TRENDS IN BEHAVIOR ANALYSIS IN EDUCATION

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The preparation of the *Journal of Applied Behavior Analysis Reprint Series: Behavior Analysis in Education* (1988) provided an opportunity to survey and analyze trends in the field, as reflected by publications in the journal. Apparently, the large volume of behavior-analytic papers on educational topics has been declining and its contents undergoing some interesting but not uniformly welcome shifts. Although the intense concern with classroom conduct has diminished somewhat, that topic continues to be heavily emphasized. Simultaneously, reports of social skills and language studies have accelerated, but analyses of academic performance have progressively declined. Explanations for the findings remain speculative, but behavior analysts are encouraged to address these areas of essential social need.

DESCRIPTORS: education, classrooms, schools

Tomorrow's world will be in the hands of today's youth. How their actions will affect the future depends in great measure upon how effectively they have been educated. The field of applied behavior analysis has made major contributions toward educational improvement throughout its publication history and has the potential of tendering considerably more.

The preparation of the *JABA* reprint series, *Behavior Analysis in Education* (1988), that occurred coincident with the journal's 20th anniversary, provided a unique opportunity to examine the *Journal of Applied Behavior Analysis's* coverage of this topic. The charge of the ad hoc editors was to identify and classify all the papers on education published in the journal since its inception and to nominate a model set to be reproduced in the volume. Participating in the process of assembling the reprint volume has permitted the authors to gain a broad perspective on the trends related to the proportion of papers devoted to educational topics and their content over the years. In this report these findings are shared with readers who are interested in where educational behavior analysis has been for the past 19 years and the directions in which it seems to be headed.

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METHOD

Participants

Five accomplished scholars of behavior analysis in education agreed to participate as editors: Ronald S. Drabman, Douglas Greer, R. Vance Hall, Brian A. Iwata, and Susan G. O'Leary. Each was asked to assume responsibility for reviewing three or four volumes to (a) identify articles in education and suggest categories for classifying them and (b) to nominate papers for inclusion in the reprint volume by using criteria of quality, representativeness of the state of the art, and utility for school personnel. Later all were asked to review the entire proposed set and "advocate for any articles you feel absolutely must be included as reprints."

Procedure

For purposes of the volume and this analysis, papers on education were defined as those whose research was set in the classroom or those that had as their objective instruction in specific academic skills for students or educational personnel. We omitted articles dealing with one-to-one instruction of developmentally disabled students because *JABA* had published a reprint volume on developmental disabilities in 1986.

Several steps were taken to assure that educational papers were identified and classified as to content and level: (a) The lists of titles were compiled by each reviewer and (b) independently by

Table 1
Definitions of Categories (Levels)

- Preschool: subject population or setting identified as preschool or prekindergarten.
- Special Education: separate instructional groups consisting of students identified as having special needs. Included were programs serving students with developmental, perceptual, motoric, language, and other special disabilities.
- Elementary: subject population or setting identified as elementary (usually kindergarten through fourth or sixth grade).
- Middle/College: subject population or setting identified as middle (usually Grades 4 through 8), junior high school (usually Grades 7 through 9), high school (usually Grades 8 or 9 through 12), and college/university. (These groups were combined due to the small representation of each group and the common focus on academic skills.)
- Professional: formal training of management and/or instructional skills, including in-service training for teachers and/or other professional or paraprofessional personnel.

Table 2
Definitions of Categories (Content)

- Defined as having targets of change or focus of intervention based on:
- Conduct: management of classroom deportment and attending (e.g., out of seat, on-task, hyperactivity, disruption, aggression).
 - Social: social skills training, such as teaching adaptive skills (e.g., play, sharing, taking turns, helping, recruiting reinforcement).
 - Academic: performance on academic subjects (e.g., reading, math, social studies, printing, and writing).
 - Language: oral communication (e.g., increasing rates of speaking, labeling objects, elaborating sentences, using adjectives, and so on).
 - Health/safety: skills related to physical well-being (e.g., nutrition, safe playground play, street crossing, and school bus and home safety).
 - Teaching: skills for teaching and managing the classroom (e.g., using praise, attending, and organizing the classroom environment).

each of the two authors of this paper. (c) The reviewers also suggested ways to classify the educational level and content of each article. (d) Based on these suggested classifications, the two authors of this paper jointly finalized sets of categories related to level and content and defined each (see Tables 1 and 2). (e) Then the two authors independently assigned a level and category for each article. (f) Next we compared the two lists and discussed the few (less than 10%) differences until both agreed as to the most appropriate designation. (No formal interscorer reliability scores were determined because the classifications ultimately were determined collaboratively.) In cases of overlap of categories, such as multiple grade level or content, we assigned the article to the category that it represented most closely. The special education category spanned all grade levels, because chronological age usually was not the basis on which students were assigned to classes.

RESULTS

The list used for the analysis included 347 educational research articles, 70 of which were nominated as reprints. In addition, four discussion/review papers (Baer, Wolf, & Risley, 1968; Bijou, 1970; Keller, 1968; Stokes & Baer, 1977) with

important conceptual messages were reprinted. These were excluded from the analyses to follow.

Number and Proportion of Papers in Education

Figure 1 displays the total number of papers published in *JABA* during each of its first 19 years and distribution of the 347 reports on education by year. The number of articles published in the journal per volume ranged from the 30s to over 90, peaking in Volume 10 (1977). The count focusing on education also peaked in that volume and in Volumes 7 (1974) and 9 (1976). In contrast with other topics, the proportion of papers on education showed a clearly diminishing trend from the first to the second decade. About twice as many educational papers were published during the first 10 years as in the second. In Volumes 3, 5, 6, 7, and 9, over half the articles dealt with education. This proportion has not been repeated since.

Populations Served

What educational populations have been served by behavior analysis? Primarily, populations at the elementary level have been emphasized (39.4%), with special education (19.9%), and preschool

Figure 1. Total number of papers published in the *Journal of Applied Behavior Analysis* and total number published on the topic of education.

(18.4%) groups falling in second and third place. By contrast, so few papers involved students at the middle or junior high school, high school, or college level, that these populations were combined for the analysis (15.3%). Professional and paraprofessional educators accounted for the remaining 6.9% of the subject populations.

Problem Areas Addressed

Aggregating content areas across all volumes revealed that the topic of classroom conduct, such as being off-task, disruptive, or aggressive, led the way (29%). Other emphasized topics have been academic skills (25%) and language (20%). Skills for instructional personnel (i.e., teaching) (12%), pupil social skills (8%), and health and safety (5.5%) were emphasized less.

Has the relative emphasis changed for each of these topics over the years? Figure 2 displays the way in which the content areas have distributed themselves among the educational papers published in *JABA* in 5-year (or 4-year) blocks. (Specific distributions by content and level for each volume may be obtained from the authors.) The focus on conduct, although relatively high in the first decade, has fallen somewhat during the second. The proportion of the papers on social skills has risen gradually, whereas the proportion of papers on language has risen more substantially. Health and safety and teaching began to rise but declined during the last

Figure 2. Percentage of each problem area addressed in studies of educational topics included in the *Journal of Applied Behavior Analysis* across 5-year blocks (except the last block, which covers only 4 years).

block of years, and studies of academic performance have shown a steady decline.

Although papers on education continue to be published in *JABA*, their absolute and relative number has fallen substantially. In the absence of experimental evidence, why this has happened can only be a matter of conjecture. One possibility is that the gradual expansion of applied behavior analysis into other realms (e.g., clinical, community, organizational, health, and safety behavior) might be crowding educational studies out of the journal. Yet a skimming of *JABA*'s content areas suggests that this hypothesis lacks support. In fact, in the past few years papers dealing with the developmentally disabled are heavily represented, whereas those on the other topics listed seem to be included increasingly in specialty journals of their own.

In a symposium on this topic at the 1988 annual meeting of the Association for Behavior Analysis, the Editor, Jon Bailey, reported that *JABA* was not receiving a heavy flow of articles on education. Functional analyses of the efficacy of important methodologies, such as precision teaching, direct instruction, the personalized system of instruction, computer-assisted instruction, educational leadership, organizational and systems studies, and the many innovative successes in the field of school psychology were essentially lacking from recent issues.

Research needs to be undertaken to determine

whether or not this is because reports are being submitted elsewhere, model papers have been absent from *JABA* for a while, authors have been punished by rejection of their papers, the papers have lacked the rigorous methodology demanded by the journal's editorial board, sufficient behavior-analytic research in these areas is not occurring, or if other unknown reasons are influencing submissions. To address these possibilities, *JABA*'s archives might be inspected to determine how many education articles were submitted on what topic and the editorial decision for each. Surveys could be sent to sample groups, such as previous authors of papers on education, to determine whether or not they continue to perform behavior analyses of educational topics; if so, where they submit their results, and if not, why they have discontinued this line of research.

Those who participate in setting or implementing public funding and policy may need to examine their practices as well. Similar to studies of the type undertaken by Braddock, Hemp, and Fujiura (1987), who investigated trends in public spending for mental retardation and developmental disabilities, trends in public support of educational research also need investigation to determine how behavior-analytic work has been faring. Perhaps the behavior of grant reviewers from within applied behavior analysis can be studied to determine whether or not they are applying overly rigorous or inflexible standards in judging the proposals or reports on education topics of their behavior-analytic peers.

In terms of focus, as the proportion of papers emphasizing classroom misconduct has diminished, the area of social skills has received growing consistent attention. From our perspective, this is a healthy sign, implying that researchers are emphasizing the promotion of constructive, adaptive skills in preference to the reduction of unwanted behavior. The upward trend in the percentage of studies of language shows a similar focus on skill development. Perhaps some of the upsurge in that area may be explained by the contemporary fascination with cognitive development.

Of special concern is the relative neglect of students at the middle-school through university level. During its first several years, *JABA* published a number of articles on the personalized system of instruction (Keller, 1968) and others on college instruction; however, the proportion rapidly diminished when the *Journal of Personalized Instruction* emerged. Unfortunately, although the latter is no longer in operation, papers on college teaching have not reappeared in *JABA*. Does this mean that behavior-analytic research on the education of adolescents and adults has diminished? Or are such studies being published elsewhere?

Certainly major educational topics merit behavior-analytic investigations. Data-based decision making in science education, remedial reading, creative problem solving, mathematical concepts, computer and job skills, foreign language instruction, and sex and health education are topics critical to society.

The hundreds of educational reports in *JABA* and the thousands published elsewhere demonstrate that behavior analysis has yielded exciting results of relevance to educational improvement (see Sulzer-Azaroff & Mayer, 1986, for an extensive coverage of this topic). The redesign of educational environments stemming from the established findings of behavioral educators promises to improve the future of our society. It is hoped that the number of high-quality papers on this topic will proliferate in *JABA* once again.

REFERENCES

- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 1, 91-97.
- Bijou, S. W. (1970). What psychology has to offer education—now. *Journal of Applied Behavior Analysis*, 3, 65-71.
- Braddock, D., Hemp, R., & Fujiura, G. (1987). National study of public spending for mental retardation and developmental disabilities. *American Journal of Mental Deficiency*, 92, 121-133.
- Journal of Applied Behavior Analysis*. (1986). Behavior analysis in developmental disabilities 1968-1985. Reprint Series (Vol. 1).
- Journal of Applied Behavior Analysis*. (1988). Behavior

- analysis in education 1968–1987. Reprint Series (Vol. 3).
- Keller, F. S. (1968). "Good-bye teacher . . ." *Journal of Applied Behavior Analysis*, 1, 79–89.
- Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, 10, 349–367.
- Sulzer-Azaroff, B., & Mayer, G. R. (1986). *Achieving educational excellence*. Fort Worth, TX: Holt, Reinhart & Winston.
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