

Ten Products of Fluency

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**Spread of 1
minute timings
throughout
North America**

At first I resisted my students departing from the continuous measurement of the laboratory free-operant towards what seemed to me mere samples or tests. I also reacted negatively to the term "probe," which not only called up images of a cold metallic object being poked into a tooth or other body cavity, but also implied that the timing was not the performance itself, only an indicator of some underlying behavior. However, soon Haughton and Kunzelmann and their students were producing such excellent learning results from one minute daily practice sessions that I admitted my error in resisting the one minute timings. At this point I was proud of the fact that I had students so fine that just a few years out of graduate school they made major discoveries. I was more proud of the fact that I could learn from my students and give them the highest compliment of all, which was to rapidly adopt their discoveries and distribute 1 minute timings throughout the hemisphere in symposia and workshops.

**Workshop free-
abbreviate
timings**

In the spring of 1972 I was using one minute timings at the start and end of workshops and university classes to measure the participants' gain in knowledge in a way that would be comfortable and have meaning. Because the first timing should be fluent and therefore fun and not threatening, participants freely abbreviate facts about themselves for one minute. Then they "correct them" by sharing what their abbreviations meant with their neighbor. This is a great warm-up exercise and a lot of fun. It also teaches how to abbreviate, how to count abbreviations, and how to structure facts for fluent abbreviation. Next, the participants free-abbreviate facts about the day's class topic. This provides the before teaching base-line and demonstrates to the participants that pre-testing need not be unpleasant - it can be fun! At the end of the session a closing one minute free-abbreviate of the class daily topic was run to determine how much each participant learned in the session. Collecting these before and after frequencies on a Standard Celeration Chart at the overhead projector showed the students how their performance compared with others in the class. The frequency distributions also showed how much the class middle had shifted up (always a doubling and often times five). The distributions also showed the participants that group distributions are spread normally - the same distance up as down on a multiply scale. So the Standard Celeration Chart normalizes performance distributions. Haughton and Kunzlemann called these think-write timings, but I, a dyed-in-the-wool, Hunter, Kimble, and Skinner trained behaviorist, renamed them free-abbreviate.

Defining products of fluency: Retention, Endurance, Application, Performance Standards

Eric Haughton originally named the first two fluency products: Retention and Application in his acronym **R/APS (Retention / Application Performance Standards)** in 1981. Eric saw retention and application as criteria for determining performance standards. You aimed at frequencies that would guarantee both retention without regular practice and application in the real world (generalization) without specific practice. The frequency that produced these was the performance standard to aim for. Retention and application were used to develop aims for the different pinpoints.

Later that year Haughton (1981) added endurance and expanded his acronym to **REAPS (Retention, Endurance, Application, Performance Standards)**. This expanded Haughton's number of fluency products to three, with performance standards actually making a fourth. These can be considered the defining products of fluency. During 1982 and 1983 Eric continued furthering fluency and REAPS, but spent most of his creative time on matrices of learning channels and their relationship to performance standards (Haughton, 1982, 1984).

Late in 1984 Eric started his nineteen month battle with liver cancer which prevented his further development of fluency products. Eric finally succumbed on 11 July 1985 (Lindsley, 1986). I am certain that, had he lived, Eric would have expanded the number of products of Fluency.

New Products discovered in University Classes

By 1981 I had 5 five years experience aiming at fluency in all my graduate classes. This was two classes a semester, three semesters per year for a total of thirty classes in 5 years. Each class had about 25 students and each student learned two decks of about 75 to 100 SAFMEDS for a total of 50 fluency learnings per class. The 30 classes, with 50 charted SAFMEDS learnings in each class, yielded 1500 SAFMEDS learning charts with graduate level adult learners. Several products not stressed by Haughton in his REAPS acronym jumped out of this mass of data. These products are described in the order in which they appeared.

Stability

First, as an aviation cadet in World War II, Lindsley I to daily practice repeating my army serial number, the names of his company officers and Air Force generals, the names of both friendly and enemy fighters, the words to Air Force marching songs and other verbal chains until they could be recited at any time on call from an upperclassman perfectly at 100 to 300 words per minute. Similarly repeated high speed practice of emergency aircraft exit drills, and field disassembly and assembly of the Army 1911A1 automatic pistol blindfolded in one minute, was part of my official military training. This was said to produce performance that could be run off under stress in battle or in emergencies, in a snow storm or sand storm without error. The same stability and resistance to distraction occurred when my graduate students approached fluency in their one minute SAFMEDS practice sessions. Only the beginners who were making the mistake of starting at slow frequencies had their pace broken by the noise of the other students saying their SAFMEDS and slapping them down on the chair arms close by.

This prompted me to convert the S in Haughton's **REAPS** to **Stability** - a fifth product of fluency.

No cheating

The eighth fluency product, no cheating, seemed obvious to anyone who has taught or practiced to fluency. But other teachers who continuously fussed with the problems of student cheating did not realize that fluency totally eliminates cheating. Different versions of practice sheets or tests are not needed. Students need not be separated by empty chairs during group timings. There is just no way a student can look at another's practice sheet fast enough to get answers above 60 per minute. There is just not enough time. Looking at another's sheet slows him/her up. Cheating slows him/her up. There is no way a student can bring another student's behavior with him/her to a grading check-out session. A student can fake his/her chart, or paper, but not his/her performance at speed.

For these reasons I listed **no cheating** as the eighth fluency product.

**Fluency
REAPS FUN**

I used the acronym Fluency **REAPS FUN** describing eight products of fluency in workshops and classes throughout the 1980's and finally published it in 1992.

Confidence

Over the last two years I realized that the urging we gave our teachers of developmentally delayed children in the late 1960's to not stop practicing when their handicapped learners reached normal frequency range, but to practice them far above normal frequencies to championship levels, was to develop the children's confidence. Since their charts seldom leveled off, the students could build speed up to super fluent frequencies beyond normal adult range. When a disabled person can write letters, or do basic add facts, or count items, faster than their brothers, sisters, parents and teachers, they gain real confidence - a confidence that no amount of verbal stroking could achieve. Carl Binder (1990) called attention to "confidence" as a benefit of fluency in the title of an article describing fluency to industrial trainers.

These events prompted adding the ninth product of **confidence**.

Generativity

Haughton's (1972) original discovery that smooth, fluent application occurs when component tool skills were truly fluent at frequencies from 400 to 100 per minute became the aim for most precision teachers. To them creativity, problem solving, and improvising depended on fluent component skills. In the middle 1970's we tried to produce "curriculum leaps" (Stromberg & Chappell, 1990) from fluent tool skills. We saw all these as a special cases of Haughton's Application product of fluency.

Johnson & Layng (1992, 1994), and Layng, Jackson, and Robbins (1992), have recently related the selectionist language and laboratory research on contingency adduction (Andronis, 1983) and generativity (Epstein, 1985, 1990) to fluency based instructional design and the Morningside Precision Teaching approach (Johnson, 1992) in particular. Although "leaps" is one syllable and follows our rules for choosing Precision Teaching words (Lindsley, 1991) more closely, I have once again temporarily accepted the discoveries of the next generation and use the term "generativity" though the six syllables still grate. You can keep "leaps" on the back burner if you prefer.

For these reasons I called the tenth product **generativity**.

Suggested fluency product measures

To further clarify product separateness a suggested measure to use in recording the presence of each fluency product is listed below opposite each product: The measures are not the only such measure, nor even the best such measure for each product. Several different tactics for measuring each product are possible. These suggestions are only listed to point out how each product requires its own unique measures. These measures identify it.

Retention	How much drop in the practiced frequency occurs after specified weeks or months without practice?
Endurance	How many minutes or hours (beyond the daily practice period) can the performance continue without error or decrease in frequency?
Application	How much drop in the practiced frequency occurs when performing in real world settings different from the practice setting?.
Performance Standards	What frequency aim produces retention, endurance, and application?
Stability	Does total bounce (measured proportionally on the chart) decrease as fluency is reached? How many strong distracters do not interrupt performance?
Fun	Count performer laughs and smiles while performing or have them rate their fun on a 19 point multiply scale?
Understanding	What portion of the fact meanings are immediately known? What portion of the meanings are figured out by learners? What portion of the meanings are asked of the teacher?
No cheating	Compare cheating incidents between fluent and dysfluent practice.
Confidence	Frequency of confident compared with fearful statements made just prior to and just after an important performance.
Generativity	Frequency of composite skills that leap up, without having been specifically taught, from fluent tool skill components.

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