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A Technique for Diary Analysis[1]

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DIARY recording is one of the oldest methods of studying the behavior of children. The relative advantages and disadvantages of such records as compared to those secured by more systematic types of observation have been subjects for considerable discussion. Special merit is frequently claimed for the inclusive nature of diary observations. On the other hand, the systematic methods of observation of delimited types of behavior lend themselves more readily to control of the observer and to quantitative treatment and interpretation. The widespread use of diary methods necessitates some inquiry into the reliability of the data collected and into the uses which may be made of the results.

In the course of a study of the adjustment of a group of nursery school children to a public school kindergarten, the writer made a series of six observations from eight-thirty to nine-thirty o'clock each morning in each of two schools. All children were observed simultaneously. The writer's object was to secure a complete protocol of the teacher-child relationship, with no selective attention to any particular activity. The record consisted of a running account of events made in longhand in a notebook.

No plan for the treatment of the data was formulated in advance. Subsequent to making the observations, it was believed to be of interest to determine whether some of the principles evolved from time-sampling techniques could be applied in analyzing diary records. The method of analysis was suggested by Olson (3). The application of such a method to an analysis of data already secured in diary form has, of course, obvious limitations as compared to that of employing the time-sampling technique originally, i.e., in both the recording of observations and the study of results.

For the analysis of the diary account, a unit of measurement was defined in general as any manifestation of a specific item or category of behavior by a child during an observation sixty minutes in length. Two large categories were established, subdivided as follows:

1. Teacher-initiated activities
    a. Teacher gives *aid* to child. (Includes unsolicited physical or verbal help.)
    b. Teacher initiates *conversation* with child. (Includes "give and take" in remarks on general matters.)

[1] From the Child Development Laboratories of the University Elementary School, University of Michigan.

c. Teacher *criticizes* social or emotional behavior of child or use of materials.
d. Teacher gives definite *suggestion* to a child. (As in calling attention to routine.)
e. Teacher settles a *group conflict* among children.

In order to use material of this type in an analysis of teacher-child or child-teacher contacts, we would wish to know something concerning (1) the completeness of the notes taken, (2) the constancy and reliability of group and individual records, and (3) the number of time samples needed to get dependable descriptions of the behavior patterns of individual children. A statistical analysis of the diary in the described units yields some information on the last two problems.

TABLE 1

*Frequency count of each trait studied**

	SCHOOL A			SCHOOL B			SUMMARY		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Teacher-initiated activities:									
Direction	28	39	67	22	13	35	50	52	102
Conversation	26	26	52	6	8	14	32	34	66
Criticism	13	14	27	19	13	32	32	27	60
Aid to child	20	18	38	13	7	20	33	25	58
Stimulation	27	16	43	1	2	3	28	18	46
Group conflict	8		8	4		4	12		12
Total	122	213	235	65	43	108	187	156	343
Child-initiated activities:									
Child asks aid	19	19	38	13	9	22	32	28	60
Questions	7	11	18	3	2	5	10	13	23
Volunteers	4	6	10	2	1	3	6	7	13
Conversation	5	1	6		1	1	5	2	7
Total	35	37	72	18	13	31	53	50	103
Number of children	13	19	32	15	12	27	28	31	59

* The maximum possible occurrence in each sub-classification under the conditions of the method is the number of children as shown in the last row of the table multiplied by six (the number of observations).

f. Teacher gives *stimulation* to guide child in making a choice.

2. Child-initiated activities
   a. The child asks for *aid.*
   b. The child starts a *conversation* with a teacher.
   c. The child *volunteers* some information.
   d. The child asks a direct *question* of the teacher.

By employing the defined categories, it became possible to go through the diary record and secure a frequency count for the various items (table 1). In the assignment of behavior to categories, there is probably a subjective factor which could be

tested by having a second person study the records in a similar fashion. Such a check was made by Andrus (1). It will be noted that the rank order of behavior items is roughly similar for boys and girls, and similar trends that can be revealed by the method. No attempt will be made here to present an analytic study of the facts of table 1. Perhaps the most obvious trend is the preponderance of teacher-initiated contacts in the total number of contacts.

The extent to which a single observation period will give reliable descriptions for individual children with respect to behavior in these categories can be studied by comparing the observations of one period with that of another. This is accomplished by setting up four-fold tables showing presence and absence of the behavior on each occasion for each child. When this is done for consecutive observations in the subdivisions of the teacher-initiated activities, it will be noted (table 2) that the coefficients (the method used is described by Kelly (2)) show considerable variability with a range from comparatively

TABLE 2

Coefficients of correlation between consecutive observations of teacher-initiated activities when analysis is made in terms of the subdivisions of the larger category

OBSERVATION PERIOD	SCHOOL A					SCHOOL B				
	Direction	Conversation	Criticism	Aid to child	Stimulation	Direction	Conversation	Criticism	Aid to child	Stimulation
1–2	.44	−.21	−.14	−.09	.00	.02	.00	.30	.52	.00
2–3	.04	.24	−.14	.25	.00	.32	−.13	.20	−.15	.00
3–4	−.09	.12	.60	.01	.11	.88	.04	.73	.20	.00
4–5	.37	.44	.83	−.15	.38	.80	.04	.72	.38	.00
5–6	.48	.03	.36	.16	.40	.89	−.09	.60	.54	.00

TABLE 3

Coefficients of correlation between consecutive observations of teacher-child and child-teacher contacts when the data are analyzed in terms of the major categories

OBSERVATION PERIODS COMPARED	SCHOOL A		SCHOOL B	
	Teacher-child	Child-teacher	Teacher-child	Child-teacher
1–2	.41	−.08	.41	.61
2–3	.23	.45	.33	.21
3–4	−.08	.10	.77	−.01
4–5	.31	.47	.67	−.09
5–6	.74	.24	.67	.73

TABLE 4

Reliability coefficients for teacher-initiated activities

BEHAVIOR	SCHOOL A		SCHOOL B	
	r Odd-even	Spearman-Brown prediction	r Odd-even	Spearman-Brown prediction
Direction.....	.78	.87	.51	.67
Conversation...	.26	.41	.57	.74
Criticism.....	.76	.86	.62	.77
Aid to child.....	.02	.04	.58	.73
Stimulation.....	.48	.65	−.01	

high positive correlations to some correlations which are actually negative. More often than not, however, the coefficients seem to be positive and show that there is some consistency involved. In the material given, it would be difficult to isolate the effects of constancy of the behavior and reliability of the recording. It is fairly safe to assume, however, that a single diary record of the activities of a group of children may be quite erroneous in describing the behavior of an individual child within it. The situation appears to be improved somewhat if we are willing to limit our description to coarser categories (table 3). Smith (4) arrives at the same conclusion in a recent report in which a running account of a child's behavior has been made and analyzed in accordance with a modified form of time sampling measurement.

The advantage pointed out in connection with current studies to the effect that multiplication of observations employing a definite unit of behavior of a stated length of time results in increased reliabilities can be illustrated with the diary data. A score was computed for each child, based on the number of one-hour observation periods in which a particular category of behavior was shown. When the odd-numbered observations are compared with the even-numbered observations, it will be observed that negative correlations tend to disappear and appreciable correlations appear (table 4).

The claims for the value of diaries in synthetic interpretations of complex behavior patterns has not been touched upon. It should be noted that interrelationships within the diary record can be studied quantitatively by the same correlational methods as were used in the study of reliability, although the scientific value of the determinations may be lower than in systematic recording.

CONCLUSIONS

It would appear from the present analysis that diary recording of observations can yield usable data when we are interested in coarse units of behavior or trends within a group, and that diaries take on an increasing reliability for individual description as the diary records are multiplied. It is believed that diaries may also serve an exploratory use to suggest subsequent delimitations of behavior for an attack by the method of repeated short samples employing carefully defined categories.

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