The Taxonomy of Intervention Intensity

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Abstract

The purpose of this article is to describe the Taxonomy of Intervention Intensity, which articulates 7 dimensions for evaluating and building intervention intensity. We explain the Taxonomy's dimensions of intensity. In explaining the Taxonomy, we rely on a case study to illustrate how the Taxonomy can systematize the process by which special educators and related personnel (a) first set up the intensive intervention process and (b) then monitor the student's response and systematically improve the program to match the target student's individual needs. The Taxonomy's goal is to increase the quality of intensive intervention, improve student outcomes, and help schools design intensive intervention programs that are clearly distinguishable from less intensive (Tier 2) intervention programs.

Keywords: intensive intervention, special education, taxonomy of intervention intensity

The Taxonomy of Intervention Intensity

Special education, which is the most intensive level of intervention within a school building, is implemented for students with disabilities by special educators or related personnel. At the same, many school buildings incorporate responsiveness-to-intervention (RTI) systems that provide Tier 2 interventions to students who are at-risk for disabilities. Over time, consensus has emerged about the optimal structure and form of Tier 2 intervention: a program that is supplemental, evidence-based, well-articulated (with a clear implementation manual that includes all materials), and delivered in small groups by a trained interventionist (Fuchs, Fuchs, & Compton, 2012; Fuchs & Vaughn, 2012; O'Connor & Fuchs, 2013).

The purpose of such a Tier 2 program is to provide time-limited support of moderate intensity to create a stronger foundation of academic skill among at-risk learners. The goal is to enable these students to achieve a level of academic performance that permits them to profit from and succeed in the general education classroom. Over the past two decades, the field has developed and validated many such Tier 2 programs that strengthen end-of-intervention outcomes for the majority of at-risk students, when schools implement the program's content and structure in the standard way (as described in the program's validation studies and in the manual).

Yet, over these 20 years, evidence has also converged that not all students respond to such standard evidence-based Tier 2 intervention programs, even when those interventions are delivered with fidelity. Research suggests that 5-10% of the general population of students require the intensive intervention afforded by special education (O'Connor & Fuchs, 2013). So it is unfortunately that schools often have difficulty identifying how to further intensify intervention (beyond available Tier 2 validated programs) for students who respond inadequately

to such programs. This lack of clarity limits the capacity of schools to analyze intervention options, and it dilutes the effectiveness of intensive intervention.

The purpose of this article is to describe the Taxonomy of Intervention Intensity, which articulates seven principles for evaluating and building intervention intensity. We explain the Taxonomy's seven dimensions of intensity. In explaining the Taxonomy, we rely on a case study to illustrate how the Taxonomy can systematize the process by which special educators and related personnel (a) first set up the intensive intervention process and (b) then monitor the student's response and systematically improve the program to match the target student's individual needs. The goal is to increase the quality of intensive intervention, improve student outcomes, and help schools design intensive intervention programs that are clearly distinguishable from less intensive (Tier 2) intervention programs.

The Taxonomy's seven dimensions of intensity are Strength, Dosage, Alignment, Attention to Transfer, Complexity, Behavioral Support, and Individualization. See Table 1 for definitions. We begin by providing relevant background information about the case study student's school history. Then we describe how this student's special education teacher used the Taxonomy to develop his intensive intervention program.

(Note that the focus of this article is intensive *academic* intervention. Because students with intensive academic intervention needs often demonstrate co-occurring behavioral problems, this Taxonomy includes behavioral support as a dimension of intervention intensity. Also note that this Taxonomy has been adapted to also address students with emotional and behavior disorders and those with co-occurring academic and emotional/behavior disabilities.)

The Case Student's History

Daniel was a fifth-grade student who had received his school's Tier 2 math intervention during fourth grade. The Tier 2 intervention program was evidence-based, well-articulated, and delivered in small groups by a trained interventionist. Its focus was fluency with basic facts, multi-digit addition and subtraction, and whole-number word-problem solving. Daniel achieved performance commensurate with his classmates on word problems, and his fluency with basic facts improved nicely. Yet, as Tier 2 intervention ended, Daniel still relied on counting strategies to solve more difficult number combinations (e.g., $7 + 8$), and regrouping within multi-digit addition and subtraction problems (e.g., $114 + 329$) still proved challenging.

Moreover, during fourth grade, Daniel fell further behind peers in other ways, as the focus on multiplication and division of whole numbers and the focus on fractions increased. Although Daniel could skip count by 2s, 3s, and 5s for multiplication, he spent considerable time calculating more difficult facts in the context of procedurally complex multiplication and division. He typically relied on repeated addition as his primary strategy, but was often inaccurate with repeated addition on 7s, 8s, 9s, and 12s. He could label a fraction from a picture, but struggled to compare fraction magnitudes without pictures, and he could not identify or calculate fraction equivalencies.

More generally, Daniel experienced working memory limitations and struggled to remember concepts and procedures that were previously mastered. He was also increasingly frustrated with his failing mathematics performance and beginning to manifest behavior difficulties. At the start of fifth grade, the RTI team referred him for special education. The comprehensive evaluation diagnosed a mathematics learning disability, and the evaluation team determined that intensive intervention, provided via special education, was required to prevent

Daniel from falling further behind. Ms. Marks was assigned to develop and implement Daniel's intensive intervention program.

Applying the Taxonomy to Derive the Student's Intensive Intervention Program

Ms. Marks builds Daniel's intensive intervention program by applying the Taxonomy of Intensive Intervention in two stages. In the Set-Up Stage, she applies the Taxonomy to select the Intensive Intervention Platform and to identify the progress-monitoring system to be used for tracking Daniel's response to this Platform. In the Implementation Stage, Ms. Marks reapplies the Taxonomy on a periodic basis: whenever the progress-monitoring data indicate Daniel's response to the program is inadequate. On these occasions, she uses the Taxonomy to identify fruitful directions for individualizing the Platform to meet Daniel's needs more effectively.

The Set-Up Stage

In the Set-Up Stage, Ms. Marks applies the first six dimensions of the Taxonomy to select the Intensive Intervention Platform and she initiates the seventh dimension by identifying the progress-monitoring system for tracking Daniel's response to this Platform.

Dimension #1: Strength. The Taxonomy's first dimension for selecting the Intensive Intervention Platform is the Strength of the intervention. Strength indicates how well the program works specifically for students with intensive intervention needs. If the program is strong for this sub-population of learners, then the program is *more likely* to produce good results for Daniel, with fewer program adjustments required to meet Daniel's needs.

Intervention effects are quantified in terms of effect sizes, which indicate how much higher intervention students score at posttest compared to students who did not receive that intervention. Let's say the intervention developers report an effect size of 1 standard deviation on an achievement test with a mean of 100 and standard deviation of 15. Let's say this effect size is

specifically for students who start intervention with academic performance at or below the 20th percentile (as is often the case for intensive intervention students). This means that if the average posttest score for students who did *not* receive intervention is 85, then the mean posttest score for students who did receive the intervention is 100. An effect size of 1.0 standard deviations is large. Generally, effect sizes of 0.25 standard deviation indicate an intervention has value in improving outcomes. Effect sizes of 0.35-0.40 are moderate; effect sizes of 0.50-0.70 are strong.

Intervention programs that demonstrate strong effects for intensive intervention students are more appropriate for use as Intensive Intervention Platforms than are interventions without such strength. Special educators should seek out interventions that disaggregate effects for students with intensive intervention needs. This information is provided, when available, in the National Center on Intensive Intervention (NCII) Intervention Academic Programs Tools Chart (http://www.intensiveintervention.org/chart/instructional-intervention-tools).

Ms. Marks goes to this Tools Chart to consider validated program options for use as Daniel's Intensive Intervention Platform. She notices that effect sizes for *Fraction Face-Off!*, disaggregated for students who begin intervention below the 21st percentile in math, range from 0.85 to 2.64. (See Figure 1 for the relevant screen shot from this website.)

On this basis, Ms. Marks thinks *Fraction Face-Off!* might be a good choice for Daniel, but she still has five additional dimensions of intensity to consider. She peruses the information describing *Fraction Face-Off!* on the NCII website. She also contacts the developers of this intervention to obtain more information and discovers that the developers have updated *Fraction Face-Off!* with *Super Solvers*. She obtains a copy of that manual and, together with the information provided in the NCII website, she learns the following information.

Super Solvers is a 39-session Tier 2 intervention. Each standard lesson lasts 35 minutes and has four parts: Problem Quest, Fraction Action, Math Blast, and Power Practice. Problem Quest addresses operations and word-problem solving with proportions, magnitude comparisons, and division of fractions. Word-problem instruction relies on schema theory (Fuchs et al., 2010), with which students learn the structure of different word-problem types. Students are taught to think about the word-problem narrative to identify the problem types and then apply the solution strategies that match the identified problem type.

Fraction Action includes explicit instruction on understanding fraction magnitudes. Students are taught strategies to compare, order, and place fractions on the number line; to differentiate between the number of parts (the numerator) and the size of the parts (the denominator); and to use benchmarks (½ and 1) for assessing fraction magnitude. Math Blast builds fluency on skills foundational for thinking about and operating with fractions. For example, students solve as many multiplication problems or fraction comparison problems on flashcards as they can in 2 minutes, with the goal of beating the previous day's score. Power Practice is independent work to practice just-introduced and previously taught content.

Super Solvers includes a curriculum-based measurement (CBM) progress-monitoring system (see Figure 2). An alternate CBM form, tapping the Fraction Action portion of *Super Solvers*, is administered before intervention occurs, every two weeks during intervention, and one week following intervention. In conjunction with this progress-monitoring system, *Super Solvers* incorporates an executive function and self-regulation component to encourage students to set realistic goals for their performance on CBMs and within *Super Solver* sessions, persevere to attain these goals, and regulate attention. *Super Solvers* also includes a behavior management system to encourage persistence, accurate work, and attentive behavior.

With this information in hand, Ms. Marks begins completing the Taxonomy of Intensive Intervention Form (see Figure 3) to evaluate the intensity of *Super Solvers* for Daniel. She awards *Super Solvers* a score of 3 (each dimension is graded on a 0-3 scale; 3 is the high end of the scale) to reflect the strong posttest score effect sizes for students who begin intervention with performance at or below the 20th percentile.

Dimension #2: Dosage. Ms. Marks now turns her attention to the Taxonomy's second dimension, Dosage. This dimension of intervention intensity is the feature most commonly discussed in the literature, in which the size of the instructional group, the number of minutes each session lasts, or the number of sessions per week define intensity. Because each of these structural design considerations reflect the number of opportunities students have to respond and receive corrective feedback, we define the Dosage dimension in the Taxonomy as number of opportunities to respond and receive corrective feedback.

If the developers do not provide this information in the program manual, we suggest the special educator randomly select two lessons near the beginning of the program, two from the middle of the program, and two near the end of the program. For each lesson, the special educator counts how many times *one single* student (not all students) has to respond and receive corrective feedback. Ms. Marks finds that Super Solvers, which in standard format is conducted in groups of two students, provides *each individual* student with an average of 50 opportunities to respond and receive correct feedback in each lesson (for two students, a total of 100). To reflect this high number, she awards *Super Solvers* a score of 3 on the Taxonomy. (There would likely be more opportunities to respond if the intervention is delivered one-on-one.)

Dimension #3: Alignment. The third dimension of intervention intensity is Alignment. This reflects the extent to which the intervention (a) addresses the target student's full set of

academic skill deficits; (b) does *not* address skills the target students has already mastered (extraneous skills for that student); and (c) incorporates a meaningful focus on grade-appropriate curricular standards. This focus on Alignment is important because many intervention programs restrict the set of skills addressed. For example, in early reading, many intervention programs limit their focus to word-level skill and reading fluency, even though many students also experience difficulty with listening and reading comprehension. In early mathematics, many programs are limited to number concepts and calculations, even though many students also experience difficulty with word problems. Maximizing Alignment increases intensity. It also creates efficiency for the special educator by reducing the number of required adjustments to the Intensive Intervention Platform.

We also emphasize the importance for intensive intervention to focus on the grade level's challenging standards. This may help the target student participate in and profit from the Tier 1 program. Alignment requires the special educator to explicitly connect intervention on foundational skill deficits to align with the standards addressed in general education. For example, if a fourth-grade target student's mathematics performance is substantially below grade level, with poor understanding of and procedural skill with whole numbers, the special educator may select an Intensive Intervention Platform with high match (content coverage) on whole numbers. Yet, recognizing that fractions are a substantial focus at the intermediate grade levels, the special educator must adjust the Intensive Intervention Platform to incorporate meaningful fractions instruction. This may be accomplished by limiting the range of denominators to minimize whole-number demands while promoting understanding of fraction principles.

To grade *Super Solvers* on Alignment, Ms. Marks considers information from Daniel's comprehensive evaluation. She identifies which of his skill deficits are addressed in *Super*

Solvers. The percentage of Daniel's skill deficits that are addressed in this program is 80% (all but whole-number addition and subtraction). Ms. Marks then considers this percentage along with the number of extraneous skills covered (0%) and the percentage of grade-level state standards addressed (50%). Together, these three percentages reflect *Super Solvers'* alignment for Daniel. Programs with a high degree of alignment are more likely to produce stronger effects for the target student. Ms. Marks judges *Super Solvers'* alignment for Daniel as moderate (grade = 2).

Dimension #4: Attention to transfer. The fourth dimension of intervention intensity is Attention to Transfer. This refers to the extent to which an intervention is systematically designed to help students transfer the skills they learn to other formats and contexts. It also refers to the extent to which an intervention helps students realize connections between mastered and related skills, which are required to produce meaningful generalization.

Transfer is a major obstacle for students with severe learning problems, and research shows the benefits of explicit transfer instruction. For example, in a large randomized control trial, Fuchs et al. (2003) contrasted schema-based instruction (teaching students to recognize the underlying mathematical structure of whole-number word-problem types) with and without explicit transfer instruction. With explicit transfer instruction, teachers explained how superficial word-problem features (e.g., response format, vocabulary – problem features that make problems look unfamiliar but preserve the problem type already mastered by the target student). Teachers also provided practice in sorting problems with confusing superficial problem features into the word-problem types students had learned, and teachers encouraged students to search novel problems for familiar word-problem types. Results indicated dramatic benefit for explicit transfer instruction.

Interventions that include explicit transfer instruction offer greater intensity than those that assume transfer will occur. Special educators should select Intensive Intervention Platforms that incorporate explicit transfer instruction, when this is available. For programs that do not include this dimension of intervention intensity, the special educator may incorporate explicit transfer instruction before implementation of the Intensive Intervention Platform begins. Alternatively, explicit transfer instruction may provide a promising direction for adjusting the Intensive Intervention Platform as mastery of taught skills is achieved.

Ms. Marks judges *Super Solvers* to provide a strong focus on explicitly teaching for transfer. *Super Solvers* explicitly encourages students to apply the skills taught during intervention not only in their classrooms but also in everyday life. It explicitly teaches students how to identify opportunities in other settings to apply what they learn during intervention. The program also explicitly teaches students how problems may look unfamiliar (e.g., be presented in unfamiliar formats or include irrelevant information or with questions posed in novel ways or include multiple steps) but how those unfamiliar-looking problems tap the skills they have learned during intervention. Ms. Marks awards *Super Solvers* a grade of 3 for its strong emphasis on explicitly teaching for transfer.

Dimension #5: Complexity. This brings us to the fifth dimension of intervention intensity: Complexity. This reflects the number of explicit instruction principles the intervention incorporates. Strong evidence indicates that explicit instruction promotes better response among intensive intervention students (for syntheses in mathematics and reading, see Gersten, Chard, Jayanthi, Baker, Morphy, & Flojo, 2009 and Vaughn, Gersten, & Chard, 2000).

Explicit instructional principles include the following: (1) providing explanations in simple, direct language; (2) modeling efficient strategies (e.g., for operating on text or solving

mathematic problems) instead of expecting students to discover strategies on their own; (3) ensuring students have the necessary background knowledge and skills to succeed with those strategies; (5) gradually fading support for students' correct execution of those strategies; (6) providing practice so students use the strategies to generate many correct responses; and (7) incorporating systematic cumulative review.

Ms. Marks carefully reads the six lessons she randomly sampled (see above, under Dosage). As she reads, she identifies where *Super Solvers* incorporates each of these explicit instructional principles (marks every instance where explanations are simple and direct and every instance where explanations are complex or indirect; marks every instance where the taught solution strategies provide students with efficient routes to correct solutions and every instance where the taught solution strategies provide inefficient students with routes to correct solutions, and so on). She finds that *Super Solvers* relies exclusively on principles of explicit instruction and awards the program a grade of 3 on Complexity.

Dimension #6: Behavioral Support. The sixth dimension of intervention intensity is Behavioral Support. Many students with severe academic difficulty display attention, motivation, and self-regulation difficulties that affect learning (e.g., Schunk & Zimmerman, 2011; Montague, 2007). Interventions that incorporate self-regulation and executive function components are more intensive than programs that do not incorporate such components. The goal is to encourage students, with a history of academic failure, to persevere through academic struggle and continue to work hard, aim high, and adopt a high standard of coherence, in which students are not satisfied with answers that do not make sense. Many students with histories of severe academic difficulty require systematic encouragement and support for developing and exercising this type of *non-cognitive* academic mindset. The behavioral support dimension of intervention intensity

reflects the extent to which interventions incorporate this focus and rely on behavioral principles to systematically build and support a strong non-cognitive academic.

At the same time, some intervention students demonstrate non-compliant behavior that interferes with delivery of and productive engagement in intervention. This may include for example refusing to respond, disrupting intervention sessions, and distracting other students in the group. Therefore, the Taxonomy's Behavioral Support dimension also reflects the extent to which interventions incorporate behavioral principles to minimize such nonproductive behavior. The comprehensiveness, tenability, and flexibility of the intervention's behavioral support system need to be considered in selecting the Intensive Intervention Platform. Ms. Marks judges that *Super Solvers'* Behavior Support as moderate (grade = 2). It incorporates executive function and behavior management components, but she is concerned that these supports are not sufficiently strong to address Daniel's challenges.

Integrating information on the first six dimensions. In terms of these first six dimensions, most standard intervention programs score higher on some than other dimensions. Ideally, the special educator has at least two programs to compare, along with deep knowledge of the student who will is targeted for intensive intervention. Understanding the program's strengths and weaknesses according to the Taxonomy's dimensions, along with the target student's skills and strategies, helps the special educator judge an intervention for its utility as an Intensive Intervention Platform for this target student. A good match minimizes the number of program adjustments over time.

Based on her analysis of the Taxonomy's first six dimensions, Ms. Marks selects *Super Solvers* as Daniel's Intensive Intervention Platform. The grades she assigned the *Super Solvers*

Intensive Intervention Platform, according to the Taxonomy's first six dimensions, are shown on the Taxonomy of Intensive Intervention Form (Figure 3's first column).

We also note that special educators can often foresee, before intervention begins, where along with Taxonomy's dimensions, an Intensive Intervention Platform will fall short. In this situation, the special educator may incorporate adjustments to the program prior to implementation. For example, although *Super Solvers'* dosage is strong, Ms. Marks decides that Daniel's performance discrepancy requires an even stronger dosage. So she modifies *Super Solvers* from the standard 2:1 delivery to a one-on-one format. She notes this on the Taxonomy Form with a plus mark on the Dosage row of the Intensive Intervention Platform (first) column. This indicates the Platform was adjusted in this way prior to implementation.

At the same time, given (a) Daniel's history of difficulty with mathematics and his complex learning needs, (b) her knowledge that even high quality validated intervention programs do not produce adequate outcomes for all intensive intervention students, and (c) the pressing need to boost Daniel's mathematics learning trajectory, Ms. Marks recognizes the importance of the Taxonomy's seventh dimension, Individualization. This calls for identifying, in the Set-Up Stage, the progress-monitoring system she will use to track Daniel's response to the Platform. Later, in the Implementation Stage, it calls for a series of adjustments to the Intensive Intervention Platform to individualize the Platform in ways that address Daniel's unique learning challenges.

Dimension #7: Individualization. After applying these first six dimensions of the Taxonomy to select the Intensive Intervention Platform, Ms. Marks attends to the Taxonomy's seventh dimension, **Individualization**, which is signature feature of special education (e.g., Fuchs et al., 2012: McLaughlin, Shepard, & O'Day, 1995). A validated process for

individualizing intervention is *data-based individualization* (DBI; Fuchs, Fuchs, & Stecker, 2005; Fuchs, Fuchs, & Vaughn, 2013). Once Ms. Marks begins implementing *Super Solvers*, she will routinely collect progress-monitoring data and apply validated DBI decision rules on a regular basis to determine if *Super Solvers* is producing adequate response for Daniel. Whenever the data indicate Daniel is not on track to meet his year-end goal, Ms. Marks will adjust the program in ways that extends or alters this Intensive Intervention Platform.

This teach-test-revise-test process continues over the course of intensive intervention. Over time, Ms. Marks uses the DBI process to derive an intensive intervention program that is aligned with Daniel's individual needs. Randomized control trials demonstrate that this DBI process improves the reading, mathematics, and spelling outcomes of intensive intervention students (Fuchs, Fuchs, & Stecker, 2005). The NCII website (http://www.intensiveintervention.org/) provides resources for selecting progress-monitoring tools and for implementing DBI. (NCII resources are made available with support from the Office of Special Education Programs, within the U.S. Department of Education.)

But first, in the Set-Up Stage, Ms. Marks must identify the progress-monitoring system she will use to track Daniel's response to the *Super Solvers* Intervention Platform. Ms. Marks decides to use the progress-monitoring system that is embedded in *Super Solvers*. This progress-monitoring system provides CBM tests to be administered every 2 weeks. Each test, called the Super Challenge, is of equivalent difficulty; samples the program's curriculum in the same way; and includes 20 problems representing the fractions content addressed in *Super Solvers*. This Super Challenge CBM system demonstrates reliability and validity. The *Super Solvers* manual provides directions for administering and scoring the tests and for engaging the student in the Super Challenge progress-monitoring system via the *Super Solvers'* executive function

component. Students master the Super Challenge when they achieve a score of 20 (see Figure 2, in which the end-point of the diagonal line signifies Daniel's goal).

Ms. Marks draws a dotted line connecting Daniel's first score (0) with this goal of 20 to show the rate of improvement Daniel needs to achieve if he is to meet the goal by the end of the program. Every 4 weeks, Ms. Marks reviews Daniel's progress. When Daniel's scores are consistently below the goal line or his rate of improvement is less steep than the goal line, Ms. Marks uses the Taxonomy to identify fruitful directions for further individualizing the Intervention Platform.

We note that Ms. Marks is fortunate that *Super Solvers* incorporates a progress-monitoring system to track Daniel's progress. Few Tier 2 interventions embed a progress-monitoring system. So special educators typically must identify the progress-monitoring system that best reflects the goals and outcomes of the target student's intensive intervention program. As noted, resources to help schools identify technically strong progress-monitoring tools for individualizing intensive intervention are available on the NCII website.

Using the Taxonomy, Ms. Marks grades her selection of the progress-monitoring system on the Taxonomy of Intensive Intervention Form (see Figure 2's first column, seventh row) in terms of evidence of the system's technical adequacy and its provision of validated decision rules for determining when adjustments to the Intensive Intervention Platform are required to increase the probability of goal attainment. (NCII's Progress Monitoring Tools Charts rating system addresses these criteria.)

The Implementation Stage

This brings us to the Implementation stage, in which the special educator reapplies the first six dimensions of the Taxonomy whenever the progress-monitoring data indicate that the

student's response to the program is not adequate. Each time the special educator makes an adjustment to the Intervention Platform, she adds a column to the Taxonomy of Intensive Intervention Form (Figure 3). She labels the column, "Adjustment __; Week __" to indicate what number adjustment the column addresses and the week the adjustment was introduced. In the first six rows for that column, she notes how she modified which dimensions of the Platform for this adjustment. In the seventh row for that column, she grades the fidelity with which she has adhered to the progress-monitoring system at that point of implementation. This includes grading (a) the accuracy with which she has collected and scored data on the expected schedule, (b) the faithfulness and timeliness with which she applied decision rules to the progress-monitoring data, and (c) the integrity with which she has implemented the Platform and all previous adjustments to the Intensive Intervention Platform.

In this section, we describe how Ms. Marks used the DBI process, in conjunction with the Taxonomy, to individualize Daniel's program. Ms. Marks administered the first CBM as she began conducting the *Super Solvers* sessions with Daniel, while ensuring accurate administration and scoring of the CBMs, responsive decision-making to the progress-monitoring system, and initial fidelity to the *Super Solvers* Platform and then reflecting to her program adjustments the *Super Solvers* Platform.

As intervention proceeded, she collected CBM data every two weeks and graphed the scores (see Figure 2). After Week 3, Mrs. Marks applied decision rules to the graphed data, which indicated Daniel's progress was inadequate. As shown in Figure 2, in the first weeks of *Super Solvers*, Daniel's CBM performance had increased by only 1 point, without mastery of any problem type (for problem mastery, see the skills profile below the graph). When skills are mastered, the special educator marks the problem type with a checkmark.

After careful analysis of Daniel's CBM graph and skills profile, his performance during tutoring, and her initial analysis of the *Super Solvers* Platform (IIP column on Figure 3), Mrs. Marks decided that the Taxonomy dimensions appropriate for adjustment/individualization were Alignment and Behavioral Support. In the Adjustment 1 column (ADJ1), on the Alignment and Behavioral Support rows, she placed a plus mark to indicate further intensification. In the Individualization row, she briefly summarizes her analysis of Daniel's struggle/needs.

In terms of Alignment, Mrs. Marks's judged that Daniel's use of multiplication in the context of fraction problems, including fraction word problems, was laborious, detracting from accurate higher-order thinking and performance. She therefore added 5 minutes of multiplication strategy instruction to each session. This included 3 minutes of "hard fact" multiplication instruction with rhymes and mnemonics during the Problem Quest component of *Super Solvers* and 2 minutes of multiplication fluency practice in the Math Blast component. In terms of Behavioral Support, Mrs. Marks judged that Daniel, although mostly cooperative and attentive, was frustrated by frequently failing to earn *Super Solver* bonus points, due to inaccurate work. Ms. Marks therefore increased the number of opportunities Daniel had to earn bonus points and included some easier problem within these opportunities.

As shown in his graph, Daniel's overall CBM score increased as a function of this adjustment to the Platform, and his skill with multiplication facts improved (see skills profile; Figure 2). After Week 7, however, Daniel's progress was still inadequate to project goal attainment. Ms. Marks noted that he was struggling with the hard comparing and ordering fraction problems (see skills profile). After inspecting work samples, she decided that his weaknesses in deriving fraction equivalencies was due to his challenges in keeping track of his work.

She therefore introduced a second adjustment to the Platform (see ADJ2), again on the Alignment and Behavioral Support dimensions, to better address Daniel's needs. With this second adjustment to Alignment, she added to each session five minutes of fraction tile work to address concepts and strategies for deriving fraction equivalencies. With the second adjustment to Behavioral Support, she altered the behavior management program to require Daniel to attack hard comparing and ordering problems using the taught strategies and to check work with fraction tiles. With this second round of revisions to the Platform, Daniel's progress accelerated nicely over Weeks 8-12.

In Sum

This case study illustrates how a special educators and related personnel incorporate the Taxonomy of Intervention Intensity to systematize the process for (a) selecting a promising Intensive Intervention Platform and (b) identifying fruitful directions for adjusting that Platform to meet the target student's individual needs. The goal is to increase the quality of intensive intervention, thereby improving student outcomes, and help schools distinguish among levels of intensity in the intervention services they provide.

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Table 1

The Taxonomy of Intervention Intensity

Intensity Dimension	Definition
Strength	How well the program works for students with intensive intervention needs, expressed in terms of effect sizes
Dosage	The number of opportunities a student has to respond and receive corrective feedback
Alignment	How well the program (a) addresses the target student's full set of academic skill deficits; (b) does *not* address skills the target students has already mastered (extraneous skills for that student); and (c) incorporates a meaningful focus on grade-appropriate curricular standards
Attention to Transfer	The extent to which an intervention is designed to help students (a) transfer the skills they learn to other formats and contexts and (b) realize connections between mastered and related skills
Complexity	The number of explicit instruction principles the intervention incorporates (e.g., providing explanations in simple, direct language; modeling efficient solution strategies instead of expecting students to discover strategies on their own; ensuring students have the necessary background knowledge and skills to succeed with those strategies; gradually fading support for students' correct execution of those strategies; providing practice so students use the strategies to generate many correct responses; and incorporating systematic cumulative review).
Behavioral Support	The extent to which interventions incorporate (a) self-regulation and executive function components and (b) behavioral principles to minimize nonproductive behavior
Individualization	A validated, data-based process for process for individualizing intervention, with which the special educator systematically adjusts an Intensive Intervention Platform over time to address the student's complex learning needs

Figure 1. Screenshot from NCII's Intervention Tools Chart. This screenshot shows effect sizes for Fraction Face-Off (an earlier version of Super Solvers), specifically for students who begin intervention below at or below the 20th percentile.
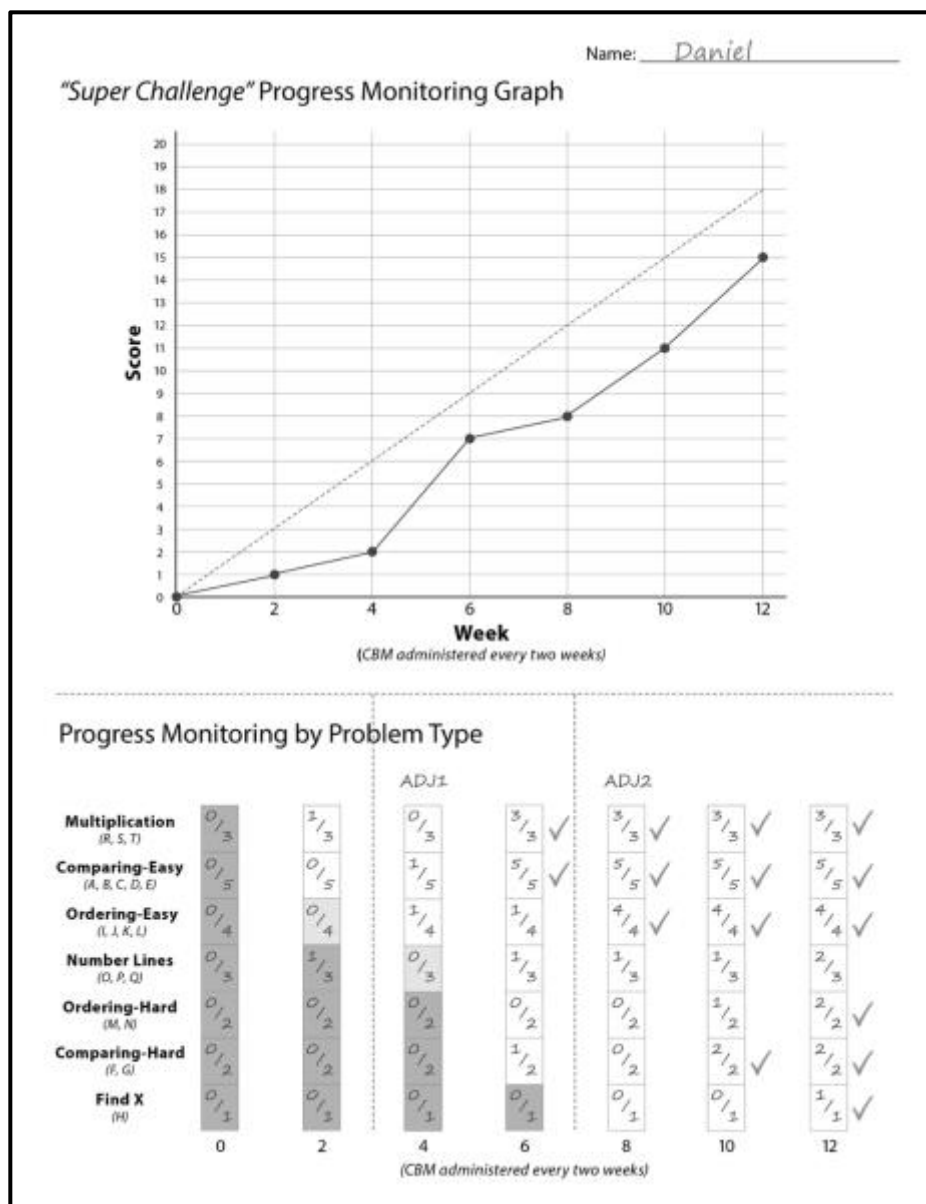
Figure 2. CBM progress-monitoring graph for Daniel, showing CBM total score correct by week (0-12). The Skills Profile (of Problem-Type Mastery) is below the graph. Each bar shows performance on one weekly CBM for each of the 6 problem types included on every CBM. On the bar, each box shows a fraction. Number of problems included on each CBM for that problem type is the denominator; the number Daniel answered correctly that week is the numerator. Checkmarks indicate mastery. Dark gray boxes indicate the problem type has not been taught yet. Light gray boxes indicate the problem type has been taught, but in the past 2 sessions. White boxes indicate the problem type has been taught with sufficient review/practice to expect mastery. Vertical dotted lines show when Ms. Marks introduced adjustments to the *Super Solvers* Platform.

Taxonomy of Intensive Intervention Form

Student Name: _Daniel_____

Intensive Intervention Platform: _Super Solvers_____

Taxonomy Dimension	IIP	ADJ1	ADJ2		Notes
1. Strength	3	■	■	Notes:	
2. Dosage	3+	NC	NC	Notes:	IIP: Before intensive intervention, increased dosage with 1:1 (instead _Super Solvers_ is 2:1).
3. Alignment	2	+	+	Notes:	ADJ1 (W4): Added 3 min. of multiplication rhymes/mnemonics and 2 min. practice; ADJ2 (W8): Added addition/subtraction with regrouping practice.
4. Attention to Transfer	3	NC	NC	Notes:	
5. Complexity	3	NC	NC	Notes:	
6. Behavioral Support	3	+	+	Notes:	ADJ1 (W4): increased opportunities to earn bonus points, with mix of easier problems; ADJ2 (W8): Behavior contract changed to require use of taught strategies for comparing/ordering fractions and checking work.
7. Individualization*	■	Oct. 1 (W4)	Nov. 1 (W8)	Notes:	ADJ1 (W4): struggling with hard multiplication facts; add new strategies & additional practice; ADJ2 (W8): cannot remember how to calculate equivalent fractions and struggles with identifying fractions equivalent to 1/2

LEGEND

Rating schedule:

IIP   Teacher analyzes potentially sutiable interventions *before* implementation

ADJ1   Instructional Adjustment 1: Teacher re-analyzes intervention because a student is making inadequate and requires individualization

ADJ2   Instructional Adjustment 2: Teacher re-analyzes intervention because a student is making inadequate and requires individualization

Coding scale for dimensions 1-6:

0   Fails to address standards

1   Addresses standard minimally

2   Addresses standard moderately

3   Addresses standard well

Figure 3. Completed Taxonomy of Intensive Intervention Form for Daniel, using *Super Solvers* as the Intensive Intervention Platform. IIP is Intensive Intervention Platform. ADJ1 is Ms. Marks's first adjustment to the Platform; ADJ2 is her second adjustment. The grading scale is 0=fails to address dimension; 1=addresses dimension minimally; 2=addresses standard moderately well; 3=addresses standard well. Plus marks denote that dimension of the Taxonomy was adjusted at that time. Note that Strength is based on studies conducted on groups of children. It does consider Daniel specifically. Therefore, this dimension is relevant only at the IIP's Set-Up Stage.