The Journal of Precision Teaching is dedicated to the direct and continuous measurement of behavior, the recording of frequency and the representation of acceleration on the Standard Behavior Chart and Chart-based decision-making. The purpose of the Journal of Precision Teaching is to accelerate the sharing of scientific and practical information among its readers. To this end, both formal manuscripts and informal data-sharing are encouraged.

Material submitted for publication should meet the following criteria: (1) be written in plain English, (2) be limited to eight typed, double-spaced pages of narrative, (3) use the Journal of Precision Teaching Standard Glossary and Charting Conventions, (4) contain data displayed on the Standard Behavior Chart, (5) be submitted in triplicate to the editor, and (6) include one set of original charts or hand-drawn copies. Each formal manuscript will be reviewed by the editor and two consulting editors, two of whom must approve it prior to publication.

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As part of its goal to disseminate research, the University Affiliated Facility for Developmental Disabilities (UAF) at the University of Missouri in Kansas City, under the direction of Carl Calkins, assisted with the production of this Journal.
SEVEN WAYS OF descrIbIng READING --
McGuFFEY'S AND SIX MORE: PART I

Malcolm Neely
Federal Way Public Schools

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: Part I - Lay categories, grade levels, readability formulas, rate, and accuracy; Part II - Reading mastery levels; Part III - Problems and confusions of the six measures and introduction to Precision Teaching, the seventh measure; Part IV - Sixteen Precision
Teaching picture components, discussion, and conclusions. The present article represents Part I of the review.

This paper reviews the seven different ways reading experts have described reading over the past 140 years. The first six—lay categories, grade level, readability formulas, rate, accuracy, and reading levels—have extensive histories. The seventh way, measurement and description by conventions using Standard Celeration Charts (Standard Behavior Charts), and known as Precise Behavioral Management and as Precision Teaching, has a history since 1964. Table 1 lists these seven different reading descriptions, what they measure, how they measure, who behaves, and who sets the description standards.

<table>
<thead>
<tr>
<th>Name</th>
<th>Year&lt;sup&gt;a&lt;/sup&gt;-Author</th>
<th>Measures (What?)</th>
<th>Measures (How?)</th>
<th>Behaver (Who?)</th>
<th>Standards Set By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lay Categories</td>
<td>Antiquity</td>
<td>Response to reading</td>
<td>Subjective opinion</td>
<td>Reader</td>
<td>Expert</td>
</tr>
<tr>
<td>Grade Level (14)</td>
<td>1840 McGuffy</td>
<td>Material complexity</td>
<td>Vocabulary size</td>
<td>Expert</td>
<td>Expert</td>
</tr>
<tr>
<td>Readability Score</td>
<td>1920 Dale</td>
<td>Material complexity</td>
<td>Weighted formulas</td>
<td>Expert</td>
<td>Expert</td>
</tr>
<tr>
<td>Rate Correct</td>
<td>1884 Romanes</td>
<td>Reading frequency</td>
<td>Count per unit of time</td>
<td>Reader</td>
<td>Peers</td>
</tr>
<tr>
<td>Reading Accuracy</td>
<td>1917 Gray</td>
<td>Reading ratio correct</td>
<td>% read correctly</td>
<td>Reader</td>
<td>Expert</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comprehension ratio</td>
<td>% read correctly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Correct</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mastery Levels (4)</td>
<td>1919 Gray</td>
<td>Difficulty of reading</td>
<td>Rate, accuracy or opinion</td>
<td>Reader</td>
<td>Expert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precision Teaching</td>
<td>1965-70 Lindsley</td>
<td>Reading pictures</td>
<td>Reading pictures</td>
<td>Reader</td>
<td>Peers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Correct and error charts</td>
<td></td>
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<td>Comprehension pictures</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Comprehension correct and error charts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a±10</sup>
Lay Categories

Lay words have described reading and readers since antiquity. Someone, usually an "expert", subjectively evaluates a reader's reading responses. As more people read and some became more accomplished, qualitative words, good and poor, were used as descriptors. Today, top, poor, slow, fast, careful, normal, and comfortable are used frequently by teachers as subjective qualifiers of reading achievement.

Because subjective opinions are variable, educators searched for standardization. Grade levels of basal readers and coefficient factors from readability formulas were used to number degrees of difficulty. Even with attempts at standardization, lay words were still used. Courtis (1914), Harris (1956), and Kunzelmann (Washington State Superintendent of Public Instruction, 1973), tied lay words to reading rates, i.e. word frequencies. Poor reading with word errors, hesitancies, and self-corrections resulted in correct-error percentages. The percentages of the number of questions correctly answered or directions accurately followed after reading measured quantitatively, poor, good, careful, or careless reading. Educators noted lay words were not descriptive for classroom reading distinctions; instructional, independent, potential, and frustration were more useful (Betts, 1946). However, mastery levels still required lay words as qualifiers.

Grade Levels

Grading basal materials by difficulty started around 1840 with the McGuffey Readers (Betts, 1946; Chall, 1958, 1967; W. S. Gray, 1917; Spache, 1972). Initially the size of the vocabulary determined the complexity and sequence of the material. McGuffey, the expert, studied the stimuli and set the standards for his series.

The grading of basal readers gained heavy momentum in the 1920's (Chall, 1977). The total number of words, different words, and word repetitions, among other factors, influenced book writers (Chall, 1958). At least 14 different reading levels came into existence, from pre-primer and primer to grade 12. Some experts subdivided these. Chall (1958) and Spache (1964) wrote that basal readers became more and more simplified through the processes, but readability levels across basal reading series and reading tests remained widely different. Grading basal readers is still not standardized and is often debated (Chall, 1977).

Readability Formulas

Readability formulas, scores, and research began in the 1920's, 80 years after McGuffey's start using vocabulary size (Betts, 1946; Chall, 1958). Subjective expert judgment gave such inadequate predictions that objective readability formulas and word lists were sought for educational book writers and classroom teachers (Chall, 1958, 1967, 1977; Dale & Tyler, 1934; Dolch, 1928; Spache, 1953; Vogel & Washburne, 1928).

Books became known by the average number of prepositions in a sentence, the average number of words in a sentence, the length of a line, the height of the letters, the type of print, the percentage of difficult words, the number of "new" words per running 100 words, etc. Numbers and weights were assigned to these characteristics and formulas were derived with
relationship to grade levels.

George Spache and Lester Wheeler are both known for their different primary grade formulas. The Dale-Chall formula was most used for middle and upper grades. Rudolph Flesch's formulas achieved wide use for rating adult reading materials (Harris, 1956). Edgar Dale is listed in Table 1 for his long-term contribution to the reading formula, reading matter measurement.

Rate

Rate of reading and rate of comprehension were the measurements Romans used in his 1884 reading study. Romans' work is recognized as the first scientific investigation in the field of reading in the United States and England (W. S. Gray, 1925; Hyatt, 1943).

By 1914 Courtis was using children's performance rates in all elementary curricula to determine year-to-year progress. He selected pupil performance aims by measuring the fluencies of successful people at their jobs.

As scientific as rate studies were considered, little standardization existed. Other contributors reported words per second, reading selections per minute and seconds, and words per minute (C. T. Gray, 1922; W. S. Gray, 1919; Harris, 1956; McCracken, 1963; Spache, 1963).

Measuring the rate of reading did measure the reader's response rather than the expert's response to the reader's stimulus. Measuring the reader's response matches the common sense basis of the lay categories. Instead of opinion setting standards, however, comparison with peers at different levels of achievement set performance standards.

After reviewing the reading performances of over 3,000 2nd and 3rd graders, Kunzelmann (Washington State Superintendent of Public Instruction, 1973) reported that the students designated as top readers by their teachers read, orally, between 150 and 210 correct words per minute with few errors. Those designated as poor readers by their teachers read between 22 and 55 correct words per minute with many repeats and errors, and with low comprehension. Kunzelmann observed that 100 correct words per minute was a comfortable performance and should be an appropriate aim for 1st and 2nd graders.

Concerned that pupils be competently prepared for both oral and silent reading, Haughton (1977) raised his earlier data-based aim estimates (1972) of 100 "see to say" words per minute to 200 to 400 "see to say" words per minute, stressing high oral fluency. Having such high aims may be necessary to achieve those oral rates which teachers consider to exemplify their top readers, as well as being necessary to achieve the transition to silent reading, "see to think".

High aims appear to be in keeping with the data presented by McCracken (1963) and with the data of Courtis (1915), Harris (1956), and Spache (1963), as McCracken's oral reading rates for pupil independent reading approximate the others' silent reading rates from the 2nd grade to the 7th grade. Courtis' data labeled such fluency as "careful" silent reading, and progressed from 120 words per minute in the 4th grade to 200 words per minute by the 8th grade. This fluency increased to grade 12 and decreased below 200 words per minute in adult ages.
According to Courtis, "normal" silent reading speed increased from 180 words per minute at grade 4 to 330 words per minute at grade 9. Only a slight decrease in the "normal" silent reading rate distinguished adults from older school-age pupils.

Although Harris (1956) reported lower silent reading rates for normal, 270 words per minute, and careful, 130 words per minute, both Harris and Courtis agree that adults reading normally read 1.7 to 2.0 times faster than when they read carefully. Harris also included the qualitative category of rapid reading, 400 words per minute, and acknowledged the reported silent reading rates of 1,000 to 2,000 words per minute. If these rapid silent reading rates are our ultimate aim, then Haughton's high oral reading rate aims for primary and older youngsters make sense.

Accuracy

Perfect accuracy (100%) for success or failure was the only accuracy standard used prior to W. S. Gray's 1917 doctoral dissertation, which presented a measurement standard for accuracy. Gray measured time to read paragraphs and accuracy in number of errors. He scored the reading by four arbitrary criteria for success and failure, resulting in accuracies ranging between 85% and 99%.

Since then, Betts (1946), Gray and Leary (1935), Karlin (1967), Hegge, Kirk and Kirk (1940), McCracken (1963), Smith and Harris (1963), Spache (1963, 1964), Strang (1964), and others have contributed to accuracy measurement, setting standards for reading, comprehension, and interpretation.

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FOOTNOTE

Dr. D. R. Lindsley is acknowledged for his counseling, editing, and gift for seeing trees within the forest, making Tables 1, 2, and 3 visible from my notation collage.

Malcolm Neely was formerly a school psychologist with the Federal Way Public Schools, Federal Way, Washington. He recently requested and received reassignment as a first grade teacher. Dr. Neely resides at 29811 Sixth Avenue South, Federal Way, Washington 98003.

***

EDITOR'S NOTE: Because of its length, this article was divided into four parts. The remaining parts contain data displayed on the Standard Behavior Chart and will appear in future issues.

It is often helpful to have a Chart Mylar handy when you are reading the Journal.
ONE MINUTE TIMING IMPROVES INNERS

Abigail B. Calkin
Topeka Public Schools

For surely it is time the effect of discouragement upon the mind of the artist should be measured, as I have seen a dairy company measure the effect of ordinary milk and Grade A milk upon the body of a rat.

Virginia Woolf, *A Room of One’s Own*, 1929.

This article discusses a project I did on myself. The project consisted of seven pinpoints. Five of them had a 1,000 minute record floor: positive feelings about myself, negative feelings about myself, skipped opportunities to have a feeling about myself, negative thoughts about myself, my husband or my marriage, and positive thoughts about myself. Two of them had a 1 minute record floor: total positive feelings and thoughts about myself, and positive feelings about myself.

I began the project by counting positive feelings about myself, negative feelings about myself, and skipped opportunities to have a feeling about myself. The other four pinpoints developed as the project progressed.

Both feelings and thoughts are inner. As I realized during the project, however, they are not the same. A feeling is an inner awareness of an emotional or affective state. It "denotes any partly mental, partly physical (but not entirely sensory) response..." (Webster, 1976). A thought is different from a feeling; it is a mental concentration on ideas as distinguished from sense perceptions or emotions (Webster, 1976). The same item can be a thought or a feeling. It depends on whether it stays purely in a mental form or whether it is partly mental and partly physical.

I defined a positive feeling about myself as feeling good about who I was or about something I had done; this was the mental aspect of the feeling. I had a positive feeling when I had a positive emotion, a sense of warmth, a twinge, or when there was a sense of expansion. This was the physical aspect of the feeling. Here are two examples. "I feel intelligent." I knew this was a feeling when it occurred because I had a sense of warmth, a twinge, as I had the feeling. "I feel independent." I knew this was a feeling when it occurred because I had a sense of inner strength, a warm tingle of "goose bumps".

The same idea as a thought was very objective, unemotional, and purely mental. It occurred in much the same way that I would view a positive in someone else. Here are two examples of positive thoughts. "I am intelligent." The thought occurred, but there was no mild physical sensation with it. "I am beautiful." The thought occurred, perhaps as the result of a compliment, but there was no sensation with it. It was purely a mental idea.

Negative feelings about myself included feelings of inadequacy and insecurity. There was a sense of being observed and sometimes a shakiness or burst of physical activity. There was also a sense of constriction. An
example of a negative feeling is: "I feel dependent." I knew this was a feeling when it occurred because I had a sense of downward spiralling, a sense of something closing in on me. A negative thought, on the other hand, was very objective and unemotional, e.g., "I am dependent under certain conditions."

A skipped opportunity to have a feeling occurred when there was a programmed event present for having a feeling but no feeling occurred. Examples included someone giving me a compliment and I didn't feel it was justified (the "What a nice dress," "Oh, this old rag?" routine) or when I had a positive or a negative thought about myself, but didn't feel it.

To count that many inners at one time requires practice. I had been counting and charting inner behavior since the spring of 1969, eight years prior to donning my 12-row bead counter for this project. The counting on this project occurred from the time I woke up until I went to sleep.

If I was in doubt about whether something was a positive feeling, a negative feeling, or a skipped opportunity, I recorded the value that first came to mind. Occasionally I had to pause to discern whether something was a thought or a feeling.

I used the freehand method to draw acceleration lines during the project. In analyzing the results after the project was completed, I used the quarter intersect method (Pennypacker, Koenig & Lindsley, 1972).

Before

I began to count positive and negative feelings and skipped opportunities on September 19, 1977. Nine days after starting these three counts, I added another pinpoint, negative thoughts. As shown in Charts 1 and 2, positive feelings were accelerating, while negative feelings were maintaining. Chart 3 indicates that skipped opportunities were accelerating. I was unable to take advantage of the skips to improve how I felt. Chart 4 indicates that negative thoughts were frequent, but decelerating. I decided to make a change.

During 1

I set aims the first weekend in October. By October 23, I wanted the positive feelings to be 40 per day and the negative thoughts to be zero. The phase change in negative thoughts began one day after I started the change for positive feelings. In addition to setting an aim for negative thoughts, I used thought substitution (Campbell, 1975). Every time I had a negative thought, I substituted at least one positive thought.

By the end of the fourth day, the positive feelings had decreased and the negative thoughts had increased enough to alarm me. I made another change on the positive feeling project. I wrote all my positives and negatives on a sheet of paper. I folded the paper so I could read the positive list without seeing the negative list. There were nine positive feelings, 24 positive thoughts, 15 negative feelings, and three negative thoughts.

After four more days I noticed that all four pinpoints had increased. I had only two weeks left to reach my goal. I panicked. I still had my aim. I read the positive list many times each day. I never looked at the negative
Calkin, Abigail B. One minute timing improves inners.
Chart 3. Skipped Opportunities to have Feelings

A. CALKIN
SUPERVISOR
DEPOSITOR

A. CALKIN
ADVISER
AGENCY

ABIGAIL
MANAGER
TIMER

SUCCESSIVE CALENDAR DAYS
ABIGAIL
COUNTER

ABIGAIL
BEHAVIOR
CHARACTER

ABIGAIL
AGE
LABEL

ABIGAIL
36
COUNTED

FEELING
ABOUT SELF
Chart 4. Negative Thoughts

Thought Substitution

Count 10-0, splash, positive thought

Discuss

SUCCESS CALENDAR DAYS

ABIGAIL

ABIGAIL

SUPERVISOR

ADVISER

MANAGER

DEPOSITOR AGENCY TIMER COUNTER CHARTER

ABIGAIL 86

AGE LABEL COUNTED THOUGHTS
I was using thought substitution for the negative thoughts. I was writing in my journal every day. I was seeing a psychologist. Nothing seemed to be working. I decided if a 1 minute timing had worked on reading and math, it might work on inners.* It certainly couldn't make them any worse.

During 2

I started a 1 minute timing. Each morning within half an hour of getting up, I wrote as many positive thoughts and feelings about myself as I could in 1 minute. If the same thought occurred at different times, I wrote it each time. There were two reasons for this: I didn't want to take the time to see if I had already written it; and it may have been a thought the first and third times and a feeling the second time. Each word, phrase, or abbreviation that I felt as I wrote it, I asterisked. I then charted the total number (see Chart 5). I also charted the items which were feelings (see Chart 6).

I added another change to the negative thoughts. Every time I had a negative thought, I counted backwards from 10 to zero. I then pictured myself going down a waterslide into a Kansas farm pond. While splashing and swimming in the pond, I recited one or several positive thoughts about myself, thus substituting a positive thought for a negative one.

I also began to count and chart positive thoughts. As shown in Chart 7, the first phase was labelled "forced" because many of the positive thoughts were a forced reciting after a negative thought. Some of these forced, positive thoughts triggered a positive feeling, although the main purpose was to counteract the negative thought.

As shown in Chart 1, I reached my goal of 40 positive feelings per day two days ahead of schedule. Charts 2 and 3 indicate that negative feelings and skipped opportunities both decelerated to zero. Chart 4 indicates that negative thoughts decelerated, but did not reach zero. The lowest frequency was three. The opportunity to extend the aim was not possible. I did the project with the idea that an improved "self-concept", i.e., increased positive feelings and decreased negative feelings and thoughts, would be a birthday present to my husband.

I should point out that I included the thoughts and feelings during the 1 minute timing as a part of my total daily counts. It was important to me at the time to record all my daily feelings on the counter and on the all-day Chart. It made me feel better to start the day with some positive feelings recorded on my counter. Thus, in During 2, there were three interventions on the positive all-day count: (1) the aim of 40; (2) the 1 minute timing; and (3) recording the 1 minute counts on my counter in the morning.

Chart 8 shows the daily positive feeling count without the inclusion of the 1 minute timing. While the celeration slowed, the frequency of positive

* I became curious about who originated the idea of the 1 minute timing. My inquiries led to the West Coast during early 1968. The source of the 1 minute timing was probably either Eric Haughton in Eugene or Harold Kunzelmann in Seattle giving advice to a teacher. Perhaps it was a simultaneous discovery.
Chart 5. Positive Feelings and Thoughts about Self
Chart 6. Positive Feelings about Self
Calkin, Abigail B. One minute timing improves inners.

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Chart 7. Positive Thoughts about Self
Chart 8. Positive Feelings about Self (not including the one minute timing)

Set aim

Write down

I'm timing

I'm timing

Sick

1. Calkin, Abigail B. One minute timing improves learning. Journal of


A. Calkin  A. Calkin  Abigail

Supervisor  Adviser  Manager

Abigail  Abigail  36

Successive calendar days  AGENCY  DEPOSITOR

Abigail  Abigail  COUNTER  CHARTER

Positive feelings about self
feelings increased and the median doubled during the phase when I was doing the 1 minute timing. The frequency of negative feelings decreased to a median of zero.

On October 15, I realized that none of the times I had written "Intelligent" were asterisked. In fact, I had never felt intelligent in my life. I decided to sit down and think about being intelligent until I felt it. I practiced each day. On October 17, I had an "Intelligent" feeling which lasted about 1 second. Realizing I could learn to feel anything, I capitalized on that and concentrated on feeling intelligent and lengthening the duration of other positive feelings.

It was during this phase that I had my first feelings of self-confidence, of value, of self-worth. I ceased to feel that something was "wrong" with me.

During 3

During 3 occurred after I reached the goal. The 1 minute timings continued. The changes were in positive and negative thoughts. I began discussing the negatives with my husband and the psychologist.

After having a negative thought, I still continued to conceive it by thinking positive thoughts. However, I did not force as many. I also did not consciously think other positive thoughts about myself during the day. This was not a planned change.

A Return to During 3

I began an after-phase at the end of November. However, three days into the phase I became ill. My positive feelings went down and my negative feelings went up. The increase in negative feelings was not recorded because I could not tolerate seeing a setback on the Chart. There were five days in the beginning of December when I intentionally did not record these negative feelings. I recorded the zero days because they felt reinforcing. The frequencies on the ignored days were as high as five and six a day. I did this project for personal, not scientific, reasons. If I had done the project for scientific reasons, I would have counted these negative feelings.

I then returned to counting positive, negative, and skipped feelings all day, positive thoughts all day, and doing the 1 minute timing. I continued this for three weeks.

After

The last two weeks of Charts 1, 2, 3, and 8 show the after-phase. I did not count negative thoughts then because I was so unaware of having any. The importance of recording the actual frequency of negative thoughts did not occur to me.

A spot check 18 months later showed positive feelings maintaining at about ten per day and negative feelings maintaining at zero.

Comments and Conclusions

I considered the project completed because I felt good about myself for the
first time in my life. Twenty-two of the 24 positive thoughts I wrote on my list in During I had now become positive feelings. Fourteen of the 18 initial negative thoughts and feelings were no longer there. The remaining four I viewed as potential improvement areas, not as feelings or thoughts of personal inadequacy.

As shown in Charts 2 and 3, the most critical aspect of the 1 minute timing may be reducing negative feelings and thoughts. Both occur so infrequently that I no longer count them. I would estimate that negative feelings occur once or twice a year, negative thoughts perhaps once or twice a month. Although I no longer count positive feelings either, there are days when I am aware of having six or seven. Because of the low frequency of negative feelings, I easily tolerate a lowered positive feeling frequency.

It is also possible that the aim had the greatest effect on increasing the positive feelings. The 1 minute timing served to decelerate the negative feelings to zero.

Eight other people have counted positive and negative feelings and then done a 1 minute timing as an intervention. Six of them showed that while a 1 minute timing may not affect positive feelings, it does decelerate negative ones. All these data need further analysis prior to publication.

The discouragement of which Virginia Woolf speaks is that of society on the mind of the artist, specifically a woman as an artist. The discouragement I speak of is that which occurs when an individual feels negatively about herself or himself.

I think I have come very close to measuring the effect of a type of discouragement on the mind of one individual. Virginia Woolf was perceptive enough to make her statement in 1929. Unfortunately, it has taken this long to approach accurate measurement of emotions and thoughts, their interrelations, and the effects of external events on them.

REFERENCES


Abigail Calkin is the Assistant Principal of Capital City High School, Topeka Public Schools, 2700 West Sixth Street, Topeka, Kansas 66606.
Using Precision Teaching for two years has been a great experience. As a speech and language clinician, I conduct therapy with children in pre-school through 12th grade, although the majority are between pre-school and 3rd grade.

Most of the probes I use contain pictures so that poor reading skills don't interfere with increasing fluency. These "see and say" probes are constructed on standard 8 1/2" by 11" paper with 20 pictures per probe. There are probes for articulation (i.e., initial /s/ blends, initial /r/, medial /r/, final /r/), syntax and morphology (i.e., pronouns, irregular past tense verbs, plural /s/), and language concepts and vocabulary (i.e., Boehm concepts, occupations, opposites). A probe for Boehm concepts and its accompanying tally sheet are shown in Figures 1 and 2.

At the end of each therapy session, probes are used to conduct 1 minute timings. Correct responses (+) and learning opportunities (-) are recorded on the tally sheet during the timing. They are then charted on the Standard Behavior Chart. Some children may be working on as many as four pinpoints at one time. Below are some performance standards I am currently using:

<table>
<thead>
<tr>
<th>Pinpoint</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>see and say picture names</td>
<td>40-50 names per minute</td>
</tr>
<tr>
<td>see and say sentences from pictures</td>
<td>30-40 sentences per minute</td>
</tr>
<tr>
<td>see and say opposite pairs from pictures</td>
<td>40-50 pairs per minute</td>
</tr>
<tr>
<td>see and say concepts from pictures</td>
<td>40-50 concepts per minute</td>
</tr>
</tbody>
</table>

As a speech clinician, I am part of the special education department for our Area Education Agency. I am required to write Individual Education Programs including objectives for each child in therapy. Stating my IEP objectives in Precision Teaching terms has been very helpful. An example of one IEP objective follows:

By **(date)**, **(name)** will name 20 pictures containing **(sound)** at the rate of 50 per minute with one error or less as recorded and charted by the speech clinician.
Figure 2. A Tally Sheet for Boehm Concepts I

<table>
<thead>
<tr>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. top</td>
</tr>
<tr>
<td>2. through</td>
</tr>
<tr>
<td>3. away from</td>
</tr>
<tr>
<td>4. next to</td>
</tr>
<tr>
<td>5. inside</td>
</tr>
<tr>
<td>6. some but not many</td>
</tr>
<tr>
<td>7. middle</td>
</tr>
<tr>
<td>8. few</td>
</tr>
<tr>
<td>9. farthest</td>
</tr>
<tr>
<td>10. around</td>
</tr>
<tr>
<td>11. over</td>
</tr>
<tr>
<td>12. widest</td>
</tr>
<tr>
<td>13. most</td>
</tr>
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<td>14. between</td>
</tr>
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<td>15. whole</td>
</tr>
<tr>
<td>16. nearest</td>
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<tr>
<td>17. second</td>
</tr>
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<td>18. corner</td>
</tr>
<tr>
<td>19. several</td>
</tr>
<tr>
<td>20. behind</td>
</tr>
<tr>
<td>21. row</td>
</tr>
<tr>
<td>22. different</td>
</tr>
<tr>
<td>23. after</td>
</tr>
<tr>
<td>24. almost</td>
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<td>25. half</td>
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There are many advantages to using Precision Teaching in speech therapy:

1. I continue to use my own therapy techniques;
2. I added Precision Teaching to measure daily progress;
3. The timings eliminate the necessity of tallying responses throughout the entire therapy session;
4. The timings add the dimension of frequency (rate) to behavior;
5. I can write IEP objectives in Precision Teaching terms;
6. I provide a minimum goal for each child;
7. I can determine what stage of learning a child is in and teach accordingly;
8. The Standard Behavior Chart allows us to see learning in straight lines;
9. I can decide when therapy should continue or be changed by checking the Chart, rather than relying on opinion;
10. I can interpret another clinician's Standard Behavior Chart without lengthy explanations;
11. I get a more sensitive measure of progress than percent correct;
12. I get immediate feedback on the performance and learning of each child;
13. I can determine exactly what items the child needs to practice;
14. The child can work with tutors (parents, aides, peers, older students and classroom teachers) in a clearly defined and effective way;
15. The child competes with himself rather than his peers;
16. The child can establish a positive attitude about errors by treating them as "learning opportunities";
17. I can keep consistent records throughout the year;
18. I can see a full semester's progress on one Chart;
19. I can communicate learning accurately and objectively with parents and educators;
20. I get feedback and measure the effectiveness of my own planning and teaching methods;
21. I am accountable for the learning of each child;
22. I have evidence in case of a lawsuit;
23. I use the same measurement system for all speech, language and behavior areas;
24. I can make sense of daily variability; and
25. The daily timings, in and of themselves, seem to improve students' performance on unrelated timed probes.

I continue to use standard articulation and language tests as pre- and post-tests. With Precision Teaching, I have seen significant improvement in scores on Boehm Concept Tests, the Peabody Picture Vocabulary Test, the Expressive One-word Picture Vocabulary Test, the Bankson Language Screening Test, the Test of Language Development and the Goldman-Fristoe Test of Articulation. My next task is to document this improvement.

Chart 1 is an example of a child naming Boehm Concepts from pictures for 1 minute. No changes were necessary in this child's program. She reached fluency in 5 weeks.

It must be obvious that I am very excited about the implications that Precision Teaching has for the field of speech and language. It is important to understand that Precision Teaching is not an approach or a therapy technique. It is an easy, inexpensive way of monitoring progress.
DAILY BEHAVIOR CHART (DCM-9EN)
6 CYCLE - 140 DAYS (20 WKS)
BEHAVIOR RESEARCH CO
BOX 335 - KANSAS CITY KANS 66103

Chart 1. Vickie's Language Chart

Boehm Concepts - I

SUCCESSIVE CALENDAR DAYS

VICKIE 6 SEE PICTURES
BEHAVIOR 6 AGE LABEL COUNTED
AND SAY CONCEPTS

D. SCHEMER S. THOMSEN SUCCESSIVE CALENDAR DAYS
SUPERVISOR ADVISER MANAGER
MISSISSIPPI BEND AREA EDUCATION AGENCY CLINTON, IOWA
AGENCY CHARTER

Precision Teaching is added to current procedures in order to make therapy more efficient.

Ogden Lindsley stated that some teachers fear Precision Teaching. They are afraid that, if they try this new thing, they will have to temporarily put aside or abandon their trusted teaching skills. Precision Teaching simply adds more sensitive measurement to present teaching, making teachers more economical, more effective, more enjoyable and more loving. I agree 100%.

Susan Thomsen is a speech clinician for the Mississippi Bend Area Education Agency, Clinton Service Center, 2604 North Fourth Street, Clinton, Iowa 52732.

CHARTING: THE QUICK PICKER UPPER

Lynne R. Conser
Wayne State College

In January of 1981 I moved from the college dorm to home for the first time in 3 years and noticed I felt very depressed. At this same time I was struggling with bitterness from a serious relationship break-up and the implications of various images* and visions* I had experienced.

While back on the Wayne State College campus I discussed my problem with Dr. Bob Bower, and he suggested that I use this as a basis for my personal management project for his Ed. Psych. class. He suggested that I count my positive and negative thoughts and feelings as Abigail Calkin had done.

I began. I used a wrist counter and counted my positive and negative thoughts and feelings each day. I began counting the first thing in the morning and quit at the end of the day. Examples of the thoughts and feelings I counted as positive are: "I did a good job"; "That looks nice"; "That was a creative, unique idea"; "That snowflake has an interesting shape"; "The sunset is pretty"; "Johnny did a nice job on his assignment"; "I look nice today"; "I handled that situation well"; "I can accept and am glad we broke up"; "I'm not 'crazy', I have a special talent"; and "I have so much to learn. I'm excited." Examples of the thoughts and feelings I counted as negative are: "I feel fat"; "I can't do a thing with my hair (face)"; "I (we) really goofed up"; "I'm strange or weird"; "No one understands or accepts me"; "Another fine mess you've gotten us into"; "What

* Image: a. "The memory of a perception in psychology that is modified by subsequent experience and that contains both intellectual and emotional elements elicited by intrapsychic and extrapsychic stimuli." b. "to call up a mental picture."

* Vision: a. "Something seen otherwise than by ordinary sight; an imaginary, supernatural, or prophetic sight beheld in sleep or ecstasy." b. "A visual image without corporal presence; a manifestation to the senses of something immaterial (as a spiritual being or state)." c. "The act or power of perceiving mental images." d. "Direct mystical awareness of the supernatural usu. in visible form."
an ugly day"; "What a cluttered mess"; "He copped out on me"; "I'll never find another"; "I miss him"; "I feel guilty"; bad vibes; and negative comments to me, about myself or others.

Important events which occurred during the 1 1/2 months were recorded. Because of my visions and imaging it was suggested by various professionals that I get myself checked out physically. Pre-tests were made and an appointment set. I was then referred to a psychiatrist to check on the nature of the phenomenon. I was questioned and given a psychological exam, and then given an E.E.G. to rule out the possibility of a form of epilepsy. (Everything came back fine; I'm "normal"!) I was also student teaching and coaching a 6th grade girls' volleyball team in preparation for a district tournament. These dates—the doctors' appointments, tournament, and other events—are labeled on Chart 1.

My negatives and positives did as I had hoped they would: the positives went up and the negatives crossed over and went down. Of particular interest is the cross-over point. It immediately followed the clear physical bill of health on 2-19-81. The clear mental bill of health was given on 3-9-81. It did not show significant effects on the slopes of the lines. My positives and negatives are independent. This can be seen in the co-bounce and counter-bounce of the thoughts and feelings.

Counting and attending to my inner behavior seemed to help. I was happier with myself and no longer felt depressed. Chart 1 tends to show the same thing. I plan to continue this study and adapt it to my adjustment to new surroundings in Topeka, Kansas. I will be counting positives and negatives and a new feeling—self acceptance. And yes, visions and images will still have a role. Abigail Calkin and I plan on counting and studying them.

REFERENCE


Lynne R. Conser is a math teacher for emotionally disturbed junior and senior high school students, Capital City High School, 2700 West Sixth Street, Topeka, Kansas 66606. She was formerly a student at Wayne State College, Wayne, Nebraska.

Do you have suggestions for changes in the Journal?

Let us know.
Chart 1. Lynne's Personal Management Chart

1- Psychiatrist; Psychiatric exam.
2- Tests: blood, etc.
3- E.E.G.
4- Physical exam.
5- Psychiatrist: E.E.G. results
6- Volleyball tournament; Difficult parents;
7- Team meeting; girls gave me flowers

Elementary Ed. Psych - Winter '81

Bower
SUPERVISOR
WAYNE STATE COLLEGE

Lynne Conser
BEHAVIOR
21

AGENCY
WAYNE, NEBRASKA

COUNTED
thoughts and feelings
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<td>Pre-Registration Fee (before Jan. 15)</td>
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ADDRESS: __________________________________________________________

I wish to reserve _________ room(s) @ $40.00 per room.
I will arrive on ________________ and I will depart on ________________
Accelerating Target—a movement the behaver, manager, advisor, or supervisor expects to accelerate; the frequency is symbolized by placing a dot on the Chart.

Accuracy Improvement Multiplier—a measure of change in accuracy over time; celeration correct/celeration incorrect.

Accuracy Multiplier—measure of accuracy: frequency correct/frequency incorrect; distance from frequency incorrect to frequency correct.

Accuracy Pair—two movements, usually correct and incorrect, charted simultaneously.

Add-subtract Scale—any measurement scale on which adding and subtracting by a constant amount is represented by a constant distance.

Advisor—person who advises a manager, usually viewing Charts on a weekly basis.

Behaver—person whose behavior is displayed on the Chart.

Behavior Floor—the lowest daily frequency possible for a particular behavior; 1/number of minutes behavior can occur; symbolized by drawing a solid horizontal line on the Chart.

Bounce Around Celeration—up bounce and down bounce combined; the range of deviations of frequencies from the celeration line.

Celeration—basic unit of measurement of behavior change; change in frequency per unit time.

Celeration Aim—the expected celeration for a given movement.

Celeration Line—a best-fit, straight line constructed through seven or more continuous frequencies of a given movement on the Standard Behavior Chart.

Celeration Multiplier (turn up or turn down)—value by which one celeration is multiplied or divided to obtain a second.

Change Day—first day of a phase change; symbolized by drawing a vertical line covering that day line on the Chart.

Counting Period Ceiling—the highest frequency observable under a given counting procedure; symbolized by drawing a dash line on the Chart connecting the Saturday and Monday lines.

Counting Period Floor—the lowest frequency detectable by a given counting procedure; 1/number of minutes spent counting; symbolized by drawing a dash line on the Chart connecting the Tuesday and Thursday lines.

Cycle—distance on the Chart between consecutive powers of 10.


Decelerating Target—a movement the behaver, manager, advisor, or supervisor expects to decelerate; the frequency is symbolized by placing an "x" on the Chart.

Double Improvement Learning Picture—both movements of an accuracy pair with celerations in the expected direction; for example.

Down Bounce—the distance from the celeration line to the frequency farthest below it.

Duration—the amount of time it takes to complete one occurrence of a behavior; 1/number of minutes spent behaving.

Event-following Celeration Line—a celeration line drawn through all frequencies for a given movement just prior to a phase change.

Freehand Method—a method of visually estimating and drawing celeration lines.

Frequency—basic unit of behavioral measurement; the number of movements per unit time.
Frequency Aim—the expected phase-ending frequency for a given movement; symbolized by drawing "A" at the expected frequency on the day the aim was set.

Frequency Line—a horizontal line on the Chart; also called a counting line.

Frequency Multiplier (jump up or jump down)—value by which one frequency is multiplied or divided to obtain a second.

Geometric Mean—the appropriate method for obtaining an average on a multiply-divide scale.

Ignored Day—a day on which the behavior being measured occurs but is not charted.

Latency—the amount of time between the occurrence of a signal and the beginning of a movement; 1/time from signal to start of movement.

Learning—a change in performance per unit time; also called celeration.

Learning Picture—the celeration lines of both movements of an accuracy pair viewed together; for example

Manager—person who works with the behaver on a daily basis.

Median Celeration—the middle celeration in a celeration distribution; symbolized by drawing a "<" on the Chart.

Median Frequency—the middle frequency in a frequency distribution; symbolized by drawing a "<" on the Chart.

Most Recent Celeration Line—a celeration line drawn through the last 7-10 frequencies for a given movement.

Movement—recorded behavioral event; usually specified in terms of a movement cycle with a beginning, middle and end.

Multiply-divide Scale—any measurement scale on which multiplying and dividing by a constant amount is represented by a constant distance, the "up the left" scale on the Standard Behavior Chart.

No Chance Day—a day on which the behavior being measured has no chance to occur.

Overall Celeration Line—a celeration line drawn through all frequencies for a given movement.

Performance—the number of movements per unit time; also called frequency.

Periodic Celeration Line—a celeration line drawn through all frequencies for a given movement in a specific time period, such as bi-weekly or monthly.

Phase Change—a deliberate alteration made to the behaver's environment in an effort to improve the behavior being measured.

Quarter-Intersect Method—a method for computing and constructing celeration lines.

Recorded Day—a day on which the behavior being measured has the opportunity to and is recorded.

Single Improvement Learning Picture—one movement of an accuracy pair with a celeration in the expected direction; for example.

Split-middle Line—a line drawn parallel to a quarter-intersect celeration line, such that half the data points fall on or above the line and half the data points fall on or below the line.

Standard Behavior Chart—a standard, six-cycle semi-logarithmic chart that measures frequency as movements/time and celeration as movements/time/time; Daily, Weekly, Monthly, Yearly and Summary versions are available.

Supervisor—a person who views the Charts on a monthly basis.

Total Bounce—distance from the highest to the lowest frequency; analogous to range of an add-subtract scale.

Trend-following Celeration Line—a celeration line drawn through visible trends for a given movement.
Up Bounce--distance from the celeration line to the frequency farthest above it.


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