

Trends in Aural Rehabilitation Research

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Over the last three years, the efforts of the Ad Hoc Committee on Research of the Academy of Rehabilitative Audiology have been directed toward identifying, describing, and proposing areas of research needs in Aural Rehabilitation. A summary of these efforts as well as results of a survey of research activities of ARA members have been reported elsewhere. In an effort to further define directions for research, our research committee thought that this year a "state of the art" report, based upon a survey of studies reported in the professional literature and business indices in the last ten years, as well as current federal grant awards, was indicated.

As a starting point, six general sub-areas within the area of aural rehabilitation were identified. These areas include:

1. Evaluation/testing Techniques
2. Habilitation Techniques—Children
3. Rehabilitation Techniques—Adults
4. Sensory Aids
5. Counseling in Communication Disorders
6. Developmental Disabilities

Computer searches in several data banks, as well as literature searches by hand, were initiated in order to identify research activities in 5 of the 6 sub-areas over the last ten years. Those data banks used for searches in some of these areas included the Education Research and Information Center, the National Technical Information Service, the National Li-

brary of Medicine (MEDLARS) System, the Engineering Index, and Psychological Abstracts. In addition, those federal agencies known to fund research in communication areas were contacted in order to identify projects currently being funded in areas related to aural rehabilitation.

The purpose of this paper is to present a summary of those searches and report on research areas currently funded federally. It is important to recognize that these data represent only a sample of the research currently being conducted in areas related to aural rehabilitation. Research funded privately, at the state level, or in educational settings has not been surveyed. In addition, several topics having implications for aural rehabilitation have not yet been summarized due to time and resource limitations. This report therefore represents a preliminary summary of research trends as evidenced from our computer searches.

RESULTS FROM COMPUTER SEARCHES

The following tables summarize the number of articles identified in the 5 sub-areas of aural rehabilitation over the last 10 years. These data primarily represent reports of empirical research (i.e., experimental studies rather than papers of a descriptive or theoretical discussion nature).

Table 1 summarizes 58 articles relating to habilitation techniques with the pediatric population. The majority of the research appears to deal with the use of specific training procedures such as total communication and auditory discrimination training (often using improvements in speech intelligibility as an assessment of the auditory input and training). Less emphasis has been placed on evaluating types of programs as a whole, such as the effectiveness of mainstreaming vs. self-contained classrooms for HI children, the effectiveness of specific parent programs, and so forth. Research reports in related areas such as linguistics, cognition and perception with the hearing impaired pediatric population are still in the process of being summarized.

Table 2 summarizes 66 studies relating to rehabilitative techniques in adults. Half of the articles dealt with general methodological approaches; a large proportion of the rest of the articles dealt specifically with speechreading techniques while some addressed themselves to auditory training techniques either alone or in combination with speechreading.

It is interesting to note that the majority of the articles about specific training techniques relating to children dealt with auditory input while the majority of articles about specific techniques with adults concerned themselves with visual input.

Table 3 summarizes those articles identified in the searches relating to sensory aids. This area comprises over half of the total number of research

articles identified in the aural rehabilitation area. Generally, the literature seems to be characterized by an emphasis on developments of a technological or evaluative nature; i.e., attention appears to have been directed toward the development of devices and measurements of their characteristics. In addition, there has been a proliferation of reports on the application of traditional approaches to hearing aid selection and the development of evaluation procedures, particularly for young children. Notably lacking are long-term evaluations of the efficacy or suitability of the selection procedure employed or of the devices developed.

Forty-seven articles in the general area of counseling with the HI were identified with a computer search. Only 7 of these were of an evaluative nature, i.e., they involved descriptive analyses of the HI population; there were *no* articles identified that were empirical evaluations of results of counseling efforts.

Table 4 reflects the literature review regarding investigations of the remedial aspects of communication programming for hearing impaired developmentally disabled persons. The majority of the articles (68%) deal with specific training techniques, e.g., the effectiveness of non-vocal communication, communication boards, auditory and speechreading training.

A computer search regarding evaluation techniques, the 6th of these areas identified, will be initiated in the future.

Table 1
Habilitation Techniques: Children

Area/Category	No. of Articles	% of Total (N = 58)
Pre-school Programs	14	24
Parent Programs	7	12
Total Communication	15	26
Aud. Trg./Aud. Disc. (using speech intelligibility as the assessment tool)	22	38

Table 2
Rehabilitation Techniques: Adult

Area/Category	No. of Articles	% of Total (N = 66)	
Specific Techniques	Auditory Training	4	6
	Speechreading	24	36
	Auditory Training and Speechreading	4	6
Methods in Aural Rehabilitation	28	42	
Geriatric Hearing/Rehabilitation	6	9	

Table 3
Sensory Aids

Area/Category	No. of Articles	% of Total (N = 203)
Evaluation: electroacoustic characteristics, effects of earmold modifications	77	25
Evaluation:		
a. Selection procedures— general (includes speech identification measures)	73	24
b. Selection procedures— children	44	14
c. Selection procedures— geriatric	11	4
	128	42
Evaluation: experimental aids (including cochlear implants);	43	14
Other sensory aids (visual and tactile)	21	7
Misc. survey information	37	12

Table 4
Developmental Disabilities: Hearing Impaired

Area/Category	No. of Articles	% of Total (N = 59)	
Educ. programming/trg.— general (including effects of instructional materials and diagnostic-prescriptive teaching)	~ 10	17	
Specific Techniques	Non-vocal communication training (includes sign language, communication boards, TC, and multi- modal input)	23	39
	Auditory discrimination training	10	19
	Speechreading	4	7
	Hearing aid use—MR, CP	3	5
	Evaluation/appraisal scales and criteria	9	15

CURRENT FEDERALLY FUNDED AREAS

Several federal agencies were contacted in an effort to identify the nature of the ongoing federally-funded research projects related to aural rehabilitation. These agencies included:

1. The National Institute of Neurological and Communicative Disorders and Stroke (NINCDS)
2. The Bureau of Education for the Handicapped (BEH)
3. The Bureau of Community Health Service of the Maternal and Child Health Research Center
4. The Veterans' Administration (VA)
5. The Rehabilitation Services Agency (RSA)

A total of 11 projects are presently being funded. The areas of research include:

1. electroacoustic evaluation of sensory aid hardware
2. evaluation of use of wearable sensory aids
3. speech diagnosis and speech training aids
4. speech processing capabilities of deaf children
5. evaluation of modality training procedures with HI adults

6. development of standard manual communication systems in other countries

Generally, it appears that the research areas are geared toward 1) describing the sensory channel capabilities for communication, and 2) developing hardware for speech reception and training aids for speech production. In addition, several projects aimed at improving the professional and vocational evaluation and counseling techniques for deaf adults, as well as training counselors, are being funded. Other funded projects are of a more descriptive analyses nature, e.g., aimed at better defining the psychosocial characteristics of the HI population.

In summary, the purpose of this paper was to identify research trends in areas relating to aural rehabilitation over the last decade. Computer searches in five areas were generated in several data bases; the articles were then categorized within each area. Table 5 provides a general summary of these searches. Keeping in mind that these search summaries reflect only a sample of the research conducted in the general area of aural rehabilitation, several conclusions can be made from these data:

1. It would appear that, in general, there is a relatively small number of reported empirical studies which address themselves to the evaluation of rehabilitative techniques.
2. The majority of studies have related to the evaluation of hardware (i.e., sensory aids) and its use.
3. 114 articles dealt with the evaluation of specific training techniques (i.e., speechreading, auditory training, and the use of non-vocal communication); this is 23% of the total.
4. Sixty-eight articles (14% of the total) involved the evaluation of program models and approaches.

It is somewhat understandable why little carefully controlled empirical data regarding the effectiveness of various habilitation/rehabilitation approaches are available. First, there is a paucity of appropriate and valid measurement instruments for assessing the effects of remediation. Second, objective (e.g., random) assignment of subjects to experimental groups, an appropriate research strategy for evaluation of methodologies, might raise ethical questions when, for instance, for HI children's development, time and placement in the "best" program become critical factors. In addition, clinicians and teachers highly skilled in all of the methodologies which may be under investigation in a study are not readily available. These factors as well as teacher and/or clinician and/or parental attitudes toward one methodology or another may bias experimental outcomes; they are difficult variables to control. These are a few of the problems that might account for the relatively small number of empirical studies in this area.

Table 5
Summary—Research Articles Aural Rehabilitation

Area	No. of Articles	% of Area	% of Total (N = 496)
(1) HABILITATION: CHILDREN (N = 58)			
Program Models	21	36	} 12
Techniques	37	64	
(2) REHABILITATION: ADULTS (N = 66)			
General Approaches	34	51	} 13
Specific Techniques	32	49	
(3) SENSORY AIDS (N = 306)			
Evaluation (Auditory)			} 62
a. characteristics	77	} 269	
b. procedures	128		
c. experimental	43		
Evaluation (other sensory aids)	21	88	
Miscellaneous	37	12	
(4) DEVELOPMENTAL DISABILITIES (N = 66)			
General Education Approaches	~10	17	} 13
Specific Techniques	40	68	
Validity of Evaluation Scales	9	15	

CONCLUSION

In order to further define research trends and needs, the following suggestions seem appropriate at this time:

1. A review and summary of the empirical literature to date in each of the categories of the 6 areas would clarify the "state of the art."
2. Specific questions based on those areas in which research has been minimal or biased need to be formulated.
3. Specific procedures for answering these formulated questions need to be defined.
4. Valid evaluation tools for testing the effects of specific procedures relating to aural rehabilitation need to be developed.

A coordinated effort of several researchers and facilities across the country might be a feasible and more efficient way of dealing with some of these issues.