of 40-45 per minute.

Each day I asked Packy if he wanted to be timed. As his learning picture shows the answer many times was "No!" "The child knows best," right? The cards were presented to him during one minute timings of corrects and errors. I did not count skips. After a week of X1.0 on the whole deck (see Chart 1), Packy asked me to present him just Larry Bird and two other players from the starting team that he named at rates higher than other team members. Accordingly, I sliced his curriculum by pulling all but the starting players from the desk and got a frequency jump-up of nearly X4.0 and an acceleration of X1.4 over 8 calendar days. After five days of routine practice and no timings, Packy said, "Daddy, I want all the guys." I put all the players back in the deck. Packy's correct frequencies divided by nearly 3.0 but started on a X1.4 acceleration over 24 calendar days. His highest frequency was 32 correct per minute with no errors.

Packy's acceleration began to turn down and flatten out over the last several timings. It was clear from observing Packy that the ceiling which was appearing was imposed by his lack of fluency in saying names with several syllables like "Red" Auerbach, "Tiny" Archibald, Gerald Henderson, and Cedric Maxwell. The calendar day after the last frequency on the Chart, I asked Packy if he wanted to do a timing. He said "No, I don't want to." That was the last time he wanted anything to do with the cards. Three weeks later I picked up the deck and tried a timing—3 correct and 9 errors. My interest is in whether Packy's retention would have been higher had he reached the adult pace I used as an aim.

Many basketball fans have looked askance at the notion of "Celtic Pride." Packy's celerations and frequencies hopefully serve as a functional definition of Celtic Pride--in two-year-olds anyway!

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TOGETHER WE CAN DO IT—WE PROVED IT

Mary Ellen Strobl
Missouri State Schools for the Severely Handicapped

Mr. and Mrs. Theron Deshazer
Parents

As a summer school student in Precision Teaching at UMKC, taught by Dr. Patrick McGreevy, I have learned that the concepts of Precision Teaching—count + time + chart— can "pay off" with big dividends of learning in short periods of time.

I teach young adult students at one of the Missouri State Schools for the Severely Handicapped. The story I share with you is about Eric, a fifteen year old student in my classroom. He has previously learned the necessary tool skills to prepare him for the currency management concept of "making change." Therefore, as one of my Precision Teaching projects, I challenged him to learn to make change for purchases up to $1.00, in three weeks. I set his counting period at five minutes. I discussed the aim with his parents. We agreed that to make change for one item every fifteen seconds (20 correct/5 minutes) would be very "hard-to-do," since this was a totally new concept for Eric. I set his aim at 25 correct/5 minutes.

Eric's parents were so excited about his challenge that they asked to watch my teaching procedure and help in any way they could. They offered to give Eric his 5 minute counting periods on the days I was unable to do so. I was elated at their interest and enthusiasm. To keep our counting periods charted separately and yet together on the same Chart, I used dots/x's for my timings and squares/x's for the parents' timings. This was an exciting cooperative experience.

Eric's first task was making change for amounts up to 10 cents. We couldn't believe that in just 10 days he reached his aim of 25 corrects/5 minutes, but his "learning picture" proved it (see Chart 1). We "leaped ahead" to amounts up to one dollar. Eric reached his aim of 25 corrects/5 minutes in just 11 days. What a thrill it was to mark the end of his three week challenge with a dot on the aim line.

The excitement Eric, his parents and I shared in this project was an enriching experience. I am sure the same feelings of successful learning have been felt by everyone who has TRIED Precision Teaching and knows IT REALLY WORKS!

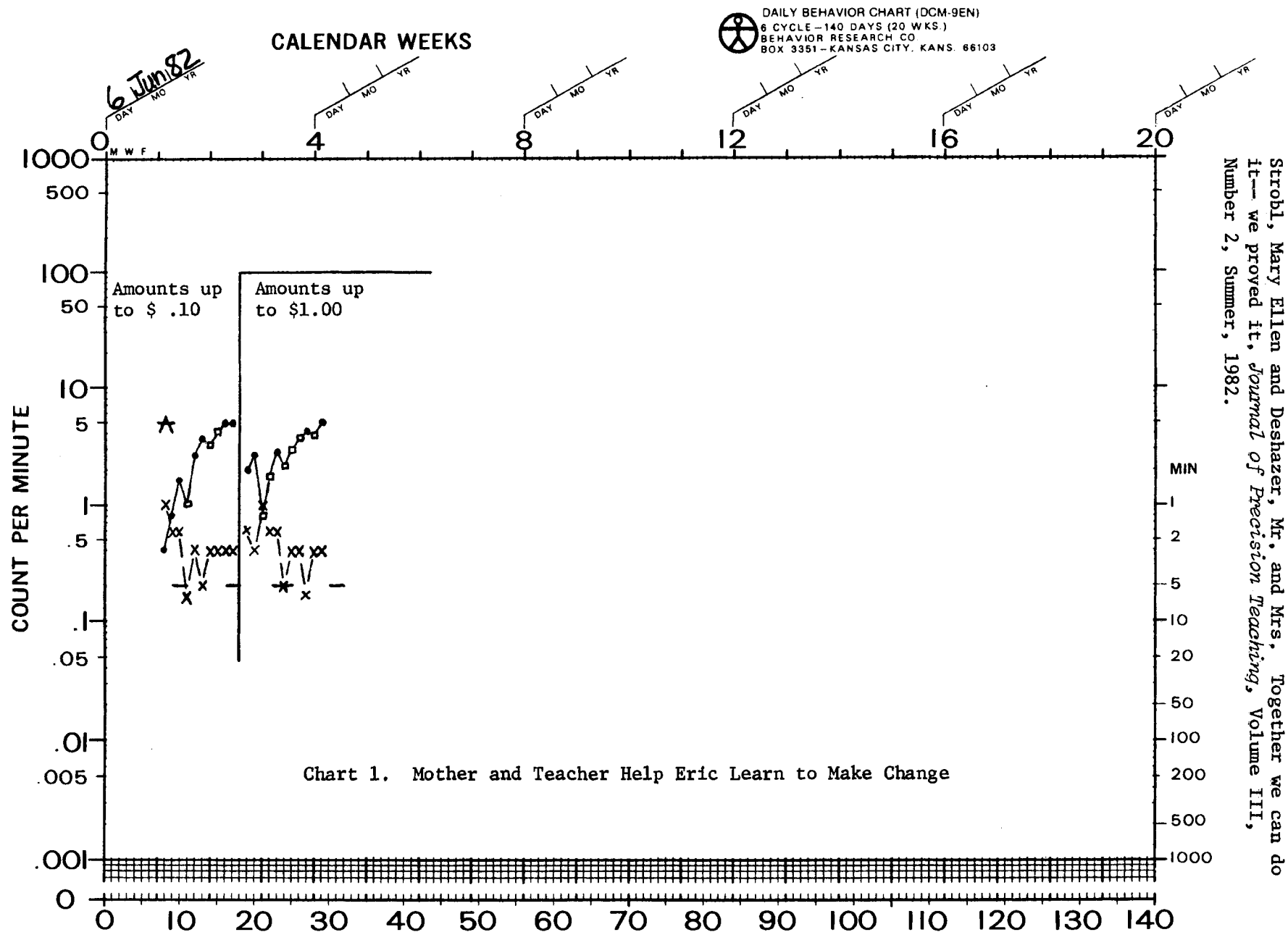

Chart 1. Mother and Teacher Help Eric Learn to Make Change

Strobl, Mary Ellen and Deshazer, Mr. and Mrs. Together we can do it— we proved it, *Journal of Precision Teaching*, Volume III, Number 2, Summer, 1982.

Mary Ellen Strobl Mr. and Mrs. Deshazer				Eric	15	see/make change	
SUPERVISOR	MANAGER			BEHAVER	AGE	LABEL	COUNTED
DEPOSITOR	AGENCY	TIMER	COUNTER	CHARTER			

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THE EFFECT OF NUMBER OF MATH DRILLS PER DAY ON MATH PERFORMANCE

Sharon Raggio and Stephen C. Bitgood
Jacksonville State University

Frequency testing or short drills on basic math facts has been shown to be an effective method of increasing proficiency in an expedient manner (e.g., Bitgood, submitted; Bitgood & Mitchell, submitted; Haughton, 1980; Van Houten & Thompson, 1976). The purpose of the present study was to find the optimum number of drills per day for frequency testing. Information on the optimum number of drills per day would be important since it would allow the precision teacher to develop more cost-effective instructional procedures.

Eight youths, 12 to 16 years of age, with grade levels from 5th to 9th grade, served as participants. At the time of the study they were all temporary residents of a group home for youths judged by the courts to be in need of supervision. Math achievement performance levels for these youths on the Wide Range Achievement Test varied from grade level 3.6 to 7.6. The students were given daily drills in all four math operations (i.e., addition, subtraction, multiplication, and division); answers were written on mimeographed worksheets each containing 100 basic math facts. The number of drills per day for each math operation was fixed at either one, two, four, or eight. Drills per day and math operation were counterbalanced. Thus, two students received one drill per day on addition, two on subtraction, four on multiplication, and eight on division; the next two students received one drill per day on subtraction, two on multiplication, four on division, and eight on addition; the next two students received one drill per day on multiplication, two on division, four on addition, and eight on subtraction; and the last two students received one drill per day on division, two on addition, four on subtraction, and eight on multiplication. Students were given a total of 16 drills on each math operation across training. Training was distributed over 16 days for the one-drill-per-day condition, eight days for the two-drill-per-day condition, four days for the four-drill-per-day condition, and two days for the eight-drill-per-day condition. Each drill was one minute in duration.

Chart 1 displays the data for each drills-per-day condition. Each data point represents an average of all the drills performed by the eight students that day. Across all four math operations, the two-drills-per-day condition produced a celeration of X1.4 per week, while the one-drill-per-day condition produced a celeration of X1.3 per week. The available data points from the four-and-eight-drills-per-day conditions indicate the possibility of much higher celerations.

These data suggest that two drills per day on math operations is likely to produce slightly higher celeration than one drill per day. Some evidence is presented suggesting that four or eight drills per day may produce considerably higher celerations.

REFERENCES

Bitgood, S. C. The effects of speed and accuracy training on basic math skills. Submitted to **Journal of Applied Behavior Analysis.**

Bitgood, S. C., & Mitchell, A. Training in basic math: Effects of drill length on response rates. Submitted to **Education and Treatment of Children.**

Haughton, E. C. Practicing practices: Learning by activity. **Journal of Precision Teaching,** 1980, **1,** 3-20.

Van Houten, R. V., & Thompson, C. The effects of explicit timing on math performance. **Journal of Applied Behavior Analysis,** 1976, **9,** 227-230.

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About PT

NOTES FROM THE EDITOR

Patrick McGreevy

Welcome to Volume III, No. 2. If you are a new subscriber, a very special welcome goes out to