

AIM*STAR WARS

[Setting Aims that Compete]

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Episode IV: Scouts, Flankers and Rear Guard

In previous episodes we followed Uncle Owen's diary as he tried to unravel the mystery of the Learner-Force as it bore on terminal proficiency aims -- aims that will ensure a skill will be useful once all artificial instruction and support is withdrawn. In this episode, Uncle Owen returns to the consideration of more elementary intermediate proficiency aims -- aims that may not ensure the immediate usefulness of a skill outside instruction, but which will allow the Learner to move rapidly through a curriculum of related steps.

Advancement through a curriculum of related steps need not require complete mastery of each step along the way. Contrary to conventional wisdom, "leap ahead" to high levels in a curriculum without a concern for the development of "prerequisite skills" has proven quite successful in accelerating the progress of many learners (Lindsley, 1981; Eaton & Wittman, 1982; Bower & Orgel, 1981; McGreevy, 1980; Johnson & Jackson, 1980; Liberty, Haring & White, 1980). There might be many reasons for the success.

First, advancement to a higher level in the curriculum does not usually mean a complete abandonment of practice, assistance and feedback for earlier skills. The learner will still encounter, still practice and still receive feedback concerning most preprimer words even when they are embedded within the context of a third grade reader. Addition and subtraction skills will still be practiced and supported when the learner receives instruction in long division. Given that continued support, it seems reasonable that the fluency standards for advancement through a cumulative

curriculum might not have to be very high.

Secondly, higher levels in any given curriculum or task sequence generally represent larger, more functional units of behavior. "Picking up a shoelace" in isolation is not likely to be very useful for a learner. Indeed, if the learner practiced such a small skill outside instruction, most people would think it was self-stimulation. Advancing rapidly through the curriculum to a point where the learner is working on the entire shoe-tying task (or better yet, an entire dressing sequence) provides the learner with greater opportunities to accomplish something of meaning and value -- something that has at least some chance of leading to accelerating consequences outside instruction.

The value of working with curricular units large enough or advanced enough to gain access to natural accelerating consequences should not be underestimated (Stokes & Baer, 1977). At times that will mean finding a level which provides the learner with a skill of personal value (e.g., buying something at the store without a special manager around, rather than practicing "see/say prices" with flashcards). At other times the value in working at a particular level will depend on the reactions evoked from other people in the learner's environment. Jennifer's inventory of math skills provides a good example (see Chart 7).

Jennifer, a third grade Learner-Rebel, was well below her classmates in all basic math skills. Five days were set aside to evaluate her frequencies more carefully in each of the 14 major skills she should have mastered by the end of the third grade. The inventory, one originally developed by Learner-Knight Liberty (1970), was very carefully designed to reveal deficiencies in a learner's demonstration of each skill and to highlight any unusual patterns in the relationships among skills. If a pupil is fluent, performances should be at or above typical Normie Aims (see the aim-stars on the chart). Moreover, since all the behaviors being assessed use the same basic tool movement (writing digits), the "conceptual" difficulty of each task should be directly



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CALENDAR WEEKS

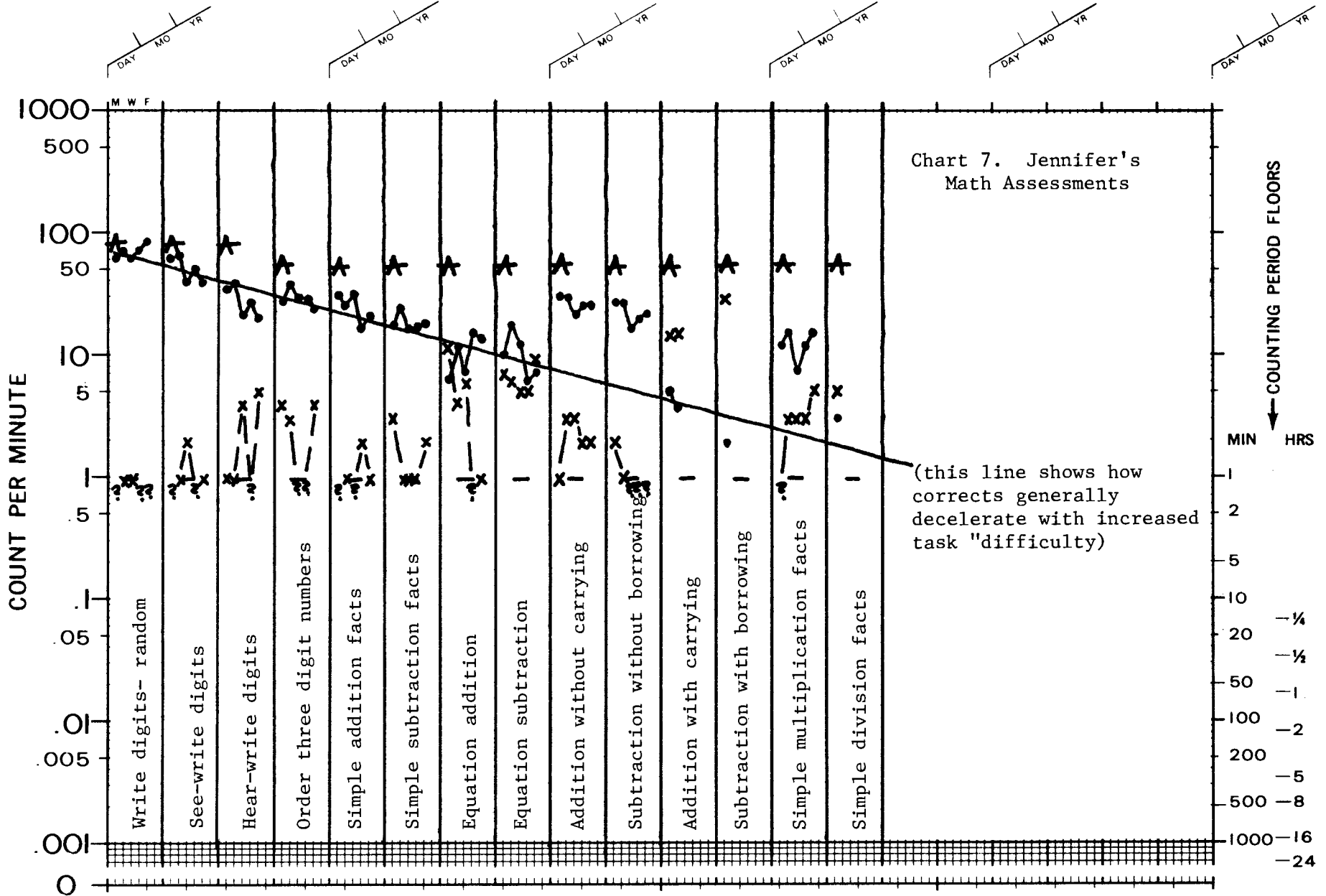


Chart 7. Jennifer's Math Assessments

(this line shows how corrects generally decelerate with increased task "difficulty")

White			Jennifer		performs numbers and computation tasks
SUPERVISOR	ADVISER	MANAGER	BEHAVIOR	AGE	COUNTED
University of Washington Seattle, Washington			COUNTER	CHARTER	
AGENCY					

related to the frequency of correct movements. As a task becomes more difficult, the learner's correct performances will slow down. (Note: All skills in the sequence are actually tested on the same five days, so simple "passage of time" could not account for performance increases or decreases across skill areas. The performance records are placed on a single chart to facilitate comparisons and analysis.)

Jennifer's performances confirm her lack of fluency in math. With the exception of the basic tool movement (free/write digits), correct frequencies are all below typical Normie Standards. Correct frequencies also fall off in a steady, predictable manner as task difficulty increases -- most of the correct frequencies fall quite close to the solid, dark, decelerating line drawn across the chart. Correct frequencies for three skills are well above that line, however. Jennifer is doing much better than expected in two-column addition without carrying, two-column subtraction without borrowing, and simple multiplication facts.

A comparison of Jennifer's two-column frequencies and her simple fact frequencies explains part of the mystery. Those frequencies are virtually identical. Jennifer is simply reacting to the two-column problems as if they were sets of two facts "scrunched together." However, Jennifer has never been provided with instruction in multiplication facts. How did she learn even a few of those facts?

It turns out that Jennifer's regular classmates are now studying multiplication. Jennifer is not even in the regular class during math period. She's off in the resource room studying addition and subtraction, but she knows what the "regular kids" are doing, and she wants to do it too. Somewhere, somehow, she's been sneaking away and teaching herself multiplication. How dare she do this without the guidance of a teacher?

Fortunately, Jennifer's teacher did not follow the tried and true method of "test up from the bottom until the child fails to meet aim and begin teaching there." If she had, Jennifer

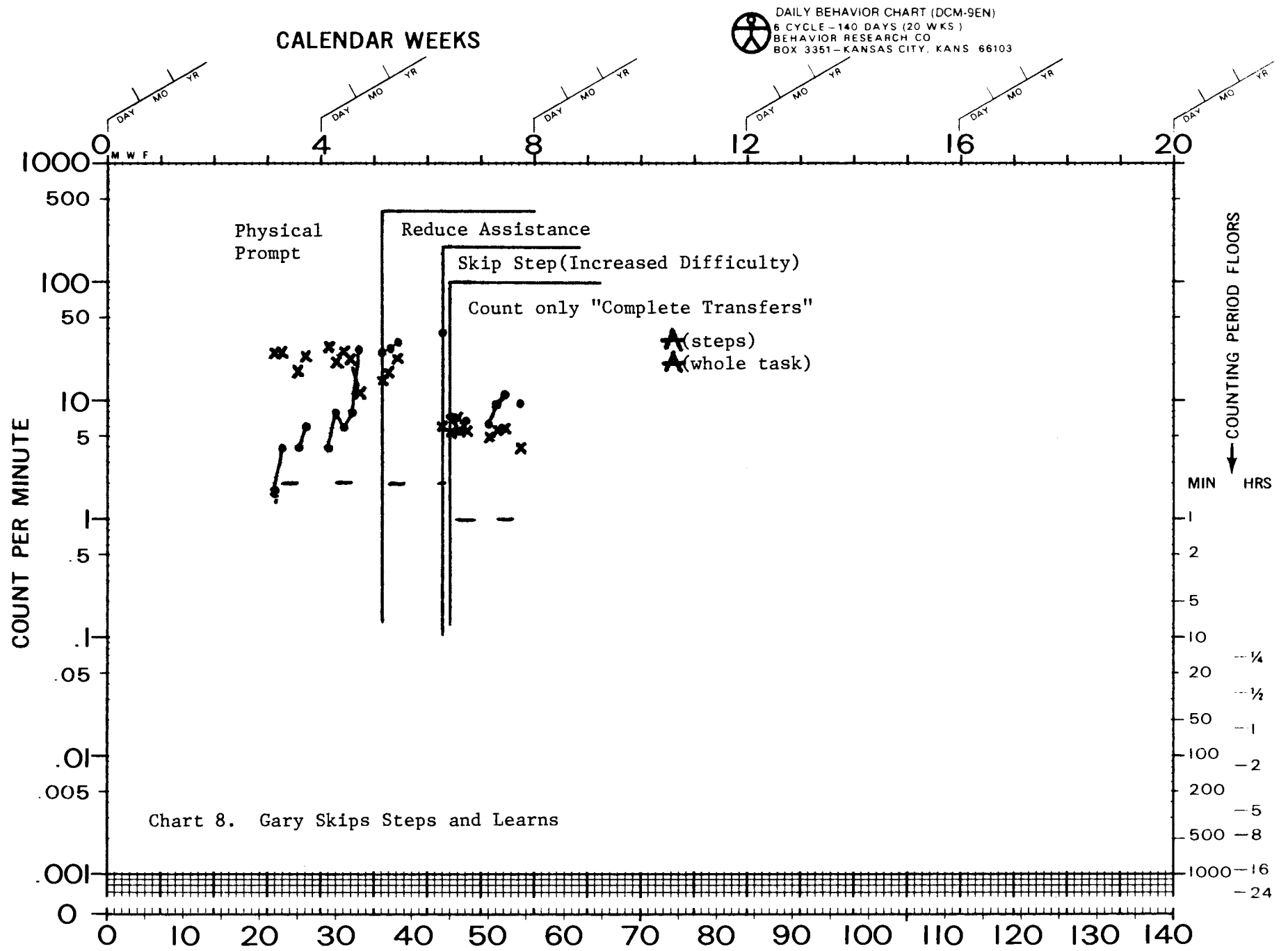
would be studying "hear-to-write," or possibly "ordering three digit numbers" with a sprinkling of add facts. Jennifer's teacher recognized her need to gain access to the natural accelerating consequences of learning what the others are learning, even if she's "not ready." So Jennifer got time to practice multiplication facts. She also worked on addition and subtraction, because she needed those skills too, at least in the long run.

This brings us to the last reason why leap aheads without fluency on intermediate steps may work. Quite simply, what WE might believe is "prerequisite" or the "natural order of things" may not be necessary or natural at all. Gary, a fourteen year-old severely mentally retarded and physically handicapped Learner-Rebel, will scout the point and show us the way.

Gary needed to develop a wider range of "self-help" skills. One skill in particular would provide Gary with a bit more dignity and would be very helpful to his managers -- moving from the toilet to a walker (or vice versa) without assistance. John Holliday, Gary's manager, began as all good behavior analysts begin. He developed a detailed outline of the steps "required" to perform the desired task. Unlike many teachers, however, he recognized the advisability of working with skills within a functional context, so he worked with all the steps in their proper sequence during each session. The results are shown in Chart 8.

The first day was depressing. Gary failed to perform even a single step in the sequence correctly. John had faith. The next day Gary performed two of the steps correctly. By the end of the ninth day Gary's correct-steps-in-sequence were better than 20 per minute and errors were down to 10 per minute. Things were going so well, John reduced the level of assistance provided for each step.

Gary's correct frequencies are still accelerating, but at a much slower pace, and the errors are accelerating much faster. Turn to the "Traditionalist's Normie Empire Handbook." Things are not going well? You tried too move to fast. Slow down. Back



	White	Holliday	Gary	14	performs steps of transferring from walker
SUPERVISOR	ADVISER	MANAGER	BEHAVIOR	AGE	COUNTED
	University of Washington	Seattle, Washington			to railing during toileting
	AGENCY		COUNTER	CHARTER	

up. Put back some of the assistance you took away, at least for the more difficult steps.

"No," cried John, aspiring Learner Knight that he was. "If I have but ONE correct performance in five days I shall not retreat!"

He put his faith in the Learner Force and thought about the type of error that Gary seemed to be making. Was there a message there?

Gary wasn't following the rules. John's task analysis(developed with Gary's special needs in mind) called for Gary to transfer each hand, one at a time, to the side of the walker closest to the railing, then(again, in two separate steps) transfer each hand to the wall railing. When he thought about it, John decided that most of Gary's errors occurred when his hand seemed to "overshoot" the walker and begin to go directly to the railing. John had reacted to such tendencies as any good teacher would. He grabbed Gary's hand before it got very far, plunked it down on the walker where it belonged, and recorded an error.

John cared more for Gary than the task analysis. If Gary wanted to perform the task in one step instead of two, that was alright. He began to allow Gary to skip any step he wanted. The next day the correct frequency edged up a bit and the error frequency plummeted. Seeing the futility of counting steps in a sequence which Gary apparently did not need, John began to count only "whole transfers" and provide assistance only when Gary really got off track. Things were confused for a few days, but moved along rather nicely thereafter.

What WE believe to be a logical, perhaps necessary sequence of tasks may not be logical or necessary at all. Addition and subtraction do not have to be mastered before multiplication. Two stops for each hand is not necessarily easier for a physically handicapped child than one stop for both hands. Send out the scouts! Take the point!

Work at the very highest level possible. If the child can progress on a mixed sheet of math problems containing all types of problems, then

it really doesn't matter whether addition comes before multiplication -- it can all come at once. If the child can work out his or her own task analysis and achieve the desired end (like Gary getting to the toilet), then it really doesn't matter whether it is the way WE would choose to do it. If the fifth grade "learning disabled" child can make progress by reading from a fifth grade book, even though the tests say a second grade reader would be "better," then let the little learner-rebel go!

Is this too much of a leap ahead? An "all mixed" math probe might confuse the child, or one type of problem might be consistently skipped and, therefore, never practiced. A severely handicapped child may need as least some guidance in figuring out a reasonable task sequence. The fifth grade child may still need drill in some particularly difficult blends in order to make the best progress possible in the fifth grade reader.

If it does seem more reasonable to work on certain subskills in a definite sequence, there are at least two ways we might avoid a lock-step, "do it my way, one step at a time" catastrophe.

First, although we might be working at one intermediate level of the curriculum, we can still scout ahead. Work on blends, assess on blends, assess again using the fifth grade reader. When climbing the ALPs (Advanced-Learning-Probes) indicates that blending-errors are dropping out of fifth grade reading, stop working on blends in isolation. Feedback for the few remaining errors can continue in the context of the fifth grade reader. Progress on the "leap up" ALPs assessment is the most appropriate and functional aim for intermediate skill instructional programs.

Second, if it simply seems unmanageable to probe all skills in a sequence at once(the ALPs are too big), then at least move through cumulatively dependent substeps in the sequence as quickly as possible -- probably whenever the pupil shows flagging interest by going flat. Get to the highest level possible as quickly as possible, and then begin to build "terminal" fluency.

This strategy makes sense. However, with almost everything, there are a few caveats. An all out charge can leave one's flanks and rear exposed.

Precisely because not all skills ARE strictly hierarchical, there is sometimes a danger of leaving something behind that won't be incorporated into what appear to be related, higher-level skills. Judy's inventory demonstrates the wisdom of sending out flankers and a rear guard (see Chart 9).

Judy is reading reasonably well in her grade level text. She's just a bit below aim. Just to be safe, though, send out the flankers and check the perimeters.

We've found a weak spot. Her blending skills are almost non-existent. Judy's teacher has to decide whether it's wise to try and turn a reasonably fluent sight-word reader into a phonics reader. That would require a controlled withdrawal to a lower frequency in order to regroup, but it might make all the difference when the final assault on functionality begins. A tough decision. If Judy's teacher had not sent out flankers to check all perimeters, however, the possibility that a controlled withdrawal might be advisable would never have been discovered.

Commander, Commander, there's another report from the flankers. Judy's math skill defenses are even weaker. She's certainly a long way from fluency in addition and subtraction, but she's not exactly out of the ballpark either. Now take a look at the flanker's report concerning her skill in writing numbers in order ("...Judy, here are three numbers...9, 13, and 2...I want you to write the smallest number first, then the next number, and then the largest number..."). Judy can add. Judy does not know that 9 is bigger than 2. If we had charged blindly on and assessed only mixed addition facts, we might never have found out that Judy was memorizing otherwise totally meaningless material. It's time to REGROUP.

Don't withdraw! Reinforce the weak flank. Continue the drive on Judy's higher math skills, but begin additional work on her more rudimentary

number concepts. Then leap ahead again!

Work at the highest level possible. Move from one step in a sequence to another as soon as possible. But keep looking back(rear guard) and around (flankers). Unless it is very obvious that all relevant skills are completely contained and adequately assessed in higher-level material, make sure those other skills get the attention they deserve. If necessary, work with high and low skills at the same time.

The second caveat concerning leap-aheads comes from a notion shared by Young Eric(Haughton, 1980). It may be advisable to have the learner practice high frequencies -- get used to the "feel" of fluency, as it were, prepare the troops for the long battle to come. If constant leap-ups produce rapid movement through the curriculum and high rates of progress, but low frequencies, we may be teaching our pupils that it's o.k. to be SLOW (Slothful, Lethargic and Obviously Worthless). We must remember that there are several forms of "competition," and that FAST (Fluency At Skill-instruction Termination) will ultimately determine whether the skill will prove useful to the Learner. The battle is joined.

The simplest way to reach the end of a curriculum is to begin at the end. Teach the final, ultimate performance from the start.

If that does not seem possible, then at least send out the scouts. Provide instruction for whatever intermediate steps seem appropriate, but keep trying to gain the vantage of the ALPs(Advanced-Learning-Probes) to assess the impact of your instruction on higher-level skills.

Leap ahead in the curriculum as quickly as possible, even if the fluency achieved at intermediate steps is less than what you know will be necessary in the long run.

But as you leap ahead, protect your flanks and establish a rear guard to make sure that all related skills are really brought to a level which will make them useful after instruction is terminated. Blind faith that skills are truly "hierarchical" or "prere-

CALENDAR WEEKS

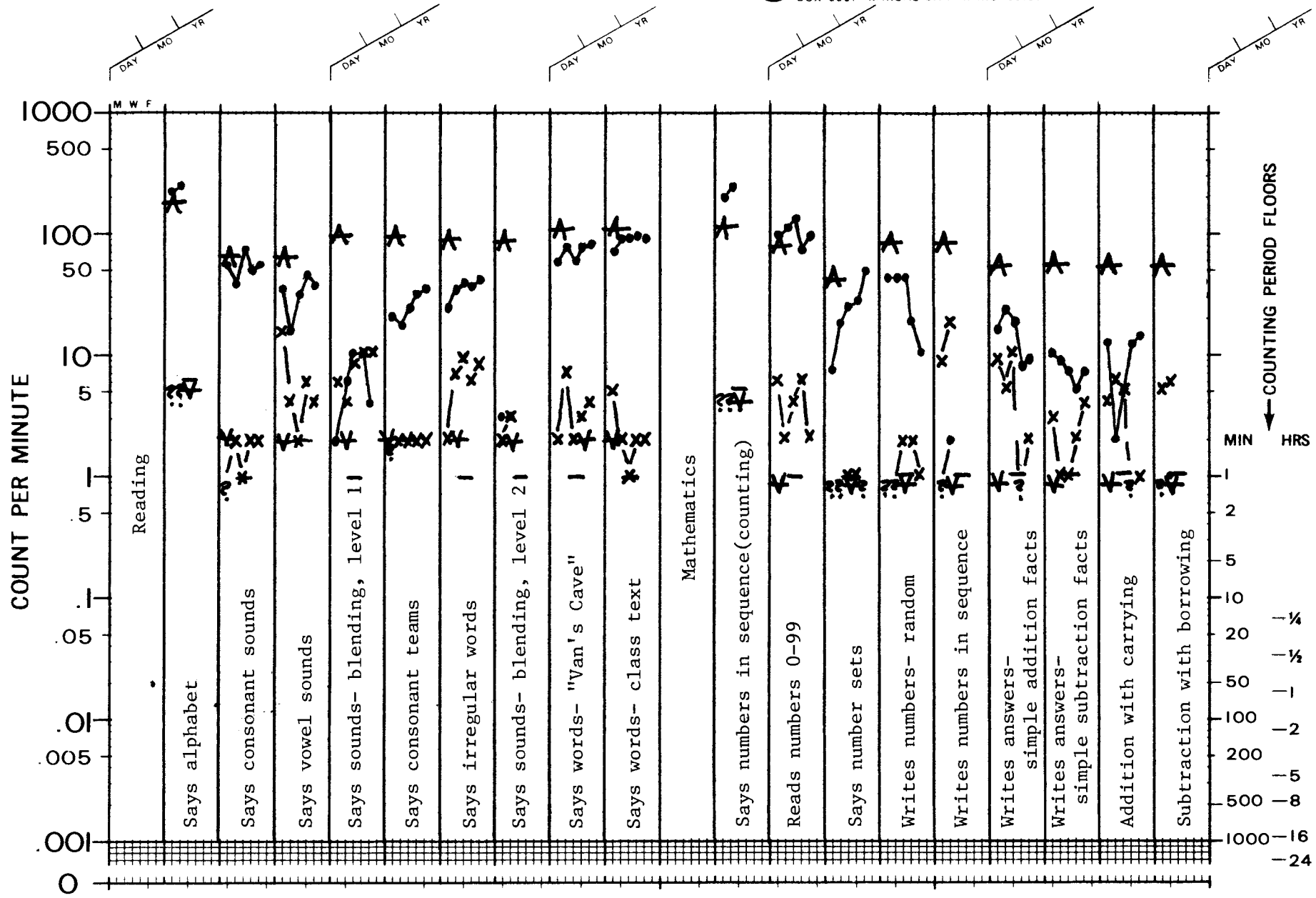


Chart 9. Judy's Reading and Math Assessments

performs reading and math tasks

White			CALENDAR DAYS		Judy		
SUPERVISOR	ADVISER	MANAGER			BEHAVIOR	AGE	COUNTED
University of Washington Seattle, Washington							
AGENCY			COUNTER		CHARTER		

quisite" to one another in sequence is rarely justified. Look around, behind and ahead.

In the next episode, Uncle Owen's diary draws to a close as he attempts to summarize his thoughts and describe the "Uneasy Truce" which appears to have been established between the Learner Rebels and the Evil Normie Empire.

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SELF-CHARTING: GIVING KIDS A CHANCE

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Most things we can record. But still some thing you can't record. Something we can record by tape recorder camera charts or pictures. When we ues a tape recorder we can here the sounds of anamills or people. When we uos a camera we can see howses bridges and parcks. If you yous a ckart you can see how mach you'v grou. But almost all things you can record one of these was.

(William Northey in Lovitt[1982, p. 282.]

RATIONALE AND HISTORICAL PERSPECTIVE

A function of education is to shape children's sense of responsibility and independence in both social and academic settings. Self-recording and self-assessment procedures have been used for such purposes. Self-recording alone has been found to be effective in producing change in classroom and non-classroom settings with children of varying ages (Rosenbaum and Drabman, 1979; Broden, Hall and Mitts, 1971; Jones, Fox and Billingsley, 1972). Positive effects of self-recording have been demonstrated for both accelerating and decelerating targeted behaviors (O'Leary and Dubey, 1979). According to Lovitt(1984), self-counting and self-recording ought to be part of any teacher's operating tactical repertoire.

Self-recording procedures can be extended to include self-assessment or self-monitoring. An evaluative element is added where the student assumes a more active role as co-teacher or co-therapist(Hallahan, Marshall, and Lloyd, 1981). Self-