Issues and Directions for the Future: Clinical Research in Aphasiology

R.H. Brookshire
Veterans Administration Medical Center, Minneapolis, Minnesota

When I was asked to speak to this conference about clinical research in aphasiology, I immediately accepted, because I have built up some relatively strong feelings about this topic during the last several years. These feelings have developed as a result of my exposure to the published literature in aphasiology and my exposure, as reviewer or editor, to a number of manuscripts submitted for pulication in various journals and books. Since 1965, I have reviewed articles for Journal of Speech and Hearing Research, Journal of Speech and Hearing Disorders, and several other journals. Since 1980, I have been associate editor for Journal of Speech and Hearing Disorders. I also have edited Clinical Aphasiology Conference Proceedings since 1975. When one adds all this together, it turns out that I have reviewed between 600 and 700 articles, most of them concerned with aphasia. This experience has, I think, given me a reasonably accurate picture of what practitioners are doing, in unpublished, as well as published work. Today I will try to communicate to you the general nature of my experiences, and the conclusions that I have drawn.

In order to predict where we are going, it's often useful to look at where we have been. In order to determine where we have been, so far as clinical aphasiologists are concerned, I did three things. First, I decided to adopt a restrictive definition of CLINICAL APHASIOLOGISTS. For the purposes of this paper, I defined clinical aphasiologists as "those whose primary professional responsibility is providing clinical services directly to aphasic persons." Second, I surveyed three journals that I consider to be primary avenues for publication by clinical aphasiologists -- Journal of Speech and Hearing Research, Journal of Speech and Hearing Disorders, and Brain and Language. Third, I reviewed my files containing manuscripts on aphasia submitted to Journal of Speech and Hearing Disorders during my time as Associate Editor.

First, let me summarize the results of my review of the three journals. In the last five years, the three journals published about 900 articles. Of these, 37, or four percent, were by persons who have attended one or more Clinical Aphasiology Conferences. However, these 37 publications do not represent publications by 37 different people -- 20 of the 37 publications were produced by six people -- the remaining 17 publications represent individuals with a single publication in the five-year period. According to my estimation, five years of Clinical Aphasiology Conference attendance represents approximately 200 different people. This means that only one in ten conference attendees has published in any of the three journals during the past five years.

However, there is more to the story. When one examines WHO it is that is publishing articles on aphasia, one finds a dearth of publications by people whose job responsibilities are primarily clinical. Thirty-one of the 37 publications were either by university faculty, by Veterans Administration service directors or by full-time research personnel.

Now I will summarize the results of my review of manuscripts submitted to Journal of Speech and Hearing Disorders. During the period 1980-1984, 50 manuscripts were submitted. Thirty-three were submitted by university faculty. Five were submitted by Veterans Administration service directors. Twelve were submitted by clinicians. Of the 50 manuscripts submitted, two (4%) were published as articles. One was by a university faculty member and one was by a Veterans Administration service director.

These data suggest that: (1) Clinical aphasiologists, (as defined herein) are not publishing much. (2) Most of what is published is by a few people, who are in supervisory, administrative, teaching, or research positions, rather than full-time clinicians. (3) The rejection rate for manuscripts in aphasia submitted to Journal of Speech and Hearing Disorders is high.

However, we appear not to be alone. Similar situations exist in other clinical professions. For example, clinical psychologists, like clinical aphasiologists, appear not to publish much -- the modal number of publications by practicing clinical psychologists in the late 1970's was zero (Barlow, 1980) In clinical psychology, as in clinical aphasiology, most of what is published is produced by university people and those in research positions, rather than by practicing psychologists. A similar situation exists in psychiatry and in medicine, where almost all research is carried out in medical research centers, and not by practitioners. This situation has led to questions about the relevance of published research to clinical concerns in clinical psychology, medicine, and psychiatry. Most clinical psychologists believe that published research articles have little applicability to clinical problems. Cohen (1976) reported that 40% of clinical psychologists surveyed felt that NO published research was relevant to their clinical practices. Joseph Matarazzo, who publishes research articles, and who is also a clinical psychologist, even questions the relevance of HIS OWN research to his clinical practice, "...even after 15 years, few of my research findings affect my practice. ... My clinical experience is the only thing that has helped me in my practice..." (Bergin and Strupp, 1972, p. 340). I have heard similar sentiments expressed by clinical aphasiologists.

We are faced then, with two problems. (1) Clinical aphasiologists rarely PUBLISH research. (2) Clinical aphasiologists may not be very enthusiastic CONSUMERS of published research. The two problems may be related, in the following way. Clinical aphasiologists are likely to be concerned with questions related to the delivery of clinical services -- the effectiveness and efficiency of treatment procedures, the relationships among patients' characteristics and their responses to treatment procedures, and so forth. Such questions are exceedingly difficult to address, using traditional techniques of experimentation. As a consequence, many practitioners give up, when they perceive the difficulty of the task. Others may persevere and carry out an experimental investigation, but fail to get the report published, because it does not meet traditional requirements for scientific rigor. The result is the same in either case -- a potential contribution to the literature in clinical aphasiology goes unrealized. As a consequence, the literature in aphasiology becomes heavily weighted with investigations of problems that ARE amenable to traditional investigative techniques -- studies involving scholarly and theoretical questions that prove to be of marginal clinical relevance. And, as we have seen, those who publish such research tend NOT to be clinical aphasiologists.

Why is it difficult to carry out research on questions related to delivery of clinical services, using traditional research procedures? There are a number of reasons. GROUP DESIGNS, in which different groups of subjects are exposed to different experimental conditions, are by far the most common vehicles for scientific investigation in the behavioral sciences. However, the requirements for scientifically adequate group designs make their use in clinical contexts difficult. Such designs require that large numbers of subjects participate in experiments -- ten subjects per group seems to be a generally-accepted minimum. Such designs also require that subjects be representative of the population that the sample represents. This requires large numbers of subjects in groups,

that subjects be randomly selected, and that they be assigned randomly to experimental conditions. Group designs usually require that subjects in different groups be equivalent on characteristics other than the variable used to assign them to groups. Rarely, in clinical practice, are the numbers and variety of subjects available that would be required to meet these requirements, unless years are spent in accumulating the necessary samples.

Group designs also require that experimental procedures be carried out in such a way that changes in subjects' performance can be unambiguously attributed to the effects of the experimental manipulations carried out, and to no other cause. In most group designs, this means that one or more control groups -- groups whose composition and treatment is identical to that of the experimental group, except for the presence of the experimental condition -- be included. In group designs in which each group is exposed to several experimental conditions, the order in which conditions are presented must be counterbalanced so that one can separate the effects of order of conditions from the effects of the conditions themselves. The inclusion of control groups and the necessity for counterbalancing both increase the number of groups (and the number of subjects) that must be recruited for the experiment. In addition, the inclusion of control groups, in which treatment is withheld from one group of subjects, poses ethical problems, because it may be unethical to withhold potentially beneficial treatment.

Group designs usually depend upon statistical analyses to draw conclusions about the significance and reliability of the results obtained. As I mentioned earlier, traditional statistical analyses usually require large numbers of subjects -- a general rule of thumb is 20 subjects per variable studied. Another problem is that statistical significance does not necessarily imply clinical significance, and vice-versa. Very weak effects can be statistically significant, if subjects are homogeneous on characteristics other than the one under study, or if large numbers of subjects are included in each group. On the other hand, experimental conditions which have strong effects on the performance of some subjects may be statistically nonsignificant if some members of the group are affected in the opposite direction, or if subjects are non-homogeneous on characteristics other than the one under study.

SINGLE-CASE DESIGNS resolve many of these problems. Large groups of subjects are not required, as long as the subjects are representative of the population to which experimental findings are to be generalized. Random selection of subjects, and random assignment of subjects to experimental conditions usually is not necessary. Single-case designs, with their capability for subject-as-own-control research, may be less objectionable on ethical grounds than group studies are, because they permit one to control for the effects of treatments without withholding treatment from groups of subjects for long time periods. Multiple-baseline and reversal designs may eliminate the need to counterbalance the order of conditions when one subject is exposed to several different conditions over the course of an experiment. When properly designed and executed, single-case designs can generate results in which changes in performance during an experiment can confidently be attributed to the effects of the experimental manipulations carried out.

Discrepancies between statistical and clinical significance are likely not to be as great in single-case experiments as in group experiments. Single-case designs depend less on statistics and more on the actual magnitude and stability of changes in performance than group designs do. As a consequence, effects that are found in single-case experiments may be more clinically meaningful than effects found in group experiments.

However, single-case designs are not problem-free. Single-case designs usually are considered to be somewhat weaker than group designs in the confidence with which one can generalize results from the experiment proper to other settings, or from the sample of subjects studied to the population represented by the sample. In single-case designs, where the number of subjects studied is small, one always runs the risk of erroneous generalization if the subjects studied are not representative of the population to which the results are to be generalized. For this reason, careful selection and detailed description of subjects is imperative if one is to generalize the results of single-case experiments with confidence. Almost always, replication across subjects and replication across settings will be needed to establish confidence in the generalization of results. Unfortunately, such replications often are neglecte

It is important to remember that those doing single-case experiments are not intrinsically more likely to study clinically relevant questions than those doing group experiments. It is just as easy to study a clinically trivial question using single-case designs as it is to do so with group designs. In fact, from what I have seen of single-case experiments in aphasiology (both published and unpublished) current single-case experiments may have little more clinical utility than group studies. This may be a temporary state of affairs, related to the relative newness of single-case designs to aphasiology. However, if those doing single-case experiments are not careful to select clinically meaningful problems for study, they, also, will find that their work will go unread by clinicians.

CASE STUDIES, although they are not classified as research, constitute another means by which clinical aphasiologists might contribute to the literature. Case studies, properly done, provide for dissemination of information about new or unusual clinical cases, and, if the case is well-documented, the published report of the case can make a contribution to our clinical knowledge. Unfortunately, my experience has been that case studies submitted to professional journals frequently fail to address issues of general clinical interest, and that patients presented in the case studies are incompletely described, or are described in terms of nonstandard measures, causing the report to be of dubious generality and limited value.

How can clinical aphasiologists produce and publish research that is clinically relevant and clinically valuable? Several alternatives, none of which exclude other alternatives, appear viable.

It is clearly practical and feasible to carry out GROUP DESIGN experiments that explore clinically relevant problems. In order to conduct such experiments with the rigor that will be necessary if the report of the experiment is to be publishable, one must, it seems to me, fractionate large general problems so that they become manageable for research in clinic contexts. For example, if one were concerned with evaluating the efficacy of auditory comprehension treatment programs, one might carry out a series of experiments in which various components of a given program were evaluated, using small groups of subjects and simple group designs. With careful selection of questions to be investigated, practitioners could systematically attack questions of general clinical import, so that important questions may be resolved. However, if this literature is to be read and used by clinical aphasiologists, it will be important that traditional preoccupation with statistical significance be sacrificed, and that investigators address the real magnitude of experimental effects, and their dependability from subject to subject.

SINGLE-CASE DESIGN experiments hold great promise for clinical aphasiology, because they permit explorations of clinically relevant problems using

scientifically sound procedures that allow one to establish the generality of their results. However, if the results of this kind of research are to be read and used by clinical aphasiologists, it will be imperative that investigators demonstrate the relevance of the experimental question asked, of the subjects studied, and of the procedures employed, to general clinical problems. Subjects must be carefully described, and the degree to which they represent a larger population must be documented. The relevance of procedures used in the experiment to those used in clinical activities also should be demonstrated. Finally, the confidence with which we can generalize the results of the experiment to general clinical situations must be addressed.

CASE STUDIES can also make important contributions to the clinical literature, if certain principles are observed. First, the case reported must speak to a problem of general clinical concern -- cases reported only because they are "interesting" are usually of little value to other practitioners. The subject of the case must be described in detail, using standard measures so that readers of the report can assess similarities or differences between the subject of the report and individuals that they may encounter in their practices. Finally, the author of a case study should address the expected frequency of similar cases in the general population, so that readers can assess the likliehood that they will encounter such a case in their own practices.

There are several criteria that ANY clinical research report should meet, in order to be publishable. First, the report should make a CONTRIBUTION TO KNOWLEDGE. It should address a nontrivial question or problem, in a nontrivial way. It should provide information that is not generally known, at least as far as the experimental question addressed in the report is concerned. It should show that the results obtained are generalizable to other nontrivial situations and groups of subjects.

Second, the report should be BELIEVABLE. It should demonstrate that subject selection, experimental design, and control procedures are adequate and appropriate to the experimental question addressed. It should demonstrate that data are appropriately analyzed, and it should address the clinical significance of results obtained, as well as their statistical significance. Conclusions drawn in the report should be supported by the results obtained, and should not include speculation or claims not supported by the results of the experiment.

The issue of clinical research in aphasiology is far too broad and complex to address with anything resembling completeness in the time that I have today. I believe that the two problems that I have addressed today -- that clinical aphasiologists are not publishing much research, and that what is published has marginal clinical relevance -- are solvable. To solve these problems will require discipline, professionalism, and creativity. I am convinced that clinical aphasiologists have all three, and simply need to apply them efficiently to generate clinically relevant and scientifically sound clinical research in aphasiology.

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DISCUSSION

Q: I think the mistake we've all (made and the point that you have made) is that we haven't done enough replication to become generalizable and we haven't gone a step farther and gotten into programmatic research so that we examine problems over time in a systematic way to contribute to the literature.

A: I agree with both of the things you said. Single case designs generally are considered to be somewhat weaker and that reflects our traditional love affair with group designs and group statistics.

Q: I guess this is a comment. I think one reason clinical aphasiologists don't have a history of publishing is because they are allowed to enter the profession ignorant of the fact that they should. I wish we could include recognition of that responsibility in their preparation.

A: Well, this raises a whole new issue. There is concern in clinical psychology today--and I think it is very relevant to clinical aphasiology also--that traditional research techniques are inappropriate to clinical science and that we need a new and different approach to clinical science. That may be coming in the next few years.