

Reading Fluency and the Science of Reading

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What is Fluency?

Reading fluency refers to the ability to read quickly, accurately, and with prosody (smoothness and expression that reflects the meaning of the text). Fluency instruction is instruction that specifically tries to improve these skills. Some of the most common forms of fluency instruction include:

1. Choral Reading: having an entire class read the same text aloud, at the same time.
2. Varied Reading: created by the Iowa Reading Research Centre, is based on repeated reading. However, instead of reading the same text, they read a text that is 80% similar. This used to require the purchase of special varied reading texts. However, with modern generative AI software, this can be easily done with programs like ChatGPT.
3. Readers Theatre: Assign students characters from a play script and then have them rehearse the play.
4. Guided Reading: Have students read, alone or in small groups, with a teacher to help with errors and unknown words.
5. Partnered reading. Students are partnered together, based on ability and take turns reading a text.
6. Silent Reading: Having students practice reading, independently.

Is Fluency Instruction Part of the Science of Reading?

Yes! There is a large body of evidence suggesting fluency instruction benefits students. In fact, the (NRP, 2000) report, which in many ways was a founding research paper for the science of reading, listed it as one of the 5 pillars of reading instruction.

What Types of Fluency Instruction Works Best?

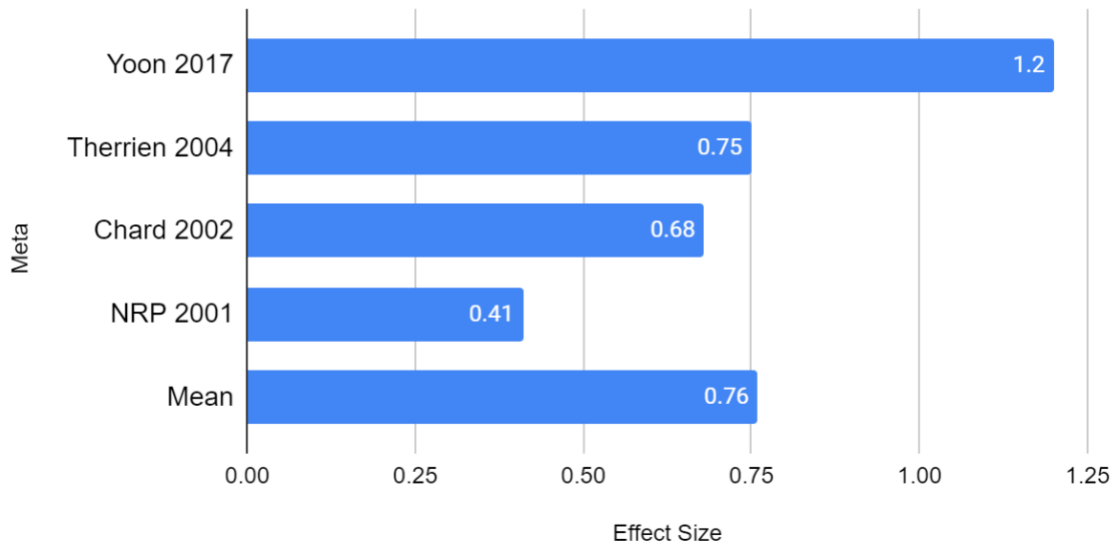
In my opinion, there is probably a time and place for most types of fluency instruction. However, the strongest body of scientific research exists for repeated reading. Indeed, to the best of my knowledge, there have been three separate meta-analyses that looked at this topic.

Meta-analyses are important to rely on when evaluating efficacy, because they show the mean result of all experimental research on a topic. (Meta-studies are studies of studies, which seek to systematically quantify the results of experimental research on a topic and synthesize those results, into standardized metrics [typically effect sizes].

Effect sizes are particularly useful because they allow us to compare the findings of different studies. Typically, effect sizes are interpreted as follows: below .20 is negligible, between .20 and .39 is small, between .40 and .79 is moderate, and over .80 is large. That said, effect sizes are typically lower in reading research. In my opinion, an effect size above .40 should be considered large for reading instruction research.) The results of the three meta-analyses on repeated reading can be seen in the below graph.

Repeated Reading Meta-Analyses Ranked by Mean Effect Size

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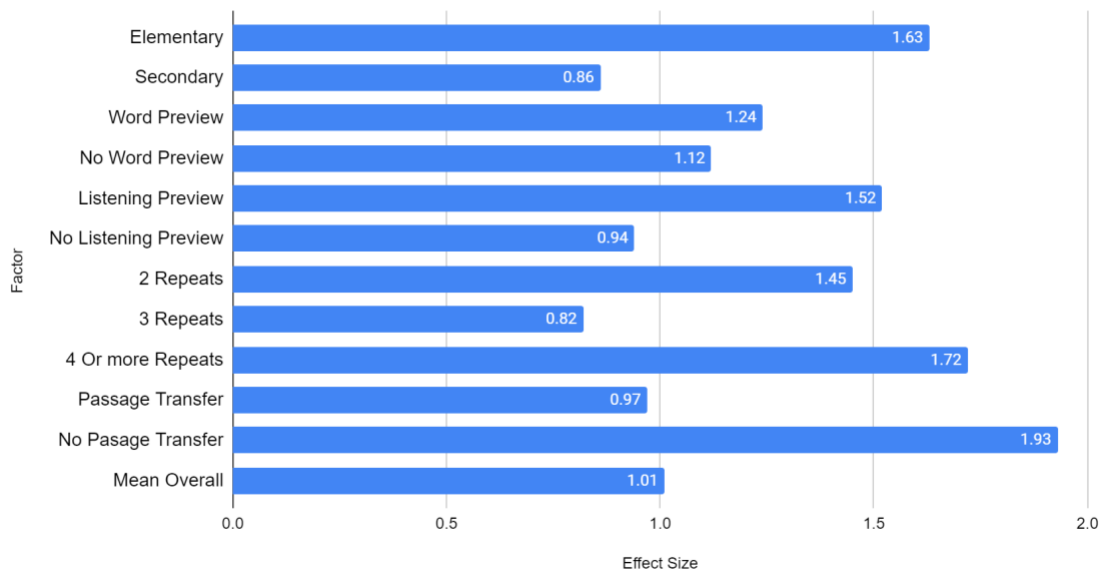


The mean effect size for meta-analyses on repeated reading is .76, which is quite large. To put the above results in context, the National Reading Panel found a mean effect size of .44, for systematic phonics and that finding has been used as the main scientific evidence for systematic phonics instruction, ever since.

One common criticism of repeated reading is that it only improves fluency for the text read and not for new texts. In other words, many claim there is no transfer effect. However, this claim is verifiably false. Both (Yoon, 2017) and (Therrien, 2004) used meta-analysis to systematically examine the transfer effect of repeated reading and found strong transfer benefits, as can be seen in the following two graphs.

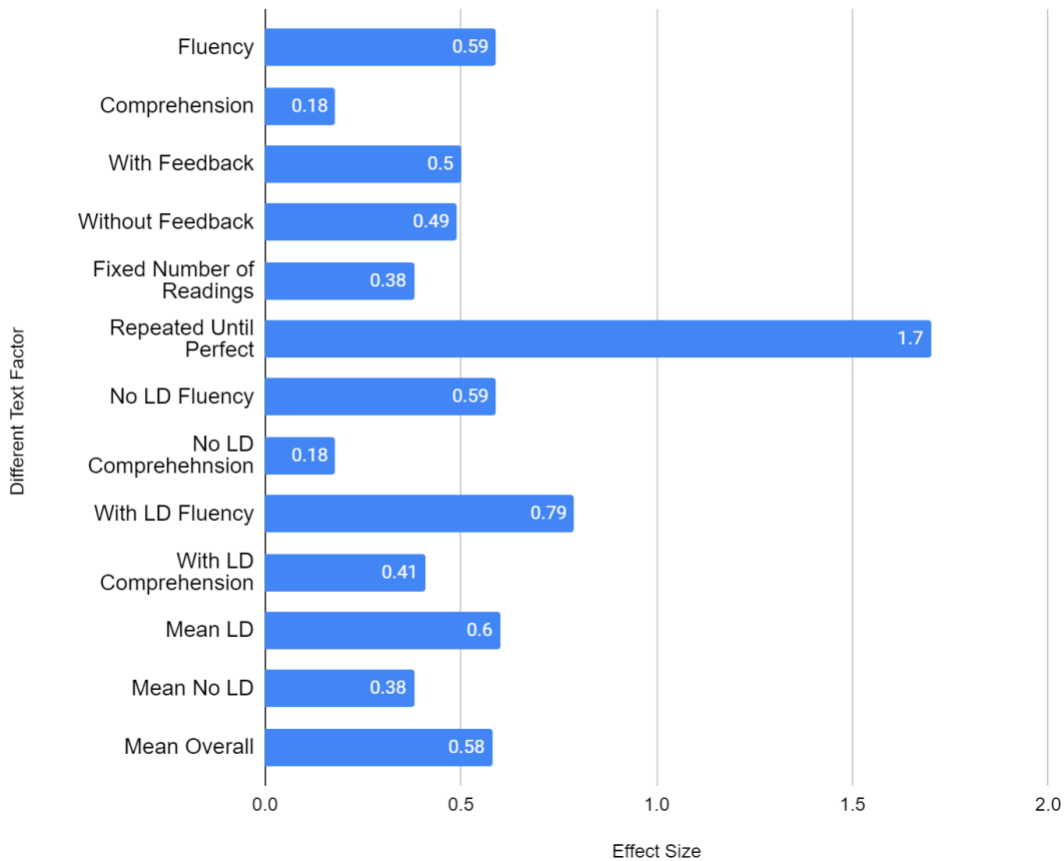
Repeated Reading Meta-Analysis Results

Yoon, et al. 2017 Meta-analysis



Repeated Reading Outcomes: Different Text Between Assessment & Intervention

Therrien 2004, et al. Meta-Analysis



Not only has scientific research suggested a strong benefit for repeated reading. It has been shown to be specifically beneficial for learning disabled students (Therrien, 2004).

How Best Can We Use Repeated Reading:

Personally, I like to do repeated reading for 5-10 minutes a day with my class. Too much more runs the risk of being boring due to the unavoidably repetitive nature. However, I like to embed my vocabulary and comprehension instruction within this fluency instruction. I typically read the text aloud first to the students.

Next, I review any difficult vocabulary or background knowledge. Then I read the text chorally with my students, repeatedly, until I can hear that they sound fluent. I have the students read till perfection, because (Therrien, 2004) showed more than 4x the benefit for fluency outcomes, when students had to read to perfection, compared with a fixed number of readings.

In my experience, using a fluid number of repetitions is superior, because it forces the students to actively participate in the process. Once my students have completed the repeated reading, I typically ask comprehension questions and discuss the content.

What Type of Text Should I Use?

I have not found meaningful research on this topic. However, I do see unique benefits for both poetry and cross curricular texts. Poetry can be great for building prosody because there is a natural rhythm; it helps students to learn to read with intonation and expression. However, lately, I have been using cross curricular texts, because it helps me to review curriculum material for other subjects and theoretically provides a long-term comprehension benefit (Hansford, 2023).

When selecting texts, the only thing that really matters is that it is appropriately challenging. That does not mean we need to use a benchmark assessment to find the right instructional level, as such assessments are typically not valid (Burns, 2015). However, in my opinion, we do want the text to be difficult enough that they might need to sound out some words or ask for support, but not so difficult that the student spends the entire exercise decoding unfamiliar words.

When Should I Teach Fluency?

Previous meta-analyses have shown a strong benefit for fluency instruction in both elementary school and secondary school (Yoon, 2017). The (NRP, 2000) found a strong benefit for repeated reading starting in the second half of grade 1. Most scholars tend to support the idea that teaching fluency alongside, decoding, and comprehension will provide a synergistic effect.

In my research with Dr. Rachel Schechter on reading legislation, we found that Reading Laws that mandated the use of all 5 pillars (phonemic awareness, systematic phonics, vocabulary, fluency, and comprehension) yielded the highest improvements in reading scores (Hansford & Schechter, 2023).

That said, in my own experience fluency instruction should shift overtime both in how it is conducted and how much time is spent on it. While kids are in the early emerging stage of reading (ages 3-6), meaning they are still learning the basics of decoding, I think it makes sense to use limited repeated reading with decodable texts. However, as kids enter the decoding stage of reading (ages 7-10), I think it makes sense to both increase the amount of fluency instruction and the number of types of fluency instruction.

Many assume fluency drills like repeated reading are meant to help students memorize words, similar to with whole language. However, if teachers help students decode and segment unfamiliar words, it can in my opinion help students better orthographically map new words and create automaticity, both with decoding and word identification.

In my opinion, fluency instruction is most important when students can decode some words, but cannot yet read fluently independently. Once students can read a variety of complex texts, without any support, I think fluency instruction becomes less important.

Are There Other Kinds of Effective Fluency Instruction?

Yes! Varied reading has a couple of RCTs, conducted by the Iowa Reading Research Centre showing similar fluency outcomes to Repeated Reading. Recently (IRRC, 2018). Konstantinos Mastrothanasis, Maria Kladaki, and Aphrodite Andreou also recently conducted a meta-analysis on Readers Theatre (2023). This meta-analysis examined 10

experimental or quasi-experimental studies on students aged 6-12. The study found a mean effect size of 1.23. However, one study included in the meta-analysis was an outlier (Huang and Luo, 2017), with a mean effect size of 5.19. That said, even with the outlier removed there would be an unweighted mean effect size of .94, that would be quite large. (Konstantinos, 2023). Personally, I think what really matters is that we are providing students with plenty of opportunities to read rich texts aloud, with opportunities to have an adult support their learning.

Final Thoughts:

Fluency instruction is one of the 5 pillars of literacy instruction and should be included as part of any literacy program. There is likely a synergistic effect for teaching fluency alongside other forms of instruction, such as decoding, vocabulary, and comprehension. However, in my opinion, fluency instruction might be most impactful when students are out of the emergent stage (can decode unfamiliar words), but not yet in the fluent reader stage (still lack automaticity with word and sound identification).

Repeated reading is the most evidence-based form of repeated reading. There have been multiple meta-analyses showing a strong benefit for repeated reading, on fluency outcomes, both for the text read and for new texts. That said, repeated reading runs the risk of being boring.

I would recommend limiting repeated reading to no more than 10 minutes a day. Therefore, I think it is best to also include other fluency exercises within daily instruction, such as: varied reading, readers theater or partnered reading.

This article was written by Nathaniel Hansford, if you want to learn more about reading instruction and meta-analysis, be sure to check out his website www.pedagogynongrata.com or his book: *The Scientific Principles of Reading Instruction*. If you would like to contact Nathaniel, you can reach him at evidenced.based.teaching@gmail.com.

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