

Read Naturally: A Teaching by Science Research Review

Article Summary:

In this article we examined the research efficacy of the program Read Naturally. Read Naturally, has a series of structured literacy computer programs designed to help struggling readers. These programs are solidly research based and their principles have strong research evidence to support them. What Works ClearingHouse has previously examined this issue. They accepted 5 studies without reservations, 4 of those studies would meet the ESSA criterion for tier 1 research, 1 one of those studies would fall under the ESSA criterion of tier 2 research. What Works ClearingHouse found that the Read Naturally programs “have potentially positive effects on general reading achievement, mixed effects on reading fluency, and no discernible effects on alphabets and comprehension for beginning readers” (WWC, 2016). We did a systematic search for Read Naturally efficacy studies and did a quantitative analysis of their results. According to our original findings, most of the studies specific to the Read Naturally program show a small to negligible results, with a mean weighted effect size of .12, on standardized tests.

Read Naturally appealed our original review, on the basis that they found serious flaws with some of the studies included by WWC and on the basis that we missed a 2009 study by Theodore J. Christ and Jennifer Davie. Read Naturally specifically, objected to the inclusion of (Kemp, 2006) and (Hancock, 2002) for not implementing the program the way it was meant to be implemented. Indeed one of these authors (Hancock) wrote an open letter to WWC to attempt and have their study removed. Upon reviewing the additional study and their criticisms of (Kemp, 2006) and (Hancock, 2002), we accepted their appeal criticisms and reconducted our analysis. After re-analyzing the research we found a mean weighted

effect size of .20, on standardized tests suggesting a small but significant benefit, especially for fluency.

Program Description

According to the company website: “**Read Naturally Live** is an online reading program that accelerates reading achievement by combining the research-proven strategies of teacher modeling, repeated reading, and progress monitoring. A student works at his or her own pace in an appropriate level of material. Text and audio guide the student through the steps. The student masters a story by reading along with audio and then practicing the story until he or she can read it fluently and with comprehension. The program automatically tracks student progress.

Read Naturally Live Steps

1. Select a Story

The student clicks on the story he or she wants to read. Choosing the story deepens the student’s investment in the material.

2. Key Words

In the Sequenced and Idioms series, the student reads the key words and their definitions while listening to an audio recording. The key words provide definitions that are important to understanding the story. In the Phonics series, the student listens to a phonics lesson and reads words that have the featured phonics patterns.

3. Prediction

The student uses the title, picture, and key words to write a prediction of what he

or she thinks the story is about. The prediction prepares the student's mind for reading the story.

4. Cold Timing

The teacher may time the student for one minute as he or she reads the story, or the student may complete this step independently. The student clicks unknown words while reading, and then clicks the last word read during the timing. Read Naturally Live subtracts the unknown words from the total number of words attempted to obtain a cold-timing score and displays it on a graph. This step establishes a baseline for progress monitoring, the component of the Read Naturally Strategy that motivates the student to improve.

5. Read Along

The student reads along quietly with a recording of the story, typically three times. This step is the teacher-modeling component of the Read Naturally Strategy, which helps the student learn new words and master others as well as learn proper pronunciation, expression, and phrasing.

6. Practice

The student practices reading the story without audio support three to ten times until able to read it accurately, with expression, and at the goal rate. This step is the repeated-reading component of the Read Naturally Strategy, which helps the student improve fluency, master difficult words, and understand the story.

7. Quiz

The student answers questions about the story. Responding to the text holds the student accountable for meaning, develops the ability to answer many types of questions, and provides teachers with information about how well the student comprehends the story.

8. Retell/Word List

In the Sequenced and Idioms series, the student retells or summarizes the story to improve comprehension.

In the Phonics series, the student works on decoding skills by practicing the word list until able to read it accurately at a predetermined rate. The Phonic series also includes a spelling step to give students practice encoding words from the word list.

9. Pass

The student reads the story for the teacher to show that he or she can read it at the goal rate, with appropriate expression, and with three or fewer errors. The teacher corrects the comprehension questions and the retelling of the story (if applicable) and reviews the results with the student.

In the Phonics series, the student also reads the word list to show that he or she can read it with three or fewer errors at the goal rate. A graph shows how much the student's fluency has improved since the cold timing.

Additional graphs show results for the comprehension questions, the retelling, and the word lists (if applicable).”

Within the company material there is evidence of the following essential types of instruction: explicit, individualized, phonemic awareness, phonics, vocabulary, spelling, fluency, and comprehension. The Read Naturally program is often cited on social media as a Orton Gillingham based approach. The company website does not list any connection to the Orton Gillingham method. However, it was endorsed by the Orton Gillingham Academy (Hill, 2019). In order to evaluate the efficacy of the Read Naturally program, we conducted a

systematic search for studies on the program and analyzed them, to determine their mean effect size.

Systematic Search

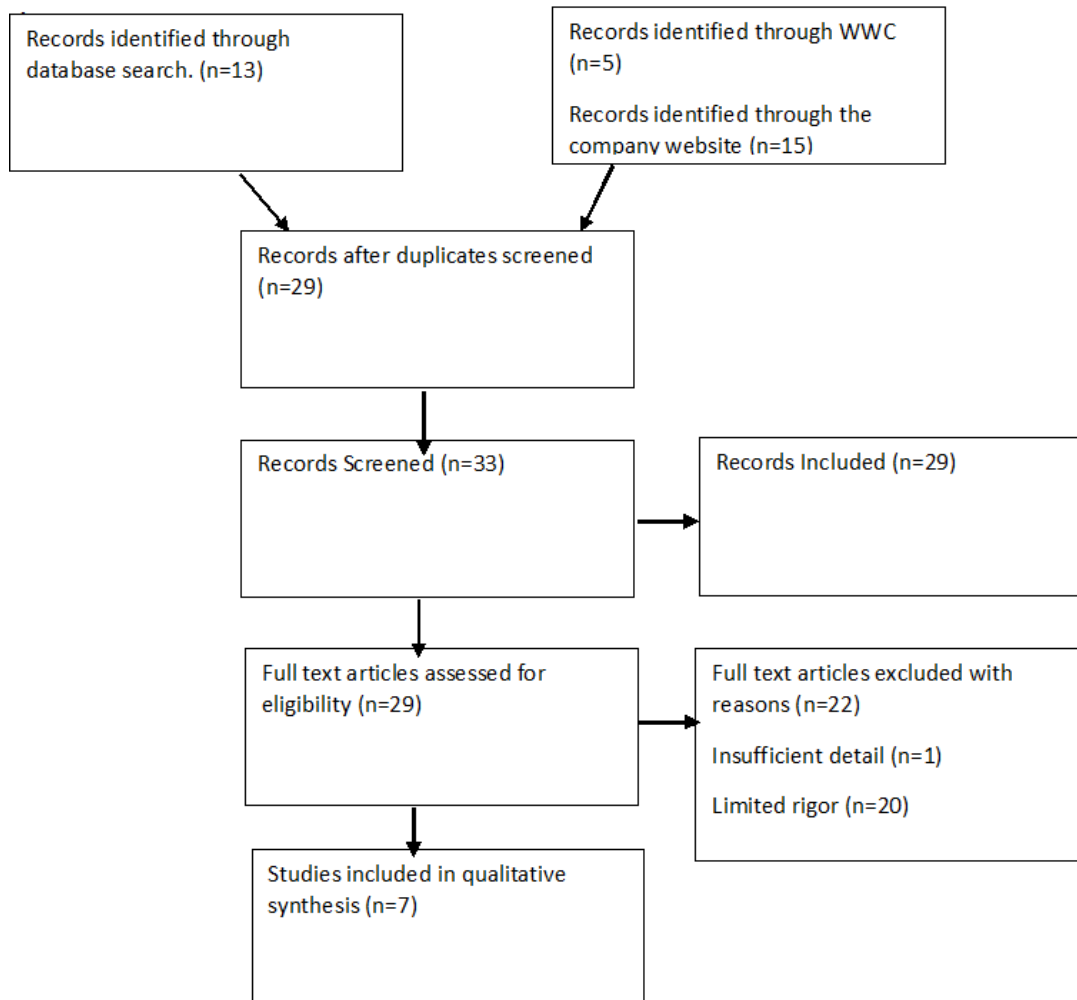
We conducted a systematic search for studies on Read Naturally. We looked on the company website, the academic database Education Source by searching “Read Naturally”, and within the What Works ClearingHouse data-base. While it is unusual to include studies from WWC in such an analysis, doing so has two distinct advantages. Firstly, WWC requires companies to submit all of their available research. This reduces the likelihood that a study is missed in the analysis. Indeed several of the studies included in the WWC data-base were unpublished manuscripts, which would not likely be found in a normal systematic search. Secondly, WWC reviewers recalculate all effect sizes based on the raw-data. This reduces the risk of an effect size being calculated in a biased way, by the original authors.

Studies were accepted in our analysis, if they had control groups, if they had sample sizes above 20, and if they had sufficient reporting to find effect sizes. Studies were not excluded based on peer-review status. In our opinions, it is important not to reject articles based on peer reviewed status, as studies with negative or null findings are less likely to be accepted by peer review (Nair, 2019). Therefore, excluding non-peer reviewed studies increases the risk of a positivity bias.

In our initial search we identified 15 studies on the company website, 13 studies in Education Source and 5 studies in the WWC data-base. Next we screened out studies that were duplicates, leaving 29 studies. The 29 full papers were reviewed for eligibility. Of which, 23 were excluded for being non-experimental, 4 were excluded for having sample sizes below 20, 1 study was excluded for having multiple programs in the treatment group, and 1 study

was excluded for having insufficient recording to find effect sizes. In total 7 studies were accepted for analysis.

Figure 1: Prisma Flow Chart



Analysis Methodology

For studies reviewed by WWC, we accepted the effect size calculations found by WWC at face value. For studies not reviewed by WWC, all three authors independently coded the study and calculated the effect size, using the Cohen's d formula. In the case of a disagreement, authors redid their calculations and came to a consensus. Effect sizes were then

weighted based on the inverse variance. A funnel plot and moderator analysis were also used to examine the distribution of effects found.

Results

After the appeal 6 studies were analyzed. All studies, except one, showed positive results. 4 randomized control trials and 2 quasi-experimental studies were analyzed, showing a mean weighted effect size of .20 and a raw unweighted mean effect size of .18, with 95% confidence intervals of [-.12, .47.] These findings suggest a small but statistically significant benefit for Read Naturally. The findings of each individual study can be seen in the below chart.

Table 1: *Read Naturally Experimental Studies*

Study	Sample Size	Duration in Months	Standardized Test Y/N	Mean Effect Size
Tucker 2010	106	2	Y	.16
Aryans 2009	82	2	Y	.10
Heistad 2008	44	9	Y	.32
Heistad 2005	88	9	Y	.38
Graves 2011	50	2.5	Y	-.21
Christ 2009	109	2.5	Y	.30

In order to control for how study outcomes changed according to assessment measurements, a moderator analysis was conducted, as can be seen in figure 2, on the next page. It should be noted that Read Naturally researchers came to different conclusions than us on some studies and used alternative statistical analysis methods. We encourage interested parties to read the summaries of the Read Naturally studies, which can be found here:

<https://www.readnaturally.com/research/reviews>

Read Naturally specifically asked us to link to the following study interpretations:

<https://www.readnaturally.com/research/studies/rn-strategy-studies/rti-4th-graders-ma>

<https://www.readnaturally.com/research/reviews/arvans-study>

<https://www.readnaturally.com/userfiles/ckfiles/files/UofMnReadNaturallyStudy.pdf>

Lastly, I would like to note that a representative of Read Naturally asked us to remove the Graves 2011 study from our analysis. The representative had two main criticisms, both of which were valid.

- (1) The treatment group was using multiple programs, each for a different pillar of literacy. Read Naturally was only used for fluency instruction. This means that the overall results of the study might be quite random, as there are many instructional variables being tested at once.
- (2) The negative results of the study were not fluency-related. In fact, the fluency results were positive, with an effect size of $d = 0.20$. It is therefore somewhat problematic to attribute the negative results of this study to Read Naturally, as Read Naturally was not used to teach the outcomes which were negative.

That said, despite these criticisms, I, as the lead author, chose to keep the paper in the analysis for three reasons:

- (1) Most education studies include multiple differing variables between the treatment group and the control group, which makes the measured effect of most education studies quite random. This challenge is one of many reasons why it is important to use multiple studies when trying to measure the effect of an intervention. For example,

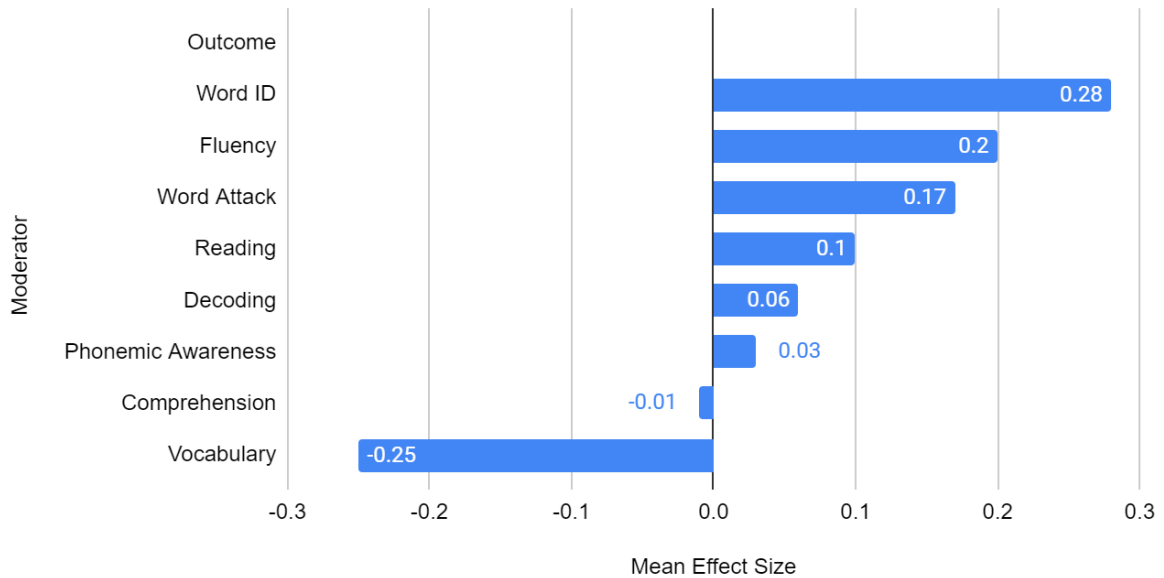
most education studies use what is called a "business as usual" control group. This means that the instruction is not controlled for in the control group, and we usually don't know what that instruction looks like.

- (2) While the treatment group using multiple programs might be unusual for an experimental study, it is quite similar to real-life application. Classroom teachers are unlikely to only use a fluency program and not use materials to teach other literacy pillars.
- (3) While the negative effects were not related to fluency, we do expect increases in fluency to correlate with increases in other literacy outcomes. Pedagogy does not exist in a vacuum. Increases in one domain usually lead to increases in another.

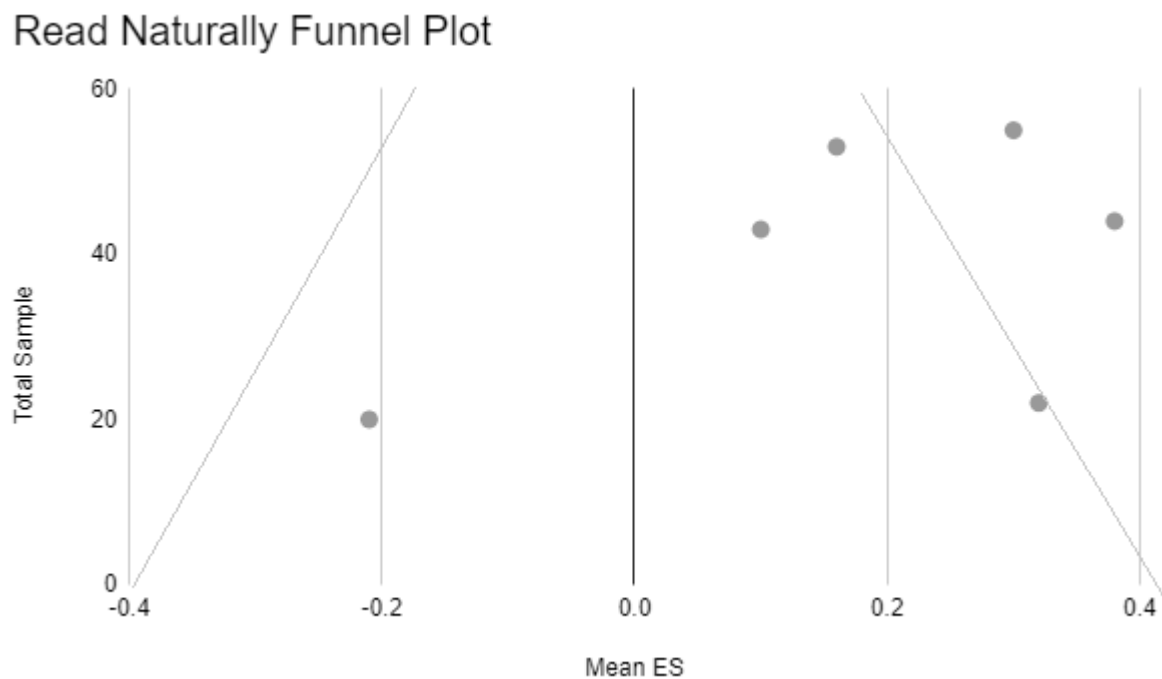
That said, out of respect for the legitimacy of these criticisms, I have added them to our review so that others can make their own evaluations. If the Graves 2011 study is removed from the analysis, the mean effect size increases to 0.24, with 95% confidence intervals of [0.03, 0.44]. On the following page, in Figure 2, you can find the results of our moderator analysis.

Figure 2: Moderator Analysis**Read Naturally Moderator Analysis**

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All moderator Variables were statistically negligible according to Cohen's guide, except for word ID and fluency. However, Read Naturally is primarily a fluency program. In order to assess whether or not sample size biased the results of the analysis, a funnel plot analysis was conducted, as can be seen in figure 3, on the following page.

Figure 3: *Funnel Plot Analysis*

The above funnel plot seems to suggest that Read Naturally, studies were negatively impacted by low sample sizes. The highest effect sizes were found with the largest studies. This also suggests that Read Naturally engaged in ethical research practices and published study results, regardless of outcome.

Discussion

The Read Naturally program is a solidly research based program. All of its principles of instruction can be solidly backed up by empirical research. Its efficacy studies show a small but significant benefit..

Final Grade: B

The program is research based. However, its efficacy research shows an effect size of below .30.

Qualitative Grade: 9/10

The Read Naturally programs contain the following essential types of instruction: explicit, individualized, phonemic awareness, phonics, vocabulary, spelling, fluency, and comprehension.

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