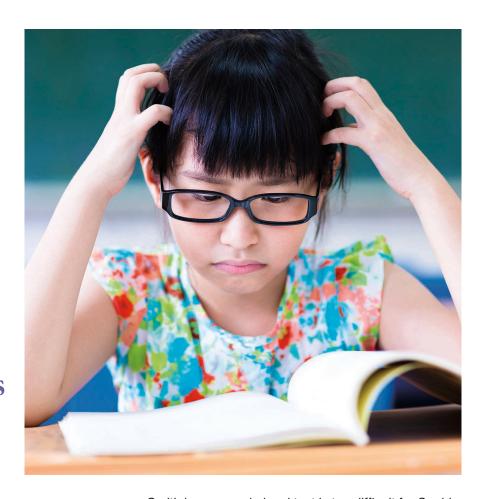
Give the Neurological Impress Method Another Chance for One-to-One Fluency Interventions

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Abstract

Students who do not show growth from whole class (Tier 1) and small group (Tier 2) reading fluency interventions, may require one-on-one interventions that are designed to support the development of fluent oral reading. The authors of this article reintroduce the Neurological Impress Method (NIM) and provide a research-based protocol and practical recommendations for implementation. Existing research on the NIM provides evidence for giving it another chance for one-on-one reading fluency interventions.

Sophia is a fifth-grade student who is below grade level in reading. Her teacher, Mrs. Smith, is concerned because Sophia is very disfluent in her oral reading and often labors through text when reading aloud. Mrs. Smith asks students to read aloud a grade level passage with a partner, as a part of the core literacy instruction. She notices that Sophia is stumbling over words and appears visibly upset. Sophia begins to turn red and reads with a shaky voice. Fearful that Sophia is on the verge of crying, Mrs. Smith has a private conference with her to find out what is wrong. Sophia tells Mrs. Smith that she hates reading aloud in class because she thinks she 'sounds like a baby'. Sophia feels like everyone in the class is staring at her when she reads because she does not read smoothly. Mrs.

Smith knows grade level text is too difficult for Sophia, so she provides lower level passages to practice oral reading fluency. She is baffled because Sophia's oral reading fluency is improving when she reads text at a lower level, but when Sophia reads grade level text she struggles. In addition to Tier 1 support, Sophia is receiving Tier 2 structured reading interventions, but Mrs. Smith doesn't know how to further support her oral reading development when reading grade level material in class.

Many teachers may find that they are in the same position as Mrs. Smith, unable to support struggling students with reading aloud grade level texts. The scenario described above was based on personal experiences, as described by the teacher in that fifthgrade classroom. Sophia is pseudonym of a student participating in the NIM in the present study. These reading challenges may impact students receiving support through Response to Intervention (Rtl) as well as students identified with disabilities, especially when they have prolonged documented deficiencies in oral reading fluency. The Report of the National Reading Panel (NRP)(2000) defined fluency as the ability "to read orally with speed, accuracy, and proper expression" (p. 193). Students struggling with fluency need guided instruction using oral reading techniques. The purpose of this article is to reintroduce the

Neurological Impress Method (NIM) as a viable strategy to support guided practice of oral reading as a one-to-one intervention for students struggling with fluency. This article also includes a description of the NIM in action in a fifth-grade classroom. This easy to implement strategy is appropriate for disfluent readers who, like Sophia, have failed to make progress in developing oral reading fluency after receiving Tier 1 and 2 interventions, as one part of a structured intensive intervention or in addition to a structured reading intervention.

Struggling Readers in an Era of New Educational Policies

The context surrounding struggling readers, relating to educational policy, has a vital impact on the implementation of any instructional practice or intervention. The 2004 reauthorization of Individuals with Disabilities Education Improvement Act (IDEIA) brought forth many changes in literacy instruction. Prior to implementation, poor readers were often identified as having a "specific learning disability" (SLD) through an IQ test. This widely implemented practice failed to predict how well a child would respond to intervention, even though research showed a positive response to early effective intervention (Johnston, 2011). One transformation that developed from IDEIA was a Response to Intervention (RtI) framework, bringing a critical change in how educators respond to struggling readers (Hawkins, Marsicano, Schmitt, McCallum, & Musti-Rao, 2015; Yell, 2006). Educators are now required to provide intensive interventions supported with scientific evidence, with regular progress monitoring to ensure effectiveness of instructional practices, while also ensuring instructional practices align to weak areas in reading proficiency. Educators may find this task to be even more challenging as expectations for student achievement increase.

The most recent change to educational policy came from the implementation of the Common Core State Standards (CCSS) initiative (National Governors Association Center for Best Practices, Council of Chief State School Officers [NGA & CCSSO], 2010). Demands for student achievement in literacy have increased drastically. According to the CCSS for English Language Arts and Literacy Standard 10 (i.e., Range, Quality, & Complexity), students are expected to have regular practice with complex text and academic language. Schools have been making CCSS-related instructional shifts to prepare students for the increased demands of complex text and the need for them to develop deep levels of comprehension that go beyond literal and inferential understanding. Main shifts resulting from new educational standards include (a) regular practice with complex texts and academic language; (b) reading, writing, and speaking

grounded in evidence from texts, both literary and informational; and, (c) building knowledge through content-rich nonfiction. In the midst of all of these shifts and in states' efforts to best prepare students for new assessments, reading fluency seems to have taken a back seat. Keeping up with ever-changing educational policies could make it challenging to identify and implement best practices in literacy instruction and intervention (Papola-Ellis, 2014).

Why Fluency?

Reading fluency enables the reader to invest energy in meaning-making instead of on decoding (Rasinski, 2006). The NRP (2000) found that students struggling with disfluent reading were at higher risk for reading comprehension difficulties. According to the 2015 report from National Assessment of Educational Progress (NAEP), 36% of students scored proficient or above on the 4th grade reading assessment, while 34% of eighth grade students scored proficient or above, showing that many students tested in the nation cannot read at a proficient level. In their study, Valencia and Buly (2004) found fluency to be a contributing factor to students' lack of proficiency on state standardized reading assessments.

There are several schools of thought on the relationship between fluency and comprehension. According to Young et al. (2015), the relationship between disfluent reading and low standardized assessment scores can be explained by LaBerge's and Samuel's (1974) Theory of Automatic Processing. As the theory suggests, when students decode word-by-word lacking automaticity, or the ability to quickly recognize words without effort, they may lack the cognitive ability to focus attention on the processes needed for comprehension.

Automaticity may not be the only factor in fluency's impact on reading comprehension as prosodic reading is also necessary. Educators can relate prosody to a reader's variation in loudness and pitch as well as duration and pauses in oral reading (Benjamin, & Schwanenflugel, 2010; Kuhn, Schwanenflugel, & Meisinger, 2010). Some think of prosody as a byproduct of oral reading, but studies suggest readers hear an inner voice while reading and use expression to aid in comprehension (Rasinski & Young, 2014). Development of prosodic, fluent reading is vital for students to master comprehension skills needed to be successful on CCSS (NGA & CCSSO, 2010).

How is Fluency Developed?

Most researchers agree fluent reading is developed through practice of oral reading techniques (Anderson, 1981). However, there is some disagreement regarding the most effective methods for the development of fluency (NRP, 2000). Several popular methods are echo reading, assisted reading, choral reading, repeated reading, and wide reading. In echo reading, the student echoes or repeats a portion of text read aloud by the teacher. Another popular method is choral reading, students and the teacher read text in unison, usually in a whole group or small group setting. In assisted reading, the child and adult read aloud portions of text together, either in an echo format or in a choral reading (Anderson, 1981). Research has shown the practice of repeated reading, using a range of texts with classroom practice, increases oral reading fluency for disfluent readers (Boulay, Goodson, Frye, Blocklin, Price, & National Center for Education Evaluation and Regional Assistance, 2015). In repeated reading, a student will reread a text either a predetermined number of times or until fluency is achieved, with regular corrective feedback from the teacher (Samuels, 1979). Allington (2014) makes the argument that wide reading, reading large volumes of texts across topics and genres, increases all areas in reading proficiency, including fluency. These techniques have a long history, but are they sufficiently assisting students who struggle with fluency in building the foundational skills needed to master current educational standards?

Reading Interventions

What about students who continue to struggle with fluent reading despite receiving support in Tier 1 instruction? The first step in helping these students is through early identification of reading difficulties. Effective practices begin with core instruction that is explicit and systematic, using evidence-based instructional strategies and techniques (Boulay et al., 2015) and include universal screening to identify students at risk for reading difficulties (Connor, Alberto, Compton, O'Connor & National Center for Special, Education Research, 2014). Identified students need access to targeted instruction outside of core curriculum with regular progress monitoring, typically administered in a small group setting (Tier 2). If students still aren't progressing, they may need additional support through one-to-one (Tier 3) interventions. Educators target specific reading skills and monitor the student's response to the intervention. The resulting data should be used in the decisionmaking process, including possible identification for services in exceptional education (Wanzek at al., 2013).

Disfluent readers need targeted practices addressing oral reading fluency. With the correlation between fluency and reading proficiency, these questions remain: Are educators doing enough to assist disfluent readers in development of fluent oral reading? What other strategies could assist educators in meeting the

needs of students who are struggling with fluent oral reading and are not benefiting from existing Tier 1 and Tier 2 interventions?

Neurological Impress Method (NIM): A Forgotten Intervention

Heckelman's (1966) underutilized assisted reading strategy, the NIM, is a promising intervention for students struggling with disfluent reading. The NIM (Heckelman, 1966) has a research base going back decades; however, it is not widely practiced in classrooms because few educators are aware of the technique (Young et al., 2015). In this intervention, the teacher and student sit side-by-side reading a passage of text aloud together, in a form of assisted reading. The teacher reads slightly ahead, into the left ear of the student using texts that are approximately two levels above the student's instructional reading level. The student reads aloud with the teacher and will mimic the teacher's prosodic, fluent reading. Heckelman is not the creator of the NIM, but found that methods used in speech and language therapy to address stuttering could be applied to help with oral reading difficulties (Heckelman, 1966; Young et al., 2015). In an early study, Heckelman (1969) reported an average gain in reading proficiency of two grade levels, for 24 disfluent readers receiving the NIM treatment over a period of six weeks.

Very few studies examining the NIM have been conducted over the past decade. Flood et al. (2005), tested the effectiveness of the NIM in their version of the intervention, titled the Neurological Impress Method Plus (NIM Plus), with researchers including a comprehension component. This study included 20 participants reading below grade level in grades threesix. Each student was paired with a student teacher, trained in NIM Plus, and was given this intervention over a period of five weeks. The intervention was delivered four days a week with each session lasting 10 minutes. Researchers reported a significant increase in oral reading fluency and reading comprehension for all students (Flood et al., 2005). The NIM intervention was also implemented with two third-grade students struggling with oral reading fluency for a period of 10 weeks, with researchers reporting over a year's growth in reading proficiency (Mohr, Dixon, & Young, 2012). Young et al. (2015) reintroduced this very promising intervention and called it, Reading Together, a combination of the NIM and repeated reading. In this quasi-experimental study, the sample included 52 students in grades three-five, who had failed the state's standardized assessment in the previous year. From this sample, 29 students were selected for treatment and compared against a control group, receiving instruction as usual. The treatment consisted of the one-to-one NIM intervention using volunteer

tutors for 30 minutes a day for a period of one month. Researchers reported statistically significant increases in oral reading fluency and reading comprehension.

Addressing Potential Difficulties with Implementation of the NIM

Although research surfaced in 1980s regarding the NIM, it is a largely forgotten intervention in all educational circles. One possible reason is that the NIM requires a one-to-one ratio between teacher and student. It is also possible that educators simply aren't aware of the benefits of this type of reading intervention although three common strategies are thought to have evolved from the NIM: assisted reading, listen-while-reading, and paired reading (Anderson, 1981; Rasinski & Young, 2014).

Although NIM is relatively easy to learn and inexpensive since it does not require specific tools, technology, or additional instructional materials, still, one-to-one interventions can be difficult to implement. However, studies show people other than teachers can be trained to provide this intervention. Young et al. (2015), reported success using volunteer tutors to deliver this intervention. Flood et al. (2005), discussed the possibility of training proficient students as peer tutors. It may be possible, through the use of software or podcasts, to use technology to provide struggling students with this type of assisted reading strategy (Rasinski & Young, 2014).

NIM in Action

Recently, author one implemented NIM in a fifthgrade classroom in an effort to explore the following question: What are the experiences of tutors and classroom teachers providing the NIM intervention in a fifth-grade classroom for a period of five weeks? The first author of this paper, a former elementary school teacher, now a doctoral student, consulted with a fifthgrade teacher, referred to above by the pseudonym of Mrs. Smith. Mrs. Smith had concerns about students struggling with oral reading fluency. We studied the implementation of NIM using a qualitative approach that employed a phenomenological research design (Cresswell, 2009); our purpose was to explore the potential of NIM, as experienced through the lived experiences of the participating teacher and volunteer tutors.

For the purpose of this qualitative research study, students scoring below the district's grade level benchmark in oral reading fluency rate were considered disfluent. Oral reading fluency rate was measured as WCPM and collected by the classroom teacher using curriculum-based assessments. The teacher selected six disfluent students, three female and three male, to receive the NIM intervention. All

students were identified as performing below grade level through district created base-line assessments and were receiving tier two interventions, addressing primarily reading comprehension.

The author provided training on the NIM to three tutors who were currently tutoring in the teacher's classroom. The tutors consisted of a former reading coach, a former teacher, and a retired business owner who was once enrolled in teacher education courses but did not finish the program. All tutors had experience volunteering in the teacher's classroom for at least two years, mainly assisting in reading assessment and data collection. For example, tutors often assessed and recorded weekly oral reading fluency rates. One tutor also worked with a small group of students in a weekly book club. The training included a description of the NIM, the purpose of the intervention, explanations, and intervention demonstration using the step-by-step guidelines provided in Table 1. Each tutor took turns demonstrating the intervention during the training and received feedback from the first author.

For a period of five weeks, the tutors implemented the NIM during the core reading block; they used leveled readers, approximately two levels above the students' instructional level. The leveled readers were selected by the first author using instructional reading levels provided by the teacher. Tutors worked one-on-one with the students using the NIM, with each session lasting about fifteen minutes. The sessions took place at a teacher table positioned in the side of the classroom while the teacher continued with whole group instruction.

During the five weeks of the NIM intervention, the first author met with two of the tutors and the classroom teacher on two occasions. They were asked to share overall impressions of the experience through an informal interview with the first author. They were also asked to share any concerns. The meetings took place in the classroom while students were out of the room. The tutors and the classroom teacher reported that the intervention was easy to learn and implement within the classroom without interrupting regular instruction. In the beginning of the five-week period, each tutor came in one day a week and worked with each of the six students, providing the intervention for about fifteen minutes per student. After about three weeks, the six students worked with only two of the tutors. The first author observed two of the tutors and provided feedback as needed using the step-bystep guidelines in Table 1. In addition, the first author attempted to observe the third tutor, however the tutor was not available due to illness.

The tutors reported some organizational challenges.

Since each student worked with different tutors, the tutors did not always know where to start in the text at the beginning of each session. The first author and classroom teacher created a chart that allowed tutors to record the students' placement in the text at the end of each session. There was still some confusion, but the tutors found that students generally remembered where to begin at each session. This specific challenge could be minimized by assigning each student to a specific tutor. The other challenge reported occurred around the holidays, with tutors unable to come in consistently and other changes in class schedule.

The classroom teacher reported that according to curriculum-based weekly fluency assessments, students improved in oral reading fluency rate measured as WCPM. The teacher and tutors reported an observable improvement in prosody, with students mimicking the tutors' phrasing and expression during the intervention. The most notable change was the improvement in the students' self-confidence in their oral reading ability during the intervention, possibly resulting from reduction in anxiety related to oral reading. In the beginning, some tutors stated that several students were reluctant to read aloud and appeared very anxious. At the end of the five weeks, the classroom teacher reported that students were visibly less anxious when reading aloud. The tutors and the teacher stated that students found it easier to read aloud after participating in the intervention.

Limitations to this exploratory study include a lack of systematic data collection, self-reports, small sample size, and duration of intervention. Although there are several methodological limitations associated with this study on NIM in action, this example of the NIM use highlights how easy it is to implement in a classroom setting, as well as the potential of NIM for supporting the development of students' oral reading fluency.

Table 1 Step by Step Protocol for Implementation: Neurological Impress Method (adapted from Flood et al., 2005; Young et al., 2015; Young et al., 2016)

The teacher selects a text approximately two levels above the student's instructional level. If the text seems too easy or too challenging, the teacher may adjust the reading level of the text.

The teacher and student sit side by side to enable the teacher to read the text into the student's left ear.

Both the teacher and student track print as they read, either from identical copies of the same text or from one copy of the text. If reading from

the same copy, the student's finger should be placed on the teacher's finger as they track print.

Both the teacher and student should move their finger as they read to ensure tracking of print.

The teacher reads slightly ahead of the student. The teacher will need to adjust his or her pace to match the student's pace throughout each reading.

The teacher models fluent reading, using expressive phrasing, chunking of text, and stopping at punctuation, while the student reads along.

The student, independently, rereads the text aloud once, in a repeated reading format.

At the end of each session, the student retells or summarizes the reading to the teacher.

Conclusion

Teachers need access to high impact instruction in foundational literacy or struggling students may find it difficult to comprehend texts at a critical level. When students begin to struggle with foundational reading skills, educators need to find the best interventions to support struggling readers. When a child does not master content, it is ineffective to repeat the same practices in an effort to provide an intervention (Anderson, 1981). Students struggling with disfluent oral reading, who have not made sufficient progress through small group targeted instruction, could benefit from the one-to-one oral fluency intervention, the NIM.

Fluency deserves more attention. Students are struggling and as the 2015 NAEP results showed, the majority of 4th and 8th grade students are not reading at a proficient level. Students struggling to achieve fluent oral reading may be at risk for poor reading comprehension, (NRP, 2000; Valencia & Buly, 2004) as fluency is a contributing factor in poor reading achievement. Fluency isn't all that is needed to create good reading comprehension, but it is an essential piece of the puzzle (Rasinski, 2016).

Non-proficient readers need effective interventions to support the level of improvement needed to master CCSS (Shanahan, 2012; Rasinski, 2016). Educators are urged to examine current practices to ensure students are receiving evidence-based, targeted instruction. Our situated implementation of the NIM provided us with positive results, although our

implementation had several methodological limitations that prevent us from making any generalizations to other contexts. At the same time, we are excited about the NIM method. Existing research on the NIM has also shown the potential of the method for developing students' prosody (Rasinski & Young, 2014). Although the NIM is not a quick fix for all students' reading fluency challenges, it is a promising method for facilitating fluency development with struggling readers. While struggling readers should still receive comprehensive interventions, the NIM has the potential to provide additional support to students struggling with disfluent reading. The NIM is extremely easy to learn, does not require specific equipment or materials, and can be implemented by classroom and exceptional education teachers, reading interventionists, paraprofessionals, volunteer tutors, as well as parents who can be easily trained in this method (Anderson, 1981; Rasinski & Young, 2014; Young et al., 2016).

In the last decade, there have been very few studies exploring the effect of the NIM on students' oral reading fluency and reading comprehension. There is a need for more current research to determine the impact of this intervention on disfluent readers. Several questions remain regarding the NIM as a one-to-one reading fluency intervention. For example, could the NIM effectively increase students' oral reading fluency if implemented in a small group of three students as opposed to the one-to-one format? This could create a greater impact as many students face similar reading struggles similar to those described in the case of Sophia. Also, given the recent attention to critical literacy and close reading, could a more effective approach to the use of NIM include a comprehension component such as Flood et al., (2005) describe in the intervention, the NIM Plus? Further research is needed on the role of the NIM in facilitating students' reading fluency. In our view, existing research on the NIM provides some evidence for giving it another chance for one-on-one reading fluency interventions.

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