The Response Opportunity Multiplier: Starting with Skinner

Carl Binder – PT 2007

The Response Opportunity Multiplier
Starting with Skinner

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Skinner’s Most Important Contributions

EVANS: Of all the... important contributions you have made... which do you feel are most significant?

SKINNER: “...the use of rate of responding as a basic datum and the so-called cumulative record, which makes changes in rate conspicuous.”

The "Standard Frequency Chart"

The Cumulative Recorder

Skinner's Opportunity Multiplier

- **Prior to his innovation:** Rats ran down alley-ways, one trip at a time; experimental replaced them at the start for each "discrete trial."
  - Labor-intensive
  - Disruptive interruptions between each trial
  - Crude measures: accuracy and duration of each run
  - Very time-consuming

- **Skinner's re-design:** from alleyway to lever-press
  - First he gave the rat a way to circle back to the start-box.
  - Then he eliminated the running altogether, gave rat a lever to press

- **Result**
  - More response opportunities, greater measurement sensitivity (rate of response, or frequency)
How can our students achieve proficiency?
Discrete Trials don't ALLOW them to do so.

- Tapping a surface: 250-350 per minute
- Writing Digits: 140 to 160 characters per minute
- Arithmetic: 70 to 110 computations per minute
- Keyboarding: 60 to 90 words per minute
- Choosing multiple choice items: 15 to 25 per minute
- Brainstorming: 20 to 30+ ideas per minute
- Reading words: 200 - 300 words per minute
- 3-point basketball shots: 15-25 hits per minute

Four Types of Ceilings that Constrain Skill Development

1. **Measurement-defined Ceiling:** when you don't measure the time dimension (e.g., percent correct)

2. **Teacher-imposed Ceiling:** When you prevent students from responding at their own rate.

3. **Deficit-imposed Ceiling:** When dysfluent behavior components prevent fluent application/combination.

4. **Handicap-defined Ceiling:** When we have not been able to break through a sub-competent level of performance.
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The Opportunity Multiplier

*Before and After a Change in Design*

- Opportunities per minute = OPM
- Opportunity Multiplier = $\frac{OPM_{After}}{OPM_{Before}}$

We look for x5 to x10 Opportunity Multipliers

Logic for the Opportunity Multiplier

- Learning occurs with active responding.
- To accelerate learning, increase opportunities for active responding and consequences.
- Instructional *efficiency* increases with increasing opportunities for active responding per time interval.
- If we can increase response opportunities per minute, we should be able to accelerate learning.
How did he do it?

"I practiced as much as anyone.... For years I hit 500 balls a day. There is no such thing as natural talent, there is natural ability, but talent comes only after relentless practice and fine-tuning."

Sam Snead
3-time PGA Champion

Simple Example, *basketball practice*

OM = 36 shots per min / 6 shots per min = X6
An Early Classroom Opportunity Multiplier

(A By Carl Binder — PT 2007)

A More Recent Example

(By permission of Beth Swatsky)
Some Behavior Ceilings
(A Few Examples)

- Frequency measures us to SEE ceilings we impose on behavior.

More Examples

- From 1:1 tennis volleys to 2:1 with two balls (OM = x2)
- From teacher-presented flashcards to arrays of cards, then worksheets (OM = x5 or more)
- From counting objects to match numbers in discrete trials to counting objects into a line of cups with numbers on outside (OM = x10 or more)
- From trainer-prompted system navigation trials to timed, self-paced "scavenger hunt" with partner (OM = x10 or more)
- From class discussion of concepts to SAFMEDS practice cards (OM = x50 or more)
- In general, from discrete trials to self-paced (OM = x2 - x100)
- From application skills to component practice, e.g., long division, customer service skills (OM = x10 - x100 or more).
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Stages of Learning

Stage One
Initial Learning
Acquiring new behavior

Stage Two
Practice components for fluency & endurance

Stage Three
Application
Combining fluent components

Focus for Opportunity Multipliers is Stage 1 - Stage 2

Practical Guidelines

- Always look for ways to raise ceilings, increase efficiency.
- Move ASAP from controlled to self-paced responding.
- Focus on component practice to multiply opportunities.
- Make materials and procedures more efficient and easy-to-use.
- Even IF the critical variable is number of response opportunities, choose procedures that allow more response opportunities per minute to avoid wasted time.

Plus... more opportunities per minute is usually more FUN!
Comments, questions, discussion, or examples from YOUR work?