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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

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A special thank you goes out to the following people for serving as guest editors:

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For those of you who are new to Precision Teaching, the following is a list of books available for use as texts, training manuals or resource materials:

**Handbook of the Standard Behavior Chart**  
by Pennypacker, H. S., Koenig, C. H., and Lindsley, O. R.  
Precision Media  
Box 3222  
Kansas City, KS 66103

**Exceptional Teaching (2nd. Edition)**  
by White, Owen, and Haring, Norris  
Charles E. Merrill Publishing Co.  
1300 Alum Creek Drive  
Columbus, Ohio 43216

**Teaching and Learning in Plain English**  
by McGreevy, Patrick  
Plain English Publications  
P.O. Box 7224  
Kansas City, Missouri 64113

**Elementary Principles and Procedures of the Standard Behavior Chart**  
by Koorland, Mark, and Martin, Mitchell B.  
Odyssey Learning Center, Inc.  
2630 N.W. 39th Avenue  
Gainesville, Florida 32601

**Strategies and Tactics of Human Behavioral Research**  
by Johnston, James M., and Pennypacker, H. S.  
Lawrence Erlbaum Associates, Inc., Publishers  
365 Broadway  
Hillsdale, New Jersey 07642

**Classroom Application of Precision Teaching**  
by Lovitt, Thomas C. and Haring, Norris G. (editors)  
Special Child Publications  
4535 Union Bay Place N.E.  
Seattle, Washington 98105

**Precision Teaching, An Initial Training Sequence**  
by Kunzelmann, Harold et al.  
Special Child Publications

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The following conference is coming up in September. A number of precision teachers are planning to attend:

**CONFERENCE ON BEHAVIOR ANALYSIS  
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Ohio State University  
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## **CURRICULUM**

**Marie Eaton and Peggy Albrecht**

Susan Thomsen at the Mississippi Bend Area Education Agency in Clinton, Iowa, wrote to describe a curriculum which she and Dave Schoemer have devised for Communication Aides to use with students who have mild articulation and language disorders.