

PEACHES AND LEMONS AID CLINICAL DISCOVERY

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Introduction

What follows this paragraph is the two pages of text and two daily charts that I handed out at my Keynote Address before the Northern California Association for Behavior Analysis on 12 February 1994. This was the first time I presented the fruit metaphor (peaches and lemons) for exceptional outlier days. The night before they surprised me and honored all of us in the family of Precision Teaching by giving me their annual "Outstanding Contributor to Behavior Analysis" award. I accepted by singing them a parody to "California Here I Come," which appears elsewhere in this journal issue.

Background

Most Applied Behavior Analysts monitor their clients' behavior before, during, and after treatment. This is done to observe treatment effects and to custom tailor the type and amount of reinforcement. There is an opportunity to discover clinical variables unique to each client by noting exceptional days and discovering what may have produced them. Few of us have taken this opportunity to discover unique variables for improving our clinical results.

What are Peaches

Peaches are unusually high frequency performances in something you are trying to accelerate, or unusually low frequencies in something you are trying to decelerate. They are unusually "good" performances. If you can find out what produced them, you might use that variable to improve performance on the other days. Peaches can be a day in a sequence of daily observations, or an outlying dot in a distribution of frequencies from different performers. Gilbert (*Human Competence*, 1978) used the term "exemplar" to describe the most highly skilled performers who should be analyzed as performance models.

What are Lemons

Lemons are unusually low frequencies in something you are trying to accelerate, or unusually high frequencies in a deceleration target. Gilbert did not write about learning from unusually high or low days, nor from unusually low performers. However, it is just as important to learn "what not to do" from lemony days and lemony performers as it is to learn "what to do" from peachy days and peachy performers.

How to see peaches and lemons

Normal curve statistics estimates the probability of an outlier by how many standard deviations it is away from the center of its distribution. This is very hard to see in a baseline or treatment portion of a behavior chart. It is easier to see the distance between the outlier and the nearest edge of the distribution. It is also easier to judge this distance by how many total bounces or spreads the outlier is away from the rest, than to estimate standard deviation distances.

Bounces away from edge of course:	Probability in one out of a:	(Standard deviations from the mean)
Half	Thousand	4
One	Million	6
One and a half	Billion	7
Two	Trillion	8

The memory aids are: across - "Half a bounce is half a Ton (Thousand)," and then down - "Thousand, Million, Billion, Trillion."

Standard Celeration Charts SCC

Since the SCC normalizes variance (making up bounce equal down bounce) and equalizes variance (keeping bounce constant as frequencies increase or decrease) peaches and lemons are much easier to see on SC Charts.

My first Lemon

I first noticed the power of outlier days in September 1966, in my first behavior analysis class for fathers of retarded children. They were to "pinpoint a behavior, record it's daily frequency, and bring the counts to class next week." One father pinpointed loud screaming by his twin daughters and brought in counts of from 35 to 100 screamings per day. When in their station wagon, the father reported the screams were louder and startled him so much that several times he barely avoided accidents. He separately counted these in-car screamings at 6 and 7 during two 20 minute drives. When charted, the in-car screamings are 5 times more frequent than the other screamings, and are one full bounce away from the others. This shows that they would happen by chance only one time in a million. After only this first week of counting, I told the father to take heart. The screamings could not be due to a run-away cerebellum, as a neurologist had told him, but were under environmental control! Because, who ever heard of cerebellums that ran 5 times faster in Fords? I told him that in two months we could stop his daughters' loud screamings. We just had to figure out a contingent change that would work.

The first try was to have each girl tie a handkerchief over her mouth immediately after each screaming for 15 seconds. This divided the frequency in half, jumping down to about 25 per day. Note that the in-car screamings also consistently divided, staying 5 times faster than the others. The next suggested try was to increase the dosage of self-masking to 120 seconds. This turned the screamings down to divide by 2 every week, taking 4 weeks to get down to the aim of zero per day where they maintained.

My first Peach

In workshops and presentations I urged Precision Teachers to search for exceptional days (I had not yet called them peaches and lemons at that time) to get ideas for improving their students' academic and social behavior.

In 1971, Bill Hulten and Warren Schoonmaker sent me Phillip Dunn's chart of the number of pages he collated per minute in the sheltered workshop at the Experimental Education Unit of the University of Washington. For the first 5 days his frequency dropped from 20 to 4 per minute, dividing by about 5 per week. Bob Bozich and Dan King offered Phillip a token for every 50 pages collated which had no effect. Phillip's performance continued to decelerate to 10 pages collated per 10 minute session.

After 4 weeks the managers noted that there were 4 peachy days in which he collated from 30 to 130 pages. On these days Phillip was 3 to 5 times faster and the days were at least a full bounce away from the others - one out of a million by chance! Asking Phillip and checking their records they discovered that on those days the worker who collated pages at the same table was absent and Phillip had the table to himself. The managers gave Phillip his own work table and he collated over 50 pages per 10 minute period without tokens.

How often do Peaches and Lemons occur

A survey of the 26 reprinted published Charts in Keith Miller's, *Principles of Everyday Behavior Analysis* revealed 6 ignored peaches and 1 ignored lemon. Peaches and lemons occur in daily, weekly, monthly and yearly frequencies. They are usually ignored. I urge you to analyze yours, discovering exciting new treatment variables and becoming more effective.

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CALENDAR WEEKS

3 Jan. 71
DAY MO YR

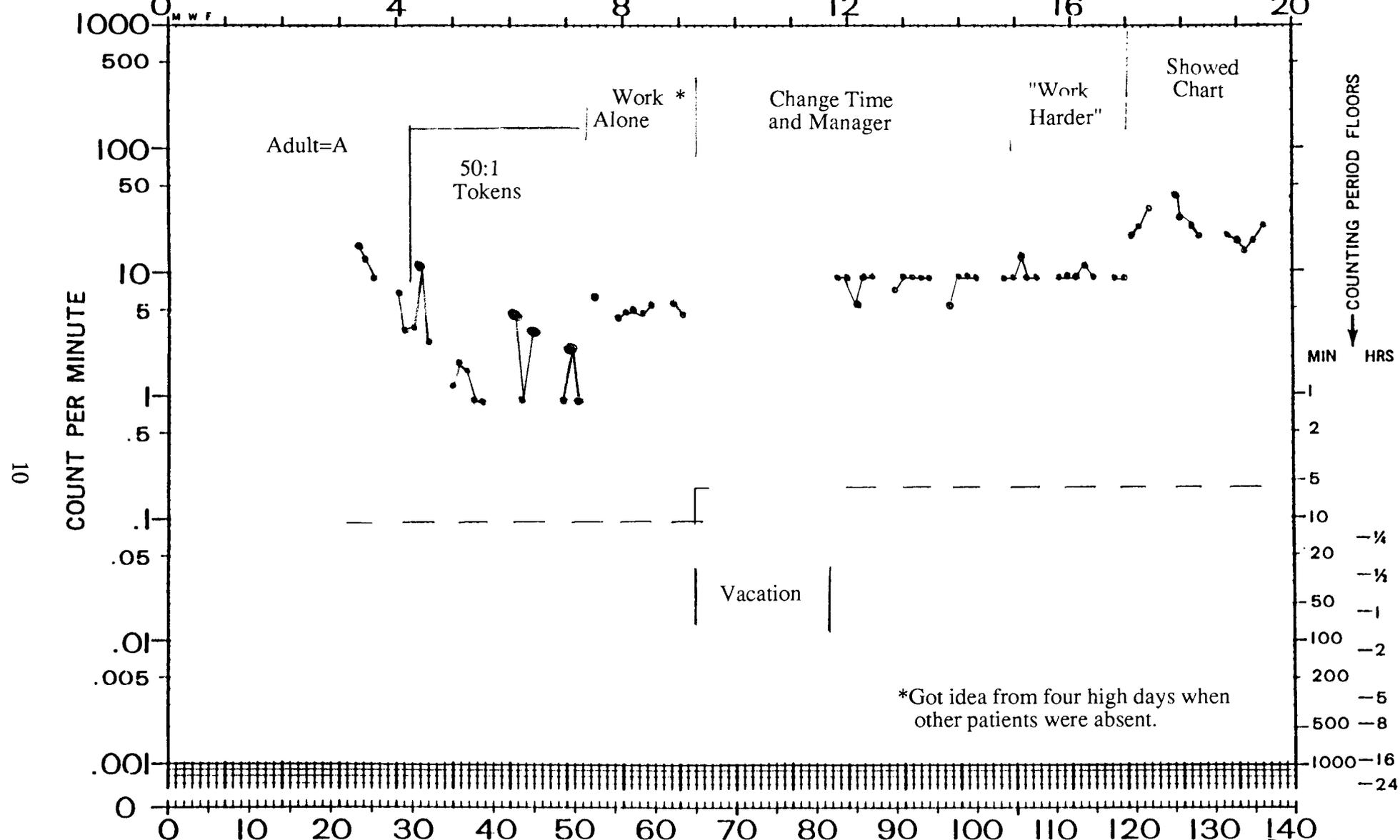
31 Jan. 71
DAY MO YR

28 Feb. 71
DAY MO YR

28 Mar. 71
DAY MO YR

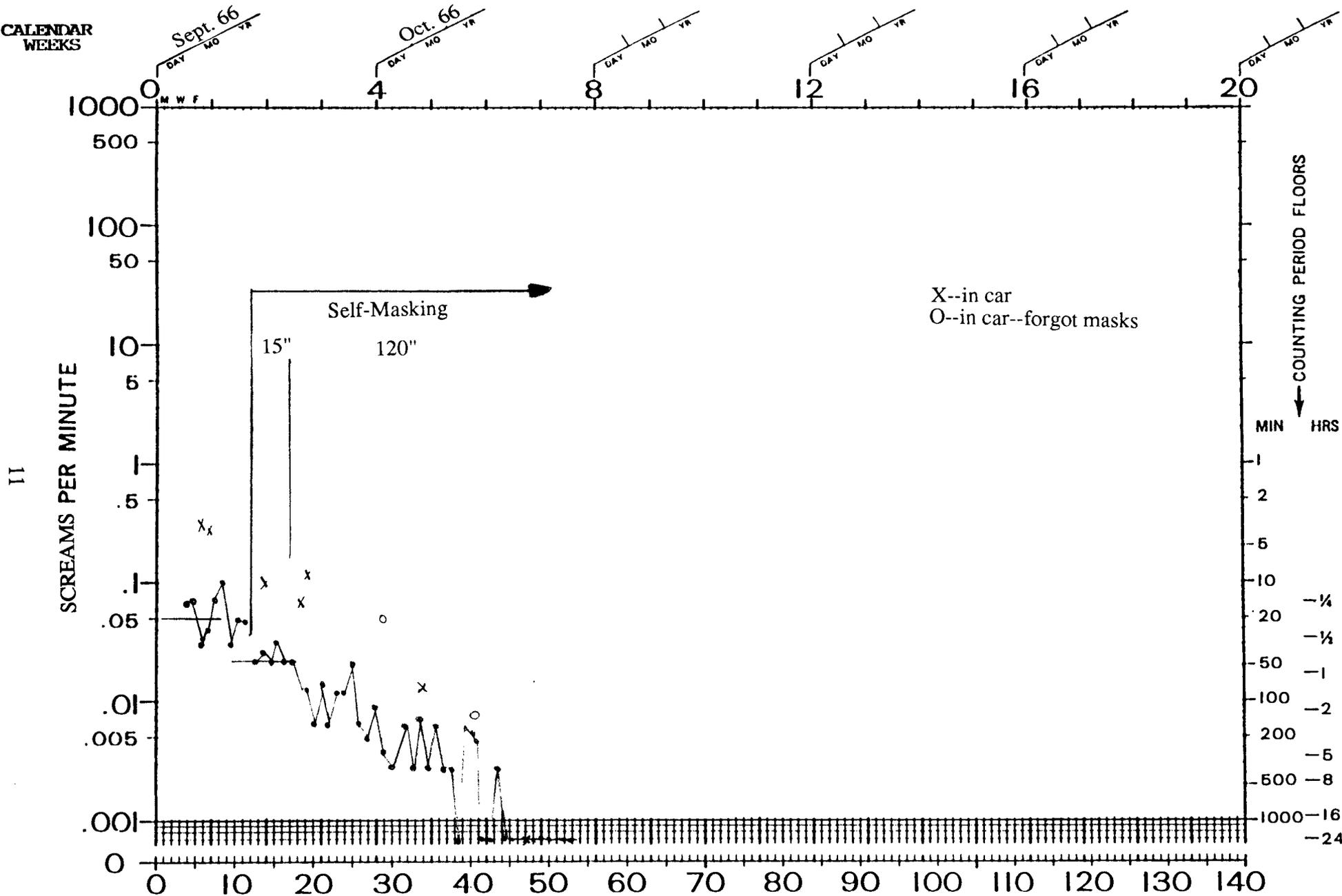
25 Apr. 71
DAY MO YR

23 May 71
DAY MO YR



Bill Hulten	Warren Schoonmaker	Bob Bozich		Phillip Dunn	14	TMR	Pages Collated
		Dan King					Correctly
SUPERVISOR	ADVISER	MANAGER		BEHAVIOR	AGE	LABEL	COUNTED
Norris Haring	E.E.U. University of Washington			Bozich			
DEPOSITOR	AGENCY		TIMER	COUNTER			

CALENDAR WEEKS



11

Lindsley	Father-Dan	Mother-Dianne	SUCCESSIVE CALENDAR DAYS		Dianne and Debby	7	MR-M	Scream
SUPERVISOR	ADVISER	MANAGER			BEHAVER	AGE	LABEL	COUNTED
FC #1					twins			
DEPOSITOR	AGENCY		TIMER	COUNTER	CHARTER			