LEAPS UP: ACCELERATION OF LEARNING THROUGH INCREASING MATERIAL DIFFICULTY

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Precision teachers are sometimes faced with students who seem to work on the same skill forever without much success. Interventions are made, instruction is altered, contingencies planned, yet still the student does not reach aim. Even worse, the data on the Chart show clearly that little or no learning is happening. Learning never seems to accelerate beyond X1.2.

At the 1981 Precision Teaching Winter Conference in Orlando, Florida, Ogden Lindsley, Owen White and others suggested at different times in different ways that a good intervention for these "reluctant" learners is to move them ahead to more difficult material. White suggested moving students ahead to the next step in the curriculum. Lindsley suggested "leaping" students up two or three levels in the scope and sequence to a point where the student was making many errors and had few correct responses. McGreevy (1980) earlier demonstrated a high error frequency with one handicapped student, which was followed by a X2.6 celeration for corrects and a /2.6 celeration for errors. Bower and Orgel (1981) generated high initial error frequencies in college students that were often followed by "jaws" learning pictures, accurate performances and high terminal correct frequencies.

I had the perfect chance to try "leap ups" in the weeks after the Orlando conference. One of my student teachers, Vauhn Wittman, was working in a junior high school learning disabilities class. The cooperating teacher had been charting data from daily timings in math. He had not, however, set aims for his students and was not aware of any decision rules. He was using charting as a recording device rather than a decision-making tool. When Vauhn took over the math programs, she began to set aims and employ the University of Washington decision rules with some success. Yet she was frustrated by the flat and inconsistent learning of some of her students, particularly in math. We discussed the possibility of using leap ups as an intervention, and she decided to give it a try.

Method

Vauhn was particularly concerned about the work of three of her students. Rhonda and Rachael were both 11 years old and were called learning disabled. Allen was 15 and had been called behaviorally disordered. All three students were accurate in the performance of the multiplication and division tables, or identification of simple fractions, yet some of them had been working for weeks to meet their aims of 60 per minute correct. Most days their correct frequencies hovered between 40 and 50 per minute. The students were bored, the teacher was bored, and learning was definitely not happening.

When Vauhn began to set aims for her students and use the decision rules, students improved their correct celerations. Rhonda, for example, met her aim in two days in multiplication, after working for thirteen days at a X1.1 celeration (see Chart 1). The error performance for all these students, however, was always at zero and the correct celerations, even with good decision rules and aims, were not as good as Vauhn felt they could do.

Vauhn decided to use a leap up intervention for these three students to accelerate learning. She moved the students from division, multiplication and identification of simple fractions to working with fractions. None of the students had been previously exposed to using fractions in problems as was evident from their initial data points after the leap up.

Results

All three students responded well to the leap ups. Rhonda's best celerations had been X1.7 for corrects and /1.0 for errors, taking anywhere from nine days to four weeks to reach aim (see Chart 1). When leap ups were begun, Rhonda's celerations changed to a range of X2.3 to X8.0 for correct and /1.6 to /4.5 for errors. She reached her aim within ten days.

Allen's data were similar to Rhonda's (see Chart 2). He had worked for five weeks on the "times 8s" and had never reached his aim. When Vauhn set aims and started using data decision rules, Allen reached his aims on both the "times 9s" and mixed multiplication facts within three weeks. When two digit by two digit multiplication was introduced, Allen was initially accurate, but his performance was slow. His performance accelerated for two weeks to about 20 correct digits per minute and then decelerated (see Chart 2).

The leap up in curriculum was immediately successful. Allen met his error aim after one day of instruction and his correct aim in nine days. The celeration for corrects was X6.0 and for errors was /4.5.

Rachael's data show a slightly different picture (see Chart 3). Rachael was reaching aims faster than either Allen or Rhonda. However, her initial performance in most of these skills was quite close to her aim and she never made

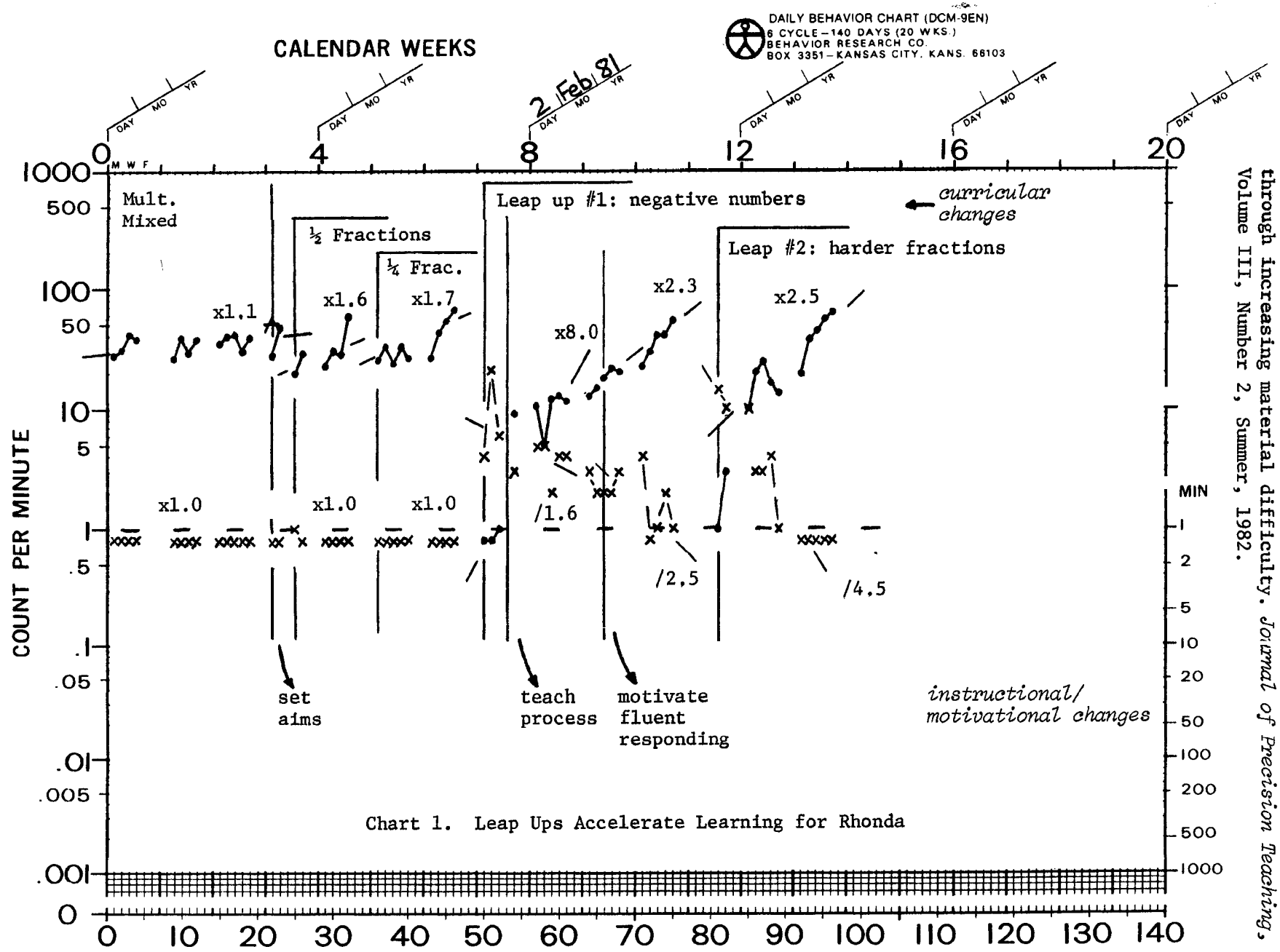

Chart 1. Leap Ups Accelerate Learning for Rhonda

M. Eaton	V. Wittman		Rhonda	11		see/write digits
SUPERVISOR	ADVISER	MANAGER	BEHAVER	AGE	LABEL	COUNTED
Western Washington University	Bellingham, Washington					
DEPOSITOR	AGENCY	TIMER	COUNTER	CHARTER		

Eaton, Marie and Wittman, Vauhn. Leap ups: acceleration of learning through increasing material difficulty. *Journal of Precision Teaching*, Volume III, Number 2, Summer, 1982.

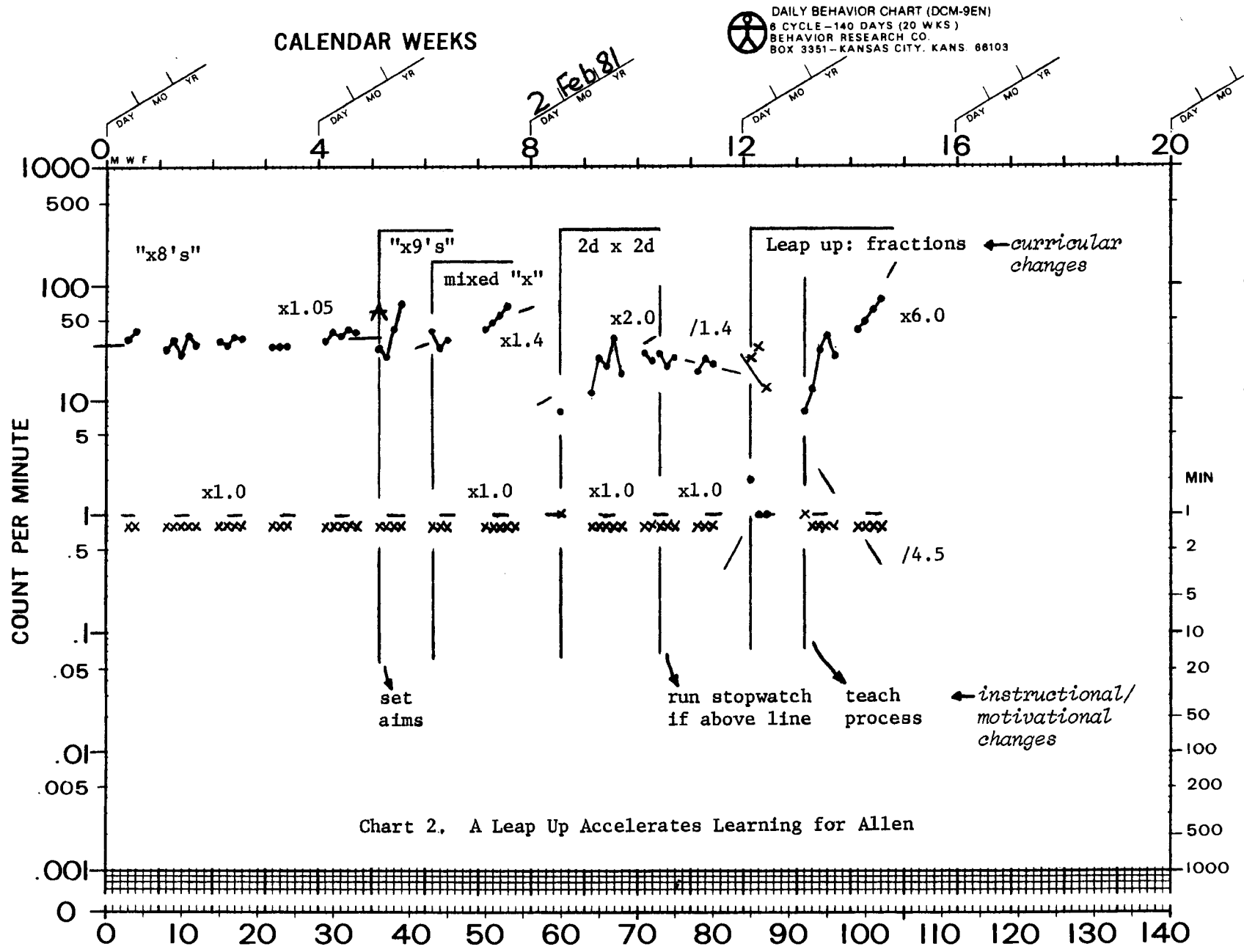

Chart 2. A Leap Up Accelerates Learning for Allen

SUPERVISOR	ADVISER	MANAGER		BEHAVER	AGE	LABEL	COUNTED
	M. Eaton	V. Wittman		Allen	15		see/write digits
DEPOSITOR	AGENCY		TIMER	COUNTER	CHARTER		
Western Washington University		Bellingham, Washington					

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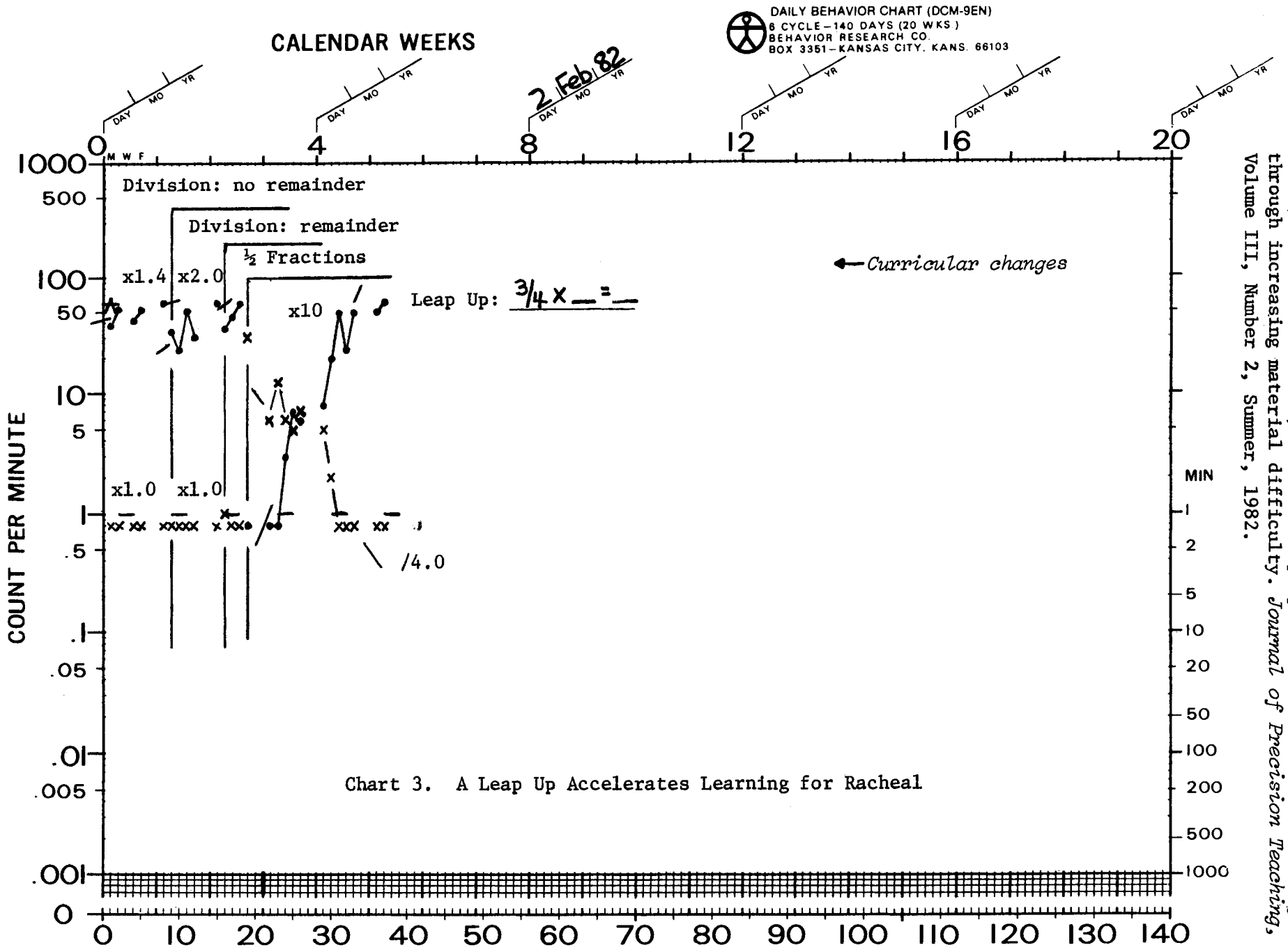

Chart 3. A Leap Up Accelerates Learning for Racheal

Eaton, Marie and Wittman, Vauhn. Leap ups: acceleration of learning through increasing material difficulty. *Journal of Precision Teaching*, Volume III, Number 2, Summer, 1982.

errors. Vauhn and I decided to see if a leap up would provide a greater challenge to Rachael.

Prior to the leap up, Rachael's correct celerations ranged from X1.4 to X2.0. After the movement ahead in the curriculum, her correct celeration was X10.0 and her error celeration was /4.0 (see Chart 3). She met her aim on this harder material in ten days.

Discussion

Leap ups in curriculum do seem to provide a means for increasing the learning of some students. For these three students, learning accelerated dramatically when they moved ahead to curriculum that was new to them.

A few cautionary notes might be necessary, however. All these students had demonstrated their ability to accurately perform the prerequisite skills for the leap up skill. They were not hampered in their leap up by faulty understanding of other basic math processes.

These students were typical of students often encountered in a learning disability classroom. They were not particularly motivated to do their best work and the teacher had many subtle indications that the students might be capable of better performance.

Teachers often are hesitant to provide practice and drill for students because they are afraid that the students will be "bored." For this kind of student, a leap up may be an excellent intervention. Certainly the data from Allen and Rhonda before the leap ups looked like the performance of students who are "bored." Boredom, however, may not be synonymous with repetition or practice, as many teachers fear, but rather repetition of an already "learned" skill. Equal amounts of repetition and practice of the leap up skill did not produce the same flat learning rates as these students had demonstrated previously.

If this notion is correct, then there are two implications for teachers. First, if a teacher is committed to requiring fluent rates of students, then other powerful motivators need to be provided to continually accelerate performance after accuracy has been established. Second, perhaps in our enthusiasm about task analysis in special education, we have created a technique that requires children to take excruciatingly small steps toward the goal of "learning to read" or "learning to do math."

I have met too many precision teachers who begin teaching addition with a "plus ones" probe sheet. After reaching aim on this probe the student moves on to the "plus twos" and so forth. Perhaps these teachers and their students would show higher celerations if the teacher began with the "pluses" and sliced back to the components of addition only for those students who demonstrated that they needed the curriculum in smaller doses.

Leaping ahead in curriculum could be a fruitful intervention for special, average and accelerated students. For the special education student, leap ups could be used to motivate or as a diagnostic procedure. For the average and accelerated student, leap ups could serve the additional purpose of allowing the student to break away from the tedious small step learning required in many classrooms.

Other students, however, may not benefit from a leap up. A student who has not yet demonstrated accuracy in a basic skill, or a student who struggles hard to reach his aim may not show the same kind of growth when given accelerated curriculum. The children, of course, have the answers to these suppositions. We need only try leap ups with these children and monitor the results.

Careful monitoring of leap ups and an analysis of the types of errors which are made in response to the higher levels of difficulty in the curriculum are crucial to the success of this type of intervention. A leap up to a place in the curriculum where errors are made can give the teacher some information about faulty algorithms. If a teacher is currently skilled in both precision teaching and error analysis, then leap ups may be an interesting addition to the repertoire of possible interventions.

We as teachers need to remember the incredible power of more difficult material to accelerate learning. The motivation to learn something new may be so powerful that the excitement can influence even reluctant learners to try their best.

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