

A Review of the Literature on Dissemination and Knowledge Utilization

Purpose and Overview

Research is not used as a can opener is used.

— Huberman, 1987, p. 589

This survey of the literature is designed to provide a knowledge base for strengthening the ways in which research results can be accessed and used by those who need them. The ultimate purpose of disability research is to be of use—leading either to changes in current practice or to confirmation of it. However, in spite of the sophistication and magnitude of disability research, and in spite of almost thirty years of federally sponsored dissemination efforts, problems remain.

Paul Leung, reviewing the testimony provided in a series of forums sponsored in 1991 by the National Institute on Disability and Rehabilitation Research (NIDRR), reports that “information dissemination is an issue of concern for consumers, family members, and professionals.” He quotes Graves (1991), who “notes that disability and rehabilitation research often ‘is viewed not only by practicing counselors as impractical, but often by people with disabilities as irrelevant’” (Leung, 1992, p. 287). Testimony from these forums “suggests the continuing need to move research and information from those who generate it to the user and the service provider in a form that has direct and immediate application” (p. 295).

Continuing problems with dissemination can be linked to a number of factors. Louis (1992) has listed four problematic characteristics of the U.S. educational system of dissemination that also may be applied to the rehabilitation field:

(a) The U.S. system is deeply indebted to the extension model developed in the agricultural tradition; (b) it has traditionally focused on the dissemination side of the equation, rather than on the knowledge use side; (c) it has grown up as a set of uncoordinated—and even competitive—activities; (d) the resulting approach is largely top down, research-to-practice focused, rather than bottom up, problem-solving focused. (p. 290)

A number of researchers have noted that, while the extension model has worked successfully in the field of agriculture, it has not been particularly effective in other areas. The reasons for this circumstance include issues of funding and coordination; also important are differences in the *user orientation* of agricultural and other research and in the *kinds of information* being disseminated. Rogers (1988) points out that agricultural researchers have always geared their work toward farmers' use of their results. He also notes that the agricultural extension system has been less successful when the subject matter to be disseminated strays from agricultural production technology.

The agricultural extension model reflects a rational, linear conception of the process of knowledge utilization; the focus of this model is on getting the word out, with the assumption that good ideas will be used by those who hear about them. As Louis (1992) explains, a key assumption of this approach to dissemination "is that knowledge is a 'thing' that simply needs to find a good home" (p. 288). However, the understandings about knowledge use emerging from the recent literature reveal that the process is complex, transactional, and heavily dependent on the potential user's pre-existing knowledge, beliefs, and experiences.

The focus on the *user* of research has come to the forefront during a period when the target audiences for disability research have broadened to include stronger attention to direct service providers and to persons with disabilities and their families. Although little empirical research has been conducted to assess the effectiveness of specific dissemination approaches with diverse user audiences, it is clear that consideration needs to be given to demographic and psychographic differences.

Many improvements have been made in the dissemination of disability research (Blasiotti, 1992). NIDRR and other branches of the federal government are working to establish common perspectives as well as coordinated approaches to dissemination, and to encourage the incorporation of dissemination into all stages of the research, development, and utilization process. This literature review, along with a series of guides to effective practice that will be developed from it, is intended to support such changes.

Definitions and Models

After a comprehensive and wide-ranging search of the literature, the authors were unable to locate a comprehensive, commonly accepted definition of dissemination.

— Friedman & Farag, 1991, p. 269

The literature is filled with differing definitions and uses of *dissemination*, *knowledge utilization*, *diffusion*, and *technology transfer*, among other related terms. These terms are sometimes used interchangeably, sometimes carefully distinguished from one another. The different uses and definitions reflect varying

assumptions and interests, ranging from a limited focus on “getting the word out” to an all-encompassing focus on seeing new knowledge or products from creation all the way through implementation by intended users.

Most recent authors are careful to include a focus on the use of research results. For example, Newman and Vash (1994) note, “Experience shows that possession of information does not mean it will be used” (p. 381). Similarly, Sechrest, Backer, and Rogers (1994) argue that “we need to distinguish between ‘dissemination’ and ‘effective dissemination,’ because the former term is often used to indicate merely the successful distribution of information” (p. 187). Even where *use* is included as a dimension of dissemination, however, the question of what is meant by *use* or *utilization* is not a settled one. Machlup (1993) articulates the question as follows:

Does use of information—the process of transmission and reception, for example, of a letter—mean (1) receiving it and thus getting a chance to read it; (2) receiving and actually reading it; (3) receiving, reading, and understanding it; (4) receiving, reading, understanding, and appreciating it; (5) receiving, reading, understanding, appreciating, and making it the basis of a decision; or (6) receiving, reading, understanding, and appreciating it, plus letting it help you in making a decision and taking an action (or refusing to act) in line with the decision reached with the help of the knowledge obtained? (pp. 449-450)

Many researchers have begun to distinguish between *conceptual use* of knowledge, which Huberman (1992) describes as “changes in levels of knowledge, understanding, or attitude,” and *instrumental use*, or “changes in behavior and practice” (p. 6). Some also include a third category of *strategic use*, which relates to the manipulation of knowledge to attain specific power or profit goals, such as

political gain; Huberman (1987) characterizes this use as being in “the ‘research-as-ammunition’ tradition” (p. 590).

The question of use moves dissemination to a focus on implementation. In an early effort to define dissemination, the federally constituted Dissemination Analysis Group (cited in Klein & Gwaltney, 1991, pp. 246-247) in 1977 identified four functions or types of dissemination:

- *spread*, which is defined as “the one-way diffusion or distribution of information,”
- *choice*, a process that “actively helps users seek and acquire alternative sources of information and learn about their options,”
- *exchange*, which “involves interactions between people and the multidirectional flow of information,” and
- *implementation*, which “includes technical assistance, training, or interpersonal activities designed to increase the use of knowledge or R&D or to change attitudes or behavior of organizations or individuals.”

Spread is described as a proactive process, in which disseminators take the initiative in distributing useful knowledge or products. *Choice* is described as reactive, providing information and materials as requested by potential users, and *exchange* and *implementation* are described as interactive processes (Klein & Gwaltney, 1991).

Definitions of dissemination also reflect differing assumptions and beliefs about the ways in which knowledge is used, indeed about the very nature of knowledge itself. The focus varies from perceiving dissemination and utilization as linear, mechanical processes of “transfer,” in which knowledge is packaged and moved from one “place” to another, much as an appliance might be packaged and shipped, to characterizing the process as highly complex, nonlinear, interactive, and

critically dependent on the beliefs, values, circumstances, and needs of intended users. Key differences are reflected in a criticism by Louis (1992) of the Dissemination Analysis Group's four-level definition; she characterizes the group's approach to dissemination as "technocratic":

A key assumption of this approach is that knowledge is a "thing" that simply needs to find a good home . . . Nowhere is this more apparent than in the worthy effort to define dissemination as consisting of four activities: spread, exchange, choice, and implementation. This definition . . . improves on the previous assumption that the purpose of dissemination was primarily to cast knowledge out into the world of practice, under the theory that a good idea would ultimately be used. The newer approach incorporates ideas about communication as a two-way process and extends the job of dissemination to include providing support for actual changes. It nevertheless embodies the belief that knowledge comes in definable, useable units that can be arrayed in front of practitioners who will then find among them something to "solve their problem(s)." Federal policies in the United States, and the dissemination system that it supports, reflect this assumption. (p. 288)

A variety of authors have proposed theories, or models, of the way in which knowledge utilization works. Paisley (1993, p. 227), for example, contrasts two models that he labels as the *diffusion* model, which emphasizes the disseminator of information, and the *information-seeking* model, which emphasizes the roles of users in seeking solutions. Wings (1990) notes that one of the first major utilization studies in the field of sociology (Caplan, Morrison, & Stambaugh, 1975) divided existing theories into three major categories: *knowledge-specific* theories, *policymaker constraint* theories, and *two-communities* theories. According to Wings and others, the latter theory, which focuses on the gaps in culture, need,

and belief between the two “communities” of researchers and users, remains “the most prevalent theory to be found in utilization research” (p. 28).

No single theory or model has gained ascendancy. In fact, Wingens (1990) asserts that:

The state of the art of *theory-building* in utilization research has remained on a low level and is, at best, mediocre. There is *no* elaborate utilization theory, let alone one that has proved its explanatory power by empirical testing. (p. 28)

For those concerned with the practical issues of dissemination, the most important distinctions among the various models have to do with their perspectives about the ways and extent to which potential users play active roles in the acquisition and use of new knowledge.

For the purposes of this paper, the terms *dissemination* and *knowledge utilization* are used interchangeably. Both are assumed to mean not only the distribution of products or information, but also the incorporation of approaches designed to promote conceptual or instrumental use.

The Status of the Literature on Knowledge Utilization

The literature on dissemination and knowledge utilization spans a number of disciplines, including rehabilitation, education, sociology, psychology, and marketing. According to one author (Backer, 1991), this literature now includes an estimated 10,000 citations. In tracing the history of the study of dissemination or

diffusion theory, Valente and Rogers (1995) note that “the diffusion of innovations paradigm began more than fifty years ago when Ryan and Gross (1943) published the results of their hybrid seed corn study” (p. 242). Backer (1991) describes the current focus on dissemination as a “third wave” of activities related to the understanding and promotion of knowledge utilization. The first wave, he notes, spanned the years from 1920 through 1960. The second wave took place during the period from 1960 through 1980, when a number of large-scale, federally sponsored dissemination and implementation studies were conducted.

Most of the current literature relies substantially on the research conducted during Backer’s “second wave” of dissemination study, and consists primarily of new analysis and refinements of understandings from the work of the 1960s, 1970s, and early 1980s. For example, key surveys by authors such as Backer, Edwards, Huberman, and Rogers, all draw heavily from these early studies. Huberman (1987), along with a number of other experts, questions the emergence of any major new data related to knowledge utilization theory:

Do the more recent reviews tell us anything fundamentally new? The claim made here is that they do not; they are essentially redundant . . . This more recent work yields useful refinements and helps to pin down combinations of variables . . . But the overarching findings, together with the key explanatory variables . . . seem unchanged.
(p. 587)

There are at least some major changes to consider. As Paisley (1993) notes, “Many of the problems that challenge knowledge utilization have changed little since the 1960s and 1970s. However, the communications environment of knowledge utilization has changed dramatically” (p. 222). The proliferation of electronic communications, in particular the widespread use of personal computers, has given rise to a number of new questions and issues about equity, access, and

effectiveness.

In addition, perspectives about the process of knowledge utilization have shifted in important ways. Edwards (1991) points out, "Today the complexities and the dynamic, transactional aspects of knowledge utilization have become more widely recognized" (p. 36). Hutchinson and Huberman (1993) describe the changes since Havelock's (1969) research-development-dissemination-evaluation model "cast the flow of knowledge as a one-way process" (p.2):

The shift focuses on the ways that knowledge is mediated in particular settings and on the "schemata" and representations that "users" bring to bear on information and expertise presented to them. According to this approach, the user acts upon information by relating it to existing knowledge, imposing meaning and organization on experience and, in many cases, monitoring understanding throughout the process. This casts the user as an active problem-solver and a constructor of his or her own knowledge, rather than as a more passive receptacle of information and expertise. (p. 2)

With this view, knowledge is not an inert object to be "sent" and "received," but a fluid set of understandings shaped both by those who originate it and by those who use it. Knowledge use, then, is conceived as an active *learning* process. The implications of this perspective for the activities of disability researchers, policymakers, and linking agents are tremendous.

Knowledge Use as a Learning Process

The recent work on social cognition . . . has shown clearly that information is processed in wondrous ways, few of which are

replicative of the original information . . . The gist of this more recent work is roughly that individuals—alone or in organizations—transform and use research in highly selective and strategic ways.

— Huberman, 1987, p. 589

The perspectives on knowledge use described by Hutchinson and Huberman in the preceding section draw from a learning theory known as *constructivism*, which has moved to the forefront of educational theory in recent years. Constructivist principles, for example, underlie many of the reform-based approaches emerging in mathematics and science education, as well as in other disciplines. Some of the basic concepts of constructivism can be found in ideas about knowledge utilization dating back to the 1970s and before; Hutchinson (1995) notes that “the constructivist perspective is evident in various models of knowledge utilization including social interaction, practical discourse, two communities, technocratic counsel, and theories-in-use models” (p. 92).

Beliefs about how learning takes place are often articulated as metaphors. The *tabula rasa*, the image of the human mind as a blank slate to be written upon, was once the most common metaphor; this theory of learning also has been characterized as “the bucket theory of the mind” (Backman, 1982), in which the brain is viewed as an empty vessel into which knowledge is poured. Shapiro (1994) notes that “despite the fact that the ‘blank slate’ view of the learner is not well regarded, it is still the view underlying the practice seen most often in school settings” (p. 8). Much the same can be said about dissemination practice in rehabilitation and in other fields.

Another common image is that of the learner as sponge, “soaking up” knowledge—a role that is somewhat more active than that of empty vessel, although what the learner absorbs is taken in wholesale, without filtering or

processing. A metaphor often used in this era of technology is that of the brain as a computer, which processes in an orderly, systematic fashion the information that is received from outside sources. In this analogy the learner actively does something to or with the information, which can be presumed to be altered in appearance, if not in substance, from the form in which it was originally received.

According to constructivist principles, none of these metaphors adequately describes the ways in which we as learners process information. Constructivism presumes that new knowledge is filtered and shaped by the learner's pre-existing experience and understandings. Learners, from the youngest children to the oldest adults, are constantly seeking to make sense of the environment; to do so, we "construct" explanations that make sense based on our personal experiences. Knowing, then, "is an adaptive activity" (von Glasersfeld, 1995, p. 7), concerned with reaching functional understandings about the various aspects of living:

Taken as the advancement of understanding, the cognitive endeavor starts from what happens to be currently adopted and proceeds to integrate and organize, weed out and supplement, not in order to arrive at truth about something already made but in order to make something right—to construct something that works cognitively, that fits together and handles new cases, that may implement further inquiry and invention. (Bauersfeld, 1995, p. 163)

As Driver (1995) explains, "Human beings construct models of their environment, and new experiences [and information] are interpreted and understood in relation to existing mental models or schemes" (p. 386). The metaphors that suggest constructivist perspectives, then, are those of *building* and *shaping* new structures. In writing about the impact of the learning process on the dissemination of research, Huberman (1990) states:

Prior knowledge does not operate like a sponge, sopping up new information . . . Rather, prior understandings are the mold into which new information is poured, such that the new understandings may not correspond to the researcher's conception of his own study. (p. 380)

From a constructivist viewpoint, the extent to which an individual's existing understandings may be "right" or "wrong" is essentially irrelevant; what matters is how well those understandings work in helping the person make sense of her or his environment. One of the major theorists of constructivism, von Glasersfeld (1995) explains: "To the biologist, a living organism is viable as long as it manages to survive in its environment. To the constructivist, concepts, models, theories, and so on are viable if they prove adequate in the contexts in which they were created" (pp. 7-8). Ackerman (1995) elaborates on this idea, explaining that "from a learner's point of view, there are no such things as misconceptions. There are only discrepancies, either between points of view or between a person's activity and some unexpected effects of this activity" (p. 342).

What is "adequate" for one individual (or organization) may vary as well. The user's self-interest and self-image sometimes include considerations that conflict with what may, in terms of efficiency or cost benefits or effectiveness of operation, appear to be the "best" solution. Merely telling people that their ideas or practices are wrong, or ineffective, or outdated, or that a better mousetrap is available to replace the one they are currently using, is generally an inadequate approach to encouraging change.

From a constructivist perspective, the task of getting learners to change their pre-existing understandings begins with helping them to recognize—and to be bothered by—the "discrepancies" that Ackerman discusses. As Shapiro (1994) points out, "In order to take on a new viewpoint, one must decide to let go of an old one.

There must be a reason to decide to make a shift in thinking” (p. 7). Sechrest et al. (1994), in applying this understanding to the task of dissemination, note that if practitioners “are not in a state of uncertainty about a problem” (p. 187) the mere provision of information is not likely to lead to changes in behavior. Backer (1994) makes the point even more bluntly: “People and organizations develop the energy to change when faced with real pain . . . whether the nature of change is personal (psychotherapy) or work-related (organizational change, implementation of an innovation)” (p. 7).

Fuhrman (1994), among others, sees constructivist perspectives as directly applicable to the enterprise of dissemination:

The research on utilization is quite clear: the meaning of research is constructed by the user . . . Individuals translate research findings through the lens of prior knowledge and understanding, making sense of new knowledge in the context of their daily activities . . . It is research on learning that is the foundation of understanding knowledge utilization. We [the educational research community] should be the *last* to offer simple access or supply-side solutions to promoting utilization. We should be the *first* to view use as a complex change process in which “getting the research out there” is only the first step. (p. 138)

In discussing the practical implications of this perspective, Fuhrman argues for two major changes in current practice: “First, we should focus more on the context of knowledge users, and second, we should strengthen the integration between research and dissemination” (p. 138). In addition, Buttolph (1992), in an article focused on the ways in which potential users adapt research results, notes that constructivism—which she calls *generative learning*—changes traditional ideas about the stages at which potential users begin (often unconsciously) to reshape, or

adapt, research findings to fit their previous understandings:

Experts have agreed that adaptation takes place later rather than sooner in the diffusion process . . . Because generative learning begins at the knowledge stage of diffusion, which is the first stage (Rogers, 1983, p. 165) however, I suggest that adaptation begins during the knowledge stage as well. The seeds of adaptation are sown in the initial diffusion stages, during first awareness and interest; later, when individuals adopt and implement the innovation wholeheartedly, they have already changed it to fit their particular situation. (p. 468)

Four Dimensions of Knowledge Utilization

While no all-encompassing theory or explanation of knowledge utilization has been described and tested, the literature includes a great deal of information that can help to strengthen dissemination efforts. Within the varied perspectives about dissemination, authors generally consider some combination of these four major elements:

- the dissemination *source*, that is, the agency, organization, or individual responsible for creating the new knowledge or product, and/or for conducting dissemination activities,
- the *content* or message that is disseminated, that is, the new knowledge or product itself, as well as any supporting information or materials,
- the dissemination *medium*, that is, the ways in which the knowledge or product is described, “packaged,” and transmitted, and
- the *user*, or intended user, of the information or product to be disseminated.

Important factors related to each of these four elements are listed in **Exhibit 1**, on the following page. The following sections describe major findings related to each element.

The Source of the Message (Originators, Intermediaries)

Important factors related to the dissemination source—the originator of the research results and/or any intermediaries, or linking agents, responsible for disseminating the results to intended users—include relationships with potential users, the source’s credibility, and orientation toward use.

Building relationships between researchers and users. An important concern here is the “two-communities” perspective on research utilization. As Fuhrman (1994) explains, “We are told that researchers and practitioners operate on different timelines, use different languages, and respond to different incentive systems” (p. 133). Leung (1992) describes a study that concludes “that distrust and even antagonism exist between researchers and those who use research” (pp. 287-288). This gap between researchers and the potential users of their research becomes an even greater concern, given these persistent findings in the literature:

- The source of information disseminated generally is more important to users than the content of the information; according to Hutchinson and Huberman (1993), one of the most important findings from the research on dissemination is that “the nature of the material that is being disseminated is less important than the links all the way down the line” (p. 15).
- Users tend to accept assistance, information, and ideas from sources they know and trust (Fullan, 1985; Carrillo, Lumbley & Westbrook, 1990; Robinault, Weisinger, & Folsom, 1980).

Some recent articles, however, note that the two-communities model is, in some cases, artificial and inaccurate, particularly given the increasing activism among many persons with disabilities. Indyk and Rier (1993), for example, in a

review of AIDS activism, note that grassroots AIDS work challenges what they describe as the “bipolar” model,

demonstrating that those who are affected can be central to the spread and application (to say nothing of the creation) of knowledge.

Grassroots actors often occupy both roles simultaneously: much of their knowledge production is geared to their own consumption . . .

Overall, the grassroots AIDS case supports Boggs’s (1992) recent formulation . . . [of] a three-way exchange in which researchers, decisionmakers, and program recipients/research subjects can each function as both knowledge producers and knowledge consumers.

(pp. 14-15)

Understanding the limitations and biases of research. One factor related to closing the gap between researchers and users—and linked to constructivist perspectives about knowledge as process rather than as received, objective “truth”—focuses on the need for researchers to acknowledge the human limitations and fallability of their own endeavors, and to understand the beliefs and assumptions they bring to their work. For example, Buchman (1982) discusses the fact that researchers and developers often fail to perceive the influence of their own theories and beliefs on the outcomes of their work; he quotes Nisbett & Ross (1980) regarding “the fallacy of misplaced certainty”:

An important step in reducing people’s overconfidence would be taken by leading them to recognize that their interpretations of events, rather than being simple read-outs of data, are inferences that make heavy use of theory. Once one recognizes that the same data would look quite different, and could easily support different beliefs, if those data were viewed from the vantage point of alternative theories, the groundwork for a humbler epistemic stance has been laid. (p. 2)

Duarte and Rice (1992) discuss researcher bias in terms of the credibility of research outcomes for minority populations. They point out that “ethnocentric biases influence research questions, methods, and the interpretation of results” (p. 9). Problems with racial/ethnic classification, population sampling, an overemphasis on between-group differences and underemphasis of within-group differences can affect the credibility of research results. They further argue that “dominant cultural values related to individualism, self-reliance, and work are evident in rehabilitation legislation, policies, and procedures (e.g., individualized written rehabilitation program plans, independent living programs)” (p. 12). Again, it is important for researchers, policymakers, and practitioners to be aware of their own values and assumptions.

Factors influencing credibility. Some utilization studies have focused explicitly on the issue of credibility. The more sophisticated studies identify two components of credibility: expertise and trustworthiness. *Expertise* “refers to how knowledgeable or competent the audience perceives the speaker to be on the topic,” whereas *trustworthiness* “means the degree to which the audience believes the communicator is honest or sincere in the statements made” (Marquart, O’Keefe, & Gunther, 1995, p. 390). Some studies suggest that perceived expertise is less important than trustworthiness in obtaining audience support.

Marquart, O’Keefe, and Gunther have identified two factors that are linked to the persuasive impact of source credibility: the “message receivers’ perceptions of the similarity of attitudes between the source and themselves,” and the message receivers’ “degree of involvement in the issue” (p. 391). They conducted a study of dairy farmers regarding the credibility of sources of information related to bovine growth hormone (BGH) in which they found that:

Dairy farmers generally differentiated between the trustworthiness and expertise of information sources . . . Other dairy farmers were

considered significantly more trustworthy than experts . . . Also scoring higher on trust than expertise were major farm and general news media . . . Evaluated as having greater expertise but being less trustworthy were institutional and commercial sources, including BGH manufacturers, university dairy scientists, feed company nutritionists, government officials overall, and the FDA specifically. (p. 396)

This study revealed that the more farmers disagreed with certain information sources, the less trustworthy they found those sources to be. The intensity of farmers' involvement with the issue also influenced their perceptions about information sources. The farmers who felt most strongly about the BGH issue not only discredited the trustworthiness of sources with which they disagreed, they also questioned the sources' expertise. The authors report that the most intensely involved farmers "seem to impugn the knowledge even more than the motives of these information sources" (p. 399).

Orientation of the research or linking organization. Studies suggest that when researchers actively gear their work to use by specific groups, research utilization is improved. In analyzing the success of the agricultural extension model, Rogers (1988) notes that agricultural researchers traditionally have oriented their work "toward potential utilization of their innovations" (p. 501) in production technology. Fuhrman (1994), discusses the need for "building a client-based research agenda . . . and developing forms for research that bring producers and users closer together" (p. 133). These latter, Fuhman states, include collaborative, or action, research projects whose benefits include "better focus on problems important to practice, enhanced validity of instruments and analyses, improved presentation of findings, and greater authority for findings" (p. 143).

Organizational structures and reward systems also can play an important role. Dentler (1984), in discussing results of a study of dissemination activities among

regional educational laboratories, noted several organizational factors that appeared to improve laboratories' dissemination effectiveness:

Labs, we found, become capable of disseminating knowledge products and services with a high impact on practitioners when they are organized toward this end. This capacity is built up when a lab's board and director give dissemination a reasonably strong and clear place in the mission of the lab; when the value of providing information, technical assistance, and staff development services is internalized within the subculture of the lab to a point where all staff identify with the value; when dissemination specialists on the lab staff are not sequestered and compartmentalized but are dealt into the applied research, policy planning, development, and evaluation functions of the lab as a whole, as well as its status structure; and when accountability for impact and rewards for its attainment are part of the operational code of the lab. (p. 4)

The Message, or Content, to be Disseminated

The information, material, or products to be disseminated can vary tremendously. Edwards (1991) notes that research results can include "theories, models, paradigms, postulates, generalizations, or findings . . . validated tests, curricula, techniques, programs, or systems," while technological advances can include "software products, devices, equipment, or machinery" (p. 54).

A number of the early studies of knowledge utilization focused on content attributes that were likely to influence adoption; Edwards reports that she "could find no significant changes" (p. 56) in the literature relating to content attributes

since 1983. She lists five major attributes that were “found to be significantly related to the rate of adoption”; these include *relative advantage*, which relates to issues of profit, efficiency, or yield; *compatibility*; *complexity*; *observability*; and *trialability*, or the ability to be tested.

Dearing and Meyer (1994) propose a list of eleven attributes of research outcomes, culled from the literature, that help determine the likelihood of adoption of research outcomes: *economic advantage*, *effectiveness*, *observability*, *trialability*, *complexity*, *compatibility*, *reliability*, *divisibility*, *applicability*, *commutuality*, and *radicalness*. However, the focus is less on the attributes themselves than on the effectiveness with which they are communicated to potential user audiences. All eleven attributes are described in terms of how they are communicated, rather than in terms of their inherent characteristics; for example, *complexity* is described as “the degree to which an innovation is communicated as being relatively difficult to use” (p. 46).

Quality of the content. A number of authors have cited the importance of quality to successful use of research results. However, Edwards (1991) reports that empirical studies have “found no relationship between research quality and use” (p. 61). This finding is confirmed by Huberman (1987), in his reports on a series of utilization studies conducted in Switzerland:

The poorly conceived and executed studies in the sample appear to do as well as the others, or perhaps even slightly better, because research staff in the especially well-designed studies underinvest in dissemination work. (p. 606)

Florio and DeMartini (1993), in their report on a case study of policymakers’ use of research, note, “If research conforms to the expectations of the policymaker, it also does not need to be high in quality. If the policymaker feels that the social

science information is counter-intuitive, then research quality is more important” (pp. 107-108). Quality of research content, then, appears to be a necessary, but insufficient, consideration in the success of dissemination efforts.

Compatibility with users’ needs and beliefs. Most lists of attributes of research outcomes include compatibility. Dentler (1984), among others, stresses that “the property of knowledge that is essential for [use] is its congruence with the real world of practice” (p. 6). Similarly, a study of Tennessee’s 140 school systems reported by West and Rhoton (1992) concludes that “the strongest barrier to research utilization, statewide, was the [perceived] non-practical focus of research reports” (p. 13). This finding fits closely with constructivist perspectives on knowledge utilization; related findings are discussed in the section on users.

Kinds of information to include. At least some studies have focused on the types of information that need to be included if dissemination activities are to be effective. For example, Backer (1988, cited in Edwards, 1991) recommends that materials should “emphasize positive behavior more than negative consequences of current behavior,” and should “emphasize current rewards, not distant negative consequences” (p. 91). A study of smoking behavior and its implications for the kinds of information that people need in order to make behavior changes “suggests that the most important contribution to changes in practice are those that move the knowledge user from awareness to understanding and to commitment” (Kennedy, 1989, p. 112). Yet, the author notes:

The predominant kind of information disseminated by educational disseminators is not designed to facilitate this movement. Instead, it assumes clients need help only with stage four—the stage when specific choices are made . . . The knowledge that moves people to commitment is knowledge about fundamental principles and ideas, whereas the knowledge that helps people make choices is about

techniques and strategies. To make decisions, we need a different, more fundamental kind of knowledge than we need to make a choice. (p. 112)

Educators engaged in dissemination activities, Kennedy argues, “move too quickly from ideas to techniques: from a finding that ‘engaged time’ is important, for instance, to a list of techniques for increasing engaged time” (p. 113). He recommends the inclusion of background information conveying basic principles and rationales for proposed changes. However, this recommendation must be balanced against the recommendations for brevity made in a number of other utilization studies.

Comprehensibility. To be effective, the outcomes of research must be comprehensible to intended users. As Majumder, et al. (1994) emphasize, “Regardless of how fast, cheap, and accurate the transmission of data might be, those parcels of data are worthless if the receiver cannot interpret and use them” (p. 332). Leung (1992), in describing a study that reinforces the “two-communities” perspective, notes that “language differences, which often hinder communication,” (pp. 287-288) were listed as a primary cause of negative attitudes about researchers and lack of use of research outcomes. West and Rhoton (1992), in analyzing the results of their study of Tennessee school systems, note that administrators who described research results as impractical “felt that research was often difficult to understand and confusing. They noted that reports are usually too technical and that the reports would be utilized more if the material was presented in a clearer fashion” (p. 13).

Backer (1988) discusses the necessity to “transform” (p. 20) the message to be disseminated for user groups. A special education dissemination project reported by Felker (1984) found that “research ‘translation’ is necessary” (p. 36). And Newman and Vash (1994) state that many researchers “need help re-packaging [material] for

those who supply the general public” (p. 385). Findings in the literature include the following recommendations for “translating” and “transforming” research outcomes into usable, comprehensible messages:

- Backer (1988, cited in Edwards, 1991) recommends that researchers “provide simple, clear, and repeated messages” (p. 91).
- “What is known about an innovation needs to be translated into language that potential users can understand readily, abbreviated so that attention spans are not exceeded, and made to concentrate on the key issues of ‘Does it work?’ and ‘How can I replicate it in my organization?’” (Backer, 1991, p. 234).
- Soumerai and Avorn (1987, cited in Sechrest et al., 1994) “concluded that to be effective, dissemination efforts must be characterized by brevity, repetition, and reinforcement” (p. 193).
- Glaser, Abelson, and Garrison (1983) note that “an innovation . . . will be accepted more easily if it is at what Halffner [1973] calls a low ‘level of abstraction’” (p. 15).
- Steinke (1995) cites Shapiro (1986), who found that “readers processed new scientific information more rigorously when articles provided analogies” (p. 435).

The Dissemination Medium

Those engaged in knowledge utilization—as well as potential users—sometimes have difficulty in distinguishing the dissemination medium

from the message; as a result, the literature includes a number of efforts to sort out the two. Machlup (1993, p. 451) explains that the use of a mode of transportation, such as a truck, “and use of the transported object are separate things. Likewise, use of a mode of information should not be confused with the use of the message or knowledge conveyed.” Experts acknowledge, however, that in many cases, “knowledge cannot be easily separated from its product, program, practice, policy, or public information vehicle. In fact, there are many interaction effects. Thus the [dissemination] vehicle selected may enhance or detract from the content it carries” (Klein & Gwaltney, 1991, p. 245). Selection of the dissemination media most appropriate for a particular content and audience, then, is a complex and challenging task.

The media and formats available for dissemination are increasing rapidly with new technological development. This proliferation is helpful in meeting the need for numerous and varied dissemination media. However, it is necessary to keep in mind that, as Leung (1992) reports, some “consumers continue to lack the basic tools required for accessing what is currently available” (p. 293); he notes that one of the most elementary—and important—guidelines for selecting a dissemination medium is that “utilization will not occur if persons with disabilities cannot physically gain access” (p. 299).

Another critical understanding is that, no matter what new and exciting technologies come along, personal interaction remains the most effective dissemination medium. Paisley (1993) points out that “the sweeping claims made for digital media today are similar to those made for analog media 20 years ago, when in fact the analog media played only a secondary role to the prime movers of social networks and personal influence” (p. 222).

Digital technology and new equity concerns. As Paisley (1993) notes, “Digital technologies bring the most significant new communication capabilities to

knowledge utilization in the 1990s” (p. 222). The widespread use of “small media” such as personal computers, and the proliferation of use of the Internet and other electronic networks, have brought new, cost-effective dissemination channels to an ever-broadening audience. However, Paisley, among others, points out that, while “the new small media seem ideal for knowledge utilization . . . little is known about matching these media to the dissemination, coordination, technical assistance, and problem solving roles of knowledge utilization programs” (p. 227).

In addition, as the U.S. Office of Technology Assessment (1988) has noted, “The advent of electronic dissemination raises new equity concerns” (p. 9). NIDRR (1994) has pointed out the implications of specific types of disability, such as movement or visual impairments, on access to computer use and the need for adaptive devices. Anderson, Bikson, Law, and Mitchell (1995) report “very large differences” in household computer access and use of electronic networks by income category, “large differences” by level of educational attainment, and some differences by race that cannot be attributed to other factors:

At least part of the race-based difference is due to lower average household income and lower average educational attainment among blacks as compared with whites. However, our analysis shows that those characteristics do not account for the entire difference in outcome variables. Rather, racial and ethnic characteristics exert an independent influence on home computer access and network use . . . There is no generally accepted explanation for these [racial/ethnic] kinds of differences. (electronic manuscript)

Equity concerns are not confined to the newest and most sophisticated technologies. There are still about six million U.S. homes that do not have direct access to a telephone (Communications Development Inc., electronic manuscript). And, as Leung (1992) notes, basic services such as captioning for persons with

deafness are still not available to many persons with disabilities.

The primacy of personal interaction. Perhaps the most consistent and ubiquitous finding in the literature on knowledge utilization is the importance of personal contact for the success of dissemination activities. The following is a sampling of the variety and persistence with which this conclusion is presented:

- “Face-to-face contact facilitates the adoption of disseminated practices, to a far greater extent than the mere provision of information” (Crandall, 1989, p. 95, reporting on the DESSI studies, one set of the major, federally funded dissemination studies of the 1970s and 1980s).
- The results of a “utilization study” comparing three methods for promoting the adoption of a job seekers workshop for drug treatment clients indicated “that dissemination methods employing personal contacts (site visits and conferences) produced significantly more adoptions than did printed materials alone” (David, 1991, p. 292, citing Sorenson et al., 1988).
- In reporting on a special education dissemination study, Felker (1984) states, “It appears that, for these audiences and circumstances at least, face-to-face and custom-tailored communication is a key to effective dissemination” (p. 37).
- “The primacy of personal contact in the diffusion of innovations has been known for years” (Fullan, 1991, p. 53).
- “Directed personal intervention is by far the most potent technical support resource, and may be a necessary condition for many forms of utilization” (Peterson & Emrick, 1983, p. 243, reviewing four of the major dissemination and implementation studies of the 1970s).

- “One of the more stable findings in the research utilization literature is that, for a study to exert a strong conceptual influence on practitioners, interactions between researchers and practitioners must occur not only on completion of the study, but also during and, ideally, before the conduct of the study. Also, many of these contacts must be face-to-face” (Huberman, 1990, p. 365). In a 1992 article, Huberman talks about “sustained interactivity” as a persistent finding in the literature.
- Hutchinson (1995) in a survey of personnel involved in child welfare services, found: “The importance of person-to-person communications within and outside the organization in the information acquisition process is demonstrated consistently” (p. 100).

The frequency of interpersonal contact also matters. Dentler (1984) says that intensity of assistance is an important factor. Similarly, Peterson and Emrick (1983) recommend that “direct intervention should be distributed over a period of two years or longer in most cases, with more frequent contacts occurring in the initial stages” (p. 243). Louis (1983), in reporting on the Pilot State Dissemination Program (another of the major studies of the 1970s), states:

The Pilot State findings suggest that a little field agent initiative in creating a demand [for information] may actually result in lower rates of use than does *no* involvement. This occurred because individuals who were unfamiliar with using research-based information or with a retrieval system were stimulated to make requests but did not receive assistance in how to interpret or use the materials they received. (p. 77)

Using multiple media formats. While stressing the necessity for in-person support, most experts agree on the need for a combination of media and interpersonal strategies (Edwards, 1991; Peterson & Emrick, 1983). Crandall (1989),

for example, concludes that “adequate materials and procedural guidelines, coupled with responsive, in-person assistance during later implementation, are imperative for maximum success” (p. 95). Sechrest et al., (1994) make a similar point, focusing as well on the importance of the intensity of the dissemination effort:

For every audience, *multifaceted* approaches to communication will be required if effective communication is to be achieved. Single modality efforts are not likely to be effective . . . Ample evidence exists to show that efforts at low levels of intensity simply do not have dependable effects. (p. 193)

Targeting media for persons with disabilities. Some information exists related to specific information channels that can be effective in reaching persons with disabilities. Fullmer and Majumder (1991) reported the existence of 36 electronic bulletin boards related to disability issues; they also noted that many Usenet newsgroups focus on disability issues. Newman and Vash (1994) conclude that people with disabilities who are already active participants in the disability service system “are likely to access new knowledge through their service-delivery contacts” (p. 384). However, they point out that:

People with disabilities who get along without services are little more likely to have access to such information than the general public. In order to reach them reliably, the mass media must be used. In addition, special targets must be identified, such as employers . . . With respect to reaching people with disabilities who are not presently service consumers, low-risk approaches include: established radio and cable TV programs on disability issues; NEW MOBILITY, MAINSTREAM, and other magazines catering to readers with disabilities; and local giveaway newspapers which run quality features focusing on human-need issues. Higher-risk approaches, such as

investing time and effort in attempts to interest mainstream magazines, syndicated columnists, or TV networks, can be explored as budgets permit. (p. 385)

The Intended Users

The major requirement for external assisters is to figure out how to work with local context.

— Fullan 1991, p. 222

As noted earlier, a focus on the user as “an agent who is active in determining how she or he will make use of” (Buttolph, 1992, p. 463) new information or products is perhaps the most important element in our current understandings about dissemination. This new understanding has two principal implications. First, the materials to be disseminated must address the context and concerns of a potential user’s daily life. Most dissemination and utilization experts conclude that the most effective way to address this requirement is to involve potential users in the project from the beginning, with ongoing and substantial interaction between researchers and users (Edwards, 1991; Fuhrman, 1994; Leung, 1992; Westbrook, 1994).

The second major implication is that disseminators must attend to the potential user’s “readiness for change,” which Backer (1994) defines as “willingness—a state of mind” that is the precursor “of actual behaviors needed to adopt an innovation (or to resist it)” (p. 2). Backer goes on to note that, “in practice, factors related to readiness are often ignored” (p. 3). He describes conditions needed for change, which include “active interventions... to deal with the human dynamics of change . . . to overcome resistances, fears, and anxieties about change” (p. 10).

In discussing readiness for change, Backer (1994) also warns disseminators not

to assume automatically that a user's lack of such readiness is a negative circumstance: "Low readiness for change is not necessarily irrational, and in fact may represent an important source of input about the practical worth of innovations, or the strategies by which they are implemented." He notes that the first four stages of the Concerns Based Adoption Model's levels of use model "are directly concerned with readiness" (p. 4).

One important task for disseminators is to understand the incentives that can influence potential users to change. Hutchinson and Huberman (1993) note that incentives may be *internal* to the user, or *external*, that is, applied or mandated by outside sources. They report on several studies that

found that both personal incentives and organizational incentives were strongly associated with use, but that personal incentives were a more potent force. External stimuli alone have limited impact in producing the openness required for the adoption of new ideas. However, mandates, when combined with personal incentives, improve the prospects for implementation. Mandates may stimulate personal incentives when professional rewards are visible, concrete, and personally meaningful. (p. 14)

Involving user audiences in setting research agendas and conducting research and development activities can help to address issues related to readiness for change. The literature includes some specific strategies for engaging users in ways that help to overcome their tendencies to discount research results that do not agree with their pre-existing beliefs. One such strategy is reported by Brown-McGowan and Eichelberger (1993). They describe a Knowledge Use System (KUS) originally developed by Barabba and Zaltman (1991) for use with corporate decisionmakers, to help increase their use of market research. Researchers first conducted extensive discussions with managers before developing a marketing survey questionnaire.

Next, the researchers shared the draft questionnaire with the managers. After a final draft was agreed upon, researchers used the questionnaire to collect information from managers regarding:

(1) results they would expect the questionnaire to produce (expected results); (2) the range of findings they would view as reasonable (comfort zones); (3) the importance of each question, or issue, to each decisionmaker, particularly if results varied greatly from their expectations (significance); and (4) individual responses to each question that can be sent to others involved in the project (comments).
(p. 402)

The researchers summarized these responses and prepared a report just as they would after actual market research: They presented in the report three types of simulated results: “good news, bad news, and surprises” (p. 402). Only then did the researchers actually conduct the market research and share the final results with managers, who also received a report showing the outcomes predicted by the managers, both individually and as a group. This approach has been used successfully in both corporate and nonprofit settings. Although the specific steps are not necessarily applicable to all kinds of research and development, the important elements—seeking input from users at all stages of the process, structuring activities around issues identified as important by users themselves, and helping users to reflect on their own preconceived ideas and concerns—should be relevant to any endeavor.

Along these same lines, Huberman (1989) recommends “multiple exchanges between researchers and potential users of that research at different phases of the study” (p. 9-10). He recommends user involvement in at least four phases: (1) before the study is conducted, “where scope is negotiated and the target public’s preexisting knowledge is assessed,” (2) during the study, “where members of the target public

are involved in reviewing findings and determining how findings might best be presented,” (3) “during analysis and write-up, when a dissemination plan is developed and the implications of the findings for challenging local norms are examined,” and (4) after the study, when “the study findings are brought directly to the user organization.”

Some experts recommend that disseminators consider carefully the size of user audience that they will be able to address effectively. Dentler (1984), for example, states, “The larger the number of recipient organizations aimed at, the lower the resulting impact is likely to be” (p. 4). He notes the dilemma that “very large and diverse user targets are a waste of effort, while very small, homogeneous user targets must be amplified somehow so that the ultimate scale of improvements, areal and demographic, is not minute.”

The literature also includes strategies through which researchers can refine their understandings about target audiences. Backer (1994) discusses “social marketing,” a strategy that is drawn from corporate marketing concepts, noting that “social marketing provides a management framework for systematic efforts to understand a target audience for change” (p. 17). He describes several major concepts:

Audience segmentation, a key concept of social marketing, involves subdividing the targets (e.g., teachers in a large school district) into both “demographic” and “psychographic” groups, based on an understanding of what personal or group characteristics have a bearing on their behavior with respect to innovation adoption. These subdivided audiences can then be *targeted* with different information, training, persuasive approaches or rewards designed to promote innovation adoption. Learning what the individual differences are requires *audience analysis*, frequently using marketing techniques such

as “focus groups.” (p. 17)

Virtually no empirical studies have been conducted to explore differences in dissemination issues related to specific racial or ethnic groups or among persons with disabilities. There is some information, however, to suggest that attention should be paid by disability researchers to differences in audience demographics.

Leung (1993) reports that “factors having strong association with disability include education, income, race, and ethnicity,” and that “members of ethnic and racial minorities are much more likely to experience disability” (p. 94). For example, he reports that one in six persons with paralysis of the extremities is Black, that Hispanics have the highest rates of orthopedic disabilities, and that American Indians have work related disabilities 1.5 times that of the general U.S. population. In seeking explanations for this correlation, he notes:

Although specific data are lacking, factors related to increased probability for disabilities include: poor prenatal and perinatal care, inadequate nutrition and diet, greater risk for injury because of living conditions and types of employment situations, inaccessible health care and a lack of proper health care knowledge and education. (p. 94)

There is evidence that members of minority populations who have disabilities are not obtaining the rehabilitation services they need (Duarte & Rice, 1992). Minorities with disabilities also tend to be underemployed in comparison with their white counterparts (Leung, 1993).

Strategies for researchers in avoiding bias, as recommended by Davis (1992, cited in Duarte & Rice, 1992) include assuring that members of minority communities who are being studied are represented on research teams, and getting feedback about results from persons from the groups studied, to help identify

inaccuracies in interpretations.

Cultural differences may affect the ways in which individuals interact and in which they perceive the work and communications of disability researchers and practitioners. These differences, according to Duarte and Rice (1992) and others, may include “world view, family boundaries, quality of life, importance of religion, meaning of work, meaning of education, decision-making style, belief in change, and response to change” (p. 17). Duarte and Rice note that experts in “the field of intercultural communication emphasize cultural differences related to context (the information that surrounds events), space, time, speed (with which relationships are developed), information flow, and rules (and rituals).”

Leung (1993), reporting on factors important among Asian American cultures, discusses “the importance of family with age, sex, and generational status being primary determinants of role behavior” (p. 95). He concludes that “the emphasis for many Asian American families is more on the welfare of the family than of any particular individual within the family,” and cites the work of Sue (1981), who “pointed out the preference of many Asian Americans for minimization of conflict and that ‘much effort is expended to avoid offending others’” (p. 95).

Gudykunst and Ting-Toomey (1988) conclude that “individualism” vs. “collectivism,” or a focus on individual autonomy as opposed to family or community well-being—“is the major dimension of cultural variability isolated by theorists across disciplines” (p. 40). They see this difference as prevalent between the predominant U.S. culture and most minority cultures in this country. They also note another important distinction, based on the work of Hall (1976), who “differentiates cultures on the basis of the communication that predominates in the culture,” distinguishing between “high-context” and “low-context” communication. “Low-context” communication is more explicit; more is stated, rather than relying

on context. American culture falls toward the low context end of the spectrum, while “most Asian cultures, such as the Japanese, Chinese, and Korean, in contrast, fall toward the high-context end of the continuum” (p. 43).

At least some research suggests that persons from different racial and cultural backgrounds have varied means of obtaining information and varied sources that they trust. One study reported by Edwards (1991) focused on three different Los Angeles communities: Watts, whose residents were predominantly black and low-income, Boyle Heights, which was predominantly Mexican American, and Reseda, which was predominantly white middle-income. Edwards reports that the researchers:

found marked differences in the patterns of information seeking among the communities. Watts residents preferred interpersonal networks of family and friends, as information sources. Boyle Heights residents preferred institutions or agencies and Reseda residents preferred mass media (print, television, radio) and the telephone. The communities also differed in choice of newspaper or station to watch or hear. (p. 94)

Edwards also sought to locate studies that focused on the information-seeking behaviors of people with disabilities. She found a study by the Human Resources Center (1990), which “surveyed information seeking among people with disabilities . . . Preliminary findings were [that] most used sources of information include friends and social service programs” (p. 94).

In attempting to analyze audience characteristics, however, it is important to recall the warnings described in an earlier section of this review. Studies suggest that analyses of racial and ethnic demographics often overemphasize between-group differences and under-emphasize within-group differences, so that differences

between racial groups, for example, may be exaggerated while differences within a specific racial group may be overlooked. Leung (1993) quotes Lee (1990), who described “the danger of assuming that all Black people are the same and that one methodological approach is universally applicable in any therapeutic intervention with them” (p. 95). Leung concludes that “many factors serve to influence any particular individual, including the amount of acculturation or assimilation—the time that an individual or family has lived in the U.S., socioeconomic status and education, and self identification” (p. 95).

Similar warnings are relevant to studies that seek to identify characteristics of persons with disabilities. As O’Connor (1993) states:

It is important to understand people with disabilities in light of all the forces that impact on their lives. Looking only at disability limits a person’s identity and does little to help us understand how a person’s ethnicity, gender, class, sexual preference, and religion play a role in their identity. (p. 16)

Implications of Utilization Research for NIDRR Grantees

It is difficult to conclude with a few tidy generalizations, given the scope and complexity of the literature on dissemination and knowledge utilization. For those concerned with improving and expanding the use of disability research, however, perhaps the most important conclusion is reported by Fuhrman (1994), who quotes a 1984 study by Yin and Moore: “Research utilization begins when research and development begins, and is not a sequential step that only follows the research and development” (p. 142).

Major conclusions that have strong implications for the ways in which disability research is conducted and disseminated include the following eight points:

- Dissemination is far more than the simple distribution of paper or products; it is a process requiring a careful match among (a) the creation of products or knowledge, and the context of that creation, (b) the needs, contexts, prior experiences, values, and beliefs of target audiences, and (c) the content, media, formats, and language used in getting the outcomes into the hands, minds, and activities of those target audiences.
- The goal of all dissemination should be utilization. Utilization may mean different things to different members of a target audience; in some cases, it may mean rejection of a product or research finding. The critical element of utilization is that the research outcome must be critically and thoroughly digested, and the individual (or organization) must fit the new information with her or his prior understandings and experience.
- One of the most effective ways to increase utilization—and to improve the quality and relevance of research—is to involve potential users in planning and implementation of the research design itself.
- Effective dissemination requires an understanding of knowledge use as a process of learning, and of change.
- Effective dissemination is critically linked to its timeliness and comprehensiveness.
- Effective dissemination of disability research requires careful planning and effort throughout the life of a research project. Huberman (1990) concludes, from a survey of the utilization literature, that projects need to allocate twelve percent of project time and resources to dissemination activities.
- Dissemination requires ongoing support and personal intervention in order to achieve utilization.
- All NIDRR grantees share in the responsibility to disseminate their project results to all appropriate target audiences, and in accessible formats.

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