Targeting Reading Interventions Based on Student Needs: Skill-by-Treatment Interaction

Matthew K. Burns
University of Missouri

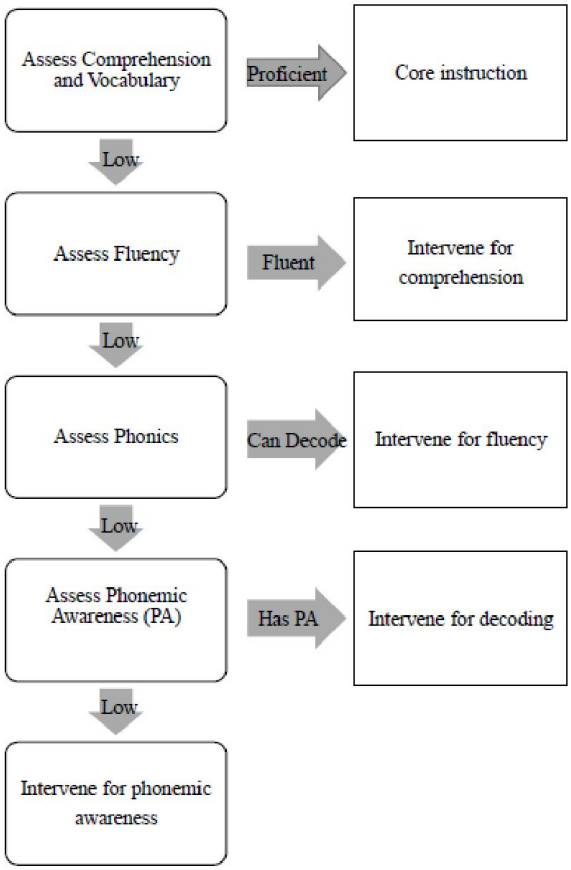
Every person reading this has probably had the experience where a new student joins their school without much data or information from the previous school. Without much information to go on, the teacher goes with her or his gut and implements an instructional approach that seems to be successful and the student outcomes improve. However, imagine a similar scenario with a new student, the teacher examines some limited data, selects a research-based instructional approach, and implements it, but this time the outcomes do not improve and the intervention does not work. Why would it not work? The two most common reasons for intervention failure are, (a) the intervention was not implemented correctly, and (b) the intervention did not actually address the student's difficulties.

It is not unusual for a school to use one supplemental (tier 2) intervention for all students who struggle in reading, but consider this exercise – ask a few teachers of their approximately 25 students in their classrooms, how many reading levels are there and how many different types of reading difficulties do they see? If the answer is 10 or 15 different reading levels and 4 or 5 different types of reading problems, then why use only 1 intervention? Reading interventions are more effective if they target individual skills than if they comprehensively address multiple reading skills (Hall & Burns, 2018), especially if the intervention target is based on diagnostic data to determine student need (Burns et al., 2016).

Using preintervention measures of achievement to predict intervention effects has been called a skill-by-treatment interaction (STI; Burns et al., 2010) and has been used to identify interventions that were most likely to be successful for individual students. Most reading teachers are familiar with the National Reading Panel (NRP; 2000) five critical reading skills that children need to acquire to become proficient readers that are outlined in Table 1. Some might argue that the NRP list of skills is too simplistic or does not adequately emphasize comprehension as the ultimate outcome, but research continues to support the areas identified by the NRP. Even influential reading curriculum author Lucy Calkins has recently acknowledged the importance of teaching basic fundamentals of reading (e.g., phonics) over cueing systems and other comprehension-only approaches (Hanford, 2020). The areas identified by the NRP can be used to target reading interventions to increase student success. Table 1 collapses vocabulary and comprehension because it is difficult to tease those two areas apart in assessment and intervention, except for children who are emerging bilingual students who should receive vocabulary interventions as part of any reading intervention effort.

An STI approach to assessment and intervention for reading is essentially a three-step process, (a) select skill-based assessment to assess specific domains, (b) select intervention based on identified skill deficit and (c) continuous progress monitoring on grade level and in the area on which the intervention focuses. The process is outlined in Figure 1.

Figure 1 – Assessment-to-Intervention Flow Chart within Skill-by-Treatment Interaction Model



Step 1: Select Assessments of Reading Skills

The primary problem analysis question at tier 2 is, what is the category of the problem? Thus, the first step in an STI framework, once a student is identified as a struggling reader, is to examine the data to find the most fundamental skill in which the student experiences difficulty and then target that skill for intervention. In reading, the five domains are assessed in the following sequence, 1. comprehension and vocabulary, 2. fluency, 3. decoding, and 4. phonemic awareness. The assessment sequence begins with a measure of comprehension (see Table 1). If the student demonstrates low comprehension, then school personnel assess fluency, etc. Once assessment data are used to identify the most fundamental skill in which the student struggles, then the intervention is selected to match that deficit.

Step 2: Select the Intervention

Based on information collected through step 1, school personnel can select the specific intervention to target the area of need for the student. Table 1 provides some examples of interventions that can be utilized for students at tier 2, readers can find lists of evidence-based interventions on several websites including the Evidence-Based Intervention Network (https://ebi.missouri.edu/) and the National Center for Intensive Intervention (https://charts.intensiveintervention.org/aintervention). Both of these sources consider the evidence-base for the interventions that they present, which is a critical criterion in selecting interventions.

Step 3: Continuous Progress Monitoring

Progress monitoring is critically important to any intervention model. An STI approach relies on both general outcome measures (GOM) and skill-mastery measures (SMM) to gauge intervention effects. GOM data indicate if a student is improving in the general area of reading, and SMM indicate if the student is learning the skill being intervened. Curriculum-based measures of reading fluency (CBM-R) is a GOM, and is one of the most well-researched assessments in education and is an especially useful tool for progress monitoring overall growth in reading (Christ et al., 2012). Previous research has also supported the psychometric adequacy of several early literacy measures as progress monitoring tools of basic reading skills (McConnell & Wackerle-Hollman, 2016; Oslund et al., 2012; Van Norman et al., 2018). GOM data should be collected every week and should be the data used for resource allocation decisions (e.g., moving from tier 2 to tier 3). SMM data could be collected every other week and are used to determine if the intervention is working, but the results have yet to generalize to a more global measure of reading.

Conclusion

There is considerable research demonstrating the relative effects of targeting interventions based on student needs. The result of the data collection may be that each grade level has one to four tier 2 interventions to use, and the older the students are, the more important it is to identify the skill deficit. For example, school personnel could probably use a phonemic awareness intervention for every kindergarten student who is a struggling student and be safe in doing so. However, it is rare for a student beyond 2nd grade to lack phonemic awareness (Chafouleas et al., 1997; McDowell et al., 2007; Parilla et al., 2004), which suggests that tier 2 interventions with older students should have a different primary focus. Phonemic awareness is a highly correlated with reading among young readers, but among students who were nonreaders in preschool, the relationship between phonemic awareness and reading was significantly lower by the time the student was approximately 6.5 years old (Powell & Atkinson, 2020). The NRP (2000) report on phonemic awareness found that the effect of phonemic awareness training was by far the largest for students in preschool, but that "kindergarten was significantly larger than the effects in 1st grade and in 2nd through 6th grades" (p. 2-24) and there was almost no transfer from phonemic awareness interventions to reading and other related skills with students beyond the 2nd grade. Remember, there is no such thing as a universal intervention or even a universal intervention target. What works for one child may not work for another, but collecting data before beginning an intervention and using those data to target intervention efforts will likely give us the best chance for success.

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