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ABSTRACT

Several sampling procedures for collecting observational data on student activities were studied in an effort to determine their relative efficiency. The setting was a fifth grade Individually Prescribed Instruction (IPI) mathematics class of thirty-three pupils. A criterion measure was obtained by cumulating the measurements obtained on the thirty-three pupils every thirty seconds for thirty minutes over a period of twenty days. Various observational designs were created by manipulating the following four variables: (1) the length of the observation period; (2) the time interval between recording observations during the observation period; (3) the number of days (replications) of observing; and (4) the number of pupils observed each day. Through this procedure it was possible to build observational designs and compare results using each design with the criterion measure, thus determining the efficiency of the several sampling plans. Comprehensive tables are included showing Scott coefficients of agreement with the criterion of the various designs. (Author/LR)

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Frequently an educational researcher must collect data about a class or group of pupils by way of direct observation of student activities in the classroom. Such direct observation procedures are time consuming and costly. The purpose of this study was to examine various observational procedures and sampling plans in order to determine which was the most efficient method for collecting this type of observational data.

The overall plan of the research was first to obtain a criterion measure and then to compare the results of various observation procedures and sampling plans to this measure. By manipulating several design variables, it was possible to build different observational designs and to test their efficiency by comparing the results obtained by them to the criterion.

Procedure

The setting of the investigation was a fifth grade Individually Prescribed Instruction (IPI) mathematics class consisting of thirty-three pupils. IPI is a program of individualized study, developed by the Learning Research and Development Center at the University of Pittsburgh, that

permits each pupil to progress through a given set of instructional objectives at a rate commensurate with his own unique abilities. Each pupil in the class was assigned randomly, on a daily basis, to one of four observers who recorded the activities that pupils engaged in during this period. The activity in which each of the pupils was engaged was recorded every thirty seconds for thirty minutes over twenty class periods. The criterion measure was the cumulative measure of the thirty-three pupils for the twenty class periods.

Activity frequencies for each of the pupils were recorded on a revised form of the student observational form developed by Lindvall, Yeager, Wang, and Wood (1967) (see page 26). The major pupil activity categories were: (1) independent activity using materials; (2) independent activity not involving the use of materials; (3) activities involving two or more pupils; (4) activities involving one pupil and the teacher; (5) activities involving the pupil and a teacher aide; and, (6) teacher directed group instruction. Under each of the main categories were listed specific items of pupil behavior that were utilized by the observers when the activities of the pupils were recorded. At the beginning of each thirty second interval, the activity in which each pupil was engaging was noted by the observer and recorded opposite one of the specific activity items. Before the data were analyzed, however, all pupil activity frequencies were cumulated according to the six major categories.

Different observational designs were created by studying the four variables: (1) the length of the observation period; (2) the time interval between recording observations during the observation period; (3) the number of days (replications) of observing; and, (4) the number of pupils observed each day. The variables were chosen on the premise that they would interact to either increase or decrease the number of classroom observations required to reach agreement efficiently with the criterion measure. It was expected that if one or two of the variables

were held constant, the other variable would interact. Thus, if the time interval and the observation period were held constant, the number of days necessary for observation would be dependent upon the number of pupils observed. It was anticipated that in studying the variables in this way, the optimal observational procedure for each of the variables (or combination of variables) could be established. Nevertheless, it was recognized that this study was constrained by several factors such as: the classroom and the grade level observed; the academic subject area; the size of the class; the observation variables and the design of the observation form; and, the observer training.

The pool of criterion measures served as "population" data for this study. Sub-sets of data based on different observational procedures were computed to determine the degree of agreement between the results obtained from the different procedures and the criterion. The criterion measure was obtained by summing, over a period of twenty days, the total number of frequencies recorded every thirty seconds in each of the six major pupil activity categories for all thirty-three pupils. Scott Coefficients (1955) were computed to determine the degree of agreement between each set of measurements and the criterion. For this study, efficiency of an observation procedure was defined as the amount of time needed for the procedure to produce a .85 level of agreement with the criterion. This acceptance level of agreement is in accordance with the standard set by Flanders (1967) in training observers to use the Flanders' Interaction procedures. However, rather than requiring that all indices be consistently .85 or above, the general rule applied, for defining an acceptable number of days or pupils for this study, was that after the initial .85 value had been obtained no three consecutive indices fell below a .80 value.

The observers for this study were trained in ten one hour sessions prior to the start of the study. Only one training session was held each

day. The first three days were used for describing the study and its purpose and familiarizing the observers with the observation form and the IPI procedures. During these three days the observers were drilled on the items of the observation form and classroom simulation was provided through the use of video tapes. These three initial sessions were followed by six days of actual classroom recording. Discussions were held both before and after the training sessions to ensure uniform and accurate recording of pupil activities. Also, during this period inter-observer reliability was checked. On the last day of the training period, all observers recorded the activities of the same eight pupils every thirty seconds for thirty minutes. The results indicated that an acceptable level of agreement had been reached among the observers.

The first variable examined was the time interval or the time allotted between recordings. At the beginning of each time interval, a recording was made of the activity in which each pupil was engaged Different time intervals were investigated and the number of pupils and days required for each variation to attain and then consistently maintain an acceptable level of agreement with the criterion were determined. As previously stated, the criterion measure for this study was a twenty day cumulative measure of all pupils.

The smallest time period studied was the thirty second interval. Table 1 shows the Scott Coefficients that resulted when the thirty second interval for one through thirty-three pupils extending one through twenty days was compared with the criterion measure. The table represents cumulated days going down the columns and cumulated pupils going across the rows. For example, .17 is the index of agreement between the cumulative activities of two pupils recorded every thirty seconds for thirty minutes for one day and the criterion measure.

Examination of the matrix shown in Table 1 shows that when one pupil was selected randomly each day and his activities were recorded

every thirty seconds for thirty minutes, it took twelve days to reach a .85 level of agreement. Further inspection of column one also shows that the level of agreement, with some variability, reached .91 at the end of twenty days. Increasing the number of pupils observed from one to two produced only slight changes in the indices obtained; but when three pupils were chosen each day, only eight days of observation were required to reach a consistent .85 or higher level of agreement.

It is interesting to note that even though the classroom was individualized and the recording of the activities of only one pupil each day produced an acceptable level after twelve days, the activities recorded for thirty-three pupils on one day did not yield an acceptable level of agreement. However, when the activities of fourteen pupils were recorded for only two days, a .85 level was attained and when the student number was increased to sixteen, an even more consistent acceptable pattern resulted. Furthermore, when the student number was only twelve, three days of observing were necessary to reach the .85 level of agreement and, except for a few slight reversals to indices below .85, this level was either maintained or raised both down and across the remaining right side of the matrix. When the matrix was triangularly divided from the bottom left to the top right, it could be easily seen that as the number of observation days increased, the number of pupils that it was necessary to observe decreased or as the number of observed pupils increased, the number of necessary observation days decreased. It was also noted that the lower half of the triangle contained coefficients of .90 or above except for a few in the low eighties near the upper dividing line of the triangle, thereby, confirming the conclusion that the number of days or pupils could be decreased with acceptable levels still being attained.

The second time interval compared to the twenty day criterion was the every one minute interval. The coefficients computed for this interval are shown in Table 2. Although there appeared to be a close overall similarity between these levels of agreement and those of the every

thirty seconds interval, there were several differences noted. When only one pupil's activities were recorded each day, fourteen days were required to reach a consistent acceptable level of agreement rather than twelve. Also, there were nine acceptable coefficients produced on the first day of recording; there were none when the smaller recording interval of every thirty seconds was used.

Further comparison of Tables 1 and 2 revealed that although the recordings of every thirty seconds and every one minute for three pupils differed only slightly, the activities of five pupils rather than three were required to produce a consistent level of .85 or above in eight days. Nevertheless, the number of acceptable coefficients in the lower triangular matrix were approximately the same as those found in the every thirty second matrix. Therefore, the general conclusion was that although much more information was obtained of the activities of the pupils by recording observations every thirty seconds, the one minute interval was satisfactory if a sufficient number of pupils were observed.

The next interval examined with respect to the twenty day cumulative criterion was the two minute time interval. Coefficients resulting from these comparisons are shown in Table 3. Although the pattern of acceptable coefficients at .85 or above was almost the same as the thirty second interval, there was one striking difference noted. It was found that after only three days of recording the activities of six pupils, an acceptable pattern of indices resulted. After this point on the matrix, there were no indices lower than .82 either across or below, and there were no three consecutive indices below .85 except for the activities recorded for twenty-seven and twenty-eight pupils. This high level consistency did not occur with so few days or pupils with either the thirty second or the one minute time interval. Also, the two minute time interval indicated acceptable consistency in eleven days when one pupil was observed each day; this was three days sooner than the every one minute interval.

But, as with the thirty second and the one minute interval, no consistent acceptable level of coefficients was found for thirty-three pupils observed for only one day. After the examination of the data yielded with the every two minute recording interval, it was concluded that for a thirty minute observation period the two minute time interval was efficient as the every thirty-second interval.

Continuing the examination of varying the length of the time interval the next observation interval explored was the every four minute interval. Scanning the indices shown in Table 4 indicated that there were very few indices at .85 or above for the first seven days of observation. Although it was noted that when the activities of four pupils were cumulated for eight days, the pattern of indices was consistent and acceptable thereafter. Furthermore, it was noted that on the eighth day the indices for four through thirty-three pupils tended to rise to .90 and above and remained at this very high level for the remainder of the matrix. The general conclusion drawn from the exploration of this interval was that a few more pupils and days were necessary to produce a consistent acceptable level of agreement than were necessary with the smaller time intervals.

The indices that resulted from comparing the six minute time interval and the criterion measure are shown in Table 5. Investigation of this matrix showed that the upper triangle had few indices at .85 or above and that over one-half of the indices in the entire matrix were below .85. Moreover, when the activities of only one pupil were recorded each day, an acceptable level of agreement was not reached with the criterion measure even on the twentieth day. Furthermore, during the first seven days of recording there were not satisfactory indices computed. Actually, nine days of recording the activities of nineteen pupils were necessary to attain and then maintain an acceptable level of agreement.

The eight minute time interval was the next interval to be examined. As seen in Table 6, this interval did produce acceptable indices a few days earlier than the six minute interval. But, the eight

minute interval required the cumulative observations of three pupils for sixteen days to yield a consistent acceptable level, whereas the six minute interval required only two pupils to produce the same results.

Further exploration of the time interval led to the examination of the every ten minute interval. Table 7 shows the matrix that resulted from comparing the measurements of this interval with the twenty day every thirty seconds cumulative criterion. A few more days and pupils were required to reach consistent acceptable levels than with the eight minute time interval even though approximately one-half of the total coefficients computed were .85 or above.

The resulting indices of agreement of the twelve minute interval are shown in Table 8. These data indicated that at least six pupils' activities had to be cumulated even on the twentieth day of observation to produce a consistent .85 or above. Also, at least twenty-nine pupils had to be observed for eight days to yield an acceptable level with this interval. Less than one-half of the coefficients computed in the entire matrix were at .85 or above.

The last interval to be explored was the fourteen minute time interval. These coefficients are shown in Table 9. Even though more than one-half of the indices in the matrix were either .85 or above, at least eight days of observing the activities of ten pupils were necessary to produce a consistent acceptable level. It was noted, however, that the ten and twelve minute intervals did not show this early acceptance level with only ten pupils.

From this investigation of the time interval, it was concluded that even though the every thirty-second time interval produced the most consistent acceptable level of agreement, the every one minute and the every two minute time intervals were satisfactory and could be utilized efficiently. By increasing the number of days of observation and the number of pupils being observed, the four minute interval could also be employed. The six, eight, ten, twelve, and fourteen minute time intervals

are not recommended because of the large number of pupils and observation periods required. However, if the physical arrangement of the school permitted the observer to move freely from one classroom to another during the same class period, it might be possible to efficiently observe a few pupils in several classrooms during the same class period by using the larger time intervals between recordings, and by adding a few more days of observation. For example, three pupils observed in each of several classrooms every six, eight, or ten minutes for sixteen days may produce consistent acceptable results.

This paper has thus far discussed three of the four variables considered in this study. While the observation period was held constant at thirty minutes, the variable time interval, number of days, and number of pupils were manipulated. Now the fourth variable, the observation period, will be examined. The time interval was held constant at every thirty-seconds for this portion of the study while the observation period was varied at 5, 10, 15, and 20 minutes. Also, the thirty minute observation period, which has already been discussed, can be added to this series.

The matrix that resulted from comparing the five minute observation period for one through thirty-three pupils and the twenty day cumulative criterion is shown in Table 10. It was noted that although there were high levels of agreement reached at various points on the matrix, they were not always followed by other high indices. Fifteen days of observing one pupil each day were required to attain an acceptable level. Moreover, even though the matrix shows that on the first day of observation high levels were reached with as few as twenty-one pupils, an acceptable level of acceptance was not maintained with additional days.

Although the matrix computed for the five minute observation period appeared to indicate that a five minute observation period was sufficient, there was doubt concerning its acceptance because of several inconsistencies occurring throughout the matrix. This doubt was

substantiated when the ten minute observation period, shown in Table 11, was explored. At several points on the matrix the indices were lower for the ten minute observation period than for the five minute period. Since consistent acceptable levels were not maintained for the ten minute period, neither the five nor the ten minute observation period could be recommended unless a sufficient number of pupils and days were added to overcome the inconsistencies that occur. In this study the ten minute period required that at least five pupils be observed for twenty days to attain and maintain a consistent acceptabel level. However, observing twenty-one pupils for two days was sufficient to attain an acceptable level and no three consecutive indices fell below .85 after this point on the matrix.

The next observation period that was investigated for twenty class periods was the fifteen minute observation period. The coefficients for this observation period are shown in Table 12. Investigation showed that the general level of agreement of corresponding indices increased over those computed for the five and ten minute periods. Following the general rule of acceptance, it was found that seventeen days of observation were required when only one pupil's activities were recorded daily while only twelve days were needed for two pupils and nine days for three pupils. Also, if twelve pupils were observed for approximately three days, fifteen minutes was a sufficient observation period.

Twenty minutes was the next observation period examined. Table 13 shows the coefficients that resulted from comparing this observation period with the twenty day criterion. When one pupil was selected randomly each day, nineteen days were required to attain a consistent acceptable level of .85 or above. But when observational measurements were made on fourteen pupils, acceptable coefficients were yielded after only two days of observance. Comparing these coefficients with those obtained for the thirty minute observation period (Table 1) revealed that the twenty minute observation period was as acceptable as the thirty minute observation period. Only a few more

indices fell below the .85 acceptance level than with the thirty minute observation period. Furthermore, approximately two-thirds of the coefficients for the twenty minute observation period were .90 or above. However, the column for thirty-three pupils does show slightly lower levels of agreement than those computed for the thirty minute period but both observation periods showed consistent acceptable levels were maintained for thirty-three pupils after the second day's activities were added. It was concluded, therefore, that twenty minutes was a sufficient observation period for the every thirty-second time interval.

General Conclusions

Several general conclusions were drawn from this study.

(1) It was found that when the time interval between recording observations and the length of the observation period were held constant, the number of pupils necessary to observe to reach an acceptable level of agreement was inversely related to the number of days of observation.

(2) The one minute and the two minute time intervals were as efficient as the every thirty second recording interval when the observation period was thirty minutes in length.

(3) With a few more additional pupils and days, the four minute time interval proved to be as satisfactory as the smaller time intervals if the observation period was thirty minutes in length.

(4) The six, eight, ten, twelve, and fourteen minute time intervals were not adequate. Several additional days or pupils had to be added in order to overcome the lack of a sufficient number of observations needed to produce a consistent and acceptable level of agreement. Therefore, these time intervals are not generally recommended.

(5) When the time interval between recording observations was thirty seconds, the twenty minute observation period was as efficient as the thirty minute period.

(6) When a few additional days or pupils were added, the fifteen minute observation period and the every thirty seconds time interval

were as satisfactory as the thirty minute observation period and the every thirty seconds time interval.

(7) The five and ten minute observation periods were not efficient observation periods with the every thirty seconds interval. Therefore, these observation periods are not generally recommended.

In summary, the general conclusion reached is that it is not necessary to record the behavior of every pupil in order to describe the activities of an entire class. Efficient methods of observation are possible through various sampling plans and observational methods.

Application

This study has identified several efficient sampling designs for studying pupil classroom activities. It has also shown that it is not always necessary to record the activities of the entire class in order to assess total class behavior. The amount of time and money spent on observational measurements, therefore, can be reduced if efficient designs are employed. Adaptations of the designs presented in this study could be utilized easily in many classroom studies which compare pupil classroom activities either between schools or within schools and either across grade levels or within the same grade level. These designs might also be used to test innovative classroom procedures or to compare new procedures to existing classroom methods in order to determine the extent to which desired pupil activity changes are occurring. In addition, this research could be utilized to direct further methodological studies of the same type using either the same or different variables.

TABLE 1

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY THIRTY SECONDS FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.38	.17	.04	.15	.20	.75	.77	.73	.69	.81	.84	.72	.55	.63	.66	.72	.79	.79	.73	.74	.76	.78	.79	.70	.71	.72	.72	.74	.67	.72	.65	.67	.69
2	.07	.52	.43	.58	.68	.87	.86	.79	.75	.76	.74	.83	.84	.86	.86	.94	.94	.93	.92	.93	.92	.92	.91	.90	.90	.90	.90	.93	.92	.93	.91	.91	.92
3	.42	.74	.63	.68	.71	.87	.83	.85	.79	.79	.77	.85	.87	.86	.86	.91	.91	.90	.89	.90	.90	.88	.87	.88	.88	.87	.86	.88	.90	.89	.90	.90	.91
4	.53	.77	.73	.79	.82	.88	.86	.85	.84	.85	.84	.84	.86	.85	.85	.89	.89	.88	.88	.88	.88	.88	.87	.87	.86	.86	.85	.88	.88	.87	.88	.87	.87
5	.66	.71	.62	.70	.76	.89	.87	.86	.83	.86	.82	.85	.86	.84	.84	.87	.86	.86	.88	.87	.87	.84	.82	.83	.82	.82	.82	.83	.84	.83	.85	.83	.84
6	.72	.70	.66	.76	.79	.89	.86	.84	.79	.84	.81	.84	.85	.81	.81	.85	.85	.86	.88	.86	.87	.84	.82	.83	.82	.83	.82	.84	.86	.85	.87	.86	.86
7	.78	.81	.73	.83	.84	.89	.88	.86	.81	.86	.84	.87	.90	.86	.86	.89	.90	.91	.92	.91	.91	.91	.89	.90	.91	.91	.88	.90	.91	.91	.92	.91	.92
8	.83	.91	.85	.92	.92	.96	.96	.95	.90	.93	.92	.94	.96	.93	.92	.95	.97	.97	.97	.97	.96	.97	.95	.95	.93	.94	.93	.94	.95	.95	.96	.95	.95
9	.80	.81	.85	.86	.91	.87	.88	.90	.93	.90	.91	.89	.87	.91	.92	.91	.90	.90	.88	.90	.89	.91	.93	.92	.94	.93	.94	.94	.94	.94	.93	.94	.94
10	.81	.81	.86	.86	.71	.86	.86	.88	.91	.89	.90	.88	.86	.90	.91	.90	.90	.89	.88	.89	.90	.91	.93	.92	.93	.93	.93	.93	.94	.93	.93	.94	.94
11	.82	.84	.89	.92	.94	.91	.90	.93	.94	.92	.93	.91	.89	.92	.93	.92	.91	.91	.91	.92	.92	.93	.95	.94	.95	.94	.95	.95	.95	.95	.95	.95	.95
12	.85	.84	.92	.89	.94	.91	.90	.92	.96	.93	.95	.92	.90	.93	.94	.93	.92	.92	.92	.93	.93	.94	.96	.96	.97	.96	.97	.97	.97	.96	.96	.96	.96
13	.86	.86	.92	.94	.95	.94	.93	.96	.94	.96	.95	.94	.93	.95	.96	.95	.95	.95	.94	.96	.95	.96	.97	.97	.97	.97	.98	.98	.98	.97	.97	.98	.97
14	.88	.87	.93	.94	.94	.94	.94	.96	.95	.96	.96	.95	.93	.96	.97	.96	.96	.96	.95	.97	.96	.97	.98	.98	.98	.98	.99	.99	.99	.98	.98	.98	.98
15	.92	.86	.92	.91	.94	.92	.93	.95	.98	.94	.94	.94	.94	.95	.96	.95	.95	.95	.95	.96	.95	.95	.96	.96	.96	.97	.97	.97	.97	.97	.98	.98	.97
16	.93	.87	.94	.92	.95	.92	.92	.95	.96	.95	.95	.94	.93	.95	.96	.95	.95	.95	.94	.95	.95	.96	.97	.97	.97	.97	.97	.98	.98	.98	.97	.97	.97
17	.94	.86	.94	.93	.97	.95	.94	.97	.94	.95	.96	.96	.95	.96	.97	.96	.96	.97	.96	.97	.96	.97	.97	.98	.98	.98	.98	.99	.99	.99	.99	.98	.98
18	.92	.88	.95	.95	.97	.96	.95	.96	.94	.95	.96	.97	.96	.97	.97	.97	.97	.98	.97	.97	.97	.98	.98	.98	.99	.99	.99	.99	.99	.99	.99	.98	.99
19	.92	.89	.93	.93	.96	.93	.93	.96	.96	.97	.97	.96	.95	.97	.97	.96	.95	.96	.95	.96	.96	.97	.98	.98	.99	.98	.99	.99	.99	.99	.98	.98	.99
20	.91	.90	.94	.94	.97	.93	.94	.97	.97	.97	.98	.96	.96	.97	.98	.97	.96	.96	.96	.96	.97	.98	.98	.99	.99	.99	.99	.99	.99	.99	.99	.99	1.00

*Underlined values indicate agreement level of .85 or greater.

TABLE 2

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY ONE MINUTE FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	.29	.12	.11	.19	.24	.21	.34	.36	.35	.52	.58	.85	.75	.84	.84	.89	.95	.94	.87	.86	.89	.90	.91	.81	.81	.82	.81	.83	.76	.81	.73	.74	.77
2	.09	.53	.48	.63	.75	.69	.70	.64	.61	.63	.62	.77	.88	.87	.86	.92	.89	.90	.92	.90	.91	.86	.86	.90	.89	.89	.88	.92	.92	.92	.92	.91	.92
3	.46	.75	.69	.73	.77	.75	.72	.70	.73	.73	.72	.84	.89	.87	.87	.91	.88	.88	.90	.87	.88	.83	.83	.86	.84	.84	.83	.85	.88	.86	.89	.87	.88
4	.55	.77	.75	.84	.86	.83	.79	.82	.79	.81	.79	.86	.83	.87	.86	.91	.90	.90	.89	.89	.89	.86	.86	.85	.84	.84	.83	.84	.86	.85	.86	.85	.85
5	.66	.71	.74	.75	.81	.83	.82	.83	.80	.83	.80	.83	.88	.82	.83	.85	.84	.84	.87	.85	.85	.82	.81	.82	.80	.81	.80	.81	.83	.83	.84	.83	.83
6	.68	.68	.66	.78	.81	.82	.81	.80	.76	.80	.78	.80	.85	.79	.79	.82	.82	.83	.86	.83	.84	.81	.80	.81	.80	.82	.81	.82	.85	.84	.87	.86	.86
7	.75	.82	.75	.85	.86	.85	.84	.82	.79	.84	.82	.85	.90	.85	.85	.88	.88	.89	.92	.90	.91	.90	.88	.89	.88	.89	.88	.89	.91	.91	.92	.91	.91
8	.80	.91	.86	.91	.94	.94	.93	.92	.89	.91	.91	.92	.96	.92	.91	.93	.95	.95	.98	.96	.96	.96	.94	.94	.93	.92	.93	.94	.95	.95	.96	.95	.95
9	.76	.79	.83	.84	.89	.87	.88	.91	.90	.89	.89	.90	.88	.90	.91	.90	.90	.91	.89	.91	.90	.91	.92	.91	.92	.93	.92	.93	.93	.93	.93	.94	.93
10	.76	.79	.85	.84	.89	.87	.88	.89	.90	.90	.89	.90	.87	.90	.91	.90	.90	.90	.88	.90	.90	.90	.91	.90	.91	.92	.91	.92	.92	.92	.92	.93	.92
11	.79	.83	.89	.90	.92	.89	.90	.92	.93	.91	.91	.92	.89	.91	.93	.92	.92	.92	.90	.92	.92	.92	.93	.93	.93	.94	.94	.94	.94	.91	.94	.94	.94
12	.81	.82	.92	.87	.93	.91	.91	.92	.94	.93	.93	.92	.90	.95	.94	.93	.92	.93	.92	.94	.93	.94	.95	.95	.95	.95	.96	.96	.96	.95	.95	.95	.95
13	.82	.86	.93	.9	.95	.92	.92	.94	.92	.94	.94	.95	.93	.94	.94	.94	.94	.95	.94	.96	.95	.95	.96	.96	.96	.97	.97	.97	.97	.97	.97	.97	.96
14	.85	.88	.93	.93	.94	.93	.93	.94	.93	.95	.94	.95	.94	.95	.95	.95	.95	.96	.95	.97	.96	.96	.97	.97	.97	.98	.98	.98	.98	.98	.97	.97	.98
15	.92	.86	.92	.91	.94	.91	.92	.94	.92	.93	.94	.94	.93	.94	.95	.94	.92	.95	.95	.95	.95	.95	.95	.95	.96	.97	.96	.97	.97	.97	.97	.97	.97
16	.92	.86	.95	.90	.93	.93	.92	.94	.94	.94	.94	.95	.93	.95	.96	.95	.95	.95	.94	.96	.95	.95	.96	.96	.97	.97	.97	.97	.97	.97	.96	.96	.97
17	.91	.85	.94	.91	.85	.95	.95	.95	.93	.94	.95	.96	.95	.95	.96	.95	.96	.97	.96	.97	.97	.97	.97	.97	.98	.98	.98	.98	.98	.98	.98	.98	.98
18	.89	.87	.95	.93	.97	.96	.94	.94	.92	.93	.94	.97	.95	.94	.95	.95	.96	.97	.97	.98	.97	.97	.97	.98	.98	.99	.99	.99	.99	.99	.99	.99	.99
19	.89	.87	.92	.92	.96	.94	.94	.96	.94	.96	.96	.97	.96	.96	.97	.97	.96	.97	.96	.97	.96	.97	.98	.98	.98	.98	.99	.99	.99	.99	.97	.98	.99
20	.91	.92	.94	.94	.97	.95	.95	.96	.94	.96	.97	.98	.97	.96	.97	.97	.98	.98	.97	.98	.97	.98	.98	.99	.99	.99	.99	.99	.99	.99	.97	.99	1.00

*Underlined values indicate agreement level of .85 or greater.

TABLE 3

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY TWO MINUTES FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Days

Cumulative Number of Students

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.13	.16	.15	.25	.31	.87	.89	.84	.80	.83	.84	.78	.60	.69	.70	.73	.81	.80	.73	.72	.74	.78	.80	.70	.71	.75	.75	.78	.70	.75	.67	.67	.70
2	.07	.50	.50	.65	.76	.84	.87	.85	.80	.76	.74	.85	.86	.88	.87	.93	.93	.92	.91	.90	.90	.89	.88	.88	.88	.89	.89	.91	.90	.90	.89	.88	.89
3	.56	.78	.66	.69	.76	.95	.93	.93	.90	.87	.85	.91	.91	.92	.89	.93	.93	.92	.91	.91	.91	.89	.88	.89	.88	.88	.86	.87	.90	.89	.90	.90	.90
4	.66	.86	.79	.86	.88	.93	.94	.91	.91	.91	.88	.90	.91	.89	.87	.91	.90	.90	.89	.89	.90	.89	.87	.88	.86	.86	.84	.86	.87	.86	.88	.87	.87
5	.73	.74	.69	.80	.84	.95	.93	.90	.93	.93	.90	.90	.91	.88	.87	.90	.90	.90	.90	.88	.88	.85	.84	.85	.83	.89	.82	.83	.85	.85	.86	.85	.85
6	.70	.65	.67	.79	.80	.93	.91	.88	.85	.88	.85	.85	.89	.83	.82	.84	.86	.87	.89	.86	.86	.84	.82	.83	.82	.84	.82	.83	.86	.86	.88	.87	.87
7	.76	.77	.75	.83	.83	.92	.89	.87	.83	.89	.86	.87	.90	.87	.87	.88	.90	.90	.94	.92	.93	.92	.90	.92	.91	.91	.90	.91	.93	.94	.93	.93	.93
8	.89	.85	.85	.93	.90	.94	.94	.95	.91	.94	.93	.95	.95	.92	.92	.92	.94	.95	.98	.97	.98	.98	.96	.96	.94	.94	.94	.95	.96	.96	.96	.96	.95
9	.78	.80	.84	.84	.87	.85	.85	.88	.88	.87	.86	.88	.86	.88	.90	.90	.90	.91	.89	.91	.91	.91	.92	.92	.91	.91	.91	.92	.92	.92	.92	.93	.92
10	.83	.80	.85	.87	.86	.83	.82	.84	.87	.85	.86	.87	.90	.88	.89	.89	.89	.90	.88	.90	.90	.91	.91	.91	.90	.90	.90	.91	.91	.91	.92	.92	.92
11	.88	.84	.85	.89	.88	.86	.86	.89	.89	.88	.88	.89	.86	.90	.91	.91	.90	.91	.90	.92	.92	.93	.94	.93	.92	.92	.93	.93	.93	.94	.93	.94	.93
12	.91	.88	.88	.90	.89	.87	.85	.87	.90	.89	.90	.89	.87	.90	.92	.92	.91	.92	.90	.93	.93	.93	.95	.95	.94	.94	.95	.95	.95	.94	.94	.94	.95
13	.91	.87	.86	.90	.87	.89	.89	.91	.91	.91	.91	.92	.90	.92	.94	.94	.94	.95	.93	.94	.94	.95	.96	.96	.95	.95	.96	.96	.96	.96	.96	.96	.96
14	.90	.89	.85	.90	.87	.91	.91	.93	.93	.91	.92	.93	.91	.94	.95	.95	.95	.96	.95	.96	.96	.96	.97	.97	.97	.97	.97	.98	.98	.97	.97	.97	.98
15	.86	.88	.85	.91	.89	.89	.90	.92	.92	.91	.91	.92	.90	.92	.94	.94	.94	.94	.94	.95	.94	.94	.95	.96	.95	.95	.95	.96	.96	.96	.96	.97	.97
16	.86	.90	.90	.92	.92	.90	.90	.90	.93	.92	.92	.91	.90	.93	.92	.94	.93	.94	.93	.94	.94	.94	.96	.96	.96	.95	.96	.96	.96	.96	.95	.96	.96
17	.87	.92	.93	.94	.92	.93	.92	.94	.93	.93	.93	.94	.93	.94	.95	.95	.95	.96	.95	.96	.96	.96	.97	.97	.97	.97	.97	.98	.98	.98	.97	.98	.98
18	.90	.92	.94	.94	.92	.94	.93	.95	.92	.93	.93	.95	.93	.94	.94	.94	.96	.96	.96	.97	.97	.97	.97	.98	.97	.97	.98	.98	.99	.99	.98	.98	.98
19	.89	.92	.97	.96	.94	.94	.93	.95	.94	.95	.95	.95	.94	.95	.97	.96	.96	.96	.96	.96	.96	.97	.97	.98	.98	.98	.98	.99	.99	.99	.98	.98	.99
20	.85	.95	.94	.95	.94	.95	.94	.96	.95	.96	.96	.96	.95	.96	.97	.96	.97	.98	.97	.97	.97	.98	.98	.99	.99	.98	.99	.99	.99	.99	.98	.99	1.00

*Underlined values indicate agreement level of .85 or greater

TABLE 4

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY FOUR MINUTES FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.17	-.09	-.31	-.05	.13	.69	.69	.62	.57	.64	.69	.87	.69	.79	.81	.84	.91	.90	.86	.84	.85	.87	.89	.82	.83	.86	.88	.90	.81	.85	.77	.77	.79
2	-.09	.43	.30	.44	.68	.74	.74	.74	.70	.67	.64	.77	.82	.80	.78	.86	.86	.84	.83	.83	.85	.83	.81	.84	.82	.81	.82	.84	.86	.85	.85	.85	.86
3	.56	.60	.39	.43	.57	.77	.76	.79	.78	.75	.71	.83	.83	.81	.80	.85	.85	.83	.82	.83	.85	.83	.82	.83	.80	.80	.79	.80	.84	.83	.86	.86	.86
4	.73	.90	.66	.67	.72	.84	.82	.81	.82	.82	.78	.84	.85	.81	.81	.85	.85	.82	.82	.83	.86	.85	.82	.83	.80	.80	.79	.78	.81	.82	.84	.84	.85
5	.64	.73	.56	.64	.71	.81	.81	.79	.81	.84	.80	.82	.84	.80	.79	.81	.83	.80	.82	.82	.84	.81	.79	.79	.78	.78	.78	.78	.82	.83	.84	.84	.84
6	.74	.58	.57	.69	.71	.80	.80	.77	.76	.81	.78	.80	.83	.78	.77	.79	.81	.79	.82	.81	.82	.80	.78	.79	.78	.78	.77	.78	.82	.82	.84	.84	.84
7	.80	.67	.64	.76	.78	.81	.83	.78	.76	.83	.81	.83	.88	.83	.83	.84	.85	.84	.86	.87	.88	.88	.85	.87	.85	.84	.84	.85	.88	.89	.90	.90	.90
8	.90	.75	.76	.89	.88	.90	.89	.87	.84	.88	.89	.90	.94	.88	.88	.89	.90	.89	.92	.91	.92	.93	.91	.91	.89	.89	.88	.90	.91	.92	.93	.93	.92
9	.82	.83	.88	.89	.92	.91	.91	.94	.91	.92	.90	.91	.89	.92	.93	.93	.93	.94	.93	.95	.94	.93	.94	.93	.94	.94	.94	.94	.94	.95	.95	.95	.95
10	.84	.86	.83	.92	.96	.90	.88	.93	.92	.90	.89	.90	.88	.91	.93	.91	.91	.93	.91	.93	.92	.92	.92	.91	.92	.92	.92	.92	.92	.93	.93	.94	.93
11	.83	.88	.88	.93	.96	.93	.91	.95	.94	.91	.91	.90	.87	.92	.93	.92	.91	.93	.91	.94	.93	.94	.95	.94	.94	.94	.94	.94	.94	.95	.95	.95	.95
12	.86	.91	.96	.93	.90	.93	.94	.91	.93	.91	.93	.91	.88	.92	.94	.93	.92	.94	.92	.95	.95	.96	.96	.95	.96	.96	.96	.96	.96	.96	.96	.96	.96
13	.91	.91	.90	.92	.93	.95	.94	.96	.93	.95	.94	.94	.92	.95	.95	.94	.96	.96	.96	.98	.97	.97	.96	.97	.97	.98	.97	.97	.97	.98	.98	.98	.97
14	.89	.94	.90	.93	.92	.96	.95	.96	.95	.95	.95	.94	.96	.96	.96	.95	.96	.96	.96	.97	.97	.98	.96	.97	.99	.99	.98	.98	.98	.99	.98	.98	.98
15	.88	.91	.90	.92	.94	.95	.93	.95	.94	.93	.93	.93	.91	.95	.96	.95	.95	.96	.95	.96	.96	.96	.97	.96	.97	.97	.96	.98	.98	.98	.97	.98	.98
16	.86	.93	.92	.93	.95	.95	.96	.95	.94	.93	.94	.93	.91	.94	.96	.95	.94	.95	.94	.95	.94	.96	.97	.97	.97	.97	.98	.98	.98	.97	.96	.97	.97
17	.85	.95	.93	.93	.93	.95	.95	.95	.92	.93	.94	.95	.94	.95	.94	.94	.95	.94	.95	.97	.97	.96	.95	.96	.97	.97	.97	.97	.97	.98	.98	.98	.97
18	.83	.95	.94	.92	.92	.95	.95	.94	.91	.92	.93	.95	.94	.93	.93	.93	.94	.93	.94	.96	.96	.96	.94	.95	.96	.97	.97	.96	.96	.97	.98	.97	.97
19	.85	.96	.95	.94	.93	.96	.95	.96	.92	.94	.95	.96	.95	.95	.95	.94	.96	.95	.96	.97	.97	.96	.95	.96	.96	.97	.97	.97	.96	.97	.98	.97	.97
20	.86	.93	.95	.93	.91	.97	.95	.96	.93	.94	.95	.97	.96	.95	.95	.94	.96	.95	.96	.97	.97	.96	.95	.96	.96	.97	.97	.97	.96	.97	.98	.97	.97

*Underlined values indicate agreement level of .85 or greater.

TABLE 5

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY SIX MINUTES FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.47	-.71	-.32	-.14	.03	.09	.28	.31	.32	.51	.59	.78	.68	.73	.77	.77	.80	.79	.72	.71	.74	.80	.78	.68	.70	.75	.77	.78	.70	.74	.66	.68	.72
2	-.47	-.05	.09	.16	.42	.43	.42	.42	.43	.47	.46	.61	.79	.76	.74	.80	.72	.72	.74	.74	.75	.72	.75	.78	.77	.74	.74	.76	.79	.77	.77	.78	.76
3	.16	.09	.06	.22	.42	.54	.54	.57	.53	.55	.54	.66	.79	.74	.76	.77	.72	.72	.74	.73	.75	.71	.73	.74	.72	.70	.69	.69	.73	.71	.72	.72	.72
4	.45	.42	.40	.48	.62	.69	.67	.67	.63	.68	.66	.72	.82	.77	.76	.74	.69	.68	.69	.69	.73	.71	.72	.72	.69	.69	.69	.69	.72	.71	.71	.71	.71
5	.44	.31	.40	.44	.59	.68	.61	.69	.66	.72	.70	.72	.78	.73	.73	.71	.70	.68	.69	.69	.71	.70	.71	.70	.69	.69	.69	.69	.73	.73	.72	.71	.71
6	.26	.13	.34	.41	.51	.61	.60	.57	.56	.63	.62	.64	.70	.65	.65	.64	.63	.64	.67	.70	.67	.67	.67	.67	.66	.69	.69	.69	.72	.72	.72	.72	.72
7	.56	.43	.46	.52	.58	.61	.60	.59	.57	.67	.67	.69	.75	.72	.67	.71	.70	.70	.74	.74	.75	.76	.76	.77	.75	.76	.77	.77	.80	.80	.79	.79	.79
8	.55	.44	.54	.58	.66	.69	.68	.70	.70	.75	.78	.78	.83	.79	.72	.77	.76	.76	.80	.80	.81	.82	.82	.81	.80	.82	.82	.82	.85	.85	.85	.84	.84
9	.57	.52	.63	.60	.66	.71	.70	.72	.74	.79	.81	.83	.86	.84	.84	.83	.84	.84	.87	.88	.88	.87	.88	.88	.88	.90	.89	.89	.91	.92	.92	.91	.90
10	.64	.57	.65	.65	.72	.76	.76	.78	.79	.84	.86	.87	.89	.87	.87	.85	.86	.86	.88	.89	.89	.88	.88	.88	.88	.90	.90	.90	.92	.92	.92	.89	.90
11	.68	.64	.69	.66	.76	.81	.80	.80	.82	.70	.91	.93	.91	.92	.91	.89	.90	.90	.91	.92	.93	.92	.92	.92	.92	.94	.94	.94	.95	.95	.94	.94	.93
12	.65	.70	.75	.74	.80	.83	.85	.86	.87	.92	.92	.94	.93	.93	.92	.90	.92	.91	.93	.94	.94	.92	.92	.93	.93	.95	.94	.95	.95	.95	.94	.94	.93
13	.68	.70	.76	.72	.78	.80	.83	.84	.83	.89	.90	.92	.93	.91	.89	.88	.89	.88	.90	.91	.92	.92	.91	.92	.92	.94	.93	.92	.93	.93	.92	.92	.91
14	.75	.77	.76	.76	.80	.81	.82	.84	.84	.89	.90	.93	.93	.91	.89	.88	.89	.88	.90	.91	.92	.92	.91	.92	.92	.94	.94	.93	.93	.93	.92	.92	.91
15	.78	.81	.82	.81	.86	.85	.85	.86	.86	.89	.89	.91	.92	.92	.90	.90	.90	.91	.92	.94	.92	.94	.93	.93	.92	.96	.94	.95	.93	.95	.92	.94	.91
16	.77	.85	.87	.85	.88	.89	.88	.88	.88	.90	.89	.92	.92	.93	.91	.91	.91	.93	.92	.95	.94	.95	.92	.95	.95	.97	.97	.96	.96	.96	.96	.95	.94
17	.83	.88	.90	.85	.87	.87	.86	.86	.87	.89	.89	.91	.92	.91	.91	.90	.91	.93	.92	.94	.94	.94	.93	.94	.94	.95	.95	.94	.93	.93	.93	.92	.92
18	.84	.90	.89	.85	.86	.87	.80	.84	.86	.88	.88	.90	.90	.90	.89	.90	.91	.91	.92	.94	.94	.94	.93	.94	.94	.95	.94	.93	.93	.92	.92	.92	.91
19	.82	.90	.92	.87	.89	.91	.88	.87	.88	.90	.91	.92	.92	.92	.92	.92	.94	.94	.94	.95	.95	.95	.94	.95	.94	.95	.94	.94	.93	.93	.92	.92	.91
20	.76	.91	.91	.89	.94	.91	.90	.89	.88	.91	.91	.92	.92	.92	.91	.91	.92	.92	.92	.94	.94	.93	.93	.93	.93	.94	.93	.93	.92	.92	.91	.91	.90

*Underlined values indicate agreement level of .85 or greater.

TABLE 6

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN CBSERVATIONS RECORDED EVERY EIGHT MINUTES FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.56	-.38	-.54	-.64	.01	-.11	.00	.08	.14	.32	.46	.74	.83	.86	.85	.90	.83	.82	.87	.85	.84	.79	.78	.84	.83	.82	.82	.85	.84	.83	.81	.79	.81
2	.22	.67	.48	.36	.72	.57	.57	.51	.52	.53	.54	.69	.82	.79	.79	.31	.80	.76	.78	.72	.71	.69	.69	.73	.71	.70	.72	.75	.78	.75	.77	.76	.76
3	.53	.66	.39	.31	.62	.63	.59	.64	.61	.61	.61	.73	.81	.76	.78	.80	.77	.74	.77	.71	.73	.69	.69	.70	.67	.67	.68	.69	.73	.71	.73	.74	.74
4	.51	.28	.67	.61	.75	.74	.66	.66	.60	.69	.66	.71	.79	.73	.64	.75	.75	.71	.74	.70	.75	.72	.71	.72	.69	.71	.70	.70	.73	.73	.76	.77	.77
5	.63	.71	.56	.59	.74	.76	.78	.74	.72	.83	.80	.81	.86	.81	.81	.80	.82	.77	.80	.77	.80	.78	.76	.77	.76	.78	.78	.78	.82	.83	.83	.84	.84
6	.58	.63	.58	.63	.79	.80	.79	.76	.73	.86	.84	.85	.88	.85	.84	.84	.86	.81	.84	.81	.82	.80	.79	.80	.79	.80	.79	.80	.83	.83	.83	.83	.83
7	.66	.78	.69	.69	.87	.84	.84	.76	.74	.85	.83	.84	.90	.85	.86	.84	.86	.82	.85	.84	.85	.86	.84	.86	.84	.84	.84	.85	.87	.86	.86	.86	.86
8	.71	.74	.69	.74	.89	.86	.87	.83	.81	.89	.91	.90	.94	.90	.91	.90	.92	.90	.93	.92	.93	.93	.91	.92	.90	.91	.90	.92	.94	.94	.93	.93	.93
9	.67	.67	.71	.75	.85	.85	.85	.84	.82	.84	.84	.85	.83	.85	.88	.89	.88	.90	.90	.91	.90	.90	.91	.89	.91	.91	.92	.92	.92	.93	.93	.94	.94
10	.72	.73	.68	.78	.87	.87	.87	.88	.85	.85	.85	.86	.82	.86	.89	.89	.89	.90	.89	.91	.91	.91	.91	.89	.90	.91	.91	.92	.91	.91	.92	.92	.93
11	.76	.78	.72	.77	.90	.89	.89	.90	.88	.86	.86	.85	.81	.86	.87	.89	.86	.89	.88	.90	.90	.91	.93	.91	.91	.90	.92	.92	.91	.92	.92	.92	.92
12	.79	.82	.77	.81	.90	.88	.89	.90	.88	.87	.88	.87	.83	.89	.88	.90	.88	.90	.89	.92	.92	.94	.95	.94	.94	.93	.94	.94	.94	.93	.94	.94	.95
13	.71	.88	.77	.81	.89	.86	.89	.88	.85	.89	.89	.90	.88	.91	.93	.93	.93	.94	.93	.95	.95	.96	.95	.95	.96	.96	.96	.97	.96	.97	.96	.96	.96
14	.71	.85	.80	.82	.91	.89	.91	.90	.86	.89	.89	.91	.89	.92	.93	.94	.93	.95	.93	.95	.96	.95	.96	.96	.96	.97	.97	.97	.96	.96	.96	.96	.96
15	.70	.84	.84	.87	.92	.91	.91	.93	.89	.88	.89	.90	.87	.91	.91	.92	.90	.93	.91	.92	.92	.94	.95	.94	.94	.94	.95	.96	.96	.96	.96	.96	.97
16	.75	.83	.89	.89	.92	.92	.93	.94	.90	.90	.90	.91	.87	.91	.91	.92	.90	.93	.91	.92	.92	.94	.95	.94	.94	.94	.95	.96	.96	.96	.95	.96	.97
17	.79	.81	.87	.86	.92	.94	.93	.92	.88	.91	.92	.93	.90	.93	.94	.95	.93	.95	.94	.95	.95	.96	.96	.97	.97	.97	.97	.97	.97	.97	.96	.96	.97
18	.84	.79	.88	.87	.92	.93	.92	.90	.87	.91	.91	.93	.95	.93	.94	.94	.94	.95	.95	.95	.95	.96	.95	.96	.97	.97	.97	.97	.96	.96	.96	.95	.95
19	.86	.84	.91	.87	.92	.93	.91	.89	.92	.91	.92	.94	.92	.94	.95	.95	.95	.95	.95	.96	.96	.96	.95	.96	.96	.97	.96	.96	.96	.95	.95	.96	.95	.95
20	.85	.83	.94	.89	.92	.94	.92	.90	.87	.94	.94	.95	.94	.94	.95	.95	.95	.96	.95	.97	.97	.96	.94	.96	.96	.96	.96	.96	.95	.95	.96	.95	.95

*Underlined values indicate agreement level of .85 or greater.

TABLE 7

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY TEN MINUTES FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.28	-.54	-.68	-.18	-.19	.03	-.09	.28	.36	.43	.33	.64	.71	.71	.71	.80	.79	.78	.79	.77	.82	.83	.83	.77	.78	.81	.86	.91	.82	.82	.78	.78	.81
2	-.54	-.18	-.06	.28	.58	.53	.37	.45	.68	.63	.51	.66	.77	.69	.65	.80	.72	.64	.65	.66	.71	.71	.72	.75	.76	.79	.79	.79	.82	.82	.84	.84	.82
3	.35	.53	.34	.51	.62	.60	.52	.52	.68	.70	.62	.72	.76	.68	.68	.78	.73	.70	.69	.70	.75	.76	.76	.76	.77	.80	.79	.77	.82	.83	.84	.84	.84
4	.50	.87	.73	.87	.88	.85	.76	.72	.84	.87	.80	.83	.84	.78	.74	.81	.78	.72	.73	.75	.70	.80	.80	.80	.82	.84	.82	.79	.83	.85	.86	.87	.86
5	.84	.65	.67	.86	.78	.81	.72	.68	.78	.84	.76	.76	.77	.71	.66	.75	.76	.72	.75	.77	.79	.78	.76	.79	.81	.84	.81	.80	.84	.86	.88	.87	.87
6	.87	.65	.69	.84	.72	.76	.66	.61	.68	.77	.71	.72	.73	.68	.65	.72	.72	.71	.75	.76	.77	.76	.74	.76	.78	.82	.80	.80	.83	.86	.88	.87	.86
7	.71	.74	.71	.84	.71	.76	.69	.65	.69	.77	.70	.73	.76	.74	.70	.75	.75	.74	.80	.80	.81	.80	.78	.80	.82	.85	.83	.83	.87	.89	.90	.89	.89
8	.73	.80	.77	.88	.77	.79	.75	.75	.78	.83	.82	.82	.82	.79	.76	.80	.81	.80	.85	.86	.86	.86	.83	.84	.86	.87	.86	.87	.90	.91	.92	.92	.91
9	.68	.67	.70	.82	.77	.77	.75	.83	.80	.81	.78	.80	.82	.80	.78	.80	.82	.82	.86	.88	.88	.86	.84	.85	.87	.89	.88	.89	.91	.92	.94	.94	.93
10	.70	.67	.73	.82	.79	.78	.81	.81	.81	.87	.83	.86	.88	.86	.84	.85	.87	.87	.90	.91	.90	.88	.86	.87	.89	.91	.89	.90	.92	.93	.94	.94	.94
11	.72	.70	.78	.85	.82	.81	.85	.83	.82	.89	.84	.75	.89	.87	.85	.85	.87	.88	.90	.91	.90	.89	.86	.88	.89	.91	.90	.91	.92	.94	.95	.94	.93
12	.84	.73	.81	.86	.85	.86	.84	.83	.81	.87	.82	.86	.89	.88	.86	.87	.88	.87	.91	.92	.90	.89	.86	.88	.89	.90	.89	.90	.91	.93	.93	.93	.92
13	.80	.73	.78	.88	.86	.85	.86	.83	.81	.88	.83	.88	.89	.87	.85	.86	.87	.87	.90	.91	.90	.89	.87	.88	.89	.91	.90	.90	.91	.92	.92	.92	.91
14	.81	.73	.79	.91	.83	.84	.84	.84	.80	.86	.81	.85	.86	.84	.82	.83	.84	.84	.87	.88	.87	.86	.84	.85	.87	.89	.87	.87	.88	.89	.90	.89	.89
15	.82	.73	.80	.87	.87	.87	.89	.86	.84	.88	.84	.89	.89	.87	.85	.85	.87	.87	.89	.91	.90	.89	.81	.88	.90	.92	.90	.90	.91	.92	.93	.93	.93
16	.91	.77	.84	.93	.89	.89	.89	.85	.84	.88	.84	.89	.88	.87	.85	.86	.88	.87	.90	.92	.92	.90	.88	.90	.91	.92	.91	.90	.91	.92	.94	.93	.93
17	.90	.80	.87	.94	.89	.88	.88	.84	.84	.87	.82	.87	.86	.85	.83	.84	.85	.87	.88	.90	.90	.88	.86	.88	.89	.90	.89	.89	.89	.90	.91	.91	.91
18	.85	.81	.87	.94	.91	.90	.89	.84	.84	.88	.84	.87	.86	.86	.84	.85	.86	.87	.89	.91	.90	.89	.86	.88	.89	.90	.90	.89	.89	.89	.91	.91	.90
19	.78	.76	.89	.91	.95	.95	.83	.89	.89	.92	.89	.92	.90	.90	.89	.89	.90	.91	.92	.91	.92	.91	.89	.91	.92	.93	.91	.91	.90	.91	.93	.92	.90
20	.84	.81	.89	.95	.92	.94	.93	.88	.89	.93	.90	.92	.90	.90	.89	.88	.87	.90	.91	.93	.92	.91	.88	.90	.91	.87	.91	.91	.90	.91	.93	.92	.91

*Underlined values indicate agreement level of .85 or greater.

TABLE 8

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY TWELVE MINUTES FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-1.33	-1.33	-1.33	-1.33	-.32	-.42	-.17	.06	.13	.43	.48	.76	.78	.81	.80	.88	.87	.86	.85	.83	.82	.83	.83	.77	.78	.82	.81	.85	.78	.82	.74	.74	.78
2	-1.33	-.56	-.79	-.56	.05	.10	.12	.15	.27	.35	.33	.52	.62	.60	.62	.69	.67	.64	.66	.64	.63	.61	.63	.68	.66	.64	.66	.67	.70	.69	.72	.73	.72
3	-1.33	-.79	-.95	-.54	-.05	.13	.12	.16	.31	.38	.40	.54	.66	.62	.67	.70	.69	.65	.67	.65	.66	.64	.65	.67	.64	.62	.62	.61	.66	.64	.65	.66	.65
4	-.56	.03	-.15	.14	.30	.41	.37	.46	.50	.63	.63	.69	.80	.74	.78	.78	.77	.74	.75	.73	.73	.71	.71	.72	.70	.70	.68	.67	.70	.69	.70	.72	.72
5	-.69	-.18	-.18	.12	.36	.46	.48	.53	.54	.68	.66	.69	.76	.72	.73	.73	.73	.70	.71	.70	.69	.68	.68	.69	.69	.70	.69	.68	.72	.72	.72	.73	.74
6	-.79	-.34	-.09	.19	.35	.40	.40	.46	.49	.62	.63	.66	.73	.68	.68	.69	.72	.68	.72	.70	.68	.68	.68	.70	.71	.74	.73	.73	.76	.75	.76	.76	.76
7	-.47	.03	.08	.30	.43	.44	.44	.47	.52	.65	.68	.71	.79	.74	.75	.75	.77	.74	.79	.78	.77	.77	.77	.79	.79	.80	.79	.79	.83	.83	.82	.82	.82
8	-.23	-.01	.11	.39	.49	.50	.50	.55	.61	.71	.77	.78	.84	.79	.79	.79	.80	.77	.82	.81	.80	.81	.81	.82	.81	.84	.84	.84	.87	.87	.87	.87	.87
9	.03	.24	.32	.46	.53	.58	.56	.63	.72	.81	.84	.87	.91	.87	.87	.87	.90	.88	.90	.91	.89	.88	.89	.89	.88	.91	.90	.90	.92	.92	.92	.91	.90
10	.12	.33	.35	.49	.59	.65	.64	.72	.78	.86	.89	.91	.94	.90	.90	.89	.92	.90	.92	.93	.90	.88	.89	.90	.90	.92	.92	.92	.94	.94	.94	.94	.93
11	.26	.46	.48	.57	.67	.74	.74	.79	.84	.90	.91	.93	.88	.93	.94	.95	.93	.96	.95	.95	.97	.95	.95	.94	.94	.92	.93	.94	.93	.93	.93	.93	.94
12	.26	.54	.57	.63	.68	.72	.74	.80	.84	.92	.94	.96	.94	.96	.95	.94	.97	.94	.95	.96	.93	.92	.92	.93	.93	.95	.94	.94	.95	.95	.94	.94	.93
13	.21	.47	.54	.60	.66	.69	.72	.75	.78	.87	.90	.95	.95	.92	.90	.88	.91	.89	.93	.91	.90	.89	.89	.89	.90	.92	.91	.91	.91	.91	.91	.91	.90
14	.38	.63	.62	.65	.67	.71	.73	.77	.80	.87	.90	.92	.93	.91	.90	.89	.91	.90	.91	.91	.90	.89	.89	.89	.90	.92	.91	.90	.91	.91	.91	.91	.90
15	.41	.66	.65	.70	.73	.74	.76	.81	.83	.88	.91	.93	.92	.93	.93	.92	.94	.92	.93	.95	.94	.93	.92	.93	.93	.95	.95	.94	.94	.94	.95	.94	.94
16	.44	.69	.71	.7	.74	.77	.78	.83	.84	.89	.91	.93	.91	.93	.94	.93	.95	.95	.95	.96	.95	.94	.93	.94	.95	.96	.96	.95	.96	.96	.96	.96	.95
17	.47	.71	.73	.73	.77	.75	.75	.79	.81	.86	.87	.81	.92	.92	.92	.91	.92	.92	.92	.94	.93	.91	.91	.92	.93	.94	.94	.93	.93	.93	.94	.93	.92
18	.66	.77	.76	.75	.74	.77	.76	.79	.82	.86	.87	.90	.91	.91	.91	.91	.92	.92	.92	.94	.93	.92	.91	.93	.94	.94	.94	.93	.93	.93	.94	.93	.93
19	.67	.79	.81	.78	.77	.83	.82	.83	.86	.90	.91	.93	.94	.94	.94	.93	.95	.95	.94	.96	.94	.93	.92	.93	.93	.94	.94	.93	.92	.92	.90	.93	.92
20	.61	.80	.82	.79	.78	.85	.85	.85	.87	.91	.92	.94	.94	.94	.94	.94	.95	.94	.94	.96	.94	.93	.92	.92	.92	.94	.93	.92	.91	.92	.93	.92	.91

*Underlined values indicate agreement level of .85 or greater.

TABLE 9

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY FOURTEEN MINUTES FOR THIRTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	.55	.55	.32	.46	.43	.67	.71	.71	.71	.63	.77	.58	.43	.53	.55	.58	.66	.68	.68	.68	.68	.71	.72	.62	.63	.69	.69	.74	.66	.70	.63	.63	.63
2	.01	.01	-.35	.24	.55	.66	.63	.63	.62	.69	.71	.73	.82	.80	.79	.84	.83	.82	.81	.80	.78	.60	.79	.79	.77	.77	.76	.78	.77	.77	.76	.78	.79
3	.32	.01	.13	.33	.55	.76	.77	.72	.74	.75	.76	.84	.91	.84	.84	.87	.84	.84	.82	.79	.80	.79	.75	.78	.75	.73	.74	.76	.72	.82	.85	.86	.86
4	.55	.66	.61	.72	.69	.84	.87	.84	.80	.86	.84	.89	.90	.87	.89	.87	.87	.89	.85	.82	.86	.84	.80	.81	.79	.77	.75	.77	.80	.82	.85	.85	.76
5	.53	.39	.70	.76	.80	.83	.83	.80	.80	.86	.88	.85	.89	.89	.87	.87	.86	.89	.86	.84	.87	.85	.81	.83	.83	.83	.80	.79	.83	.85	.86	.86	.86
6	.32	.18	.68	.73	.72	.78	.78	.76	.73	.77	.76	.76	.79	.76	.73	.75	.76	.80	.80	.78	.82	.80	.76	.79	.80	.80	.79	.78	.81	.83	.84	.85	.86
7	.40	.41	.74	.75	.79	.79	.78	.75	.75	.80	.79	.79	.82	.80	.79	.79	.79	.83	.83	.84	.85	.85	.84	.83	.82	.83	.84	.84	.84	.84	.84	.86	.86
8	.66	.44	.72	.81	.83	.84	.83	.82	.80	.85	.86	.85	.87	.85	.83	.83	.83	.86	.86	.87	.88	.88	.87	.86	.86	.86	.87	.87	.86	.87	.87	.89	.86
9	.68	.60	.76	.86	.85	.85	.86	.86	.87	.89	.90	.88	.87	.92	.91	.92	.92	.94	.93	.94	.92	.93	.96	.94	.95	.94	.95	.95	.95	.94	.93	.94	.94
10	.69	.66	.75	.85	.87	.82	.84	.82	.88	.87	.89	.88	.86	.91	.93	.94	.93	.92	.90	.92	.91	.92	.96	.94	.94	.93	.95	.95	.94	.93	.93	.95	.94
11	.67	.69	.73	.81	.84	.88	.88	.89	.86	.88	.89	.91	.91	.93	.92	.91	.93	.95	.94	.97	.95	.95	.97	.96	.97	.96	.97	.97	.96	.95	.95	.97	.96
12	.67	.78	.78	.84	.84	.89	.89	.91	.89	.89	.90	.92	.89	.94	.93	.93	.94	.93	.93	.95	.94	.94	.98	.97	.97	.96	.97	.98	.97	.96	.96	.97	.97
13	.71	.79	.78	.83	.81	.89	.90	.92	.89	.88	.89	.94	.94	.94	.93	.91	.92	.95	.96	.97	.96	.96	.97	.97	.97	.98	.97	.97	.97	.98	.98	.98	.98
14	.69	.81	.80	.82	.81	.90	.91	.93	.89	.90	.90	.94	.96	.94	.93	.91	.92	.96	.95	.96	.98	.98	.95	.95	.96	.97	.95	.94	.95	.96	.96	.92	.94
15	.69	.87	.87	.89	.90	.90	.92	.91	.94	.93	.94	.93	.90	.94	.97	.95	.96	.96	.95	.96	.95	.95	.98	.98	.99	.98	.98	.98	.98	.98	.98	.98	.99
16	.69	.84	.86	.89	.91	.88	.89	.90	.93	.92	.94	.91	.89	.92	.94	.95	.94	.93	.92	.94	.93	.93	.96	.96	.96	.95	.97	.98	.97	.95	.96	.98	.98
17	.68	.84	.89	.90	.90	.91	.91	.93	.93	.92	.94	.94	.91	.94	.96	.95	.95	.96	.95	.96	.95	.96	.97	.98	.97	.97	.97	.97	.97	.97	.97	.98	.98
18	.68	.82	.88	.89	.91	.89	.90	.92	.92	.93	.95	.93	.91	.94	.95	.96	.95	.95	.94	.96	.95	.95	.97	.97	.97	.96	.97	.97	.97	.97	.97	.98	.98
19	.68	.81	.87	.90	.93	.88	.88	.91	.93	.93	.96	.93	.92	.93	.94	.95	.95	.94	.94	.95	.94	.95	.97	.97	.97	.96	.97	.97	.96	.96	.97	.97	.98
20	.67	.83	.88	.91	.92	.90	.90	.93	.93	.93	.96	.95	.94	.95	.96	.96	.96	.96	.96	.97	.97	.97	.97	.98	.97	.96	.97	.96	.96	.96	.96	.96	.97

*Underlined values indicate agreement level of .85 or greater

TABLE 10

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY THIRTY SECONDS FOR FIVE MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.40	-.25	-.20	-.04	-.08	-.19	-.19	.10	.12	.44	.33	.65	.76	.77	.76	.89	.86	.79	.74	.78	.89	.83	.86	.90	.89	.91	.89	.90	.88	.93	.85	.87	.90
2	.23	.21	.22	.40	.76	.78	.71	.69	.62	.69	.58	.72	.89	.86	.87	.86	.87	.83	.78	.81	.90	.84	.90	.94	.94	.91	.87	.86	.89	.85	.90	.87	.85
3	.55	.70	.74	.71	.85	.93	.81	.90	.87	.86	.79	.84	.90	.89	.87	.87	.87	.84	.80	.82	.87	.82	.84	.87	.84	.87	.82	.82	.86	.82	.86	.85	.83
4	.68	.79	.72	.86	.91	.90	.82	.88	.84	.88	.83	.85	.89	.87	.85	.93	.95	.91	.90	.90	.92	.87	.85	.87	.84	.87	.83	.85	.85	.84	.87	.86	.86
5	.71	.66	.75	.83	.92	.88	.92	.86	.87	.84	.87	.86	.90	.88	.87	.94	.95	.94	.92	.93	.93	.89	.87	.88	.84	.87	.84	.84	.87	.87	.90	.89	.91
6	.76	.73	.73	.75	.88	.89	.90	.89	.88	.88	.86	.85	.87	.85	.85	.89	.92	.92	.93	.92	.93	.89	.87	.88	.85	.88	.85	.84	.86	.87	.90	.89	.90
7	.74	.84	.78	.86	.93	.88	.89	.87	.87	.87	.86	.84	.89	.87	.87	.92	.94	.93	.93	.92	.94	.95	.93	.93	.91	.93	.90	.89	.91	.90	.94	.92	.93
8	.72	.87	.83	.86	.86	.88	.84	.87	.83	.89	.85	.86	.82	.85	.89	.88	.92	.92	.91	.92	.92	.95	.96	.94	.94	.96	.96	.94	.95	.94	.96	.95	.95
9	.63	.72	.82	.81	.83	.79	.83	.79	.83	.80	.80	.77	.75	.81	.79	.81	.80	.81	.81	.83	.83	.86	.88	.87	.91	.89	.92	.94	.93	.93	.91	.93	.92
10	.62	.74	.85	.79	.84	.75	.79	.76	.80	.76	.75	.72	.70	.77	.77	.78	.78	.80	.80	.83	.82	.85	.88	.87	.90	.89	.92	.94	.94	.93	.93	.93	.92
11	.74	.82	.89	.85	.92	.85	.87	.84	.89	.84	.84	.79	.77	.82	.82	.93	.82	.84	.84	.86	.87	.89	.92	.92	.95	.94	.96	.96	.96	.95	.96	.96	.95
12	.84	.82	.86	.86	.90	.84	.87	.84	.88	.86	.86	.82	.81	.86	.86	.86	.86	.88	.88	.90	.90	.93	.96	.94	.98	.96	.97	.96	.96	.95	.97	.97	.96
13	.77	.79	.88	.89	.93	.88	.91	.88	.90	.88	.88	.85	.84	.90	.89	.89	.89	.90	.90	.92	.92	.95	.97	.97	.95	.97	.95	.95	.94	.93	.95	.95	.94
14	.79	.78	.88	.89	.94	.90	.92	.89	.91	.87	.87	.84	.84	.88	.88	.88	.88	.89	.90	.91	.92	.95	.97	.97	.96	.98	.96	.95	.95	.94	.95	.95	.95
15	.87	.82	.93	.89	.89	.87	.89	.88	.91	.85	.87	.84	.84	.89	.87	.87	.87	.89	.88	.90	.91	.94	.95	.95	.96	.96	.96	.95	.95	.94	.96	.96	.95
16	.92	.91	.92	.91	.89	.84	.87	.86	.89	.85	.87	.84	.84	.89	.86	.87	.86	.87	.86	.88	.89	.91	.93	.94	.95	.95	.95	.96	.95	.95	.95	.96	.95
17	.81	.87	.92	.92	.90	.86	.89	.89	.92	.87	.89	.86	.85	.90	.88	.88	.88	.89	.88	.89	.90	.92	.93	.94	.96	.95	.96	.97	.97	.96	.96	.97	.96
18	.82	.85	.91	.90	.89	.86	.90	.89	.91	.87	.89	.86	.86	.91	.88	.89	.89	.89	.88	.89	.90	.92	.93	.94	.96	.95	.97	.98	.98	.97	.97	.98	.98
19	.88	.82	.88	.87	.87	.83	.86	.85	.86	.83	.77	.83	.83	.87	.85	.86	.85	.86	.85	.86	.88	.90	.91	.92	.94	.93	.95	.96	.97	.97	.95	.96	.97
20	.87	.85	.88	.88	.88	.84	.86	.85	.87	.85	.87	.84	.85	.89	.87	.88	.87	.87	.87	.87	.89	.91	.92	.93	.96	.95	.97	.98	.98	.98	.97	.98	.98

*Underlined values indicate agreement level of .85 or greater.

TABLE 11

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY THIRTY SECONDS FOR TEN MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.18	.35	.13	.34	.49	.79	.75	.81	.79	.80	.69	.69	.53	.61	.65	.65	.73	.66	.63	.61	.66	.69	.72	.64	.66	.64	.59	.54	.48	.53	.48	.49	.51
2	-.06	.62	.34	.49	.65	.76	.78	.69	.66	.66	.73	.85	.84	.86	.84	.94	.94	.93	.93	.91	.93	.93	.92	.91	.91	.91	.91	.92	.89	.90	.87	.87	.86
3	.48	.52	.70	.70	.74	.85	.81	.83	.79	.75	.79	.87	.87	.86	.84	.91	.87	.88	.89	.90	.88	.84	.85	.86	.84	.86	.87	.89	.92	.90	.91	.90	.90
4	.39	.43	.91	.80	.84	.84	.86	.86	.84	.85	.86	.86	.85	.84	.83	.90	.90	.88	.88	.88	.87	.87	.87	.86	.85	.86	.87	.89	.90	.89	.89	.89	.89
5	.66	.71	.76	.84	.89	.89	.90	.89	.89	.88	.89	.88	.87	.87	.86	.92	.91	.90	.90	.90	.89	.88	.87	.87	.84	.86	.87	.88	.90	.90	.91	.90	.90
6	.69	.78	.84	.76	.84	.81	.85	.88	.89	.88	.89	.87	.86	.86	.86	.91	.91	.90	.90	.90	.89	.89	.87	.87	.86	.89	.89	.91	.91	.91	.90	.90	.90
7	.75	.75	.84	.72	.82	.83	.87	.90	.91	.91	.92	.91	.91	.91	.91	.95	.95	.93	.94	.93	.93	.94	.92	.92	.91	.94	.94	.95	.95	.95	.94	.94	.94
8	.70	.79	.77	.67	.78	.81	.83	.85	.92	.88	.91	.90	.88	.95	.95	.94	.92	.92	.93	.92	.94	.95	.96	.95	.95	.94	.95	.96	.94	.94	.92	.93	.92
9	.59	.66	.66	.60	.69	.67	.70	.72	.78	.77	.78	.78	.75	.82	.84	.81	.79	.79	.81	.82	.84	.84	.87	.86	.88	.85	.86	.87	.86	.85	.84	.86	.86
10	.65	.66	.68	.62	.70	.70	.71	.73	.79	.77	.79	.79	.77	.83	.84	.81	.79	.79	.81	.82	.84	.84	.86	.86	.87	.84	.85	.85	.85	.84	.84	.85	.85
11	.69	.66	.67	.66	.74	.74	.75	.78	.83	.80	.81	.80	.77	.83	.85	.82	.80	.80	.83	.82	.84	.85	.87	.87	.88	.85	.86	.86	.86	.85	.85	.86	.86
12	.68	.57	.62	.60	.71	.73	.72	.74	.81	.79	.81	.80	.78	.83	.86	.83	.81	.81	.83	.83	.85	.85	.88	.88	.89	.87	.87	.88	.87	.87	.87	.88	.88
13	.67	.58	.66	.66	.76	.79	.78	.90	.86	.83	.86	.84	.82	.87	.90	.88	.85	.85	.87	.87	.89	.88	.91	.91	.92	.90	.90	.90	.90	.90	.90	.91	.91
14	.68	.57	.66	.66	.76	.77	.77	.79	.84	.82	.84	.84	.82	.87	.89	.88	.85	.85	.88	.88	.89	.90	.92	.92	.93	.91	.91	.91	.91	.91	.91	.92	.92
15	.75	.59	.69	.69	.79	.80	.80	.82	.87	.85	.87	.85	.84	.89	.92	.90	.87	.87	.89	.88	.89	.90	.92	.92	.93	.91	.91	.91	.91	.92	.91	.92	.92
16	.82	.64	.69	.70	.80	.82	.82	.85	.90	.88	.89	.88	.87	.91	.94	.92	.89	.88	.90	.90	.91	.92	.94	.94	.94	.92	.92	.93	.93	.93	.93	.94	.93
17	.89	.68	.72	.74	.84	.86	.87	.89	.93	.92	.93	.92	.91	.95	.96	.95	.93	.92	.94	.93	.94	.96	.97	.97	.97	.95	.95	.96	.96	.97	.96	.97	.97
18	.86	.71	.73	.76	.84	.86	.86	.89	.94	.93	.94	.93	.91	.95	.96	.95	.93	.92	.94	.93	.94	.96	.97	.97	.97	.95	.95	.96	.96	.97	.96	.97	.97
19	.90	.70	.73	.75	.84	.84	.84	.87	.93	.91	.92	.91	.90	.94	.94	.93	.91	.91	.93	.92	.94	.95	.97	.96	.96	.95	.95	.96	.96	.97	.96	.97	.97
20	.90	.73	.73	.76	.85	.85	.85	.89	.93	.92	.93	.92	.92	.95	.96	.95	.93	.92	.94	.94	.95	.97	.98	.97	.97	.96	.97	.97	.97	.98	.98	.98	.98

*Underlined values indicate agreement level of .85 or greater.

TABLE 12

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY THIRTY SECONDS FOR FIFTEEN MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	.20	.25	.08	.37	.41	.82	.83	.74	.71	.73	.88	.73	.55	.64	.67	.67	.76	.70	.65	.63	.66	.69	.71	.63	.65	.64	.60	.55	.49	.54	.48	.50	.50
2	.16	.56	.28	.57	.76	.64	.66	.79	.79	.78	.82	.81	.70	.77	.78	.83	.84	.78	.76	.77	.78	.80	.81	.77	.79	.79	.78	.79	.76	.78	.74	.76	.75
3	.48	.61	.40	.64	.80	.90	.89	.87	.83	.81	.84	.87	.84	.90	.87	.87	.91	.88	.85	.82	.81	.83	.84	.82	.85	.85	.86	.86	.84	.86	.84	.85	.86
4	.53	.73	.63	.80	.85	.84	.86	.85	.85	.86	.87	.87	.86	.89	.88	.90	.91	.89	.85	.84	.81	.83	.85	.84	.88	.88	.90	.89	.87	.89	.87	.90	.90
5	.61	.66	.62	.80	.80	.86	.85	.84	.79	.82	.83	.84	.87	.86	.86	.92	.92	.92	.91	.91	.89	.90	.90	.89	.89	.89	.89	.91	.91	.91	.91	.91	.92
6	.70	.71	.61	.72	.82	.86	.85	.82	.77	.81	.81	.84	.86	.83	.85	.90	.91	.91	.91	.90	.90	.90	.89	.89	.88	.88	.89	.90	.90	.91	.90	.90	.91
7	.77	.78	.67	.81	.87	.88	.89	.85	.79	.84	.85	.87	.91	.88	.89	.94	.94	.93	.90	.91	.90	.91	.93	.91	.92	.92	.92	.94	.92	.93	.91	.93	.94
8	.79	.85	.81	.91	.90	.91	.94	.92	.87	.90	.92	.94	.94	.94	.95	.98	.98	.97	.92	.92	.91	.92	.94	.91	.93	.93	.95	.94	.93	.94	.93	.94	.94
9	.62	.84	.86	.82	.85	.81	.84	.88	.93	.91	.88	.85	.83	.87	.88	.85	.84	.83	.80	.81	.81	.82	.85	.84	.86	.85	.87	.86	.85	.85	.84	.86	.86
10	.69	.81	.74	.82	.82	.80	.83	.86	.92	.90	.88	.86	.83	.87	.88	.85	.84	.83	.80	.82	.82	.83	.86	.85	.86	.86	.87	.86	.86	.85	.86	.87	.87
11	.84	.84	.86	.88	.91	.87	.89	.94	.96	.94	.93	.91	.87	.92	.93	.96	.88	.87	.84	.85	.85	.87	.90	.88	.90	.89	.90	.90	.89	.89	.89	.90	.90
12	.83	.86	.91	.87	.88	.95	.87	.92	.98	.95	.95	.92	.90	.93	.93	.91	.89	.88	.86	.87	.87	.88	.91	.90	.92	.90	.92	.91	.91	.91	.91	.92	.92
13	.85	.87	.91	.92	.94	.91	.93	.96	.95	.96	.97	.95	.93	.96	.96	.94	.92	.91	.88	.89	.90	.93	.92	.93	.92	.93	.93	.93	.92	.93	.94	.93	
14	.91	.87	.91	.93	.94	.91	.93	.97	.96	.96	.96	.97	.94	.97	.96	.96	.94	.91	.91	.91	.93	.95	.94	.95	.94	.95	.94	.94	.94	.94	.95	.94	
15	.84	.82	.88	.86	.88	.88	.91	.95	.95	.94	.93	.93	.93	.94	.95	.94	.92	.92	.90	.91	.90	.92	.93	.93	.94	.93	.94	.93	.93	.93	.93	.93	
16	.78	.85	.90	.87	.88	.89	.91	.95	.94	.94	.94	.94	.93	.95	.96	.94	.93	.92	.90	.91	.90	.92	.93	.93	.94	.93	.94	.93	.94	.93	.92	.93	
17	.89	.87	.91	.88	.90	.90	.93	.96	.95	.95	.94	.95	.94	.95	.96	.95	.93	.93	.91	.91	.90	.92	.93	.94	.94	.94	.94	.94	.94	.93	.93	.94	
18	.90	.91	.94	.90	.90	.91	.93	.96	.93	.93	.94	.96	.94	.96	.96	.95	.94	.94	.92	.92	.91	.93	.94	.94	.94	.94	.94	.94	.94	.94	.93	.94	
19	.86	.88	.91	.89	.90	.92	.92	.96	.94	.94	.95	.96	.91	.96	.96	.95	.93	.93	.91	.91	.91	.93	.94	.94	.95	.94	.95	.95	.95	.94	.94	.95	
20	.84	.89	.91	.90	.92	.93	.92	.96	.94	.94	.95	.97	.96	.97	.96	.96	.95	.94	.92	.92	.91	.93	.94	.95	.95	.95	.96	.95	.96	.92	.95	.95	.96

*Underlined values indicate agreement level of .85 or greater.

TABLE 13

SCOTT COEFFICIENTS OF AGREEMENT BETWEEN OBSERVATIONS RECORDED EVERY THIRTY SECONDS FOR TWENTY MINUTES AND THE TWENTY-DAY EVERY THIRTY-SECONDS CUMULATIVE CRITERION*

Cumulative Number of Students

Cumulative Number of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	-.27	.16	.06	.24	.31	.78	.81	.75	.72	.76	.86	.70	.54	.62	.65	.71	.80	.77	.69	.67	.72	.73	.76	.67	.68	.67	.65	.66	.59	.64	.58	.60	.62
2	.07	.54	.30	.57	.78	.81	.84	.86	.81	.78	.80	.85	.79	.86	.87	.86	.88	.87	.85	.85	.87	.90	.90	.86	.88	.88	.88	.89	.86	.87	.89	.84	.85
3	.44	.73	.56	.68	.79	.88	.88	.87	.83	.80	.81	.86	.85	.88	.88	.92	.94	.91	.89	.88	.88	.91	.91	.89	.90	.89	.90	.92	.92	.92	.92	.92	.92
4	.35	.68	.71	.85	.86	.85	.86	.85	.84	.85	.85	.85	.85	.87	.87	.91	.91	.89	.88	.87	.85	.89	.89	.88	.88	.88	.88	.90	.90	.90	.90	.90	.91
5	.60	.77	.62	.76	.86	.89	.89	.87	.87	.87	.87	.86	.88	.87	.88	.92	.93	.91	.91	.90	.90	.90	.89	.90	.87	.88	.87	.88	.90	.90	.90	.90	.91
6	.54	.80	.71	.86	.89	.86	.88	.86	.86	.86	.85	.85	.87	.86	.87	.90	.90	.90	.90	.89	.89	.90	.88	.89	.87	.89	.88	.89	.90	.90	.90	.89	.90
7	.60	.84	.75	.87	.89	.89	.92	.91	.87	.87	.87	.89	.92	.91	.91	.93	.93	.93	.92	.93	.92	.93	.93	.92	.92	.92	.92	.93	.93	.93	.93	.92	.93
8	.68	.87	.87	.86	.88	.90	.94	.95	.94	.95	.94	.95	.96	.97	.96	.97	.97	.97	.94	.93	.93	.94	.95	.94	.95	.95	.96	.96	.95	.96	.95	.95	.94
9	.60	.72	.83	.79	.82	.78	.80	.82	.86	.85	.86	.85	.81	.86	.88	.87	.84	.83	.82	.83	.83	.85	.87	.86	.88	.88	.89	.89	.88	.88	.87	.88	.88
10	.66	.74	.85	.80	.83	.79	.80	.81	.85	.83	.85	.84	.81	.86	.88	.86	.84	.83	.82	.83	.83	.85	.87	.87	.88	.88	.89	.89	.88	.88	.87	.89	.88
11	.63	.73	.85	.83	.87	.84	.83	.85	.89	.86	.88	.86	.83	.87	.89	.88	.86	.85	.85	.86	.85	.86	.89	.88	.89	.88	.90	.90	.89	.89	.89	.89	.89
12	.68	.74	.85	.80	.86	.85	.83	.84	.90	.87	.90	.87	.85	.88	.90	.89	.87	.87	.87	.88	.87	.88	.91	.90	.91	.90	.91	.92	.91	.91	.90	.90	.90
13	.71	.76	.89	.86	.92	.90	.88	.90	.95	.93	.94	.94	.88	.91	.93	.92	.91	.90	.90	.91	.90	.91	.93	.92	.93	.92	.93	.93	.93	.92	.92	.92	.92
14	.72	.77	.91	.87	.93	.91	.89	.91	.94	.91	.94	.91	.89	.91	.93	.92	.91	.91	.90	.92	.91	.92	.94	.93	.94	.93	.94	.94	.94	.94	.93	.94	.93
15	.79	.77	.90	.87	.93	.91	.90	.91	.95	.92	.94	.91	.89	.92	.94	.93	.91	.91	.91	.91	.91	.92	.94	.93	.94	.93	.94	.94	.94	.94	.94	.94	.93
16	.87	.83	.91	.89	.93	.91	.90	.92	.96	.93	.95	.92	.90	.93	.95	.94	.92	.91	.91	.92	.91	.93	.94	.94	.94	.93	.94	.95	.95	.96	.96	.96	.95
17	.83	.83	.89	.89	.96	.94	.93	.95	.97	.96	.97	.94	.92	.95	.97	.96	.94	.93	.93	.94	.93	.94	.95	.95	.96	.95	.96	.97	.97	.97	.97	.96	.97
18	.83	.86	.91	.92	.96	.95	.95	.97	.95	.97	.98	.96	.95	.97	.98	.97	.95	.95	.95	.95	.94	.95	.97	.97	.97	.96	.97	.97	.97	.97	.96	.97	.96
19	.85	.84	.89	.90	.94	.92	.92	.95	.98	.95	.96	.94	.93	.95	.95	.94	.92	.92	.93	.93	.93	.94	.95	.95	.96	.95	.96	.96	.96	.96	.95	.96	.95
20	.87	.86	.90	.91	.95	.93	.94	.95	.98	.96	.97	.95	.94	.97	.97	.96	.94	.94	.94	.94	.94	.95	.96	.97	.97	.96	.97	.98	.98	.98	.97	.97	.97

*Underlined values indicate agreement level of .85 or greater.

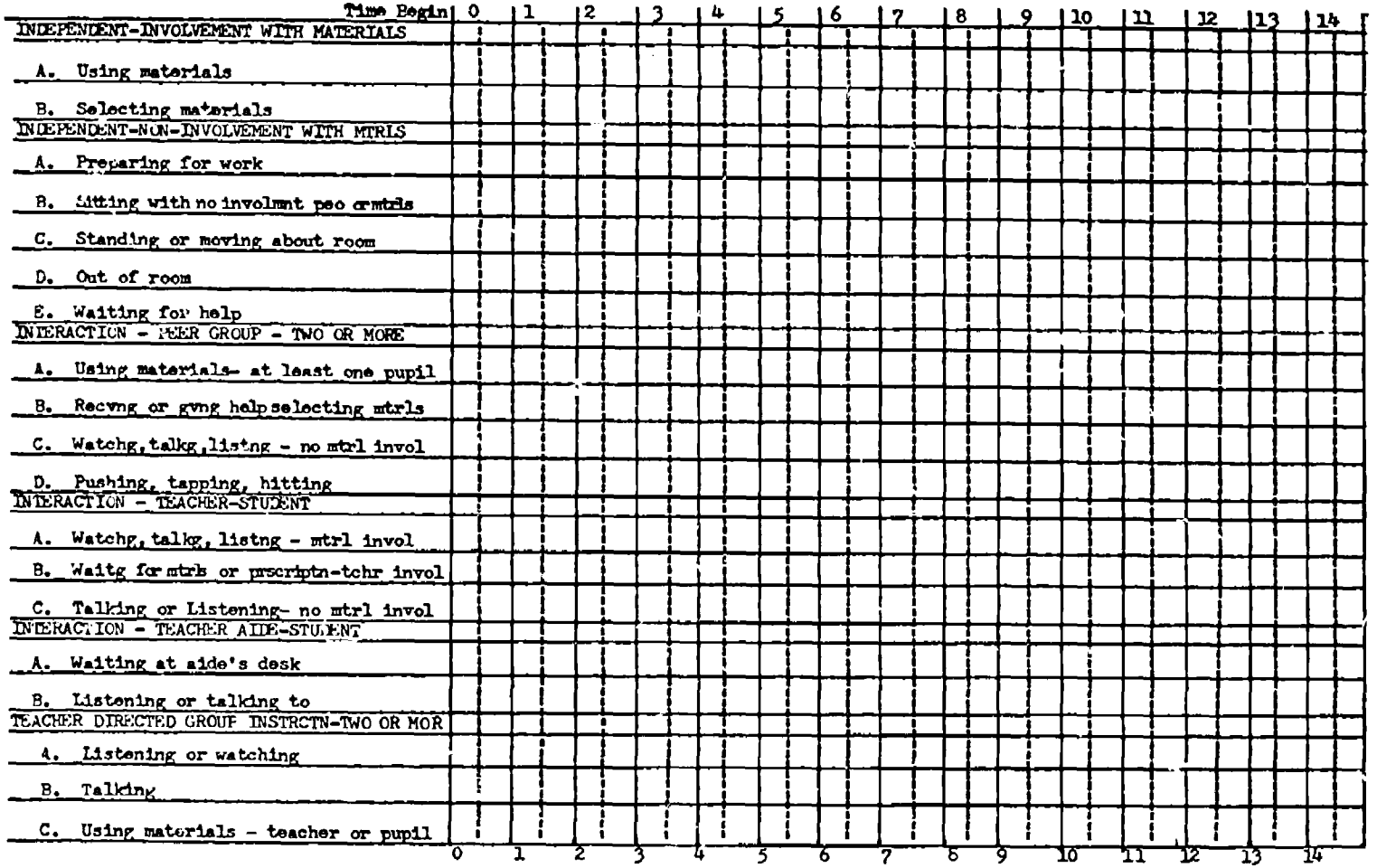
OBSERVATION SCHEDULE

Date _____

Observer _____

Pupils

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____



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