TECHNICAL NOTE

AN INEXPENSIVE METHOD FOR MAKING DATA
RECORDS OF COMPLEX BEHAVIORS¹

A time-lapse camera mounted in a classroom can offer a permanent record of a wide variety of simple and complex behaviors. Data such as reported by Hall, Lund, and Jackson (1968) on study behavior, or by Madsen, Becker, and Thomas (1968) on teacher contacts are easily detected by the method. The record is permanent and the developed film can be displayed by a stop-action projector for as long as necessary for analysis, separately for independent observers, or later for re-analysis. The system has many advantages over other data collection systems, some of which are suggested below:

1. Perhaps most significant is the great saving in man-hours of observer time.
 - (a) It often takes both students and teachers some time to adapt to observers in the classroom, whereas the camera, though perhaps requiring even more adaptation time, is not using valuable manpower during that period. In fact, it need not be loaded with film until the adaptation period appears over.
 - (b) The equipment does not fatigue during long observation sessions, nor does it change its criterion of behavior as it collects more and more data samples or as a function of changed experimental conditions.
 - (c) Sampling rate can easily be adjusted, usually in the range of from one frame every 30 sec to one frame every 10 min, depending on the investigator's particular needs. Thus, for long inter-sample times, no manpower waste occurs.
2. The equipment is easily obtained at most universities from the Film Production services or similar organizations.
3. The film record is small and a large amount of data is easily stored.

4. The method is very inexpensive. For example, we are using a time-lapse camera loaned by the Radio-TV Department of Southern Illinois University in a fifth- and sixth-grade classroom of 14 children.² A single frame of 16-mm film is shot every 6 min. The teacher turns the camera off when her class is out of the room and the resulting footage per day is approximately 18 in. (10 frames per hour for 6 hr; 0.3 in. per frame). At this rate, well over two months of daily data can be collected for the price of a single 100-ft reel of film (approximately \$7.14 for ASA 400 Black and White or \$14.45 for ASA 125 Color, including processing).

The discussion above is oriented toward classroom behaviors. However, the method is appropriate to many situations in which behavior sampling is required. By changing the lens, the equipment may be used to take

Table 1

The per cent agreement between the three scorers for black and white film (B and W), color film, and before and after scorer discussion. The "n" row refers to the number of opportunities to agree or disagree.

Behaviors	B and W (18-Frames Samples)		Color (15-Frames Samples)	
	Before	After	Before	After
in seat	98.6	100.	98.5	100.
looking at work	92.2	98.6	98.5	100.
pencil or pen in hand	90.9	97.3	87.9	94.5
n	204		219	

¹The work reported is being carried out at the Alto Pass Grammar School, Alto Pass, Illinois. We would like to thank Mr. Wayne Miller, President of the School Board, and Mrs. Lois Berger, fifth- and sixth-grade teacher, for their cooperation. The entire Alto Pass project is possible because of the support and encouragement of Dr. Robert W. MacVicar, Chancellor, Southern Illinois University.

²The actual camera in use at Alto Pass is a 16-mm Cine-Kodak Special 11, with a 12-mm Elgeet, f1.2 Cine Navitar wide-angle lens (approximate cost \$1000). The equipment was mounted on a shelf at the front of the classroom approximately 14 ft above the floor. The time-lapse mechanism was a cam operated, synchronous motor driven device requiring 110 v ac service and made by Stevens Eng. Co., 2604 Military Ave., Los Angeles, California (approximate cost \$60).

data on a single subject, a few subjects, or an entire classroom.

The teacher indicates on a sign provided for the purpose, the date, the subject being taught, and a letter indicating the method of instruction; e.g., lecture (L), deskwork (D), or recitation (R). This information allows the rater to determine the appropriateness of the behaviors observed.

Some inter-scorer agreement figures for the behaviors indicated are provided in the table below. The three scorers (the authors) rated each frame independently and then discussed any discrepancies. Data are presented from both the independent analysis and the general discussion analysis. It can be readily seen that agreement was higher for gross behavior than for more detailed behavior. In general, discussion of the behaviors resulted in greater agreement. No differences obtained between black and white *versus* color film. The per cent figures are based on a ratio of number of

agreements to number of opportunities to agree or disagree.

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