DOCUMENT RESUME

ED 137 637 CG 011 222

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TITLE Experimental Method for Evaluating the Effectiveness of Training Techniques.
PUB DATE Sep 76
NOTE 9p.; Paper presented at the Annual Convention of the American Psychological Association (84th, Washington, D.C., September 3-7, 1976)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Attendant Training; Child Care Workers; *Job Training; Manpower Development; *Nonformal Education; *Nonprofessional Personnel; *On the Job Training; Resource Materials; *Teaching Techniques; *Training Techniques

ABSTRACT

Training materials are beginning to be developed, packaged and (sometimes) evaluated for use by behavioral professionals to train nonprofessionals teaching and care-giving skills; however, economic factors in many programs require that non-professional staff be trained by their non-professional predecessors. To evaluate the function of training material built into an infant day care system, an experimental design was developed to efficiently analyze the transmission of skills from one worker to the next across several "generations" of workers. When staff members were simply instructed to train their replacement "until they knew their job," each successive generation of worker was markedly less accurate than the last; however, when explicit training materials were available to the staff members, high accuracy was consistently maintained across successive generations of workers. This "generation design" requires only as few as eight subjects for an experimental demonstration of the adequacy of the training materials for transmitting skills across successive generations of staff. (Author)

EXPERIMENTAL METHOD FOR EVALUATING THE EFFECTIVENESS OF TRAINING TECHNIQUES

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Paper presented at the 84th Annual Meeting of the American Psychological Association, Washington, D.C., September, 1976.

Experimental Method for Evaluating the Effectiveness of Training Techniques

As applied behavior analysis moves into the delivery of programs and techniques for more widespread use, the importance of effective training procedures increases. Training materials are beginning to be developed, packaged and (sometimes) evaluated for use by behavioral professionals to train nonprofessionals. However, economic factors in many programs require that nonprofessionals be trained by their nonprofessional predecessors. In this situation, old staff train new staff and with each such turnover a new "generation" occurs. We mean to present here an experimental design which we have employed to compare the transmission of skills from one worker to the next across several generations of workers.

The rationale for the design goes somewhat like this. The change in skills or traits across generations has been termed "evolution." From the time of Thomas Hunt Morgan at Columbia, geneticists have found the study of evolution a much more reasonable endeavor when they have employed methodology which demonstrated principles of evolution in a short period of time. Thus, Morgan's lab at Columbia was filled with jars of common fruit flies which reproduced quite rapidly, allowing him to study, in a short period of time, principles of evolution which with other species would have taken years if not lifetimes.

In a similar manner, if we are to study the evolution of

our training materials in adequately preparing not just one worker or group of workers, but successive generations of workers, then we must somehow simulate, in a short period of time, what would otherwise take years. Thus, if you wish to know what your program will look like in two or three years, you could simulate the turnover of staff, with the necessary training of each new staff member. The test of whether training materials can be used by successive generations of workers without appreciable change in program quality, we have explored in what we call a "generations design".

As an example of the use of the generations design, let me present a study which was conducted to evaluate training procedures used in an infant day care center where departing caregivers trained their replacements. Because we wished training procedures to be appropriate for workers who might prove to be good with children but who might not have extensive formal education above the high school level, we approached a local high school, offering a minimum hourly pay rate for those who wished to participate in our study. From those who responded to our offer, we selected sixteen high school girls, in grades 10, 11, and 12. The study was conducted at the Infant Center of the Lawrence Day Care Program, a facility providing full and part-day care for up to twenty infants, six weeks to one year of age. Caregiver duties had been specified during the development of the program and workers' ability to adequately perform these duties was our prime concern in identifying adequate staff training.

For this study, two methods of training new employees were used, each with the goal of transmitting the same detailed caregiver routines. One method was the usual "informal" or verbal transmission method, in which an old employee would teach her replacement until "she knows the job." The second method was more formal, utilizing written, illustrated training "packages" and written feedback in the form of a check sheet detailing each correct, incorrect, or omitted staff duty.

After the subjects in either the informal or package training method were reported trained, the "new employees" were asked to perform the staff duties one more time for a "criterion trial." During these trials, one or more observers watched the new employees perform the routines and recorded on check sheets which steps of the routines were performed correctly. On 67% of criterion trials (at least once for each generation), two observers independently and simultaneously recorded the new employee's performance of the routines. Reliability between observers was calculated by comparing the records of the two observers and dividing the number of entries on which they agreed by the total number of agreements plus disagreements. Interobserver agreement averaged 96% (ranging from 90% to 100%).

The generations design employed in this study is presented in Figure 1. Of the sixteen new employees, eight were randomly assigned to the informal group and eight to the package group. For the first generation, the Infant Center supervisor trained

two of the girls by the informal method and the experimenter trained two by the package method. For all four, training was continued until they achieved an accuracy score on the check sheet of at least 90%. Each first-generation employee was then asked to train another person according to the method by which she herself had been trained, thereby creating four second-generation employees. Each of these then trained a third-generation subject, who, in turn, trained a fourth-generation subject. With normal attrition rates, such a four generation turnover in staff would normally occur over a two-to-three year period. In this study, however, the four generation turnover was accomplished in one month, since as soon as one generation subject was trained, she immediately began to train the next generation subject.

The results of this study are presented in Figure 2. As can be seen, the generations design used in this study produced clear results showing one method of transmitting job skills across successive generations of workers to be adequate and one to be deficient. Beginning with the second generation, package-trained employees maintained greater accuracy than did those who were informally trained. For all package trained employees, accuracy remained above 90% across all four generations. Informal training, however, resulted in a cumulative loss of the job skills attained by the first generation; that is, accuracy on the criterion trial dropped from 94% for both first generation employees to 57% and 51% by the fourth generation.

In summarizing these data, let me refer back to the early geneticists. Thomas Hunt Morgan studied fruit flies in his laboratory at Columbia, and from his study reported specific information about fruit fly mutation. He also reported a methodology permitting general conclusions about principles of genetics. Unless you are a fruit farmer, clearly you and the advancement of science were better served by the contribution of Morgan's methodology and the generalized conclusions which resulted.

With regard to the present study, two conclusions can be drawn from our data. One is that our package training method of Infant Center operation is far superior to an informal word-of-mouth method. A second, more general conclusion, is that an experimental design such as the generations design can serve in identifying evolutionary processes which are likely to take place in a program as a function of specific training procedures which you might develop or be asked to use.

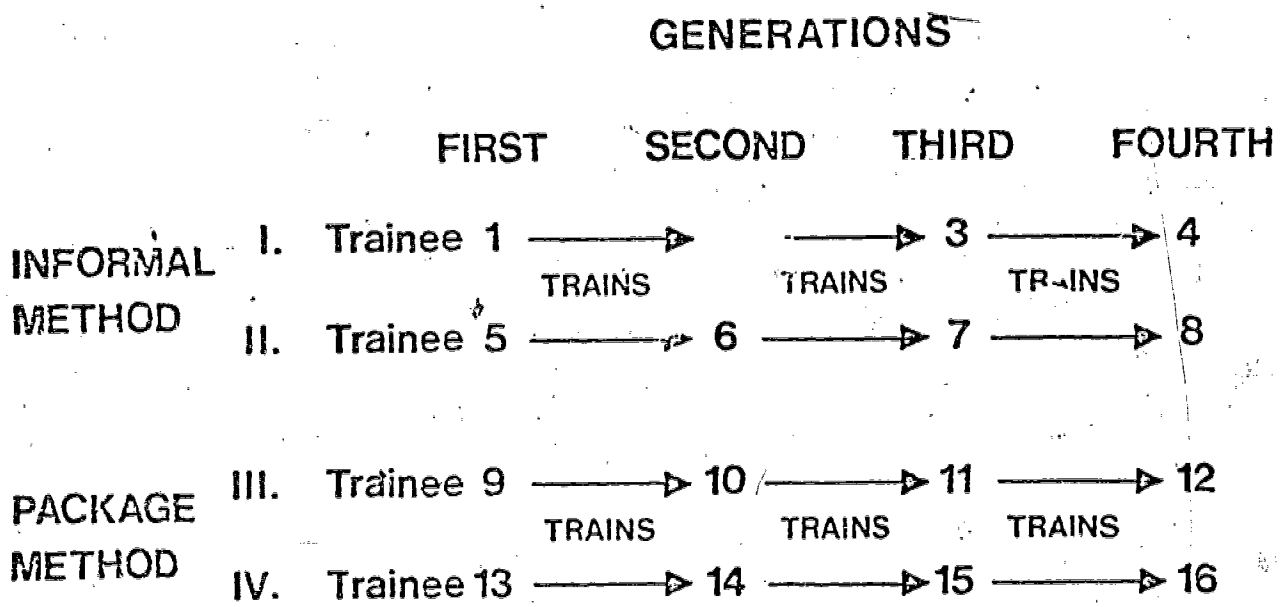

Figure 1. Schematic of the Generation Design employed in the comparison of informal and written package methods to train day care center staff.

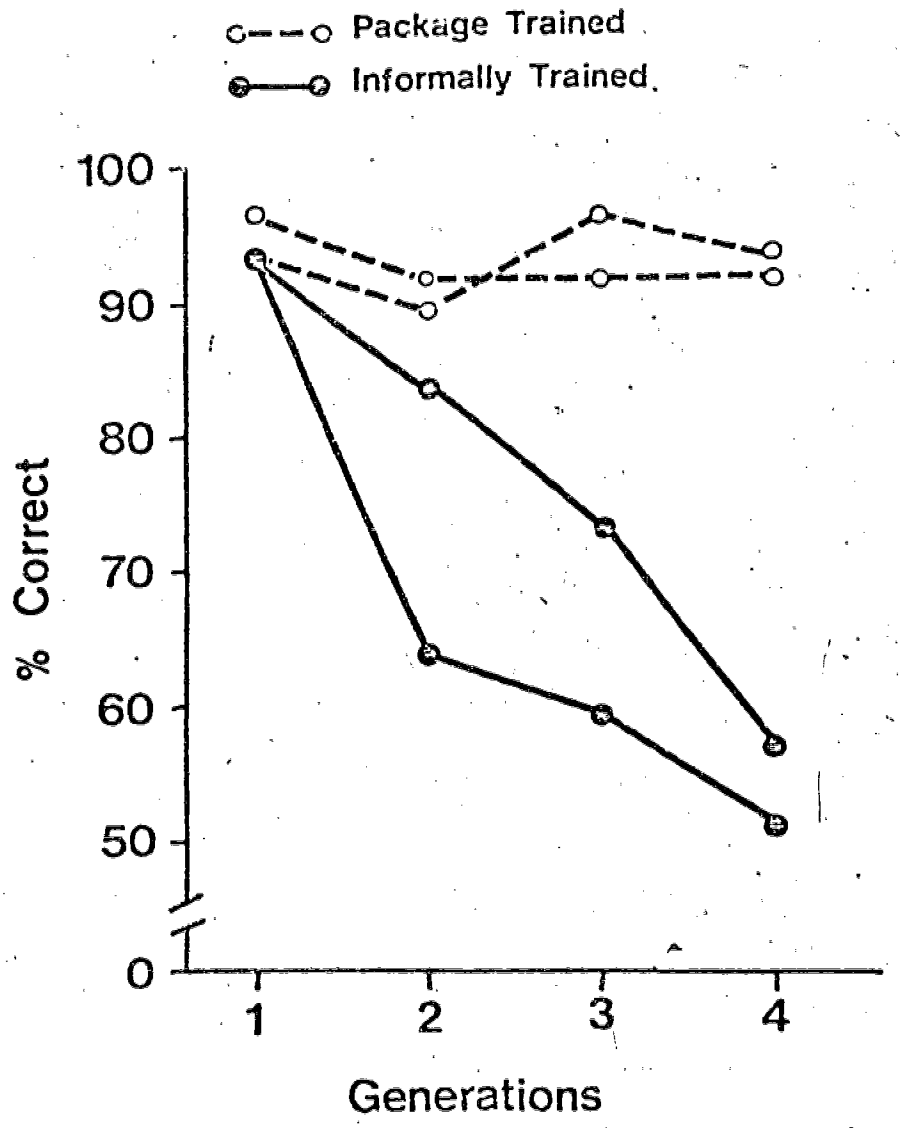

Figure 2. Percentage of correct staff performance of required duties across successive generations of staff.