

CHAPTER

4

**Technical Drift
and Conceptual
Myopia: The
Merlin Effect**

Kevin P. Kearns

Cynthia K. Thompson

Researchers have evaluated the direction and progress of clinical aphasiology, and this careful introspection has helped ensure a strong foundation for the future (Brookshire, 1985; Davis, 1986). In keeping with this analytic tradition, the program chairperson asked us to review information on single-subject designs that would help “refine our research” in the future. As ardent proponents of a time-series approach, we felt that the assigned topic was both timely and important. Moreover, the recent rise in popularity of single-subject designs in aphasia research seemed to support the need for further critical evaluation in this area.

Our enthusiasm was somewhat tempered, however, by an uncertainty as to whether technical improvements in the design of aphasia treatment studies were real or illusory. That is, we wondered, for example, if aphasiologists were beginning to use multiple baseline and reversal designs as something of a universal solution to design difficulties encountered in treatment studies. Relatedly, had we begun to use these designs uncritically for their availability and apparent ease of application without giving sufficient forethought to experimental control issues? Similarly, was there an evolving trend toward the rigid application of a technology that is inherently flexible? Were we forcing our questions to fit our designs rather than having our experimental methods and procedures emanate from our questions? Most disconcerting of all, we wondered if clinical aphasiologists were entrenched in a research quagmire in which investigators were preoccupied with demonstrating experimental control and manipulating target behaviors without giving due consideration to basic theoretical and conceptual issues.

In an attempt to understand and clarify these issues, we decided to review treatment research published in the *Clinical Aphasiology* from 1978 through 1987. Our primary goal was to examine trends in the aphasia treatment literature, identify problematic areas, and provide recommendations for future changes. Following the lead of Hayes, Rincover, and Solnick (1980), aphasiologists’ use of single-subject designs was evaluated by scanning the past decade of *Clinical Aphasiology* to determine if aphasia treatment studies contained basic components of applied behavior analysis (ABA).

Baer, Wolf, and Risley (1968, 1987) indicate that, among other things, applied behavioral research should be applied, analytic, general, and conceptual. The *applied* component refers to the fact that proponents of single-subject design strategies are committed to studying socially significant behavior. That is, there is a commitment to improving, through treatment research, the lives of individuals suffering from socially significant problems such as aphasia. The *analytical* component of applied behavior analysis refers to the emphasis on operationally specific time-series analyses that demonstrate experimental control. Thus there is a

strong commitment within the ABA tradition to a technology of behavior change largely through the use of single-subject experimental designs.

A third basic component of applied behavior analytic research is the desire to seek *generalizable* treatment outcomes. From a philosophical point of view, the goal of attaining “appropriately generalized outcomes” is inherent in the applied behavioral perspective (Baer, Wolf, and Risley, 1987). Finally, behavior analysts strongly support the notion that investigators should examine basic principles of behavior. That is, treatment research should remain *conceptually salient* as well as technically accurate.

PURPOSE

Given the prevalence of single-subject studies presented at the Clinical Aphasiology Conference (CAC), we decided to explore how well aphasia treatment research conforms to the basic components of applied behavioral research. The specific purpose of this chapter is to discuss overall trends in the use of single-subject, case-study, and group designs and to present our analysis of the research styles (Johnston and Pennypacker, 1980) employed by clinical aphasiologists. The hypothesis that “technical drift” (see below, and Hayes, Rincover, and Solnick, 1980) poses a serious threat to the future development of our clinical science is also discussed. The results of our analysis of technical aspects of single-subject aphasia treatment studies are presented in Chapter 5 of this volume.

REVIEW OF CAC PROCEEDINGS

All data-based treatment studies published in *Clinical Aphasiology* between 1978 and 1987, including a few that examined nonaphasic disorders such as apraxia of speech, were included in our review. Abstracts, round-table discussions of treatment issues, and special sessions were excluded from the analysis. The four general categories examined included the types of research designs employed, research styles, technical aspects of single-subject designs, and generalization. Factors within these categories were rated as plus or minus on code sheets that were subsequently used for determining interjudge and intrajudge reliability.

Our procedures and definitions were adapted from the work of Hayes, Rincover, and Solnick (1980) and Johnston and Pennypacker (1980).

Technical aspects of research design (i.e., operational definitions, replication, and reliability) and issues pertaining to generalization were only reviewed for single-subject designs, and these results are presented in Chapter 5. The types of designs employed and the three research styles found in our review are described in this chapter. Our discussion of these facets of aphasia treatment research begins with a consideration of the guidelines used for scoring parameters within these categories.

Research designs were coded according to overall methodology (i.e., single subject, case study, group) and, when appropriate, by type of single-subject design employed (e.g., multiple baseline across behaviors). Designs were coded according to the labels and descriptions used by investigators, regardless of experimental control problems or unusual design components that were present.

Johnston and Pennypacker (1980) define *research style* as the nature of the research questions that guide methodological decisions and the functions that the research serves for the experimenter. This analysis was initiated as a means of documenting the prevalence of research styles, and it also served as the basis for inferring factors that influence the type of applied research being conducted. Johnston and Pennypacker (1980) discuss six research styles commonly found in applied research: *thematic*, *independent*, *demonstration*, *advocacy*, *pilot*, and *inhouse*. (We identified a seventh research style, the outhouse style, but decided not to discuss it in this forum.) Three research styles, thematic, independent, and demonstration, are directly relevant to this discussion and will be considered here.

A study was rated as being *programmatically* if it was identified by the authors as an extension of treatment research conducted by the same investigators within the previous 2 years. Relatedly, studies were tallied as *independent-style* efforts if there was no stated link to an overall research program or if the study was not described as a follow-up to intervention research conducted by the same research group within the previous 2 years. Finally, studies were coded under *demonstration* style when the authors failed to relate their experimental questions or results to basic behavioral, linguistic, or cognitive principles or theories.

RESULTS

The average point-to-point interjudge agreement for ratings of design type was 89 percent for the 10 years covered by this review. Disagree-

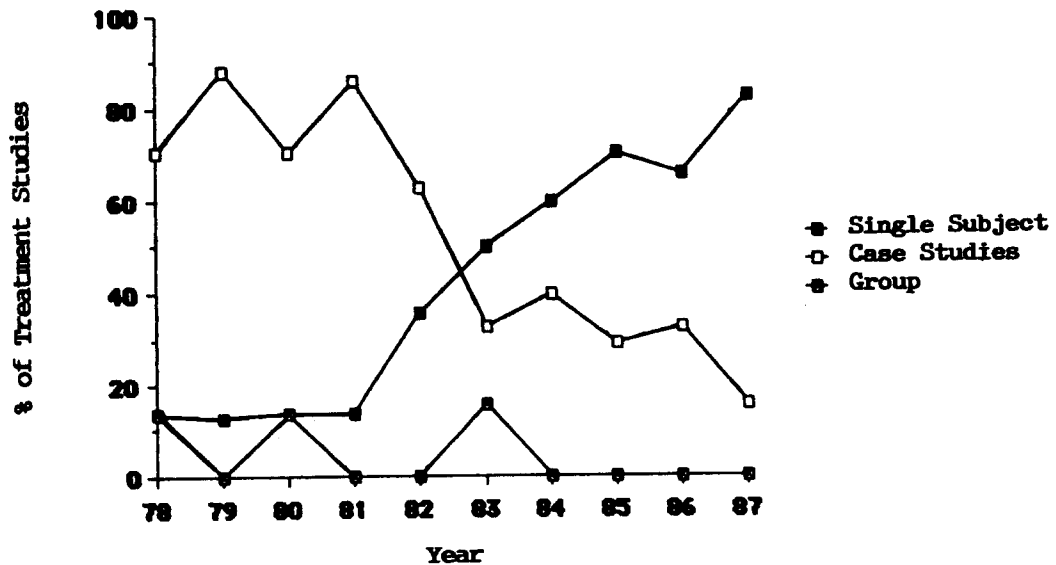
ments occasionally occurred for categorizing case studies that were labeled by the authors as single-subject designs. Agreement on design type was reached for these studies through discussion and review of manuscripts. The mean point-to-point intrajudge reliability was 94 percent for the rescoring of all treatment studies found in three arbitrarily selected volumes of *Clinical Aphasiology*.

RESEARCH DESIGNS

A total of 73 treatment studies, including single-subject, case-study, and group articles, were examined in our review. This represents 22 percent of the total number of articles (334) examined in *Clinical Aphasiology* between 1978 and 1987. It is interesting to note that there was an equal distribution of treatment studies published during the first 5 years (N = 37) and the last 5 years (N = 36) of our survey. Clinical aphasiology investigators have maintained a relatively low but stable rate of publication of treatment research in *Clinical Aphasiology*.

Figure 4-1 reveals the distribution of types of treatment studies found in *Clinical Aphasiology* over the past decade. The figure provides a graphic illustration of the percent of total treatment studies by year for case studies, single-subject studies, and group studies. It is apparent that there was a predominance of case studies (open squares) published in *Clinical Aphasiology* between 1978 and 1982. Although case studies

Fig. 4-1. Percentage of single-subject, case-study, and group treatment studies published in *Clinical Aphasiology* between 1978 and 1987.



accounted for between 63 and 88 percent of all treatment studies published during the first half of the review, there has been a dramatic decline in the percentage of case studies published in *Clinical Aphasiology* over the past 5 years. The percentage of case studies published between 1983 and 1986 ranged from 29 to 40 percent of all treatment studies. The percentage of case studies declined even further, to 16 percent of the total, during the final year of the review (1987).

Examination of Figure 4-1 also reveals a concomitant increase in the percentage of single-subject studies (filled squares) published in *Clinical Aphasiology* over the years. This category comprised 0 to 14 percent of the treatment studies published in the proceedings between 1978 and 1981. Furthermore, single-subject designs did not account for more than a third of the treatment studies until 1982 (36%). Over the past 5 years, there has been a steady increase in the percentage of single-subject investigations. Single-subject studies have increased from 50 percent of all intervention efforts in 1983 to 83 percent in 1987.

Overall, single-subject studies accounted for approximately one-half (49%) of all treatment studies examined in this survey. The vast majority of single-subject investigations (24 of 33 = 73%) incorporated multiple-baseline designs. Various forms of reversal and withdrawal designs appeared in 27 percent (9) of single-subject investigations.

The final trend of note regarding types of research designs employed relates to the use of group designs. As shown in Figure 4-1, group treatment studies have consistently represented a relatively small proportion (0–16%) of treatment research over the past 10 years. Although this finding was somewhat surprising, the time and expense of group treatment comparisons may delimit the number of group treatment studies presented at a yearly clinical conference.

RESEARCH STYLES

The three research styles evaluated in our review were programmatic, independent, and demonstration styles. There were virtually no programmatic treatment studies published in the proceedings between 1978 and 1982. Equally disconcerting was the finding that programmatic studies accounted for a mere 22 percent of the treatment studies examined between 1983 and 1987. The slight rise in the percentage of programmatic studies during the second half of the review represents a relatively small number (8) of investigations. Consequently, it is unclear if this increase represents a positive trend that will be continued in the future.

The second type of research style examined was the independent

style. Since programmatic and independent styles are reciprocal, it is not surprising that the vast majority of *Clinical Aphasiology* treatment studies were coded as independent-style studies. Virtually all 37 (100%) of the treatment studies published in the proceedings during the first half of the period surveyed (1978–1982) were viewed as independent-style studies. Similarly, 78 percent of studies examined for the second half of the review also were considered to be independent-style investigations.

The third research style examined, the demonstration style, also permeated the *Clinical Aphasiology* treatment literature. Specifically, 86 percent of all studies published in the first half of the review and 75 percent of treatment studies from the second half of the review were coded as demonstration-style studies. Typically, these were “how to” treatment studies with no stated link to basic behavioral, linguistic, or cognitive principles or theories.

DISCUSSION

The results of our review of *Clinical Aphasiology* published between 1978 and 1987 demonstrate that treatment studies account for less than a quarter (22%) of all manuscripts. Certainly the nature of our review process, the wide variety of topics accepted for presentation at the conference, and difficulties encountered in conducting treatment research may limit the number of intervention studies conducted and published. Nevertheless, it is surprising that a conference that is dedicated to the clinical management of aphasia and related disorders produces so few empirically based treatments. Our findings extend Brookshire’s (1985) conclusion that clinical aphasiologists are not publishing much research, and this seems to be particularly true for treatment research.

In terms of the types of designs used to investigate treatment questions, the results of our survey indicate that there has been a rather dramatic shift away from the use of descriptive case studies and toward the use of single-subject experimental designs. Group treatment studies continue to represent a small portion of the treatment research published in *Clinical Aphasiology*.

The trend away from case studies and toward single-subject studies can be viewed as evidence that investigators are opting for a more powerful design technology for conducting treatment studies. Whereas properly conducted single-subject studies permit valid conclusions about the functional relationships between an independent variable (i.e., treatment) and a dependent variable (i.e., target of intervention),

case studies lack the experimental control that allows such conclusions. Although there are numerous areas in which aphasiologists can continue to improve and refine single-subject designs in the future, the trend toward a more experimental approach to treatment research attests to the growing sophistication of our applied methodology.

While the results of our survey of treatment designs were not unexpected, our analysis of the research styles of aphasia treatment research was both surprising and revealing. Ideally, the literature should be replete with programmatic research that examines questions within a common theme and systematically evaluates a different piece of the same experimental puzzle. This systematic, thematic approach to applied research ensures that an area of inquiry is examined comprehensively, and it makes it less likely that important questions will remain unexplored. The reciprocal of programmatic research is the independent research style. Independent-style studies are not systematically preceded or followed by other studies to which direct and meaningful relationships can be traced. The independent style is opportunistic. With this approach, investigators behave like a waterbug—bouncing and jumping in a seemingly random fashion from one unrelated area to the next.

Data from this review indicate that there is an abundance of independent studies and a relative paucity of programmatic aphasia *treatment* research being presented in *Clinical Aphasiology*. As Johnston and Pennypacker (1980) remind us, an excessive number of independent studies virtually guarantees a lack of direction and growth for an applied field such as clinical aphasiology. A literature that is dominated by independent-style studies lacks coherence to the extent that the literature may resemble a puzzle that is incomplete and remains largely uninterpretable.

There are, of course, many reasons that investigators eschew a programmatic approach to research in favor of conducting unrelated studies. Certainly most programmatic research is carried out in centers that have obtained grants and other funding to support a systematic and thematic line of investigation. Relatedly, pressures to obtain academic tenure may prompt researchers to become opportunistic and become involved in projects as opportunities present themselves. Over time, this independent style of research may be reinforced by publications and acceptances to conferences until it becomes an established pattern. Perhaps most important, there may simply be insufficient emphasis on and modeling of programmatic research during graduate training so that new investigators are not exposed to any style except the independent style of scientific enquiry.

In addition to independent and programmatic research styles, we also examined the demonstration style in our review. Our results indicate that over three-quarters of the treatment studies surveyed were dem-

onstration-style studies. Recall that the emphasis in demonstration studies is on showing that a method or variable controls responding. Demonstration that a treatment variable or treatment package is effective takes precedence over other goals and more detailed explanations, such as showing why control is effective or examining which components contribute most to a treatment effect. The demonstration style reflects a "how to" approach that is rarely based on or related to basic principles or theories.

The preponderance of demonstration-style studies in our literature can be taken as an indication that investigators of aphasia treatment issues have not sufficiently addressed analytical questions that elucidate parameters of treatment. Consequently, refined and improved aphasia interventions may be delayed or prevented as a result of our emphasis on demonstration-style research. It is also critical to reiterate that demonstration-style research fails to relate experimental questions, outcomes, and rationales to basic behavioral, cognitive, and linguistic theories. As a result, the concepts upon which our interventions are based may not be challenged or refined and the conceptual underpinnings of our clinical science may eventually be eroded.

The results of our review demonstrate that *Clinical Aphasiology* researchers have nearly replaced the formerly popular case-study approach to treatment research with single-subject designs. However, although we are becoming more technically sound (see Chapter 5), we continue to favor demonstration studies that, overall, lack conceptual salience. Taken together, these trends indicate that clinical aphasiologists may be succumbing to the phenomenon called *technical drift*, which is the tendency for applied research to become a purely technical, cure-oriented effort with limited or declining interest in conceptual issues (Dietz, 1978; Michael, 1980; Baer, 1982). Hayes, Rincover, and Solnick (1980) examined the first 10 issues of the *Journal of Applied Behavior Analysis (JABA)* to determine if there was evidence of technical drift in the literature. Their review demonstrated that published studies in *JABA* were becoming more technical and less conceptual. Specifically, they found that *JABA* investigators were using technically accurate but increasingly simpler single-subject research designs. In addition, Hayes, Rincover, and Solnick found that research into some aspects of generalization was declining. Perhaps most important, they also found that investigators were increasingly failing to relate their procedures to basic principles. The results of our review document a similar trend in *Clinical Aphasiology* treatment studies.

While recognizing the need for purely applied research, it seems apparent that we do not have a complete grasp of the basic principles that underlie interventions for our aphasic patients. It seems, therefore, premature to assume that we have sufficient data to develop the most effi-

cient and powerful interventions possible. In the final analysis, our results support the conclusion that programmatic treatment research that examines and makes explicit its relationship to basic behavioral, cognitive, and linguistic principles and theories is needed to reverse our technical drift and facilitate the development and maturity of clinical aphasiology. While the use of a powerful and relatively new treatment technology such as single-subject designs may require a period of demonstration, the technology must eventually become a tool for the analysis of conceptually salient questions. Otherwise, we may become modern-day alchemists influenced by the illusion that the technology is our science. By combining theoretical and conceptual compounds with a strong design technology, we may eventually shape our clinical wizardry into an even stronger clinical science.

ACKNOWLEDGMENTS

This research was supported in part by VA Rehabilitation Research and Development funds. The helpful suggestions of Dr. Jay Rosenbek and Katherine Yedor are also gratefully acknowledged.

REFERENCES

- Baer, D. M. (1982). A flight of behavior analysis. *The Behavior Analyst*, 4, 85–91.
- Baer, D. M., Wolf, M. M., and Risley, T. R. (1987). Some still-current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 20, 313–327.
- Baer, D. M., Wolf, M. M., and Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 1, 91–97.
- Brookshire, R. H. (1985). Issues and directions for the future: Clinical research in aphasiology. In R. H. Brookshire (Ed.), *Clinical aphasiology*, Vol. 15 (pp. 9–14). Minneapolis, MN: BRK Publishers.
- Davis G. A. (1986). Questions of efficacy in clinical aphasiology. In R. H. Brookshire (Ed.), *Clinical aphasiology*, Vol. 16 (pp. 154–162). Minneapolis, MN: BRK Publishers.
- Deitz, S. M. (1978). Current status of applied behavior analysis. *American Psychologist*, 33, 805–814.
- Hayes, S. C., Rincover, A., and Solnick, J. V. (1980). The technical drift of applied behavior analysis. *Journal of Applied Behavior Analysis*, 13, 275–285.
- Johnston, J. M., and Pennypacker, H. S. (1980). *Strategies and tactics of human behavioral research*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Michael, J. (1980). Flight from behavior analysis. *The Behavior Analyst*, 3, 1–22.
- Thompson, C., and Kearns, K. P. (1989). Analytical and technical directions: The Midas touch. In T. Prescott (Ed.), *Clinical aphasiology*, Vol. 19 (pp. 31–40). Austin, TX: PRO-ED.