

Precision Teaching a Foundational Motor Skill to a Child with Autism

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Since the early work of Anne Desjardin (1980) and others, Precision Teachers have developed Big 6+6 skills in their students' repertoires when needed. The Standard Celeration Chart (SCC) that we present here documents how we analyzed the Big 6+6 skill of *squeeze* in terms of arranging sequences of instruction. The SCC shows the progress of a student named Joshua as he learned to squeeze various objects.¹ When this Chart began, Joshua was 2 years and 1 month old and had a diagnosis of pervasive developmental disorder not otherwise specified. Joshua received in-home behavior analytic intervention for approximately 25 hours per week under the direction of the first and third authors, and the second and fourth authors implemented Joshua's intervention.

Before beginning to work on Joshua's squeezing, we conducted an analysis of the skill to determine what important features of the instruction we would like to control and thus ensure that Joshua

experienced. We identified (a) the hand that Joshua squeezed with, (b) the length of time for which he squeezed, and (c) the difficulty of the objects that he squeezed as important features of the instruction. Which hand Joshua used to squeeze objects was important because we wanted to ensure that he was equally facile with both hands; the length of time for which he squeezed was important because we wanted Joshua to be able to squeeze objects for as long as needed to enjoy an activity and because we predicted that we would need to start his instructional sequence using very short timing intervals to avoid overly fatiguing him; and the difficulty of the object he squeezed was important because we wanted to ensure that he would squeeze objects that offered varying degrees of resistance, rather than only squeezing objects that offered little resistance.

After determining that Joshua would squeeze with each hand separately, we then arranged the other two important features of the instruction (the length of the timings and the difficulty of the objects used) into an instructional sequence that we would use to guide Joshua through the development of his squeezing skill. The following sequence comprises the steps we planned for Joshua:

Slice 1: Easy squeeze/short timing
Slice 2: Hard squeeze/short timing
Slice 3: Hard squeeze/long timing
Outcomes checks

The SCC is divided in half, with the left side of the Chart showing Joshua's squeezing performance with his left hand and the right side of the Chart showing his performance with his right hand. The dots on the Chart show Joshua's frequencies of squeezing, and the triangles in the lower cycle of the Chart show his practice frequencies (number of timings completed per 16 hours). We did not count incorrect squeezes.

Joshua began timed practice squeezing on November 11, 2002. The first phase for each hand shows his performance during the first step in the instructional sequence we outlined. This step required Joshua to squeeze objects that offered little resistance ("Easy Squeeze") for rather short timing intervals (six seconds). Joshua completed a total of 10 six-second timings with his left hand across six days of timed practice, and 11 six-second

¹ Improving Joshua's motor skill development played only one part in his behavior analytic intervention. We also focused on the areas of imitation skills, language, articulation, play skills, and social skills.

timings total across six days of timed practice with his right hand. His frequency of correct responses accelerated at x3.5 with his left hand and x7.0 with his right hand, and each ended at final frequencies of 120 squeezes per minute.

Because his performance accelerated so quickly during the first instructional phase on each of his hands, we elected to skip the second instructional phase we had planned (Hard squeeze/short timing) and progressed instead to the third planned instructional phase, squeezing objects that offered more resistance (Hard Squeeze) across a longer timing period (20 seconds).

Joshua's frequency of correct responses stepped down for each hand when we changed the instructional phase. His celeration of correct responding changed by $\div 1.2$ for his left hand and $\div 5.5$ for his right hand. During this harder phase of instruction, Joshua's frequency of correct responding accelerated by x2.0 for his left hand and x1.4 for his right hand. The number of practices he completed each day for each hand did not change significantly during the second instructional phase when compared to the first instructional phase.

After 7 days of timed practice for both his right and left hands, Joshua reached the targeted frequency aim we set for him of 150 squeezes per minute. At this point, we began testing for the outcomes of fluent performance following the procedures outlined by Fabrizio and Moors (2003). During the fluency outcomes checks, Joshua's performance clearly demonstrated stability (performance in the presence of distraction; Johnson & Layng, 1992) but did not show the features of skill endurance, application, or retention. Thus, it appears that the combined features of Joshua's instructional experience (daily timed practice, differential reinforcement of higher rates of behavior, and shaping up to a frequency of 150 correct responses per minute) did not predict completely fluent performance; Joshua's performance demonstrated some of the features of fluency (skill stability), but not all of them.

The work we present here extends the previous work of Precision Teachers in the area of Big 6+6 intervention in that it provides (a) a description and charted example of how we analyzed and arranged the sequence of instruction for this child; (b) an empirical analysis of the relationship between charted performance and the separate outcomes

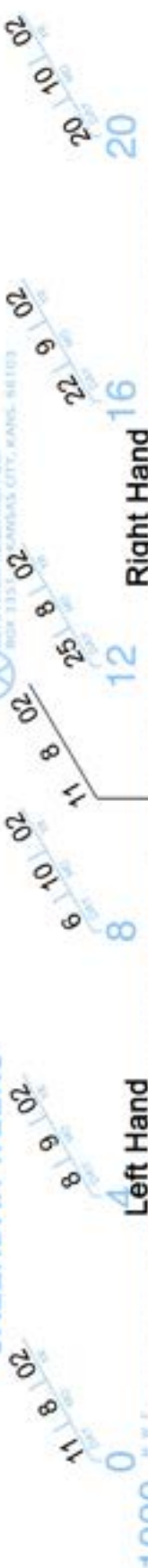
of fluency; skill retention, endurance, stability, and application; and (c) a demonstration of one of the ways we use celeration as a basis for data-based decision making. Although we had planned an intervening instructional step between the first and second phases for both Joshua's right and left hands, his performance accelerated so quickly during the initial phase (x3.5 for his left hand and x7 for his right hand) that we omitted the planned second phase of instruction (Easy squeeze/short timing) and proceeded to the third planned phase. This omission of the second phase resulted in savings of both time and effort for Joshua and his therapists as well as money for his family, thus improving the efficiency of the instructional sequence.

Although we could not empirically demonstrate that Joshua's performance showed all of the hallmarks of fluency, we happily report that the progress Joshua made in his squeezing was sufficient to allow him to play with toys that required that skill and to engage in a wider range of activities of daily living. Joshua is now almost 5 years old and will start kindergarten with his typically developing peers in the fall of 2005. He continues to squeeze when and where appropriate, and he has recently used the skill to begin to learn to play the guitar.

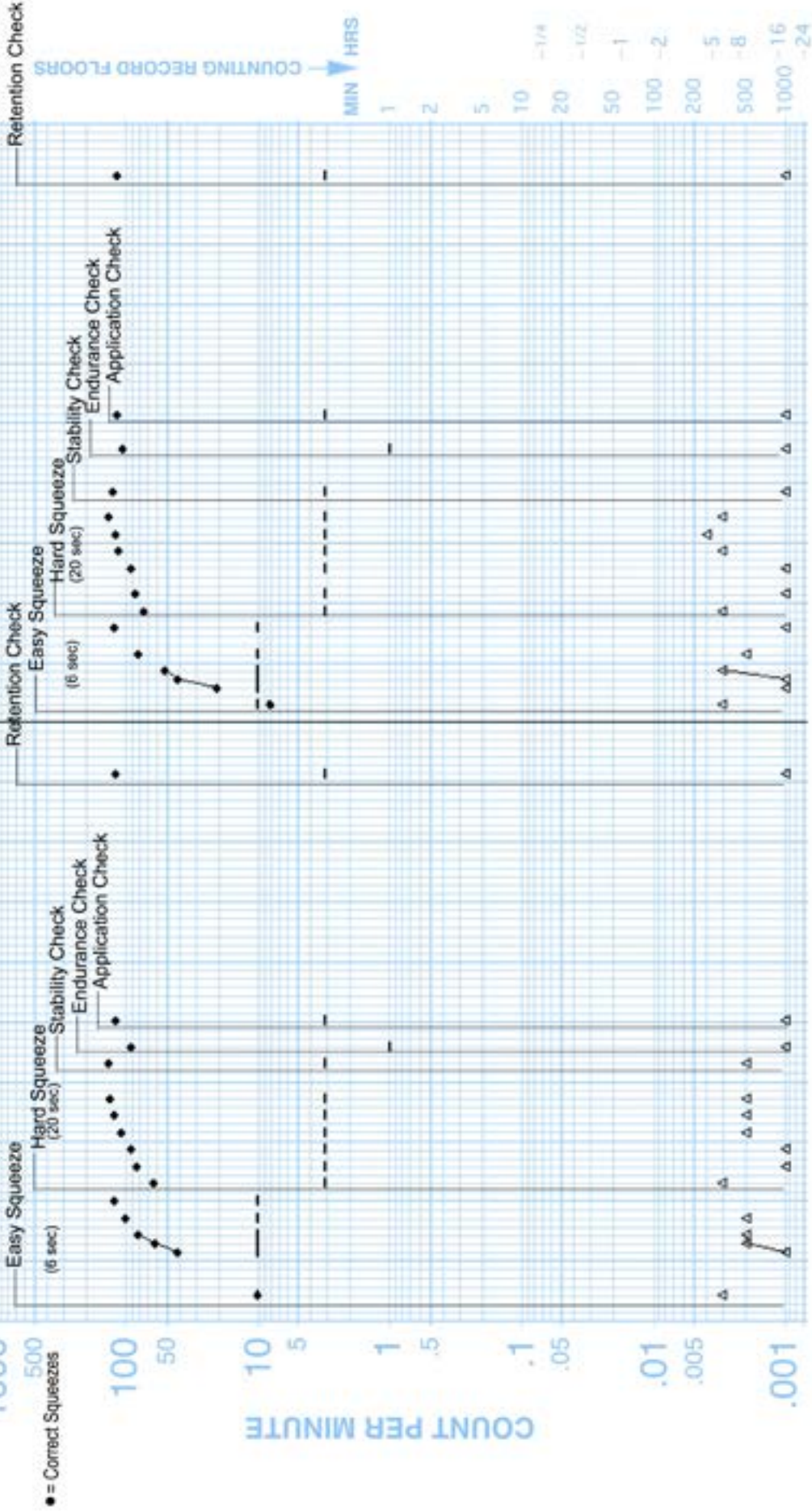
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CALENDAR WEEKS



Left Hand



RIGHT HAND

MIN HRS	BEHAVIOR	AGE	PDD-NOS LABEL
1	Joshua	2.1	Free/Do Squeeze
2			
5			
10			
20			
50			
100			
200			
500			
1000			
16			
24			

SUPERVISOR	ADVISOR	MANAGER	TIMER	COUNTER	CHARTER	COUNTED
Michael	Amy	Kristin	Ami, Kristin	Ami, Kristin	Ami, Kristin	Free/Do Squeeze
Amy	Fabrizio/Moors Consulting					