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EDITORIAL POLICY

The **Journal of Precision Teaching** is a multi-disciplinary journal dedicated to a science of human behavior which includes direct, continuous and standard measurement. This measurement is composed of standard units of behavior--frequencies--which are collected and recorded on a standard scale—the Standard Behavior (Celeration) Chart. Collections of frequencies are summarized on this Chart using a standard measure of behavior change--celeration. Frequencies and celerations displayed on the Standard Behavior (Celeration) Chart form the basis for Chart-based decision-making and for evaluating the effects of independent variables.

Materials submitted for publication should meet the following criteria: (1) be written in plain English, (2) contain a narrative that is brief, to the point and easy to read, (3) use the **Journal of Precision Teaching Standard Glossary and Charting Conventions,** (4) contain data displayed on the Standard Behavior Chart that justify conclusions made, (5) be submitted in quadruplicate to the editor, and (6) include one set of original charts or hand-drawn copies. Each formal manuscript will be reviewed by one consulting editor and two reviewers, two of whom must approve it prior to publication.

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SEVEN WAYS OF DESCRIBING READING— McGUFFY'S AND SIX MORE: PARTS III and IV

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Abstract

A literature review reveals six traditional ways of describing reading with problems and confusions. Two describe the reading stimuli and four measure reading performance. A solution is to measure the teaching product, learning. Reading learning is measured by ratios and becomes the seventh way of describing reading. The review of the six ordinal methods plus the ratio way to describe reading has both historical and systemic value. The review is divided into four parts: (I) Lay categories, grade levels, readability formulas, rate, and accuracy; (II) Reading mastery levels; (III) Problems and confusions of the six measures and introduction to Precision Teaching, the seventh measure; (IV) Sixteen Precision Teaching picture components, discussion, and conclusions. The present article represents Parts III and IV of the review. Parts I and II appeared in Vol. II, Numbers 3 and 4.

PART III

Problems

The major problems in describing and measuring reading over the past 140 years have been: (a) there is little agreement between one measurement system and another (Chall, 1958; Felsenthal, 1973; Spache, 1964; Starlin, 1971), (b) the systems are mainly process oriented, too complicated, and too time-consuming for extensive classroom teacher usage; and (c) there is little that facilitates specific matching of a pupil with appropriate material (Chall, 1958, 1977; Spache, 1964; Starlin, 1971).

These problems do not imply that the work through the nineteenth century and the first three-quarters of the twentieth century has been entirely fruitless. It is important to be able to know these elements in order to revise the stimuli, when necessary. To know when to revise requires additional measurement.

Dolch, in 1928, stated, "Two books of the same size may have vocabularies about equal in extent, and yet the words in one may be more difficult for children than the words in the other. The problem is to measure this difficulty" (p. 173). Dolch vainly continued to examine the stimuli in search of the measure of response difficulty.

Just recently, Chall (1977) wrote, "It should be noted that none of the objective readability measures tells how difficult reading material should be" (p. 30). In fact, Chall is as concerned with how hard a book may be, as she is with whether or not it may be too easy.

The fuss over vocabulary control has created many word lists, readability formulas and still more basal reading series. Their narrowness and delimiting nature have been criticized.

Spache (1964) takes exception to the claim that a basal vocabulary is necessary as a foundation of all future reading. He cites three reasons which contradict that claim. First, it has been shown that average pupils who have advanced as far as the primer level learn many words other than the basal vocabulary and that their own speech vocabularies are far in advance of the concept level of basal readers. Second, there is no essential core or basal vocabulary except for a few hundred service words that recur frequently and universally. These are mainly prepositions, conjunctions, verbs, and adverbs. Spache (1964) elaborated:

> Numerous studies of the vocabularies of various basal series show very little overlap. For example, a recent survey by Selma E. Her, cited by James M. Reid, found only six hundred words used in all of the twelve series studied, out of a total of approximately twelve thousand words. Furthermore, only 206 of the twelve thousand words were introduced at the same grade level in more than one basal series. Apparently each basal series has its own essential or core vocabulary which isn't even required to read common supplementary basals? (p. 81)

Third, the "new words" presented in the basals are not new to the children. Spache (1964) cited a study by Gates in which 300 third graders were tested on their knowledge of the third and fourth grade words found in their basal series. "On the average the pupils knew as many fourth grade as third grade words. Over half the pupils recognized 90% as many fourth grade words as they did third grade" (Spache, 1964, p. 81). Spache (1964) also cited a second study by Gates with second grade youths which revealed that about half of the total vocabulary had been prematurely learned by the poorest 10% of the readers.

Spache allows for a possible need for some vocabulary control at certain, early stages of learning to read and for certain pupils who exhibit very slow reading growth. McCracken

(1968) impassionately writes that large words need not be withheld from even these situations and pupils.

> What we need are good stories, high-interest stories with exciting language and exciting words, stories which can be read and reread, drilled if you wish, because they are so good. Our able readers reread stories hundreds of times. We seem afraid to allow our poor readers this privilege. (p. 64)

McCracken elaborates upon how much more exciting longer, harder words can be and how dull shorter but perhaps easier words are. He then points out that teachers do not have to maintain the practice of presenting easy words.

> We can note the affixes, the syllables, the vowels, the consonants. We can use these words, just as we can use any words, to learn about words. Since this is so, we might as well use interesting words rather than easy words. Easy words have never been easy for poor readers, perhaps because easy words are not interesting. (p. 65)

So we are still attempting to determine ease and difficulty of reading and in so doing the concepts of short words, long words, interesting words, etc., continue to enter the literature. Established procedures and beliefs become shrouded as mythology by conflicting evidence and their critics. The guidelines for improving the readability and learnability of our textbooks become weakened by the diversity of their products. Starlin (1971) states the issue well:

> Because publishers are not standardized in their criteria . . . , it is difficult to know what book of what particular series would be most appropriate for a given youngster. Even knowing a grade level from the nonperformance-based achievement tests does not help, for the 2-2 book in one series may be considerably more difficult than the 2-2 book in another series. (p. 454)

But no matter what point of view, the pupils', the teachers', the educational specialists', the writers', the publishers', the researchers', the administrators', the parents', or the school patrons', empirical data are still lacking. Surveys yield momentary whims and biases. Various tests yield various results. Different textual series yield different grade levels. Different examiners label the same pupil performances with different labels.

Precision Teaching

Reading level and curricula debates will continue until a viable, compare-all, standard measurement system is used to resolve these questions.

The National Advisory Committee on the Handicapped (1977) recognized the need for "development of precise and uniform measures permitting reliable assessment of the impact of various programs and approaches" (p. 16). The Committee stated:

> Such a system of measurement would bear the same relationship to communicating progress in special education that having a common tongue bears on creating greater understanding among people in disparate parts of the Nation. With it, improved practices not only could be clearly documented and displayed but could more readily be disseminated. Without it, each such gain must be translated into a variety of different measurement "languages." An important aspect of this work will be studies that specifically relate gains to the interventions that produced them, toward spelling out which interventions, under what conditions, are most productive, most cost-effective, and most likely to be applied, given the availability of the kinds of skills they require. (p. 16)

Precise Behavioral Management (PBM) measurement, known in the classroom as Precision Teaching (Jordan & Robbins, 1971; Lawrence, 1971; Lindsley, 1964; Kunzelmann, Cohen, Hulten, Martin, & Mingo, 1970; Pennypacker, Koenig, & Lindsley, 1972; White & Haring, 1976) is the seventh way of describing reading.

Comparison of the data reported in the reviewed articles shows that the most conclusive reading data were count over time. Lindsley's (Lawrence, 1971; Lindsley, 1964, 1972; Pennypacker, Koenig, & Lindsley, 1972) extension of frequency measurement to standard multiply-divide charting offers education not only a ratio measure of performance but at the same time a ratio measure of learning.

Frequency permits us to directly compare performance in two or more very different curricula. Ratio levels of measurement on the Standard Celeration Chart permit us to directly compare the learning in two or more very different performances. These concepts were previously ignored by education and the behavioral sciences.

Precision Teaching can be used in lieu of or in conjunction with the traditional methods of

curricular planning.

White and Haring (1976) recently advanced the following five phases of the learning process: acquisition, fluency building, maintenance, application, and adaptation. The words are basic English with reference to any standard dictionary revealing their distinctions.

The acquisition phase represents the initial "getting" of the skill basics, no matter how infrequent or rough the student's performance may be.

The fluency building phase refers to becoming more fluid with the skill to a point of smoothness and rapidity. For basic tool skills, such as saying words or writing numerals, the fluency phase begins when the correct frequency is 20 counts per minute with as many as 10 errors per minute. A 2:1 ratio is proposed for lower frequency behaviors.

The maintenance phase assumes adequate proficiency for more complex or advanced skills within the application and adaptation phases. However, such proficiency is not necessary to begin application and adaptation. These two phases can even feasibly begin during acquisition and run parallel with fluency building.

These concepts are not new. In 1917 Gray (p. 27) wrote, "The classes and the pupils who do not attain fluency in oral reading are usually slow, ineffective silent readers."

The formalized concepts, however, are useful for teachers. The independent reading level can include maintenance, application, and adaptation. The teaching step, depending upon one's definition of teaching, could include all five steps but certainly must include acquisition and fluency-building.

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PART IV

Precision Teaching shows performance "snap shots" of correct and error frequencies and provides for accuracy statements. Precision Teaching also shows dynamic, moving, learning pictures.

The performance measure and the learning measure applied to a reader's reading provide reading pictures and comprehension pictures. These pictures can be compared to other pictures, the reader's or peers', to determine rank, show progress, make decisions, or set standards.

The pictures are composed of nine components:

(1) **Correct performance** counted and timed daily yields correct count/minute/day (correct frequency);

(2) **Error performance** counted with the correct performance yields error count/minute/day (error frequency);

(3) **Correct learning** progress is indicated by weekly celeration, which is determined by a "best-fit" line through 5 to 10 daily correct performance counts;

(4) **Error learning** progress is indicated by weekly celeration, which is determined by a "best-fit" line through 5 to 10 daily incorrect performance counts;

(5) **Performance accuracy** is measured by the vertical ratio distance between any correct and error performance pair showing corrects to one error (with conversion to percent possible, but not recommended); beginning accuracies and ending accuracies are teaching concerns;

(6) **Changing accuracy,** technically called accuracy improvement multiplier, is shown by the spreading of the correct and error celeration lines; it is measured by the correct and error celeration quotient/minute/day/week (Pennypacker, Koenig, & Lindsley, 1972);

(7) **Correct daily variance,** performance "bounce" around the celeration line, is the up and down ratio distances from the correct celeration line to the highest and lowest frequency; total correct bounce is the distance between the highest and lowest frequency around the correct celeration line;

(8) **Error daily variance** is the bounce from and around the error celeration line;

(9) **Endurance,** measured by the recording time, shows the amount of time of the measure.

Chart 1 shows five reading pictures across the 1976 Spring semester of a first-grade pupil's Fry reading group lessons within his 30 minute reading instruction class in a resource room for pupils with learning disabilities. The 9 picture components described above can be seen in each of the five pictures.

Two more picture components can also be seen in Ron's Chart:

(1) **A correct learning course projection** is beamed into the future by projecting the correct celeration line and its performance bounce forward; extending the correct celeration line of the 5th picture to the end of the chart projects the final correct frequency near 50 correct words per minute, with the width of the projected course extending from 20 to 60 correct words per minute;

(2) **An error learning course projection** is beamed into the future by projecting the error celeration line and its performance bounce forward; extending the error celeration line of the 5th picture projects no errors within the minute's reading; decisions to change or continue a pupil's reading plan are made from the picture of these two projections.

As we go from one picture to the next, six additional picture components can be seen:

(1) **The correct frequency shift factor,** technically called a correct frequency multiplier, is the distance between the final correct frequency of the first picture and the beginning correct frequency of the next picture; in Ron's Chart all correct frequency shift factors are downward and show that each new reading lesson is 2 to 3 times "harder to do" (McGreevy, 1981);

(2) The **error frequency shift factor,** technically called an error frequency multiplier, is the distance between the final error frequency of the first picture and the beginning error frequency of the next picture; Ron's Chart shows upward error frequency shift factors, indicating that each new reading lesson was 4 to 6 times harder to get right;

(3) The **correct celeration change factor,** technically called the correct celeration multiplier, is measured by the angular ratio of change from the correct celeration line of one reading picture to the correct celeration line of the next reading picture; Ron's correct celeration line of X 1.5 in his second reading picture is X 1.1 steeper than his first picture

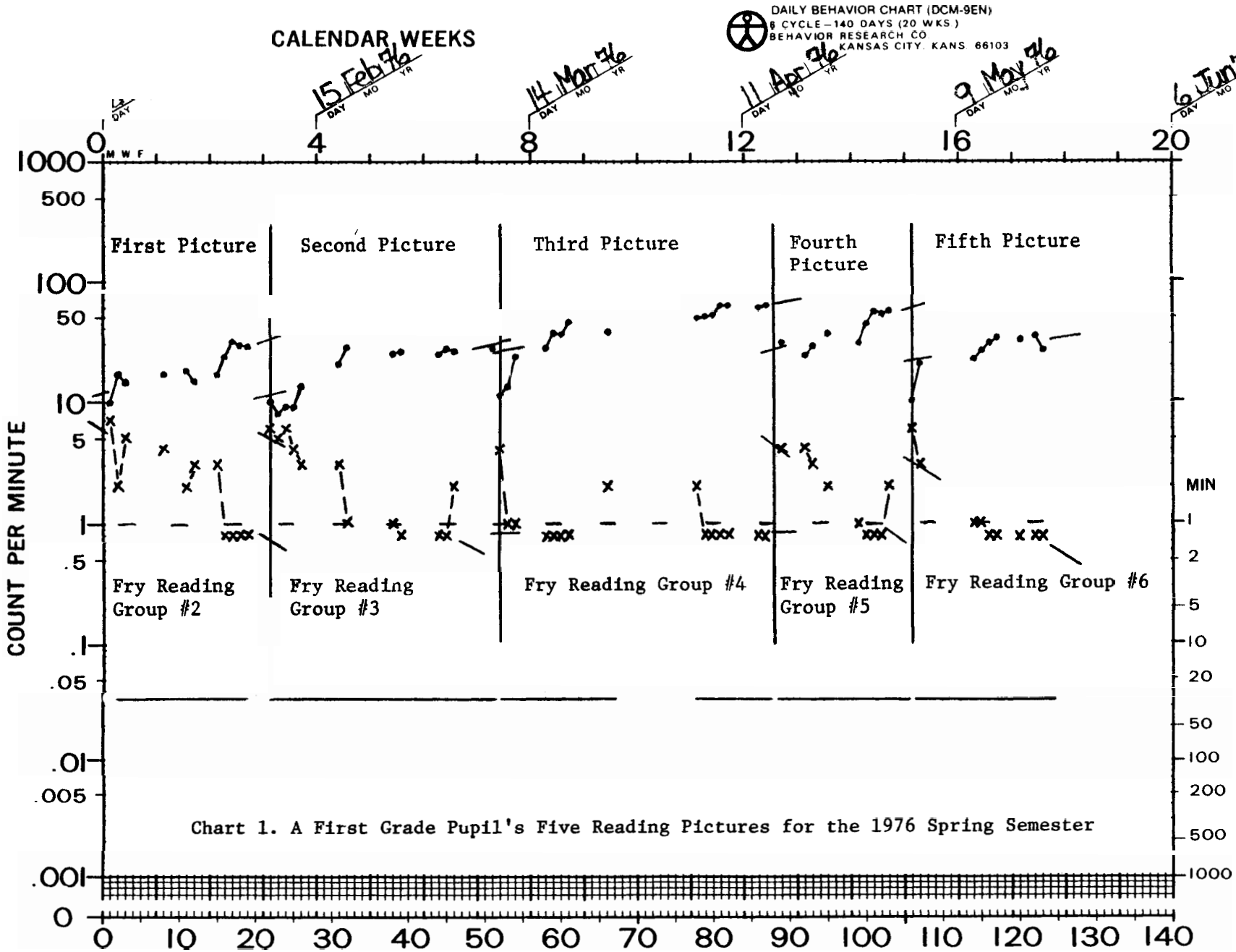

Chart 1. A First Grade Pupil's Five Reading Pictures for the 1976 Spring Semester

Neely, Malcolm. Seven ways of describing reading-- McGuffey's and six more: parts III and IV. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

S. Wood	C. Priest	J. Anderson	Ron**		Gr. 1	says words
SUPERVISOR	ADVISER	MANAGER	BEHAVER	AGE	LABEL	COUNTED

TCCSS, Olympia	School District #111	Olympia, Washington		N. McRayde	
DEPOSITOR	AGENCY	TIMER	COUNTER	CHARTER	

**name changed to protect identity

correct celeration line of X 1.4; in other words, Ron's correct word learning in the first picture was 1.1 times faster than his correct word learning in the second picture;

(4) The **error celeration change factor,** technically called the error celeration multiplier, is measured by the angular ratio of change from the error celeration line of one reading picture to the error celeration line of the next reading picture; Ron's error learning in the first two pictures is the same; the lines are decelerating at the same rate, /2.0; the third picture shows that learning new words or correcting mistaken words was essentially impossible as the error learning was X 1.0 with nearly zero errors; examining the error celeration lines of the last two pictures shows that Ron was learning new words 1.2 times faster in the fourth picture;

(5 & 6) **Correct** and **error daily variance shift factors** are measured by the proportional changes of each picture's total correct and error bounce; Ron shows a fairly steady X 2.0 to X 3.0 correct bounce in each picture; the error bounce ranged from X 3 to X 8, yielding no exceptional error bounce shift factors.

Correct and error celerations viewed together comprise a learning picture.

Lindsley (1977) suggested counting and charting various types of learning pictures to periodically monitor pupil, classroom, and program learning. He suggested using Weekly, Monthly, and Yearly Standard Behavior Charts.

All (1977), Sokolove (1977-1978), Shawnee Mission Schools (1978), and James White (1977) reported finding from 11 to 14 different learning pictures empirically useful in monitoring their classrooms and programs. All's (1977) pupils named the 11 learning pictures used in their classroom.

Four of Ron's five reading pictures in Chart 1 are the "jaws" learning picture named by All's pupils. McGreevy (1981) refers to these four pictures as "up to aim/down to zero." Ron's third reading picture is the "TR7" picture named by All's pupils. McGreevy (1981) refers to this picture as "up to aim/zero."

Chart 2 shows another jaws learning picture. The first two weeks of Vanessa's comprehension picture shows cross-over jaws. This is the best learning picture. Errors are initially greater than corrects, but both correct and error learning occurs so rapidly that steep celeration lines cross each other and soon show favorable, final performances. Vanessa made her comprehension picture from 17 daily one minute exercises of **asking** questions aloud about material she just read.

Ron's jaws reading pictures (Chart 1) and Vanessa's cross-over jaws comprehension picture (Chart 2) oppose the beginning percent accuracies for reading and comprehension recommended by the reading experts in Part II, Table 2. In Ron's four jaws pictures beginning performance accuracies ranged from 1.5 corrects for each error to 5 corrects for each error, 61% to 83% correct. In Vanessa's cross-over jaws picture the beginning performance accuracy was 1 correct and 7 errors, only 13% correct.

Other jaws citings (All, 1977; Neely & Lindsley, 1978a; Sokolove, 1977-1978; J. F. White, 1977) confirm steep correct and error learning.

Learning pictures from pupil performances are products of curriculum and instruction and the strategy behind each (Neely & Lindsley, 1978a, 1978b). A low error strategy yields curricula that produces minimal learning described by"goalie," "railroad," and low-angled TR7 (All, 1977) learning pictures, and shown by most of the average learning pictures of 94 classroom reading books (Neely & Lindsley, 1978b).

Discussion

The reading experts' low-error, high-beginning accuracy strategy has certainly influenced twentieth century reading curricula. Educational experts attended to stimuli logically, rather than to responses, empirically. The responses were measured with ordinal measures only—and then with only "snap-shot" pictures. Required now is a twenty-first century higher-order teaching strategy, curricula, and measurement.

Barbara Bateman (1971) wrote, "We can no longer hide our heads or our inadequate reading instruction in platitudinal sands. Reading failure is a large and regrettable reality" (p. 13). She then cited from the HEW Secretary's National Advisory Committee on Dyslexia and Related Reading Disorders 1969 report that 8 million children in America's elementary and secondary schools that year will not learn to read adequately. Chall (1967) warned, "If schools do not ask for better published programs, and for hard evidence that they are better, they will not get them" (p. 304).

Cross-over jaws and jaws learning pictures show that much greater learning is possible than the 5% to 10% opportunity given by current reading programs. Teachers and other reading experts who measure learning will discover new curricular dimensions and greater teaching. They will also discover what beginning competitive swimmers have known: improving can be joyous, not frustrating.

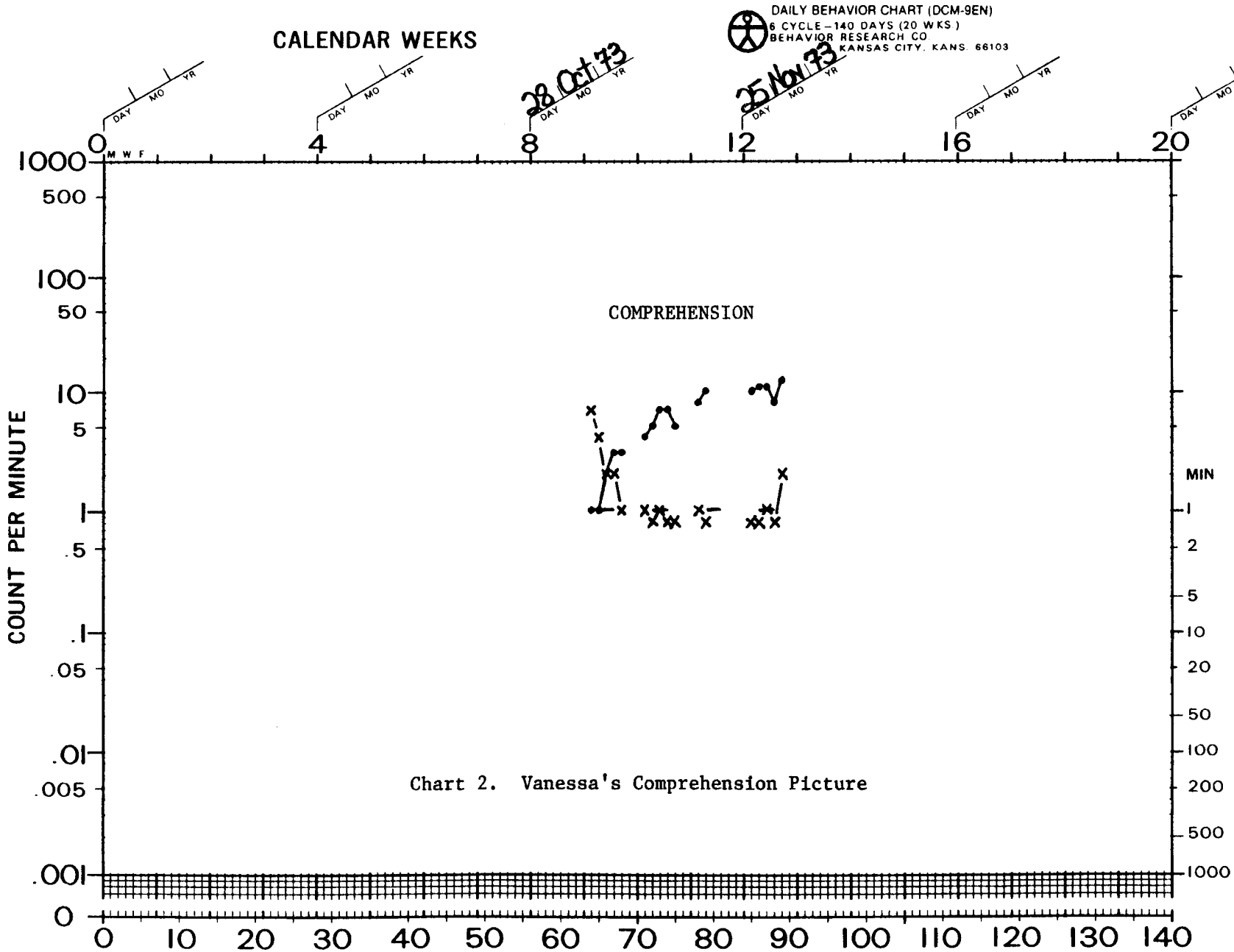

Chart 2. Vanessa's Comprehension Picture

Horensky	Martin	Carkeek		Vanessa**	10	Gr. 5	asks questions
SUPERVISOR	ADVISER	MANAGER		BEHAVER	AGE	LABEL	COUNTED

Garfield Elementary School	Everett, Washington			
DEPOSITOR	AGENCY	TIMER	COUNTER	CHARTER

**name changed to protect identity

Neely, Malcolm. Seven ways of describing reading-- McGuffey's and six more: parts III and IV. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

Karen Neufeld (1978) discovered better curriculum-pupil matching. After her classroom reading study with 49 pupils she concluded, "The best way to place children in reading materials for best accuracy and speed learning was by comparing charted learning pictures of several performance levels tried minutes apart for ten days. This method was more effective than placement by the instructional level of an informal reading inventory or by student choice" (pp. 49-50).

Gradually, a growing body of educators is using frequency, celeration, and Standard Celeration Charts in education. Many of these Precise Behavioral Management advocates and Precision Teachers are listed, along with their publications in Neely's dissertation (Appendix H, 1978) and by Precision Media (1976).

Precision teachers are being favorably recognized by private evaluators for the Federal Government. The Project IEP report prepared for the Bureau of Education for the Handicapped stated that the language of PL 94-142 fits the basic tenets of Precision Teaching and favorably cited the State of Washington special education programs using Precision Teaching as exemplary (Safer et al., 1978).

In addition, Precision Teachers are being recognized by other educators. Bateman (1971) writes:

> One of the real difficulties we face in our efforts to improve reading instruction is having few evaluation systems sensitive enough to provide data for daily instructional decisions . . . Precision Teaching . . . is one evaluation technique which could revolutionize research on the efficacy of group and individual reading instruction. Reading teachers, remedial specialists, curriculum planners and researchers alike can demonstrably improve their teaching and evaluation skills by the use of Precision Teaching. (p 385)

Precision Teaching provides far more than a flick of hope. Precision Teaching learning pictures focus our attention upon curriculum and teaching-learning--for the price of one dot and one "x" on the Standard Celeration Chart each practicing day.

Conclusions

Parts I, II, III and IV of this review warrant the following confusions:

(1) Six traditional ways reading experts describe reading since McGuffey were reviewed and shown wanting as merely ordinal measurement methods;

(2) Poor measurement methods, over-attention to stimuli and pupil performance, lack of standardization, simplification of reading materials, inadequate curriculum-pupil matching process, and the use of low-error, high-accuracy, teaching strategy were cited as reading instruction and curricular problems;

(3) Precision Teaching, the seventh and ratio way to measure reading, was described to point the way to better curricular choices, higher-order teaching strategy, and faster pupil learning (the final teaching product).

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AN ANALYSIS OF INTERVAL SIZE IN A MOMENTARY TIME-SAMPLING PROCEDURE

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Behavior Prosthesis Laboratory

Debbie Jameson
Fitchburg State College

In momentary time-sampling an observer glances at the behaver at the end of each of a pre-determined series of intervals. The observer then records whether or not a specific behavior is occurring or a particular posture or "state" is being maintained. Time-sampling is defined by the duration of the measurement session and the frequency of observations. On the Standard Celeration Chart, measurement duration is recorded as the record floor (1/minutes in session) and the frequency of observation determines a record ceiling (number of observations/session length). The graphic distance between the floor and the ceiling, sometimes called the "recording window" (Pennypacker, Koenig, & Lindsley, 1972), reflects the sensitivity or ability of the recording procedure to measure a range of behavior frequencies. The lower the ceiling, the less likely we are to observe all occurrences of a relatively high-frequency behavior. The higher the floor, the less likely we are to observe very low-frequency behaviors or to account for variability in frequency over the course of increasing durations. In designing time-sampling procedures it is generally best to create as large a recording window as possible, with floor and ceiling values determined by compromises between practical concerns and the need to record actual frequencies of the target behavior.

This paper illustrates the effects on measurement sensitivity of choosing different inter-look intervals (i.e., record ceilings).

Method

Subject and Materials

The subject was a 24 year-old woman working in the Behavior Management Unit of a sheltered workshop. For a total of two hours per day, broken into four half-hour periods, she worked in an individual cubicle packaging sets of ten metal springs in small plastic bags. She received payment each day on the basis of completed work.

Measurement Procedure

Each day the manager or her assistant counted the number of bags completed and computed the count per minute performance for the entire two hours. In addition, the observer conducted a two-minute momentary time-sampling procedure. With the assistance of a tape recorded signal which occurred every two minutes, she marked at the end of each interval whether or not the client was engaged in the task at the moment of observation. This procedure continued for 20 working days without any intervention.

Results

Chart 1 displays production rates which averaged about 13 bags per minute over the 20 day period. The solid celeration line is based on a quarter-intersect calculation (White & Haring, 1980) for the first ten days. It projects as a dotted line into the following ten-day period, bisecting the second half of the data with nearly perfect accuracy. Production was relatively stable, and nearly flat (x1.02 per week) over the entire period.

Chart 2 displays data from the two-minute momentary time-sampling procedure. Again, the celeration of the first ten days is nearly flat

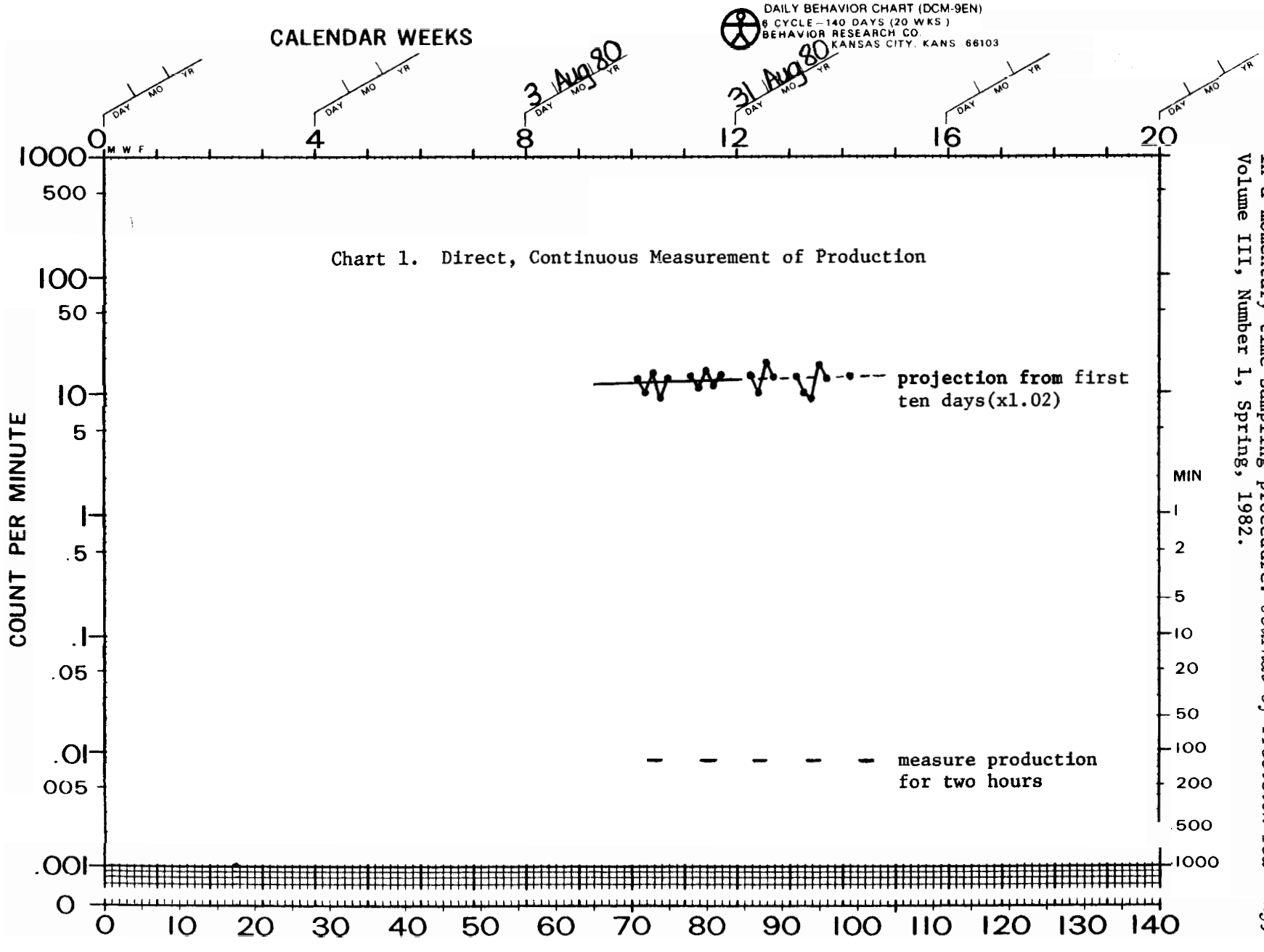
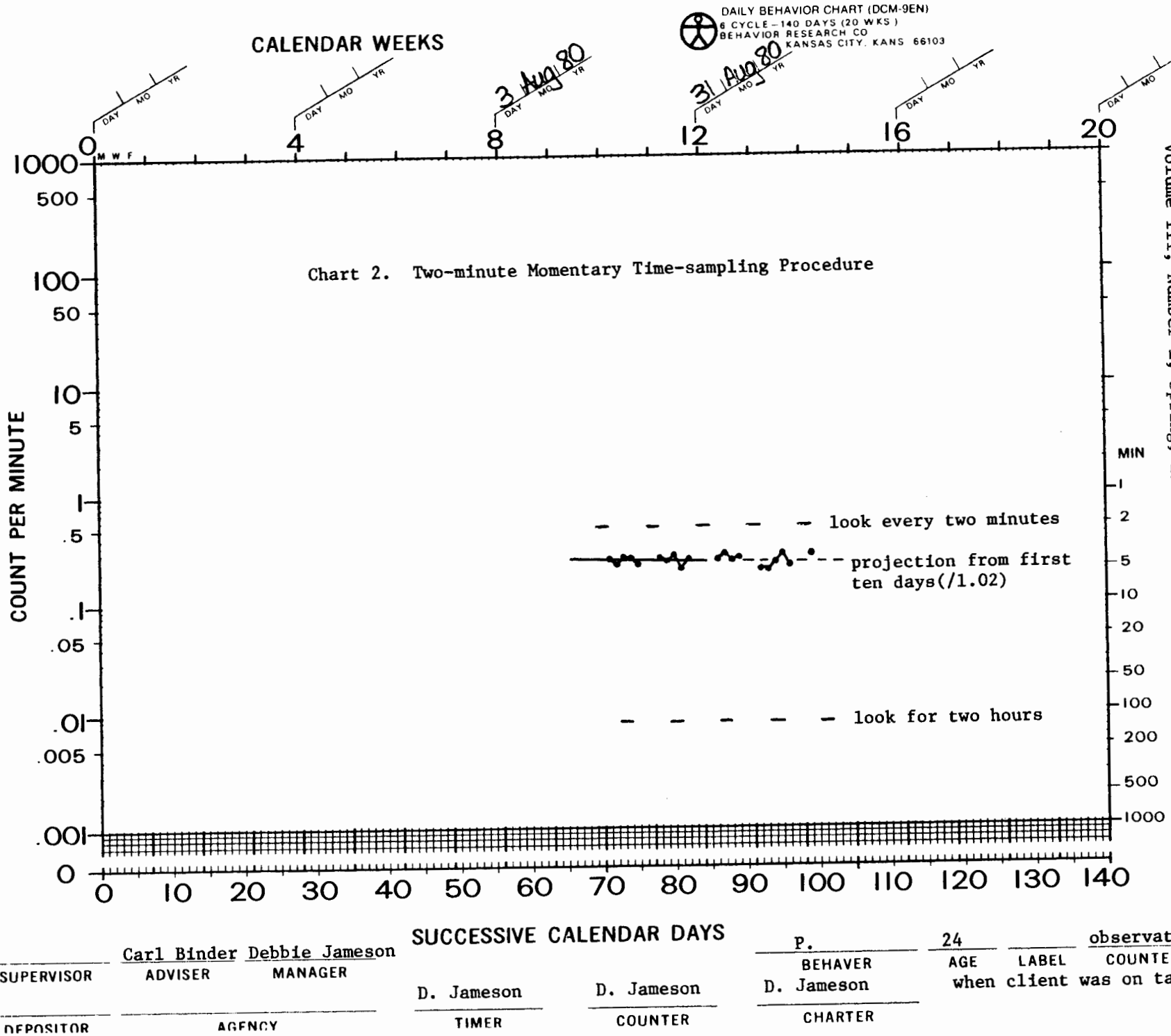


Chart 1. Direct, Continuous Measurement of Production

	Carl Binder	Debbie Jameson		P.	24		puts 10 strings
SUPERVISOR	ADVISER	MANAGER		BEHAVER	AGE	LABEL	COUNTED in plastic bag
			D. Jameson	D. Jameson	D. Jameson		
DEPOSITOR	AGENCY		TIMER	COUNTER	CHARTER		

Binder, Carl V. and Jameson, Debbie. An analysis of interval si
in a momentary time-sampling procedure. *Journal of Precision Tea* *ing,*
Volume III, Number 1, Spring, 1982.



Binder Carl V. and Jameson, Debbie. An analysis of interval size in a momentary time-sampling procedure. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

(/1.02) and its projection bisects the second half of the data with nearly perfect accuracy. There is thus good agreement between the continuous performance measure and the two-minute time-sampling procedure. Note that the ratio between on-task frequency and the record ceiling in Chart 2 is approximately /2.0 indicating that the time-sampling procedure "caught" the client on-task at about 50% of the observations.

Chart 3 represents a four-minute momentary time-sampling procedure calculated from the set of every second observation in the two-minute time-sampling procedure. Again, one celeration line represents a quarter-intersect trend estimation from the first ten data-days projected into the second half of the measurement period. The second celeration line is the actual quarter-intersect celeration for the entire 20 days. The overall celeration (x1.09) based on four-minute inter-look intervals differs from the actual celeration (x1.02) in Chart 1 and also from that based on two-minute intervals (/1.02) in Chart 2. Moreover, with four-minute intervals, the first ten days (/1.20) predicts a trend that is quite different from the actual 20-day celeration. (This disparity can be quantified as a celeration multiplier of /1.31.) Looking at the ratio between the actual celeration line and the ceiling in Chart 3, we have the impression that the client is increasing the proportion of the time she spends on task.

Chart 4 represents a momentary time-sampling procedure with eight-minute inter-look intervals, based on the set of every other observation in the four-minute procedure. One celeration line projects from the first ten days into the second ten days and the other is the overall 20-day celeration line. The disparity between the two is even greater than in Chart 3 (a celeration multiplier of /1.38) and the proportion of time on task (ratio between the solid line and the ceiling) appears to be improving even more. Note also that eight-minute inter-look intervals produce a rather bouncy picture of "on-task" as compared with procedures having more frequent observations.

Discussion

These data illustrate the capacity of momentary time-sampling procedures for distortion and insensitivity. (See Springer, Brown, and Duncan, 1981, for a more general discussion of the problem.) In practical terms, they serve as a warning to those who would use such procedures by arbitrarily choosing a convenient inter-look interval without having first calibrated their measurement procedures to the characteristics of the behaviors and behavers involved. This case does **not** illustrate ways in which discontinuous measurement procedures might affect our decisions concerning the behavioral effects of **interventions.** But it surely suggests that the design of such procedures can lead to incorrect decisions. In the present case, if we aimed to **maintain** on-task behavior, on the basis of a ten-day decelerating baseline with four- or eight-minute inter-look intervals (10-day projections in Charts 3 and 4), we would decide to intervene. On the other hand, if we hoped to **increase** time on-task and looked at the 20-day baselines in the same figures, we might decide **not** to intervene. **According to Charts 1 and 2, neither of those decisions would have been correct!**

Insofar as discontinuous recording procedures involve a form of probabilistic sampling, we would expect their reliability to increase as a function of the number of samples obtained. Quantitatively this number is equivalent to the ratio between the ceiling and floor frequencies, an index of the recording window. In the present example, daily bounce increases as the size of the recording window decreases. And as this variability increases, the celeration projections from the first ten days of data become less reliable. The message is that if we choose a lower number of observations per day, we probably need to obtain a longer baseline before making any decisions or projections. What is more, the disparities between 20-day celerations in Charts 3 and 4 and those in Charts 1 and 2 suggest that with smaller recording windows (i.e., fewer samples per day) we risk obtaining a distorted picture **no matter how long the baseline.** Therefore, if you **must** use momentary time-sampling procedures, be sure to use the widest possible recording window and allow for a period of calibration, as illustrated in the present case, in order to determine the degree of concordance between a direct, continuous measurement procedure and the chosen time-sampling procedure. Better advice is to avoid discontinuous recording procedures altogether.

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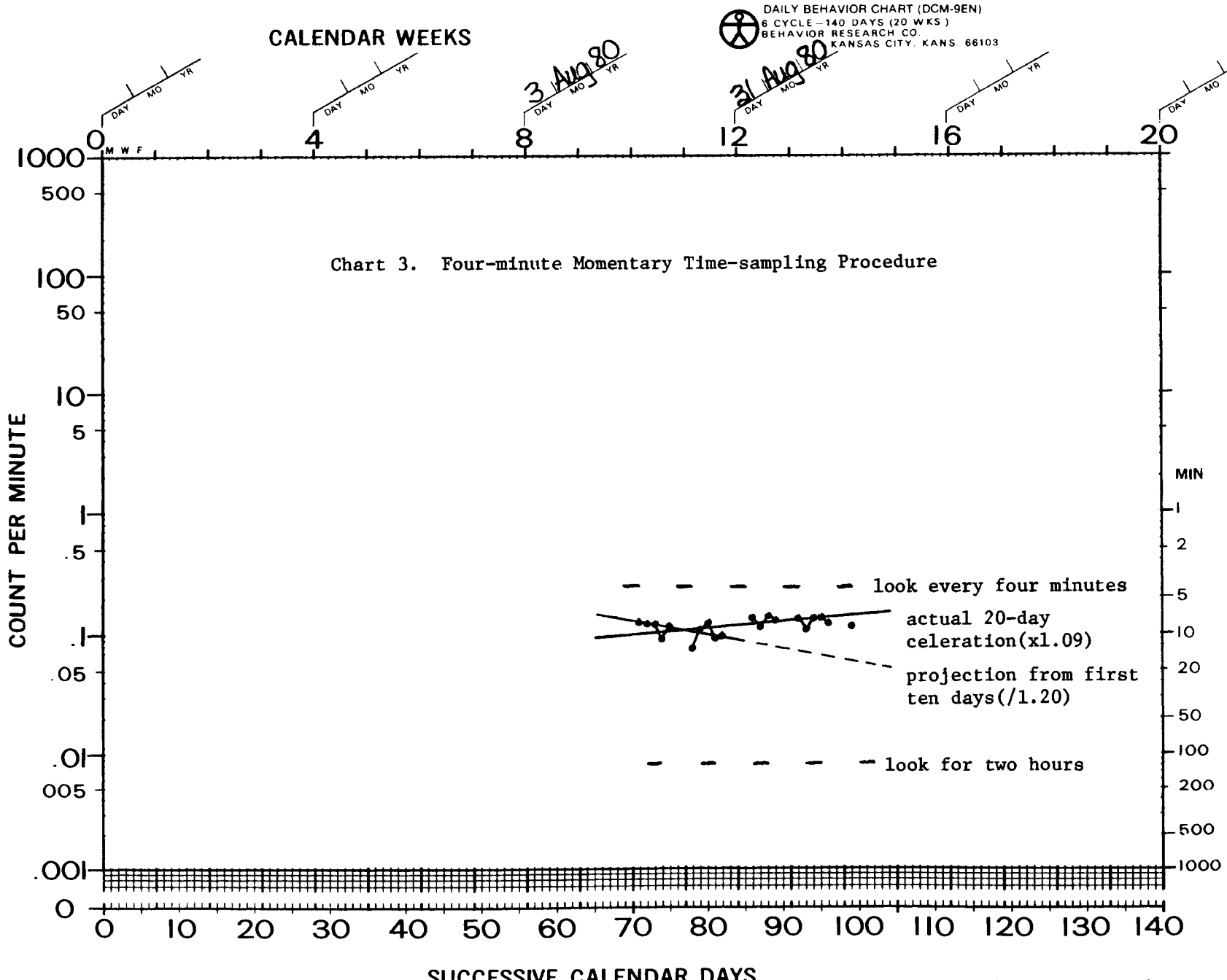

Chart 3. Four-minute Momentary Time-sampling Procedure

	Carl Binder	Debbie Jameson		P.	24		observations
SUPERVISOR	ADVISER	MANAGER		BEHAVER	AGE	LABEL	COUNTED
			D. Jameson	D. Jameson	D. Jameson	when client was on task	
DEPOSITOR	AGENCY		TIMER	COUNTER	CHARTER		

Binder, Carl V. and Jameson, Debbie. An analysis of interval size in a momentary time-sampling procedure. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

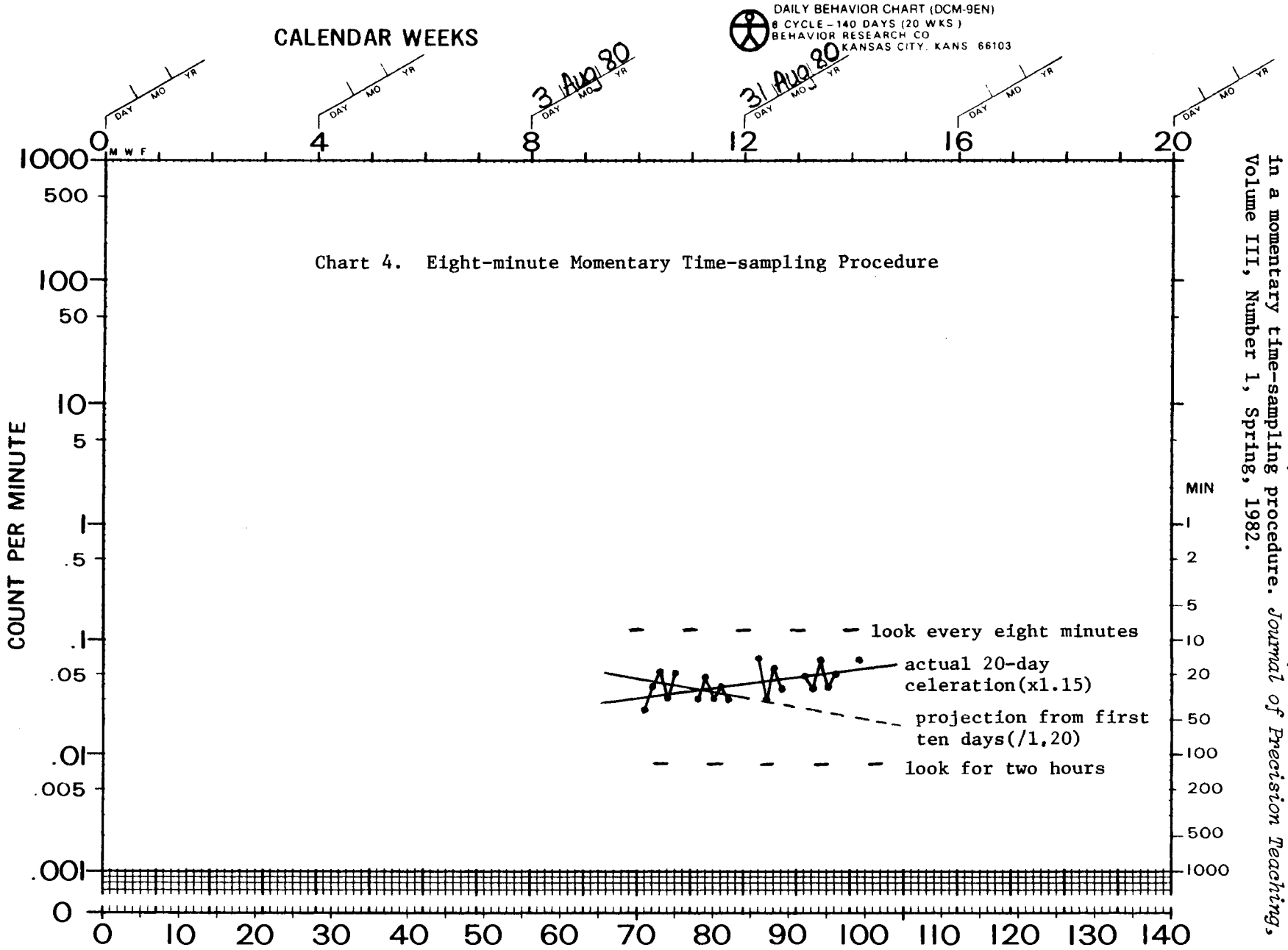

Chart 4. Eight-minute Momentary Time-sampling Procedure

	Carl Binder	Debbie Jameson		P.	24		observations
SUPERVISOR	ADVISER	MANAGER		BEHAVER	AGE	LABEL	COUNTED
			D. Jameson	D. Jameson	D. Jameson		when client was on task
DEPOSITOR	AGENCY		TIMER	COUNTER	CHARTER		

Binder, Carl V. and Jameson, Debbie. An analysis of interval size in a momentary time-sampling procedure. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

Carl Binder is the staff Psychologist at the Behavior Prosthesis Lab, Walter E. Fernald State School, Box 158, Belmont, MA 02178. Debbie Jameson is a developmental disabilities specialist at a sheltered workshop. Her address is P.O. Box 71, Ashby, MA 01431.

TECHNICAL NOTE: A SIMPLE CALCULATOR TO COUNTER CONVERSION

Charles T. Merbitz
Rehabilitation Institute of Chicago

Lindsley (1968) has noted an inexpensive mechanical counter now widely available, and McGreevy (1981) has listed a series of devices that may be used as counters.

When it is desired to have a behavioral event counted without a separate "push the counter" movement, or when the frequency of the behavior is greater than a mechanical counter will accommodate, an option to consider is an electronic counter. Any calculator with a "repeat function" feature (usually part of the "equals" key) can be so used by simply entering the key sequence -1, +1, =; and every subsequent depression of the "=" key will increment the total by 1.

However, this method requires a mechanical depression and release of the "=" key. For some clients, a larger keypad surface may be desired, and for some applications, e.g. wheelchair pressure relief push-ups or refrigerator door openings, a mechanical arrangement to physically push the "=" key may be clumsy or unreliable. Instead, wires may be added to a calculator "=" key contacts such that simply shorting the wires increments the counter. That arrangement permits a wide variety of switches and types of contact devices to be used.

An inexpensive (about $10.00) calculator, the Unsonic 1541L, is very readily converted to such a counter without disturbing any of its calculator functions. With the calculator turned off, the case may be pried open by gently working a screwdriver blade around the joint at the perimeter of the case. Small cracking sounds will indicate that the latches holding the case together are breaking, which is normal. The bottom of the case will come off, exposing a printed circuit board attached at both ends by bare gold wires. At the bottom end of the calculator (away from the display), 17 wires join the printed circuit board to the keyboard back. Strip 1/8" of insulation from two wires of any length or gauge desired (#22 stranded, insulated wire is convenient) and solder one of them to the 7th gold wire and one to the 11th gold wire, counting from either end of the array (see Diagram 1). Pencil marks on the edge of the board next to the appropriate wires will mark the ones to be soldered. Do not allow solder drops or any other contact with the remaining gold wires. The two soldered wires will be separated by 3 untouched ones. If you use #22 stranded wire, then 2 small 1/16" holes drilled anywhere convenient in the case will permit egress of your new leads. Gently lead the new wires out of the calculator case. Make sure that no extraneous contacts or shorts can occur.

Replace the back cover and turn the calculator on. Enter -1, +1, =, and then touch your two new leads together several times. The display will increment each time you short and release the two wires, as you are simulating a depression of the "=" key. These new leads may then be attached to any sort of switching device that makes and breaks contact, and you have an electronic counter with a wide variety of applications.

REFERENCES

Lindsley, O. R. A reliable wrist counter for recording behavior rates, **Journal of Applied Behavior Analysis**, 1968, 1, 77-78.

McGreevy, P. **Teaching and learning in plain English.** Kansas City, Missouri: Plain English Publications, 1981.

Charles Merbitz is a research associate in the Learning Research Unit at the Rehabilitation Institute of Chicago, 3345 East Superior Street, Chicago, Illinois 60611 (312-649-6000).

Chart-sharing

THE KEY TO SUCCESS

Carrie Brown
Wayne State College

Bob Bower
Wayne State College

The client is a 27-year-old mentally retarded male named Cliff. Cliff lives with six other

Merbitz, Charles T. **Technical** note: a simple calculator to counter conversion. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

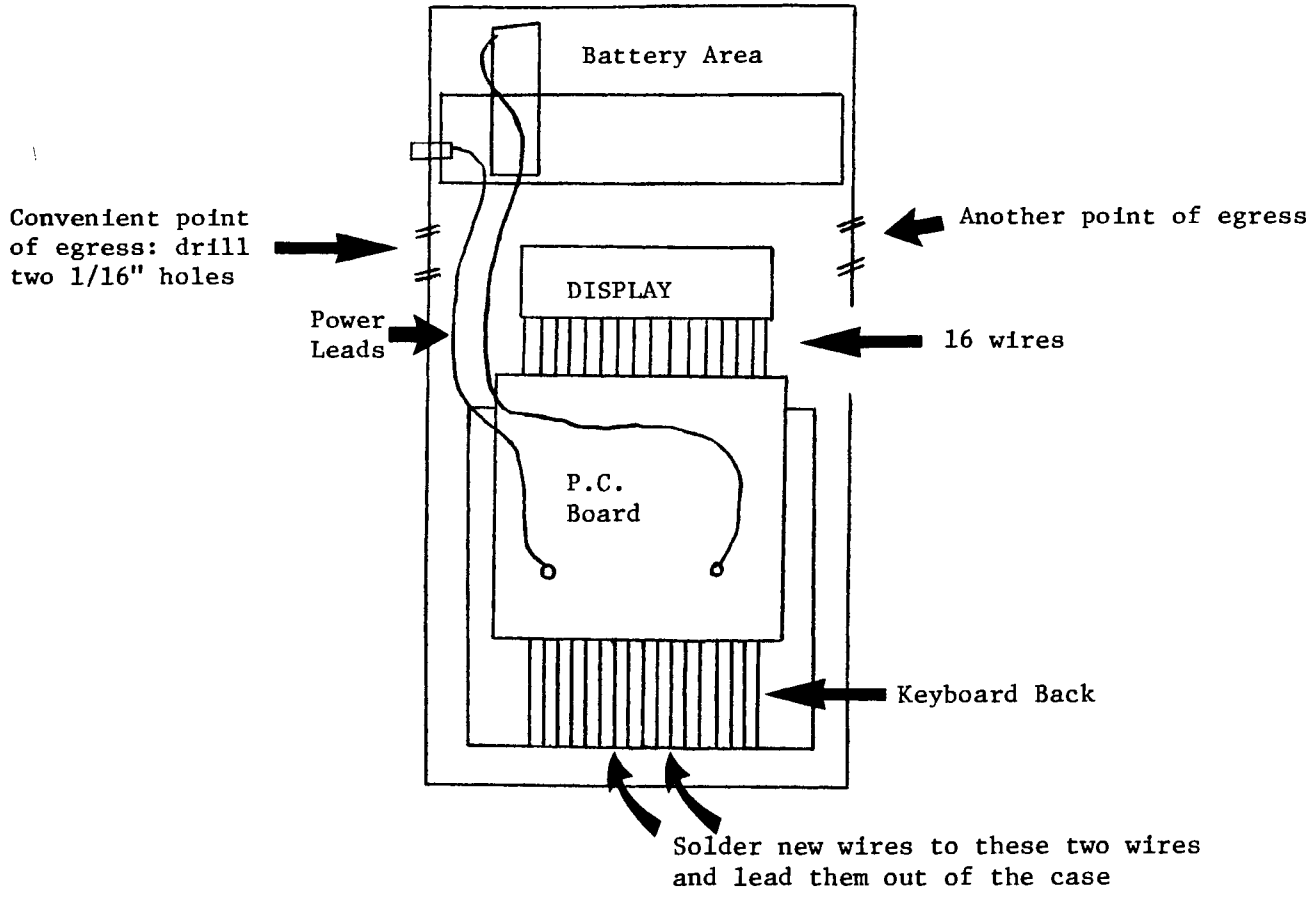

Diagram 1. Converting a Unisonic 1541L Calculator to a Counter with a Wide Variety of Applications

clients at a group house managed by the Regional Developmental Center in Wayne. He has lived at the house for several years. According to the house manager, Cliff was unable to unlock the outside door of the house. This limited his mobility and independence.

The house manager completed a task analysis of the door unlocking process which included the following twelve steps: has key with him, gets key out, holds key, inserts key, turns key, turns knob, turns key and knob, pushes door open, removes key from door, puts key away, closes door, and opens door independently.

We practiced the steps for three days using the front door to the house. A 30-second counting period (timing) was used. As seen in Chart 1 there was no progress. In fact, during the initial three days of timings, Cliff had a great deal of difficulty inserting the key into the lock and did so only on the second day. The following changes were made in the training program. The practice session was moved to an indoor setting using an almost identical key, lock fixture, and door. A new task analysis was completed. It consisted of six rather than twelve steps, and started with "inserting key into lock." The process included these steps: inserts key, turns key, turns knob, pushes door open, removes key, and closes door. These 6 steps were each attempted once during a timing that varied from day to day. After each timing, Cliff would look at the stopwatch to see how fast he could unlock the door. Training sessions, which immediately followed the timing, included practice inserting the key into the lock and practice of the entire procedure three times. On occasion, candy and cookies were given to Cliff following practice sessions.

The results were terrific! In just six days, Cliff progressed from barely getting through two steps in 30 seconds to unlocking, opening, and closing the door in approximately 10 seconds. The celeration is about X3.

Cliff enthusiastically approached training sessions. The authors feel the social interaction between Cliff and Carrie as well as the continued daily improvement in performance contributed significantly to Cliff's reliably enthusiastic response to training sessions. His self confidence improved greatly since the initiation of this program. The house manager made and continues to make positive statements concerning Cliff's independent behavior. Carrie is currently learning sign language vocabulary and teaching that vocabulary to Cliff.

Carrie Brown is an undergraduate student in elementary and special education at Wayne State College, Wayne, Nebraska. She is also a part time employee of the Regional Developmental Center in Wayne. Bob Bower is an assistant professor at Wayne State College, Wayne, Nebraska, 68787 (402-375-2200).

STANDARD CELERATION CHARTING GROWS YEARLY AT ABA

Stephen A. Graf
Youngstown State University

The following excerpt from The Behavior Analyst describes ABA. "The Association for Behavior Analysis is an interdisciplinary group of professionals, paraprofessionals, and students interested in the experimental, theoretical, and applied analysis of behavior. Founded in 1974, ABA was organized to establish a separate identity for behavior analysts working in diverse disciplines and to promote the development of behavior analysis as a profession, a science, and a means for improving human welfare."

The Eighth Annual Convention of the Association for Behavior Analysis (ABA) will be held 27-31 May 1982 in Milwaukee, Wisconsin. Standard Celeration Chart (SCC)-sharing sessions have been a part of the last two conventions, and in these sessions, individuals have expressed interest in seeing how the SCC has grown in use at ABA.

The counts come from the index of each yearly program, with the exception of the second year program which I haven't been able to find.

For each year, I counted the number of presenters listed in the program, and the number of total presentations, first for ABA presenters as a whole and then for individuals that I identified as "Standard Celeration Charters" or "Precision Teachers." These results are shown in Charts 1 & 2. The counts are obviously not "true values," but are likely to be representative of the way things were. One can see that if the growth of Celeration Charts and ABA continue at the same acceleration, all of ABA will be using Standard Celeration Charts around 1995, and all the people will be "Charters." Do you think that will happen? A tendency exists for growth from within an organization to be seen as a "cancer" when the size of the subgroup becomes about 1/5 of the entire organization (Lindsley, 1982).

For those attending the 1982 convention, two Chart-sharing sessions will be held. The first has been planned to preview all the Chart sessions of the entire conference with five-minute summaries by the presenters. This is

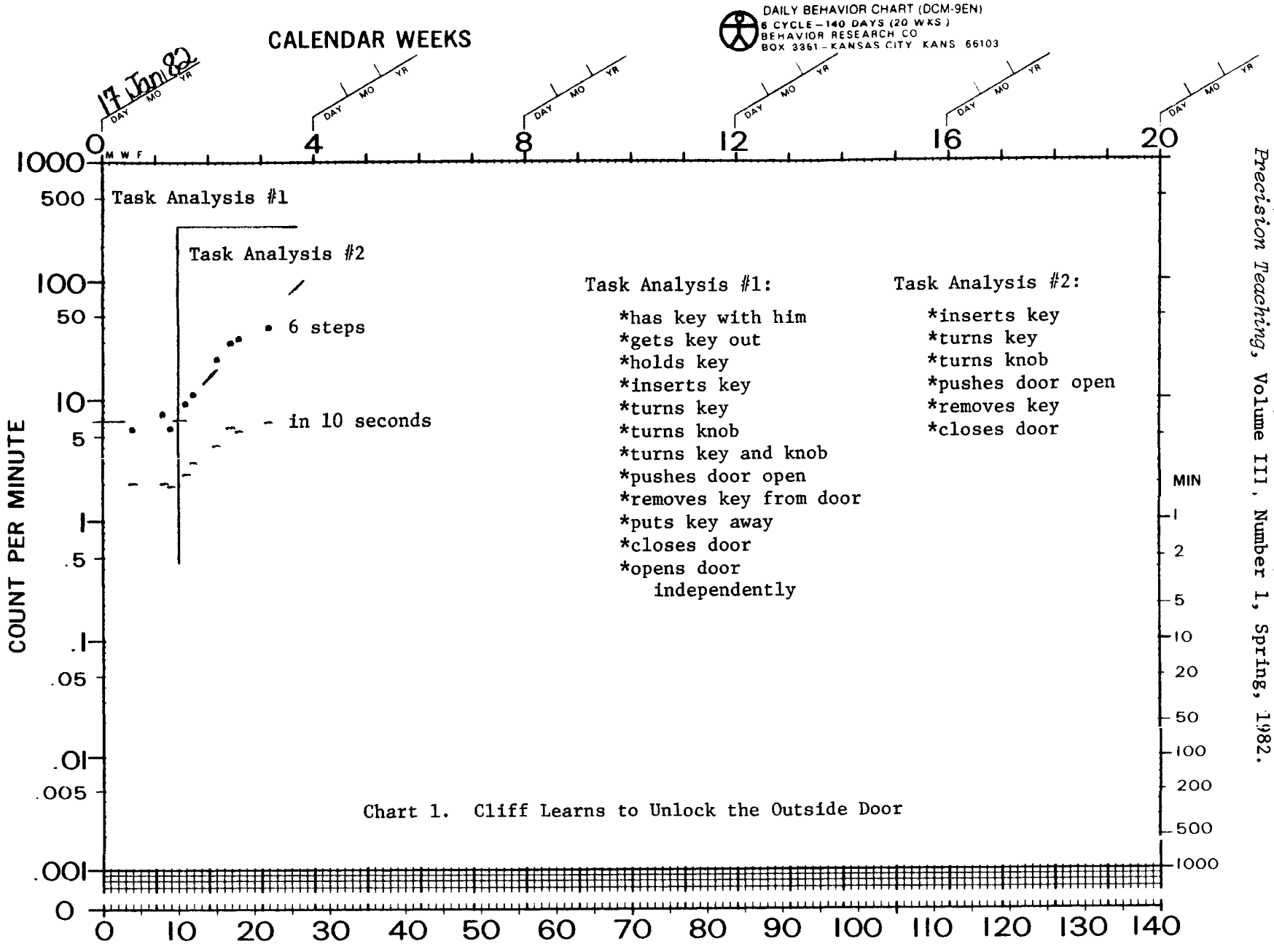

Chart 1. Cliff Learns to Unlock the Outside Door

Bower	Bower	Carrie Brown		Clifford B.	27		completes steps
SUPERVISOR	ADVISER	MANAGER		BEHAVER	AGE	LABEL	COUNTED
Regional Developmental Center Wayne, Nebraska				Carrie Brown			to unlock outside door
DEPOSITOR	AGENCY		TIMER	COUNTER	CHARTER		

Brown, Carrie and Bower, Bob. The key to success. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

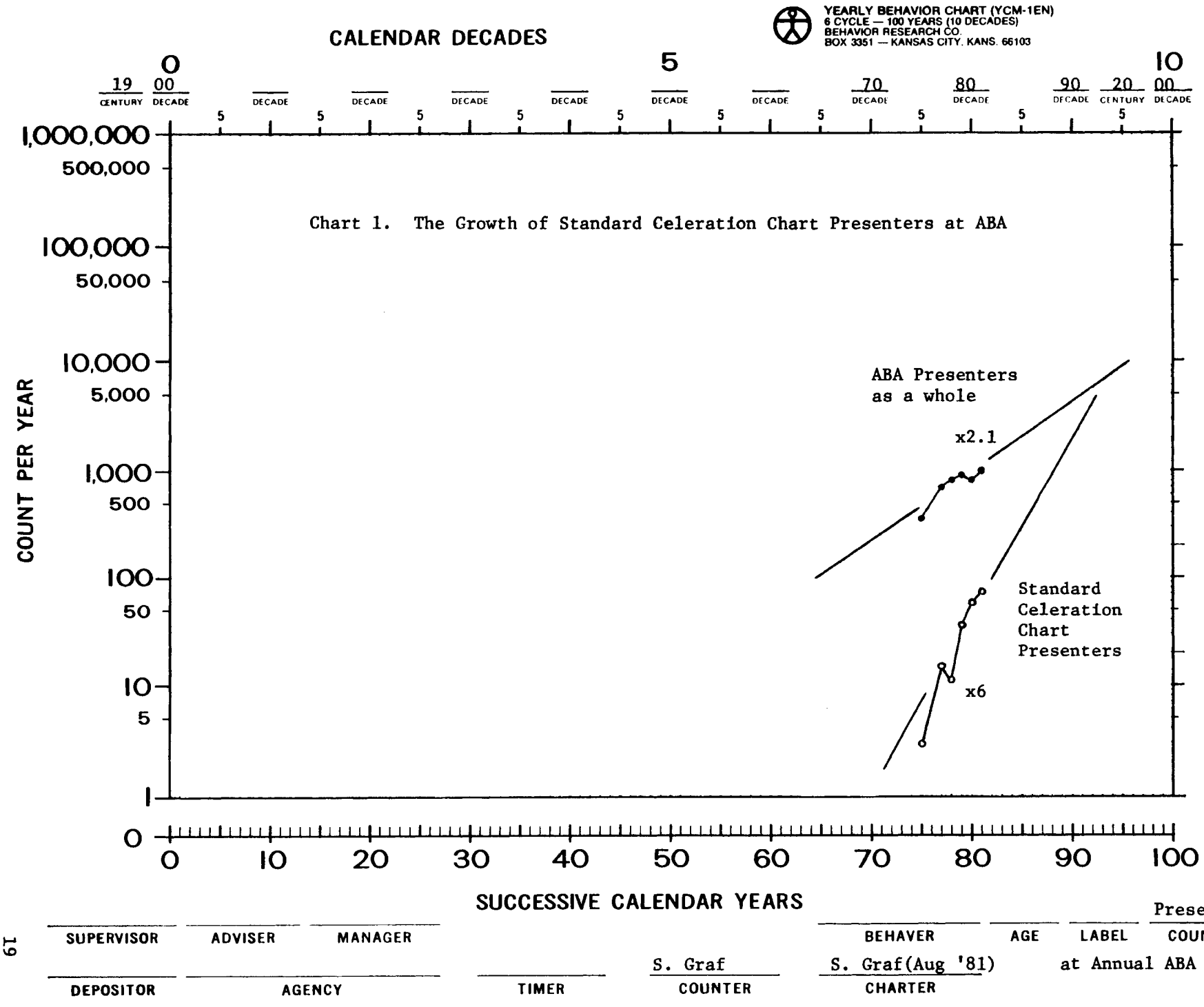

Chart 1. The Growth of Standard Celeration Chart Presenters at ABA

Graf, Stephen A. Standard Celeration Charting grows yearly at ABA. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

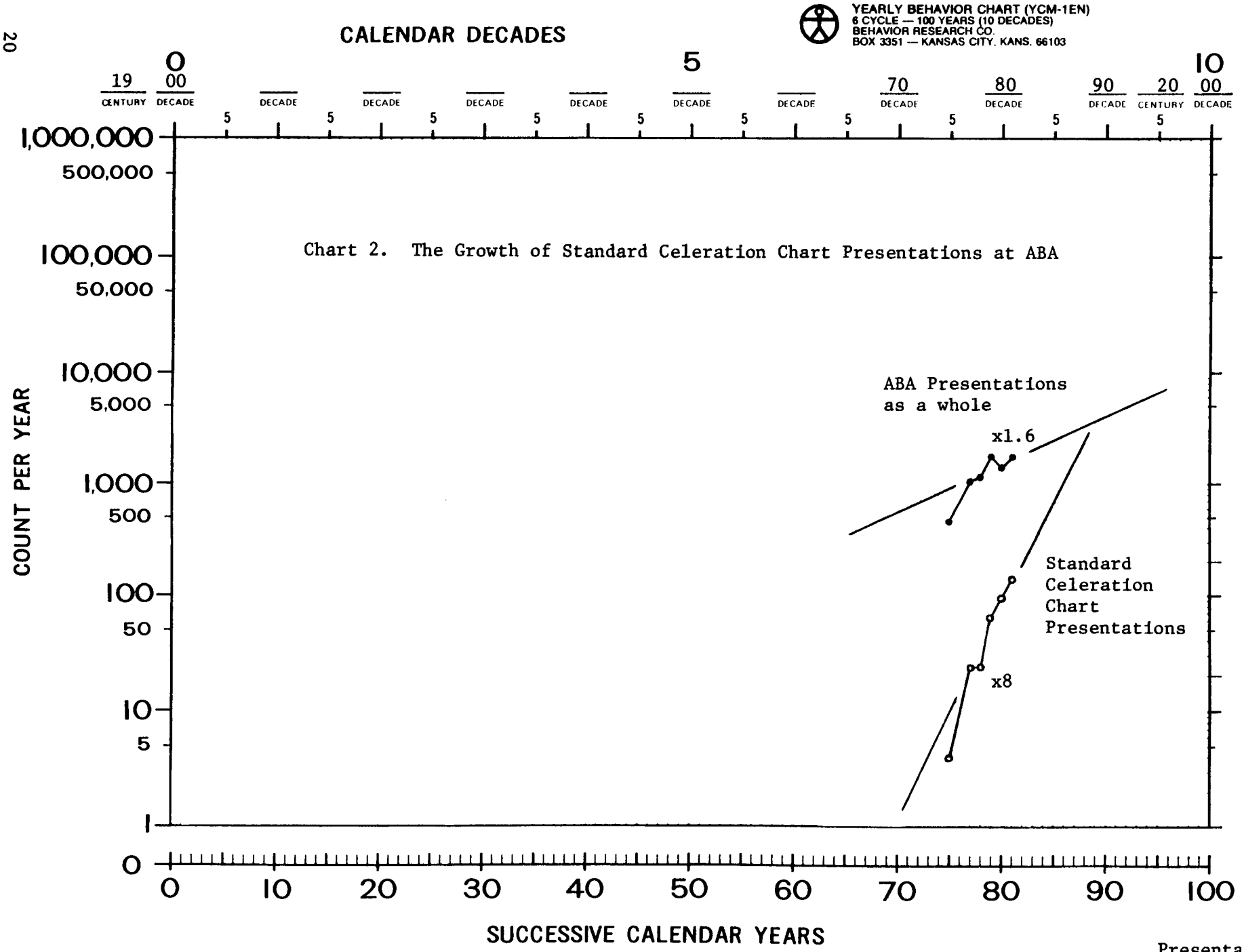

Chart 2. The Growth of Standard Celeration Chart Presentations at ABA

SUPERVISOR	ADVISER	MANAGER		BEHAVER	AGE	LABEL	COUNTED
							Presentations at
DEPOSITOR	AGENCY	TIMER	S. Graf COUNTER	S. Graf CHARTER		at Annual ABA Convention	

Graf, Stephen A. Standard Celeration Charting grows yearly at ABA. *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

the first time this type of preview has been attempted. It was suggested last year because the growth of Charters produced numerous conflicts, where more than one Chart-based session occurred simultaneously and one couldn't see everything. This event will be held at the start of the convention, Friday morning at 8 a.m., in the Solomon Juneau Board Room.

Another session will be open to any and all who wish to share data on Standard Celeration Charts. Three minutes are allotted to each individual in each round. Everyone is encouraged to bring several "shares," and we'll recycle until all sharing is complete. This event will be held Saturday evening at 7 p.m. in Gilpatrick B & C.

If you are not familiar with ABA but would like more information about the organization, send me any questions. If you are familiar with ABA and would like to be a part of the 1983 Convention, please let me know by 1 Sept 1982.

REFERENCE

Lindsley, O. R. Personal communication, February 1982.

Stephen Graf is Associate Professor of Psychology, Youngstown State University, 410 Wick Avenue, Youngstown, Ohio 44555 (216-742-3401).

About PT

NOTES FROM THE EDITOR

Patrick McGreevy

Welcome to Volume III of the **Journal of Precision Teaching.** As you can see, **JPT** has taken on a "new" look. This was the result of a consulting editors meeting held at the Second Annual Winter Precision Teaching Conference in Orlando, Florida. Fourteen editors, myself and Julie Vargas attended that meeting. A number of suggestions were made to improve content, format, and indexing. These suggestions were then sent to the remaining editors for their input. Some of these suggestions have been implemented in this issue. Others, such as, a cumulative author/subject index, article abstracts and the indexing of JPT will be implemented during the coming year.

One part of our "new look" is a series of regular columns "about Precision Teaching." This column will share information and answer questions about **JPT.** It will also serve as a forum for other issues relative to publishing and Precision Teaching. The following columns will share information and answer questions about the application of PT to specific content areas. In order to be included in the summer issue, material should be sent to column editors by 10 June 82. The column editors should send it to me by 25 June 82.

First of all, I would like to congratulate Ron Stearns and the Orange County Public Schools. The Second Annual Winter Precision Teaching Conference was a tremendous success. Special thanks go to Marilyn, Linda, Jan, Charlie and the entire staff of the Precision Teaching Project.

The Journal needs subscribers! In order to cover costs, we need to increase subscribers by x2.5! Please help! Xerox the enclosed order blank and pass it to at least five colleagues or friends. We need these subscribers or we will not be able to continue.

A very special thank you goes to Mary Ventura of Kansas City, Missouri for serving as a guest editor.

Finally, and most importantly, please send articles and Chart-shares. Many subscribers have expressed to me their interest in seeing more Chart-shares. Many of you are making discoveries and doing great things. Let's get them in print so others can benefit from your experience.

One last thought: if you've never tried a leap-up or crossover project, get out there and try one. If you want more information or need help getting started, write me a note or call me:

P.O. Box 7224
Kansas City, MO 64113
(816) 474-7770

CURRICULUM

Marie Eaton & Peggy Albrecht

This column is intended to provide a place for teachers and other practitioners to share ideas about curriculum development and how existing curriculum can be adapted to be compatible with

Precision Teaching.

The 1982 Winter Conference in Orlando provided some potentially interesting topics for discussion in this column:

1. The inclusion of non-instances on practice sheets and probes;
2. The development of probes which monitor the development of thinking skills as well as the development of skills in basic content;
3. The development of practice sheets and probes which are compatible with the Direct Instruction Model;
4. The effects of the format of practice sheets and probes on the rates and acceleration of students' learning;
5. The development of curriculum compatible with Precision Teaching methodology in college level courses.

Peggy and I would like to be responsive to your interests in this area and would be happy to accept ideas and examples of things you have done as well as requests for help in the curriculum area. If you have something you would like to share with other Precision Teachers, send a copy of your probe/practice sheet and/or a description of the curriculum idea to either:

Marie Eaton
Dept. of Education
Western Washington U.
Bellingham, WA 98225

Peggy Albrecht
Precision Teaching Project
330 Third St. N.E.
Great Falls, MT 59404

Watch in future issues for more on this theme.

REHABILITATION

Carl Binder & Charles Merbitz

Precision Teaching seems to have a unique potential for the field of rehabilitation because it is a data language that can be used by specialists in all clinical disciplines in working with the behavior of each patient or client. In rehabilitation, the skills of professionals of many areas (Physical Therapy, Occupational Therapy, Nursing, Psychology, to name a few), are focused simultaneously on assisting one patient to maximum adaptive performance. Currently, each discipline has its own jargon, assessment methods, and ways of discussing behavior. Many commonly cited problems in rehabilitation ("lack of motivation," "poor memory," "depression," "inconsistency"), are problems of behavior that may be exacerbated by imprecise communication between team members because teams have no common data language for discussing behavior.

The **Journal of Precision Teaching**, and this small part of it, will hopefully serve as an interdisciplinary forum for the exchange of data and news about the use of Precision Teaching in rehabilitation. Please send your comments, notes, Charts and suggestions to: Carl Binder, Ph.D., Behavior Prosthesis Lab, Walter E. Fernald School, Box 158, Belmont, MA 02178, or Charles Merbitz, Ph.D., Room 981, Learning Research Unit, Rehabilitation Institute of Chicago, 345 E. Superior Street, Chicago, IL 60611.

We are particularly interested in Journal citations and material published and presented that is Chart-based. In that vein, one of us (Binder) gave a presentation entitled **Precision Physical Therapy** at the Precision Teaching Winter conference, the latest in a long series of presentations on the use of PT in PT and OT. The other (Merbitz) also presented a case study of speech-language rehabilitation following severe head trauma using data collected by Trudy Miller from the Rehabilitation Institute of Chicago. Finally, an article entitled "Analysis of Therapeutic Technology Through the Use of the Standard Behavior Chart," written by Bonnie Carr and Mark Williams, appeared in the February, 1982 issue of **Physical Therapist.**

Let us keep these articles and presentations flowing, and perhaps some day we can see a set of articles, written from the perspective of different disciplines, using the Standard Celeration Chart, documenting the rehabilitation of a single person in all areas of life.

PRESERVICE AND INSERVICE TRAINING

Peggy Albrecht & Marie Eaton

This column will provide information concerning inservice and preservice training available to educators across the country. We are requesting information on the extent of training, successful procedures, research indicating the effects of this training, both on teachers and students, and problems encountered in training.

If you have workshops or conferences coming up that you would like to advertise, we will also include this information in the column. Please submit your information to: Marie Eaton or Peggy Albrecht; co-editors for this column.

Great Falls Precision Teaching Project

As a developer/demonstration project for the National Diffusion Network, the Great Falls Precision Teaching Project provides training to interested districts across the United States and

Canada. A division of the U.S. Department of Education, the National Diffusion Network supports exemplary programs which have demonstrated effectiveness with students. The major focus is to disseminate these proven practices to other interested school districts.

The Great Falls Precision Teaching Project has been a training program in the NDN for the past seven years and has provided training in 32 states, the District of Columbia, and two provinces of Canada. Chart 1 shows the number of states, buildings, educators trained and the number of students affected by year since 1975. The yearly statements are cumulative and as such the 1981 count shows 5,590 educators trained since September of 1975.

The training is inservice in nature and involves three days of initial training and two to three days of follow-up technical assistance to adopting districts. Teachers trained in Precision Teaching have access to the Materials Bank which houses over 10,000 individual practice sheets in thirteen curriculum areas.

Information concerning training opportunities may be obtained by contacting Ray Beck, Director or Peggy Albrecht, Coordinator. The address is:

Precision Teaching Project
3300 Third St. NE
Great Falls, MT 59404
Phone: (406) 791-2270

Teacher Training Revisited

Bill Wolking

This is a brief artic le reporting on Teacher Training Revisited, one of the sessions on Trainer's Day at the Second Annual Winter Precision Teaching Conference, Orlando, Florida, March 1982.

This was the second annual edition of a session devoted to issues in training Precision Teachers. It was the first afternoon session on Trainer's Day. The objectives were: (1) to find out if anyone got any good ideas from last years session on teacher training; (2) to provide a forum for discussion of problems and changes we might try; and (3) to gather some data on the main training issues so we could pass them along to readers of the **Journal of Precision Teaching.**

A lively crowd showed up after lunch. There were more than 50 people there, including University and College preservice and grad school trainers, shortcourse and workshop trainers, project-based trainers, agency personnel and an unlikely assortment of distinguished others. Five people were asked on the spot to give a five minute summary of their favorite training procedures and their consistently frustrating training problems. Peggy Albrecht, Great Falls Precision Teaching Project, Marie Blackburn, Minneapolis Public Schools (Sims Project), Marie Eaton, Western Washington University, John Eshleman, West Virginia University, and Eric Haughton, Loyalist College each gave some of their best ideas. Discussion followed.

The remainder of this report is a summary of brief written responses that the speakers listed above and 16 others attending the session contributed in response to a form that was distributed. The form requested information on the person's typical training roles and responsibilities and a list of 3 or 4 issues or problems in training that need our urgent attention. They are listed below without comment. The purpose is to share the ideas on problems in training expressed at the Second Annual Winter Conference, and to encourage you to share training procedures which you have found to be effective with respect to these problems.

The largest number of problems were about providing stable and continuing support systems for Precision Teachers. Follow-up training, administrative support, curricular materials support, and data-sharing networks were all seen as areas needing attention. Another area of concern had to do with performance standards for the skills included in preparing precision teachers. What fluency criteria are supportable, and are there other standards in addition to fluency and accuracy that should be considered? On a related topic, some expressed concern about developing a more or less standard curriculum, and asked for suggestions as to what it should include. A third theme of concerns was expressed about developing simulated teaching experiences in order to condense the number of teaching decisions made into a short period of time under well controlled conditions. Closely related to the issue of simulated teaching experiences is a widely recognized set of problems in bringing teachers' decisions under stimulus control by learning pictures, celerations and decision rules. In short, how to help them become analytic functionalists and to give up their old structuralists movements.

The last area with some related problems dealt with issues of teacher-learner relationships. How to get the teacher to turn over more of the PT responsibilities to students, how to get teachers to challenge their students with bigger curriculum steps, higher aims and an emphasis on learning instead of accuracy. And to get teachers to try Precision Teaching with skills beyond the basic academic skills. Other issues

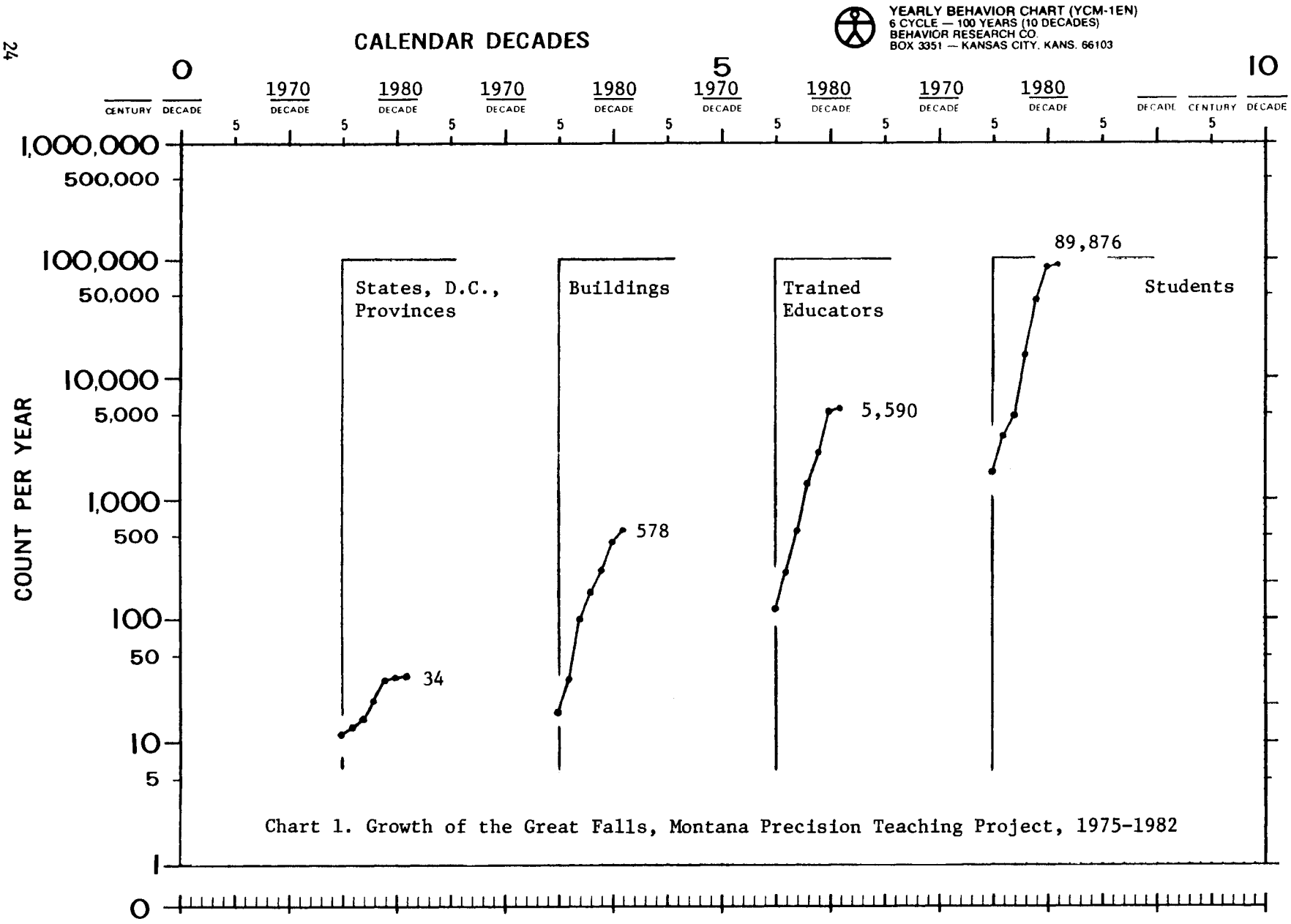

Chart 1. Growth of the Great Falls, Montana Precision Teaching Project, 1975-1982

CALENDAR YEARS

R. Beck — SUPERVISOR
P. Albrecht — ADVISER
MANAGER

Precision Teaching Project: cumulative growth — BEHAVER
AGE
LABEL
COUNTED 1975-1982

Great Falls Public Schools — DEPOSITOR
Great Falls, Montana — AGENCY
TIMER
COUNTER
CHARTER

Albrecht, Peggy. PRESERVICE AND INSERVICE TRAINING COLUMN, *Journal of Precision Teaching*, Volume III, Number 1, Spring, 1982.

included finding better ways to teach charting, training teachers as change agents and developing ways to confirm the general usefulness of the training procedures we use.

ADMINISTRATIVELY SPEAKING

Skip Berquam and Ann Starlin

Welcome to a new column in **JPT.** One of the results of the Second Annual Precision Teaching Conference held in Orlando in March was a re-structuring of this journal. As **JPT** is a growing and improving publication, considerable discussion took place regarding specific improvements that could be made. In the coming issues you will see and read the results of much of that discussion.

This section is being written especially for administrators and managers. It is not intended to be specific to school administrators. Our purpose is to address a wide range of administrative applications for precision data. We will be seeking input from administrators and managers who operate in a variety of settings.

Our goal in editing this column (notice the verb "edit"; it is our hope to be swamped with material submitted on this topic), is to present data concerning program development, implementation, and evaluation, all from the perspective of administrative decision-making. We also hope to include information regarding publications of interest to administrators, and vacancy notices for the precision administrator, when available. Correspondence can be sent to either of us:

Eugene "Skip" Berquam	Ann Starlin
1308 W. Fourth	2921 Harvard
Port Angeles,WA 98362	Lawrence, KS 66044

A number of Precision Teachers have found useful information in the book **Human Competence: Engineering worthy performance,** written by Thomas Gilbert, and published by McGraw-Hill. This book presents a model for doing performance evaluations in a wide range of settings. A chapter on education presents some unique concepts that are compatible with a Precision Teaching approach. However, some of the specific suggestions concerning education are considerably behind where we currently are in Precision Teaching. Perhaps in a future column we will have a short (precise) abstract of this book.

Another feature that will be included in this column is a question and answer section. We will start this month with the following question: How can charted data be used to help structure the administrator's day? Those of you who have found ways to make your work more efficient, please send in your ideas, preferably with charts.

In closing, we would like to present a quote from Education Secretary Terrel Bell. In summarizing research on effective teaching to a national elementary principals' group, Bell mentioned that one of the primary factors related to school achievement is a system for monitoring and assessing past performance. Bell stated, "When performance is measured, performance improves. When results are fed back, performance accelerates." Interesting vocabulary! Many charts say the same thing.

Take care and take data,

Skip Berquam & Ann Starlin

HIGHER EDUCATION

H. S. Pennypacker

Since 1969 when Jim Johnson and I first devised a college-level instructional technology around direct, nearly continuous behavioral measurement displayed on the Standard Chart, a growing portion of the professoriat has found that variations of this practice make teaching at the college level far more fun and productive. Moreover, many have noticed that courses taught in this fashion make excellent laboratories for the study of human learning, largely because real-world contingencies are in place and available for analysis. Students do, in fact, learn nonsense syllables more rapidly if grades and graduation are at stake than if the only reward is to stymie a graduate student's thesis project.

Over the past several years, I have observed a decline in published reports of innovations and their outcomes in this style of college teaching. At the same time, I have experienced a decided increase in informal communication about these matters. Individuals like Steve Graf, Julie Vargas, Charles Merbitz, Claudia McDade, Charles Olander, Bob Spangler, Bob Bower, and Og Lindsley, to name just a few, call or write to me at least twice a year to discuss a new tactic or discovery. These contacts are over and above the lengthy conversations that occur at every conference we jointly attend.

My aim in this column will be to share as many of these new procedures and their outcomes as possible. To accomplish this, I will need the help of everyone who is already using, or even thinking about using, the Chart as part of college-level curriculum. Please call (904) 373-3444 and follow the recorded instructions. I will return your call and add your contribution

to the column.

To give you an idea how the process works, I returned from the Orlando Precision Teaching Conference to discover that virtually all of my undergraduate students were at least one week behind optimal pace. We have made a textbook change this semester; an analysis of the charts suggested that the new book is not too good with technical definitions, the absolute foundation of any fluent technical vocabulary. My staff and I decided to implement Ogden's SAFMED procedure for our technical terms but were not sure of some procedural details that he had perhaps already refined. I placed a call to him and 30 minutes later we had the outline of a basic research question that badly needs asking. I will discuss both the question and the data in the next issue, but the problem is essentially this: Does it matter which component--term or definition--is on the "See" side of the card and which is on the "Say" side? Perhaps many of you have already addressed this problem. If so, would you please share your discoveries? We may be on the threshold of a revolutionary advance in instructional design, an advance that deductive cognitive theorizing has prevented us from recognizing. As always, of course, we will let the data decide.

I look forward to hearing from you and continuing both to learn and to teach as a result of Editor McGreevy's kindness in asking me to manage this section of the Journal.

COMPUTERS

Stephen Graf & William Wolking

Who's doing what and where with Precision Teaching and computing? Help keep us posted on what you are doing by writing the Editors. Prod for more information if you're interested.

Odgen Lindsley, Lawrence, Kansas. Lindsley has been at the forefront of Word Processing and microprocessed instruction. He is teaching classes in use of the Apple II. His presentations on computers at The First Winter Precision Teaching Conference (1981) and the Seventh Association for Behavior Analysis Convention (1981) use celeration analyses to address some myths currently surrounding computer-based education.

Charles Olander, Jacksonville, Alabama. Olander, Claudia McDade and their associates have implemented frequency and celeration-based computer assisted instruction at the Center for Individualized Instruction at Jacksonville State University. Data from the students is plotted on a video screen representation of the Standard Celeration Chart. Olander uses the Apple II.

Charles Merbitz, Chicago, Illinois. Merbitz helped initiate the program at Jacksonville State, and is now working at the Rehabilitation Institute of Chicago using Apple II computer games as exercises in rehabilitation following head trauma.

Ron Stearns, Orlando, Florida. Stearns and his associates in the Orange County Precision Teaching Project have developed "Bounce," a program for the Apple II which accepts data and draws celeration lines and learning pictures for 1, 3, 6, or 9 weeks on the Academic Chart.

Owen White, Seattle, Washington. White uses the time-sharing computer in his course on Exceptional Teaching that covers his book (with Norris Haring) of the same name. Student testing is handled by the program.

Jack Auman & Steve Graf, Youngstown, Ohio. Auman & Graf have constructed a program for the Apple II which provides students and data for teaching decisions. Users of the program try to help the fictitious students reach aims by making changes geared to affect the Learning Picture.

INNERS

Abigail B. Calkin

While I was not at the recent Orlando conference, I did receive Pat's letter about the idea of small columns. I suggested to Pat we add a column on inners.

Inners fall into several categories: thoughts, feelings, urges, and attitudes. Often some people lump these together and think they're all the same. A thought is a mental idea. A feeling is an idea with a mild physiological sensation accompanying it. An urge is a forcible drive or a continuing impulse toward an activity, according to the dictionary. Behaviorally defined, an urge is 20 thoughts per minute about something as opposed to 1 thought every 20 minutes. An attitude is a collection of 30-40 (or more) thoughts and feelings on a topic.

A project in a Human Relations class at Capital City Schools in Topeka helps students learn self-evaluation. Each student checks how she/he felt she/he did that day in class in the following 10 areas: self-starting, relaxing, participating in charting projects, controlling own behavior, sharing in discussions, respecting others, having a positive attitude toward self and others, caring about appearance, doing a good job, and keeping the journal.

The teacher also marks her perception of the student's behavior in those areas. The goal of the project is that the student and the teacher agree on how the student behaved. The teachers, Doreen Overman and Marie Rothschild, think that student-teacher agreement at whatever level, is more important than being perfect every day. As an intervention, they have used a one minute timing on positive feelings. Look for their data share after the end of the semester!

Lynne Conser and I have been working on a unique project. We are each counting a variety of mental inners: illusions/imaging, hallucinations, natural highs, visions, and ESP. Some people call these experiences a gift, others say we're crazy! It took us several weeks to clearly define the behaviors. We used unabridged dictionary definitions and about two weeks of trial counting before we defined what we each meant by a certain term. We wonder how much time is influenced by Kansas pollens. We're also collecting pollen, weather, caffeine and medication data.

I should like to know if anyone has counted positive and negative inners all day, either thoughts, feelings or a combination. I'd also like to know if anyone has used a one minute timing on positives as an intervention or any other intervention. If so, would you share your charts with me. Thanks! I'd also like to know who is interested in doing such counting.

Please send your Charts, ideas, information you'd like to share, and requests for information to Abigail B. Calkin, 631 Lane, Topeka, Kansas 66606. Questions can go in here also and we'll see if we can find some answers!

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