competence. Training or capacity building is a key process leading to precise performance and predictable outcomes (Altman, 1995). *Expertise* strategies can include supervised internships for new researchers coming into the field or materials such as step-by-step manuals to promote the use of new research instruments. *Expertise* can also be focused on the provider community. Training programs can directly teach and supervise providers who want to learn new

techniques in order to increase the effectiveness of their practice. Training manuals, in conjunction with interactive training programs, can increase the number of providers who can deliver the innovation and also promote the development of providers who can then train others (i.e., "train the trainers" approach). When training programs use learning activities such as modeling, role play, feedback, and homework, they enhance sustainability of the innovation because they not only help staff learn the new techniques but also encourage the use of these skills in the practice settings (Corrigan et al., 2001). Last, when these same training strategies are directed to the older consumer and their families, consumers are empowered by their increased competence to take charge of their own health (Altman, 1995; Prochaska et al., 2000).

Embedding strategies are complex knowledge utilization methods whose goal is to increase use of the new findings or innovation over time. This need to institutionalize knowledge in daily practice has long been recognized as one of the most difficult aspects of knowledge utilization (e.g., Altman, 1995; Backer et al., 1986; Goodman & Steckler, 1989; Mittlemark, Hunt, Heath, & Schmid, 1993; Rogers, 1983; Rosenheck, 2001). As with the other categories of strategies, *embedding* strategies are targeted to specific users (see Table 1). Most *embedding* strategies are focused on program- or system-level administrators because these are the main agents of change and the maintenance of change. Strategies can include technical assistance or organizational change techniques to help organizations develop structures that support the use of the information (Nemec et al., 1991; Rosenheck, 2001); "power strategies" that establish rules, legislation, and public policy that strengthen social norms and expectations about what is possible (Orleans, 2000; Roberts-Gray & Gray, 1983) or strategies that affect resources to make the changes sustain over time, such as funding (Altman, 1995). Although administrators and providers may be respectful of scientific evidence, their decisions about what to implement on a daily basis are shaped more by these types of power structures, ingrained routines, and established resource configurations than by the scientific evidence (Rosenheck, 2001; Simon, 1997).

Embedding strategies targeted at consumers and family members tend to be personally focused. They include strategies such as promoting the development of peer support groups for those attempting to use the new information or innovation. Peer support can be developed electronically (e.g., listservs, newsgroups, Web communities) or in person. Another strategy that promotes consumer or family use of an innovation in daily practice is the development of feedback mechanisms (Bracht et al., 1994). This includes tools such as graphs or simple scales to chart progress or organized follow-up contact, such as regular E-mails or visits.

Although the framework was not designed as a developmental process (i.e., requiring that strategies be created for each category sequentially), it can certainly be used developmentally. If researchers develop particular findings that they believe will have implications for new knowledge, attitudes, competencies, and systems for *many* constituencies over a number of years, they might find it helpful to plan for strategies that translate findings into products and methods designed to meet each goal. For example, researchers might want to think through the necessary products for *exposure* (articles, newsletters; presentations) to create field awareness of a set of findings; out of the awareness that is created in specific constituencies, identify how demonstration sites or mentorship would be developed to promote *experience* with a particular practice, set of skills, or technology; think through the kinds of curricula and training programs and financing of such to train those with experience in the practice, thereby promoting *expertise* in each relevant group, and last, develop a plan for programmatic or systems change that would promote *embedding* of the practice or technique. Not all findings have such broad sweeping implications, nor are they relevant for a range of constituencies. The framework is flexible enough to accommodate a focus on one goal or the full range of goals.

Using the Four Es: Application of the Framework

The dissemination framework of *exposure*, *experience*, *expertise*, and *embedding* to generate knowledge and its utilization can be used to examine the dissemination strategies targeted at various constituencies, used by the Boston University Roybal Center. We focus here on the dissemination strategies used for three of its primary research projects. Late Life Function and Disability Instrument, Strong for Life, and Fear of Falling: A Matter Of Balance.

Late Life Function and Disability Instrument

Background and Target Users.—The Late Life Function and Disability Instrument (Late Life FDI) was developed to fill a specific need for researchers to have a more comprehensive and sensitive measure of physical functioning than was previously available (Jette et al., 2002).

Strategies: Exposure and Expertise.—Because the primary goal was to increase researchers' knowledge and use of the instrument, predominantly *exposure* strategies were used, such as writing peer-reviewed articles published in journals that researchers were most likely to be reviewing for new findings (e.g., S. Haley et al., 2002; A. M. Haley, Ludlow, Coster, & Langmuir, 2002). In addition, other *exposure* strategies, such as providing the manual

and software at nominal cost via the Roybal web site (<http://www.bu.edu/roybal>) were designed to broaden the audience. *Expertise* was addressed briefly through the development of an administration manual and data entry/scoring software package, along with plans for a list of the most frequently asked questions (FAQs) about the use of the instrument available and updated online, so that researchers will have ongoing access to expert information as they seek to become more competent in the use of the Late Life FDI.

Strong for Life Exercise Intervention

Background and Target Users.—Strong for Life (SFL) is a muscle-strengthening program developed specifically for older adults with some degree of physical disability. The program consists of a 35-min videotaped program of 11 exercise routines performed by a trained exercise leader (Lachman et al., 1997). The routines were shown in randomized trials to achieve significant improvements in participants' muscle strength, gait stability, and degree of physical disability (Jette et al., 1999; Krebs, Jette, & Assman, 1998). A sequence of dissemination activities targeted all three constituencies: researchers, providers, and consumer audiences.

Strategies: Exposure.—Dissemination goals were initially focused on creating awareness of the SFL program in researchers, rehabilitation practitioners, public health agencies, professionals, and social service providers. Findings from the SFL studies were presented at domestic and international scientific and clinical conferences sponsored by these groups' professional societies and organizations. Second, timely publication of the SFL efficacy findings was achieved in both the research journal and professional literatures of aging, rehabilitation, and public health (e.g., *Archives of Physical Medicine & Rehabilitation*, *The Journal of Gerontology: Medical Sciences*, *the Journal of Public Health*, and *The Gerontologist*). Because interactive methods enhance the impact of dissemination, researchers included information about the SFL program and the Strong for Life videos on the Boston University Roybal Center Web site where visitors could E-mail their questions and comments about the information.

Experience.—*Exercise: It's Never Too Late* is a 15-min motivational video developed for the purpose of teaching older adults about the importance of physical activity and exercise in late life. The conceptual framework helped the researchers to expand the original dissemination plan for this video. Although originally designed as part of a training program (an *expertise* strategy) to increase the competence of consumers and professionals,

it has also begun to be used separately to reach a wider audience, providing an *experience* of late life exercise. The video, now promoted by a worldwide distributing company, is intended not only to inform the audience but also to create positive attitudes toward exercise for both consumers and practitioners.

Expertise.—A direct effort was undertaken to improve the expertise of consumers in performing the SFL program. A 35-min video, *Strong for Life*, was developed to complement *Exercise: It's Never Too Late*. It contains the actual program of exercises along with set-up information and warm-up and cool-down exercises. This video for professionals and older adults includes step-by-step instructions provided by an exercise leader and peer demonstrations of how to perform each exercise included in the SFL program.

Additional *expertise* strategies are being achieved through close collaboration with an existing community-based program sponsored by the Robert Wood Johnson Foundation. *Faith in Action* is a national, faith-based volunteer program helping people who are chronically ill, frail, elderly, or disabled to maintain their independence. The Boston University Roybal Center staff has prepared a *Facilitator's Manual* to complement the videos that will be used by the *Faith in Action* volunteers in a pilot program across 10 sites. The volunteers will teach older adults how to perform the SFL program. This *Facilitator's Manual* includes an introduction to the SFL program, set-up instructions, illustrations of each SFL exercise routine, problem-solving instructions, tips on how to avoid injuries and how to progress in the SFL program, and detailed information on how to enhance adherence to the program. A companion *Users' Manual* will be provided to each older adult who participates in the SFL program provided by *Faith in Action*. These materials will also be available to other consumers and professionals through the Roybal Center Web site. Roybal staff are planning training workshops that will be conducted in each of the 10 *Faith in Action* pilot sites. Roybal exercise experts will train volunteer trainers from each *Faith in Action* site to teach older participants how to perform the SFL program. The competence of each trained volunteer will be assessed by one of the Roybal experts to ensure successful implementation of the SFL program.

Embedding.—The developers of SFL are in the process of creating *embedding* plans. The plan is to add SFL as a regular service provided by *Faith in Action* volunteers in all 3,000 *Faith in Action* sites operating across the United States. The Robert Wood Johnson Foundation, through the University of Illinois, will evaluate the success of the Boston University *Faith in Action* pilot site programs. Success of the pilots is anticipated because the SFL

program adheres to basic components of successful innovations (Kolbe & Iverson, 1981; Orlandi et al., 1990; Rogers, 1995). Innovations that are likely to be adopted tend to *be compatible with those adopting it, be flexible, demonstrate a relative advantage over other products, and be less complex, more cost-efficient, and low risk*. *Faith in Action* is a national program whose goal of maintaining the independence of older adults living in the community is completely *compatible* with the intent of the SFL program's goals. Although the SFL program was designed to be taught by professionals, it is *flexible* enough to allow for training by lay volunteers associated with the *Faith in Action* sites. The exercise routines can also be adapted to meet the unique physical limitations faced by an older adult. SFL meets the criterion of *relative advantage over other methods* as it targets the population of functionally challenged older adults who are all but ignored by the vast majority of exercise programs currently on the market. Designed to be taught and performed in the older adult's home, the SFL program has already been shown to be *simple to use* and *cost efficient* when compared with traditional, group exercise programs offered outside of the home. Finally, the collaboration between SFL and *Faith in Action* programs greatly reduces the *risk* exposure of both organizations. By using an existing national network of volunteer sites, the SFL program avoids the cost of setting up a dissemination network. By collaborating with SFL, the *Faith in Action* program does not have to incur the costs of developing a safe yet effective exercise program for its participants.

Fear of Falling: A Matter of Balance Intervention

Background and Target Users.—Along with falls, fear of falling is now recognized as an important health problem for older adults (Arfken, Lash, Birge, & Miller, 1994). Fear of falling has been associated with declines in activities of daily living function (Cumming, Salkeld, Thomas, & Szonyi, 2000; Mendes de Leon, Seeman, Baker, Richardson, & Tinetti, 1996), reductions in activity (Kellogg International Work Group, 1987; Nevitt Cummings, & Hudes, 1991; Tinetti, deLeon, Doucette, & Baker, 1994), and subsequent increased falls risk (Campbell, Borrie, & Spears, 1989; Hindmarsh & Estes, 1989; Maki, Holliday, & Topper, 1991). The Matter of Balance (MOB) approach aims to reduce the fear of falling as well as associated activity restriction. Program objectives include (a) promoting a view of falls and fear of falling as controllable, (b) setting realistic goals for increasing activity, (c) changing the environment to reduce falls risk, and (d) promoting exercise to increase strength and balance. The MOB program is conducted in structured groups and held in nine 2-h

sessions. It uses a multimodal approach, including videotape, lecture, group discussion, role playing, mutual problem solving, exercise training, and home assignments. Participants who attended at least five of the nine sessions in a randomized controlled trial (Tennstedt et al., 1998) reported reduced fear of falling, enhanced ability to manage falls and falls risk, and increased activity levels. The target users of the information were providers who would conduct the program in community sites such as senior centers, senior housing facilities, assisted living facilities, and adult day health centers. The secondary target users were other researchers.

Strategies.—The two primary dissemination goals of MOB were to increase knowledge in the field about the results of the MOB trials (*exposure*) and to increase the competence of providers to use the MOB program (*expertise*). A secondary goal was to institutionalize the innovation within community organizations so that the implementation would be sustained (*embedding*).

Exposure.—The first *exposure* strategy was to describe both the progress and results of the Fear of Falling program on the Roybal Website, thereby decreasing the typical time lags in disseminating information to the provider community. The majority of the 150 daily Web visits originate from practitioners, researchers, and students. To increase *information seeking* (Paisley, 1993) rather than simply *information transfer*, the Web site allows visitors to make direct inquiries to the Boston University Roybal Center administrator as well as view downloadable clips from three videos that form part of the MOB package. Approximately 100 Website inquiries per year are made regarding the MOB materials.

More traditional methods were also used in order to increase MOB's *exposure* to those in the practice community who might not be comfortable with electronic media. These methods included newspaper and magazine articles and a newsletter. The reach of the *exposure* efforts was extended by holding a practitioner conference. This conference, cosponsored by Massachusetts Department of Public Health and the Boston University Roybal Center, disseminated findings from the studies to the New England gerontology/provider community and also generated program income that was used for further dissemination activities. Last, a private organization (Boston Health Intervention) was begun by Roybal Center collaborators to disseminate *A Matter of Balance* to numerous community, public health, and consumer groups. The Boston Health Intervention has made presentations nationally as well as in Sweden for Danish and Swedish orthopedic surgeons and at a geriatric policy forum in Copenhagen, Denmark, generated at least in part by project

journal articles (e.g., Howland et al., 1993; Tennstedt et al., 1998).

Researchers, the secondary target user group, were targeted through presentations at a variety of domestic and international conferences and publications of articles and other texts. Professional awards or publicity in well-respected journals can enhance the desirability of a particular research project (Roberts-Gray & Gray, 1983). The dissemination effort gained momentum when an outcomes paper (Tennstedt et al., 1998) received the *Excellence in Research* award from the Research Committee of the Section on Geriatrics at the American Physical Therapy Association meeting. *A Matter of Balance* will be replicated in Europe by the University of Maastricht in the Netherlands and by the Witten Institute for Applied Nursing Science in Germany, with the collaboration of the program developers.

Expertise.—*A Matter of Balance* was awarded the first Archstone Foundation Award for Excellence in Program Innovation through the American Public Health Association, thereby increasing the program's interest and credibility among providers. Based on the manual used in the evaluation trial, a 140-page step-by-step Facilitator's Guide was developed for providers in clinical and community settings. The manual is accompanied by an award-winning video, "*Fear of Falling: A Matter of Balance*," produced to introduce the cognitive/behavioral concepts of the program. To date, 450 manuals and videotapes have been sold across the nation and in Canada, Australia, New Zealand, the Netherlands, and Germany. A Boston area community hospital offers the program at community sites and senior centers in surrounding communities. It has translated the program manual and video into Chinese and Russian, advertising it in the local Chinese and Russian community newspapers. These efforts demonstrate the adaptability of the package and its ability to be shaped for specific target users, two factors that enhance the utilization of information (Orlandi et al., 1990). To date, 48 programs have been held by this hospital for over 500 participants. A Boston area public health department offers the program three to four times a year, often with a waiting list. Behavioral Health Intervention has trained over 100 facilitators to deliver the program in five states. BHI conducts ongoing seminars and workshops on the program at the University of Illinois at Chicago, area senior centers, academic institutions, and health centers.

Embedding.—*Embedding* strategies have been used to sustain the implementation of MOB. Specialized mailing lists for informing groups about updates of the program have been developed in order to keep the MOB user community informed and motivated to continue. The list includes 650 names gathered from inquiries about the program made in

any of the media (electronic, conferences, mailing) used by the Roybal Center.

A second series of *embedding* organizational strategies were initiated as an outgrowth of the *expertise* focus. Partnership for Healthy Aging, a collaborative enterprise in Maine established by MaineHealth (an integrated, not-for-profit health care delivery system), Maine Medical Center, Community Health Services, and the Southern Maine Agency on Aging, decided to offer the MOB program statewide. The Partnership used several strategies that successfully embedded or institutionalized the program in the state. First, by conducting the program in senior centers, churches, senior housing, and other sites where elders congregate, they reduced the need for specialized transportation or additional resources. Second, they assigned one person to lead the program and promote dissemination. Third, member organizations have provided the services of nurses, physical and occupational therapists, and others who serve as program facilitators. These organizational structures not only support the MOB program in terms of resources, but also establish an official mandate to continue the program. Begun in the greater Portland area, the program has spread throughout the MaineHealth organization as well as Maine's Area Agencies on Aging and hospitals. Forty-one facilitators had been trained by January 2002. The National Council on Aging identified the Partnership for Healthy Aging MOB program as one of five exemplary healthy aging programs in the country, including it in a National Council on Aging "best practices" report that will be disseminated to practitioners, researchers, and other leaders in the aging field.

Conclusion

It is interesting to note that like most research projects, all three projects of the Boston University Roybal Center for Late Life Functioning concentrated their efforts on *exposure* strategies. Using the framework, however, they conceptualized dissemination as a learning process designed with specific end users in mind who are information-seeking participants rather than passive recipients in the *exposure* strategy. As a result, they were able to develop more comprehensive *exposure* strategies. For example, the design and development of a Roybal Website with both video and text components as well as the use of E-mail to access direct information from the Roybal administrator increased the interaction between the audience and the Roybal projects. This interaction allowed the center to continue to shape and tailor its information over time, and more effectively for providers and researchers.

Exposure strategies are the most commonly used dissemination strategies by researchers because they are the least costly and the least time consuming.

However, they are the least likely to affect utilization of products and new knowledge. The dissemination framework presented in this article encouraged the researchers in the Boston University Roybal Center to think beyond *exposure* strategies to increase their ability to impact practice in the field. For example, the SFL program used the concept of *experience* to develop an easy way of promoting positive attitudes toward exercise (a short video).

Embedding efforts to incorporate the programs into regular provider practice require complex series of activities well past the purview of most researchers' funding and personal interests. Thinking through these activities, however, allowed both the SFL and MOB programs to look for relevant partners who would, with researcher support, take the lead in embedding the program in the practice field. The MOB program developed a systematic way to actually put its *embedding* strategies into practice by working with a collaborator to change organizational structures and practices, thereby institutionalizing the program in a particular geographic area. Planning out *embedding* strategies allowed the dissemination team not only to find collaborators but also to create alternative funding mechanisms (e.g., private companies, other grant funds). These efforts served to promote the application or utilization of the center's findings, thus creating possibilities for sustaining the implementation of the findings beyond the life of the Roybal Center.

Overall, the utility of the framework was threefold: simple concepts that encouraged researchers to expand the range of their dissemination efforts from their traditional focus of transfer of information to that of helping information to be incorporated into daily practice; encouraging the design of the effort to begin and end with an understanding of the specific end user, and, finally, encouraging the development of a comprehensive dissemination/utilization plan as an integral part of the research effort rather than as an afterthought.

The framework of *exposure*, *experience*, *expertise*, and *embedding* helps researchers understand dissemination and utilization as a series of active learning strategies and to organize these directed at particular knowledge goals and the needs of particular users. The use of this comprehensive framework for dissemination and utilization increases the likelihood that relevant research findings and outcomes do not remain within the research community alone but are also used by the gerontology provider and consumer community in health promotion programs to reach the ultimate goal—increasing the well-being of individuals in late life.

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