

A Behavioral Measurement Parable

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Percent-town was a growing, thriving community - - a suburb of that bigger metropolis known as Los Behavior Analysis, called "Los Analysis" or "LA" for short. In percent-town lived a person known simply as the Behavior Analyst. The Behavior Analyst had lived in Percent-town for quite some time, and lately had observed, with a twinge of sadness, the disappearance of erstwhile farms, open spaces, and behavioral domains into shopping malls, housing sub-divisions and psychology clinics. A new sub-division recently had opened up just down the road from where the Behavior Analyst lived. And another couple more sub-divisions and interventions further on down the road were in the works. The road, though, was the same old two-laner, and it seemed to be getting more and more traffic. Rarely were traffic levels as low as they had been in the old times. Mostly, there just seemed to be more and more Stretch-to-Fill-Mobiles and other such vehicles stressing the inadequate infrastructure of the road.

What with the new sub-divisions preparing to open up, the Behavior Analyst, ever the avowed scientist, decided to measure the amount of traffic and the increase thereof (perhaps as a basis to petition for road expansion or a halting of further sub-divisions - - but that's beyond the scope of this parable). So, the Behavior Analyst, armed with pencil, tally sheet and metronome beeper, sat outside in the front yard, twice a day, for an hour each time. One hour was morning "rush hour," and the other was not rush hour. The beeper was set to sound once every six seconds. Whenever it went off, the Behavior Analyst would look straight ahead. If there were any vehicles passing by - - even one - - a check mark would be made on the tally sheet for the six-second interval just concluded. If there were no vehicles for that interval an x would be written on the tally sheet. For each minute there would be 10 tallies, either check marks or x's. For each minute, then, the percent of time intervals that there was traffic would be computed. A minute that had 7 check marks and 3 x's would be scored as 70%, for example. And this sampling procedure was the basis for deter-

mining the change in the traffic over time. As the traffic increased, the percentage of intervals with check marks would increase too. And so, day in and day out, the Behavior Analyst rigorously sampled the traffic.

Then, one day a pickup truck stopped, and the driver got out. He approached the Behavior Analyst. The driver was a tall, lanky figure, with grayish-white hair. He wore an old blazer with blue pinstripes on a white background, gray slacks, black shoes and glasses. He carried a Halliburton aluminum briefcase. His overall appearance was somewhat suggestive of the Uncle Sam character. He walked up to the Behavior Analyst, and said, "I've driven by a few times this past week in my pickup truck on my way into LA, and I have watched you making tallies on a recording form. May I ask what you're counting? I'm just curious about what you're doing."

The Behavior Analyst, somewhat miffed that a recording session had been interrupted, nevertheless replied, "I am a Behavior Analyst, and I am measuring the increase of traffic on this road. It seems to be increasing, and I just wanted to assess whether there was a significant difference."

The tall driver, still looking like the Uncle Sam figure, but now poised, faintly reminiscent of a Missoula, Montana flame jumper, grinned and asked, "Oh really? That's kind of interesting. I'm a Precision Teacher and behaviorist myself. What kinds of frequencies and celerations have you been getting?"

The Behavior Analyst, not really familiar with the word 'celeration' unless it had an 'ac' or 'de' prefixed, answered, "My measures indicate that the amount of traffic has increased from 64% of the time to 87% of the time intervals."

Astonished - - not by the increase - - the Precision Teacher inquired further: "Why percent? Why do you waste time measuring percent of intervals? Doesn't that - - aren't your counts on the tally

sheet really your own behavior of watching the clock?"

The Behavior Analyst, teeth clenched, strained a forced smile and then explained the sampling procedure, adding, "Anyway, I use a metronome, and don't 'watch the clock.' Besides, if you're a behaviorist, surely you're familiar with interval recording and time sampling. All good applied behavior analysts use it."

Now truly astonished, the Precision Teacher asked, "But why don't you simply count the number of cars themselves that pass by here? Each time a car goes by, you make a tally mark or press a wristcounter." The Precision Teacher thereupon retrieved a wristcounter and pressed it rapidly a few times. Continuing on he said, "Measure the traffic directly! At the end of the hour, you'd stop counting. And then you could figure out the number of cars per minute - - the actual frequency! Then, by plotting these frequencies on Standard Celeration Charts, you could see if the frequency was truly increasing, decreasing, or maintaining over time - - the celeration!!! You could also see the daily bounce! Your interval recording places an arbitrary ceiling of 10 per minute. And, for chrissakes, there's a lot more than 10 cars per minute on the road right now! Here, I have a spare wristcounter. I even have some standard charts that you may have to plot the frequencies." He pulled out a couple of pieces of strange looking chart paper from the aluminum briefcase.

"No thanks," replied the Behavior Analyst tersely.

"But, why not?" returned the Precision Teacher. "Direct measures tell us so much more. Frequency is a universal measure"

Growing irate, the Behavior Analyst responded, "My measurement is perfectly okay! Rate sometimes can be too time consuming to take! Or it's not always possible to take! And it may even be irrelevant in some circumstances; maybe a lot of circumstances. Other behavioral measures are appropriate, too. Behavior analysis uses all kinds of acceptable measurement - - just look in the journals. Besides, I've seen those silly blue graphs for years, and I've never seen what all the whoopee is about. The lines are too close anyway. And with my own graphs, I can focus in on the changes. Or I can expand them out to see the big picture." The Behavior Analyst pretended to stretch a rubber band. "And also, the journals won't print those silly semi-log graphs. Now, if you don't mind, I'd like to get back to my applied

traffic analysis here."

Aghast, the Precision Teacher chocked back an "arghh" and left. Climbing back into the truck, he realized that the Behavior Analyst would continue to sit there and use the tally sheet, not to count the traffic itself directly, but to use it in a bastardized role. And further, that the most revealing and powerful measures of the traffic - - frequency and celeration - - would continue to be overlooked, avoided, put-down, and discounted by that person who otherwise professed an interest in behavior, behavior change, and behavior analysis. The Precision Teacher was glad to be getting out of Percent-town, though.

Morals

(1) In the Middle Ages academicians argued over the number of teeth in a horse's mouth. It was a long time before some bright individual suggested that the teeth be counted directly. Even today you find among behavior analysts a persistent resistance to direct measurement: a negative "can't do", "can't measure" attitude instead of a positive "can do" attitude.

(2) What is the best way to convince percent users and stretch charters to adopt standard measurement and standard displays? Logical arguments, reasoning, and even data probably won't be enough. Also, arguing and debating with them probably won't be helpful.

(3) If you're on your way into Los Behavior Analysis, it's better not to stop in Percent-town. Bypass it altogether, if you can!

Postscript

This parable came to me when I left late for work one day and got caught in rush hour traffic. There were so many more cars on each road. I got to thinking how a behavior analyst - - absurdly - - might count or measure such a difference, and how each one, such as myself, who is committed to frequency would do so.

In the spirit of actual science, and to accompany this parable with some real data, I actually counted the traffic going past my office window on the avenue a few yards out front. I used an interval recording method described in Cooper, Heron, & Heward (1987), and also counted the frequency and charted it on Standard Charts (e.g., Pennypacker, Koenig, & Lindsley, 1972). The difference in sensitivity of the two recording methods was monumental, with frequency being many

times more revealing of what actually was going on in front of me. Interval recording really is watching the behavior of the clock. Not having a metronome, I had to keep my eyes on my watch to see when the six-second intervals were starting and ending. I could watch the traffic only with my peripheral vision. When I recorded frequency, I could set the one-minute timer on the watch, and then focus all of my attention on the traffic. To this day, I swear I saw a kindly old Uncle Sam figure driving by in a pickup truck, signaling a thumb's up of encouragement.

References

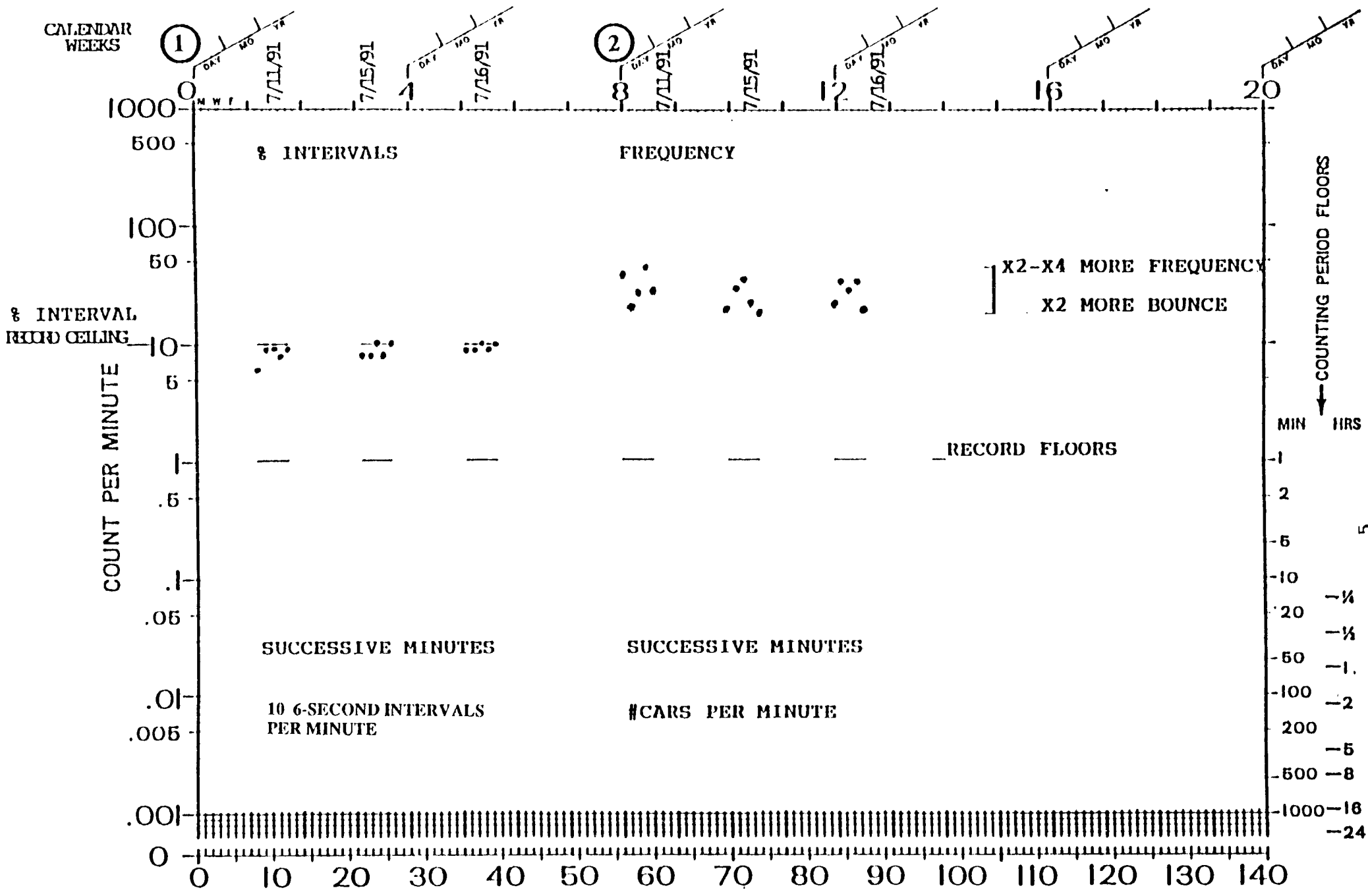
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CALENDAR WEEKS

1

2



% INTERVAL RECORD CEILING

% INTERVALS

FREQUENCY

X2-X4 MORE FREQUENCY
X2 MORE BOUNCE

COUNT PER MINUTE

COUNTING PERIOD FLOORS

MIN HRS
1
2
5
10
20
50
100
200
500
1000
-18
-24

SUCCESSIVE MINUTES

SUCCESSIVE MINUTES

10 6-SECOND INTERVALS PER MINUTE

#CARS PER MINUTE

RECORD FLOORS

SUCCESSIVE CALENDAR DAYS

VEHICLE TRAFFIC ON LANE AVE, COLUMBUS, OHIO

BEHAVIOR AGE LABEL COUNTED

5 MIN. OF % INTERVAL RECORDING FOLLOWED BY

5 MIN. FREQUENCY RECORDING FOR EACH DAY

TIMER

COUNTER

JWE 12/01/91 2:30-2:40 PM

CHARTER