

Comprehension-Based Silent Reading Rates: What Do We Know? What Do We Need To Know?

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Abstract

This paper uses a review of research to consider a fundamental aspect of reading instruction that has been marginalized in policies and practices over the last decade: the development of silent reading habits that involve strong comprehension and optimal reading rates. The review of research attends to typical development and performances of students at different levels and of varying proficiencies, the relationship between oral reading and silent reading comprehension, and typical instruction. Three studies are also summarized that illustrate growing attention to how comprehension-based silent reading can be supported through instruction. Finally, critical questions are raised which require research evidence if students are to be brought to the optimal comprehension-based silent reading rates needed for the digital-global age.

Comprehension-Based Silent Reading Rates:

What Do We Know? What Do We Need To Know?

As has been the case with many aspects of reading instruction, an emphasis on oral or silent reading activities has varied in particular educational eras (Allington, 1984). During the whole language period of the 1990s, silent reading experiences were emphasized (Hagerty, 1999). Some oral reading occurred during guided reading and for obtaining running records but occasions for monitored, repeated oral reading were few, even for beginning and struggling readers. In 2000, when the National Reading Panel (NRP) (NICHD, 2000) concluded that guided, repeated oral reading but not sustained silent reading (SSR) facilitated fluency, comprehension, and vocabulary, the pendulum swung to an almost-exclusive emphasis on oral reading. An emphasis on oral reading went beyond the primary grades since the NRP had concluded that the fluency of all students through the fourth grade and struggling readers through high school was enhanced with guided, repeated oral reading. Evidence of the dominant role of oral reading can be seen in the prominence of the Dynamic Indicators of Basic Essential Literacy Skills (DIBELS)—a test of oral reading tasks—in the implementation of Reading First (Gamse, Jacob, Horst, Boulay, & Unlu, 2009).

Oral reading serves many critical functions, especially during the early stages of reading development. At the same time, when the diet becomes skewed, as we believe it has, the prospects of the poor getting poorer are likely. When, as has been the case with DIBELS (Good & Kaminski, 2002) and similar oral reading assessments that have been prominent in Reading First implementations, the emphasis is on oral reading speed without attention to comprehension, beginning and struggling readers may come to perceive reading as nothing more than word

calling (Samuels, 2007). Especially for the students whose reading experiences occur primarily in school, a diet heavy on oral reading with an emphasis on speed is unlikely to lead to the levels of meaningful, silent reading that is required for full participation in the workplace and communities of the digital-global age.

Proficient silent reading is the means whereby individuals access the ever-increasing stores of knowledge within texts that are required for the workplace and community. Silent reading rates and processing is limited by capacities such as eye movements (Samuels, Hiebert, & Rasinski, 2010) but oral reading rates are even more constrained by the speed of speech production. Very early in the acquisition of reading proficiency, silent reading rates exceed oral reading rates. Data on oral and silent reading norms (Hasbrouck & Tindal, 2006; Taylor, Frankenpohl, & Pettee, 1960) show that silent reading rates exceed oral reading rates by at least 30%, even for students at the 50th percentile in the primary grades. Once speech production become stable in early adolescence, the amount of words that can be read silently becomes substantially greater than can be read orally. As the findings of the NRP (2000) indicated, simply creating silent reading venues will not guarantee that students' time will be used productively. However, under the right conditions where students read texts at appropriate difficulty levels, they process many more words in silent than in oral reading. In this context, our focus is on a construct that has been described as comprehension-based silent reading rate (Hiebert, Wilson, & Trainin, 2010). As this term implies, the emphasis on reading silent reading rate is always a function of appropriate levels of comprehension. In considering comprehension-based silent reading rate, comprehension and rate are inseparable.

In this paper, we review existing research on silent reading performances of students and the nature of opportunities to read in classrooms that support meaningful, silent reading. In addition to a review of descriptive research on levels of and opportunities to read, we highlight

several empirical studies that illustrate a new era of research on meaningful, silent reading where the effects on comprehension are established. In the final section of the paper, conclusions are summarized and questions raised that require the attention of researchers if students are to be provided the experiences that engender the kinds and levels of silent reading proficiencies that are needed in the 21st century.

Current Evidence on Comprehension-Based Silent Reading Rates

In this section, we examine three areas of descriptive research related to comprehension-based silent reading rate: (a) typical patterns of development and performance, (b) differences in the processes of silent and oral reading, and (c) attention to comprehension-based silent reading rates within typical current instructional programs.

Typical patterns of development and performance

Whereas there are several sets of oral reading norms (e.g., Good & Kaminski, 2002; Hasbrouck & Tindal, 2006), information on silent reading norms is limited. Carver (1989), identified only two sets of norms that extended across the school years: those he had developed (Carver, 1982) and those of Taylor (1965). Carver chose the Taylor data to establish grade-equivalent norms because they were adequate on the following dimensions: sample size, sampling technique, range of grades represented, rates estimated in words per minute (wpm), and reliability. According to Carver's extrapolations of the Taylor norms, rate in wpm ranges from 0-81 at Grade 1 to 333+ in Grade 18 (graduate-level/proficient adult). There is a gain with each successive grade in school of about 10 to 20 wpm.

Even with Carver's (1989) additions, it should be remembered that the original data for these norms were gathered in the late 1950s (Taylor et al., 1960). The data that Carver (1983) gathered approximately 20 years after Taylor (1965) would suggest that reading rates stay fairly

constant but the technological changes even since Carver gathered his data have been substantial. Further, the currently available silent reading norms are provided for only the 50th percentile. How students do at the 10th, 25th, 75th, and 90th percentiles is also important information.

Despite these limitations, the silent reading norms have a significant component that the various oral reading norms that have proliferated over the past 20 years do not: the silent reading norms (Taylor et al., 1960) are based on comprehension. This distinction is an important one. We do not know how American students' comprehension-based silent reading rates compare to those of their counterparts 50 years ago. There is data available, however, that can serve as a baseline for comparison.

While there are not data to indicate how current students' development of comprehension-based silent reading rates proceeds over time, there are data on how well students at particular levels perform on silent reading tests. The National Assessment of Educational Progress (NAEP; National Center for Education Statistics, 2009) shows that approximately 35% of a fourth-grade cohort fails to attain the basic level, while an additional 32% fails to reach the proficient level that is the goal for all students. Our analyses of the texts that have been used on these assessments indicate that they are at approximately a 3.5 grade-level according to conventional readability formulas. The text on the NAEP, then, is not the complex text that is emphasized within the Common Core Standards (Common Core State Standards Initiative, 2010).

When follow-up studies have been conducted on the NAEP where students read aloud texts that they have read silently, data indicate that it is the speed with which students read, not their word accuracy that distinguishes students who achieve different standards. While there are differences in word accuracy across levels, these differences are not statistically significant

(Pinnell, Pikulski, Wixson, Campbell, Gough, & Beatty, 1995). These differences in speed have been used as added justification for an emphasis on oral reading in instruction and assessment, as is discussed shortly. However, it appears that many students, even those in the bottom quartile, can recognize almost 90% of the words in grade-level texts (Jenkins, Fuchs, van den Broek, Espin, & Deno, 2003; Wise, Ring, & Olson, 1999). This word recognition is slow, however. In the Jenkins et al. study, fourth graders who had been classified as reading disabled read approximately 100 fewer words in a one-minute reading of a text than their same-age, skilled-reading peers.

The relationship between oral and silent reading

There has been a large literature on the relationship between oral reading performances (without comprehension and measured as words correct per minute (wcpm)) and performances on silent reading tests, which have included standardized reading tests and state standards-based tests (Good, Simmons, & Kame'enui, 2001; McGlinchey & Hixson, 2004; Schatschneider, Buck, Torgesen, Wagner, Hassler, Hecht, & Powell-Smith, 2004). In Marston's (1989) review of such studies, the correlations were between .63 and .90 with the most clustering around .80. In Good and Jefferson's (1998) review of the correlations within a single grade (Grade 3), the correlations ranged from .60 to .80. Wiley and Deno (2005) and Pressley, Hildren, and Shankland (2005) have reported lower correlations (.40 to .50).

The finding of a high correlation between wcpm in oral reading and comprehension has had a strong influence on policy and practice in reading education. Underlying the mandates for instructional practice, assessment, and curricular materials regarding oral reading, there appears to be an implicit assumption that practice in oral reading will carry over to proficient silent reading rates and comprehension. Even with adolescent, struggling readers, the fluency

interventions reviewed by Wexler, Vaughn, Edmonds, and Reutebuch (2008) concentrated on oral reading. This emphasis, even when it has produced higher reading oral rates (which was not always the case), has typically not been reflected in improved comprehension on silent reading tasks.

Critical questions need to be asked, as Valencia, Smith, Reece, Li, Wixson, and Newman (2010) point out, about the use of wcpm as the basis for instructional assignments (e.g., who gets particular tiers of an intervention and who doesn't) and for instructional practices (i.e., an emphasis on oral reading activities). As Valencia et al. (2010) have shown, even including a measure of prosody within a wcpm assessment or varying the length of time produced stronger predictors of comprehension. The findings of Valencia et al. also point to the need for considering the changing relationship between wcpm and comprehension with developmental and proficiency levels. Within their study of second, fourth, and sixth graders, they found that the correlation between wcpm and comprehension decreased as students' proficiency increased.

In addition, the limitations of correlations need to be remembered. A high correlation does not impute a causal relationship between two variables. Further, when a variable (as is the case with wcpm) has a deviant range, the magnitude of correlations is affected (Valencia et al., 2010). In particular, a high correlation does not mean that two processes are identical. While there are shared processes such as automatic recognition of words, there are significant and not-so-subtle differences between oral and silent reading processes. The most obvious is the role of vocalization. Whereas overt vocalization can be an impediment in silent reading, it is the outcome in oral reading. Every word needs to be read in an oral reading context, whereas readers can use context to grasp the meaning of words that they cannot pronounce while reading silently (Nagy, Anderson, & Herman, 1987).

Another significant difference lies in support for staying with the task. Oral reading involves external supports such as the teacher or a recording device. These external supports mean that students' attention to the text is ensured. They can't move their eyes away from the text for several minutes and daydream. They cannot skip over a page or two that looks disinteresting or too difficult. In silent reading, individuals do not have external supports. Students need to learn to persevere as well as monitor what they are reading if they are to comprehend texts that they are reading silently. Monitoring strategies become particularly critical when background knowledge is limited, a circumstance that is often the case for less proficient readers (McKeown, Beck, & Blake, 2009).

As scholars have observed (e.g., Pearson, 2006; Pressley, Hildren, & Shankland, 2005; Rasinski, 2006; Samuels, 2007), instruction that aims at increasing students' wcpm without attention to comprehension has the potential to adversely affect comprehension and knowledge acquisition. The development of proficient silent reading strategies and habits, including comprehension-based silent reading rates, likely require unique experiences and instruction. We move next to studies of the nature of current reading instruction to determine attention given to comprehension-based silent reading rates.

Attention to comprehension-based silent reading rates within most current instructional programs

The presence (or lack thereof) of opportunities to read silently in school predicts reading achievement (Foorman, Schatschneider, Eakin, Fletcher, Moats, & Francis, 2006; Guthrie, Schafer, & Huang, 2001; Taylor, Frye, & Maruyama, 1990). Most students, however, do not spend substantial periods of their school day reading. In the 1980s, Gambrell (1984) reported that students read approximately 14 minutes daily. A decade later, Foertsch (1992) documented

similar amounts of reading. A decade after that, a survey by Donahue, Finnegan, Lutkus, Allen, & Campbell (2001) showed that fourth graders reported, on average, reading 10 or fewer pages per day in school and for homework which translates into approximately 8 to 12 minutes of daily reading.

In a recent analysis of how much time during a 90-minute reading block was spent reading texts, Brenner, Hiebert, and Tompkins (2009) found that students spent an average of 18 minutes reading text—20% of the reading period. Half of this time was spent reading orally and half was spent reading silently. The 90-minute reading periods were spent on a variety of activities such as lessons on elements of texts or words, playing word games, and completing workbook pages. Students' time in engaged reading, however, was limited. Even within the time that students spent reading in a single school day, the time devoted to any one text was typically short. Students might read a story about a boy writing to his grandmother in Korea in the large-group, teacher-directed period, an excerpt of text about a basketball player in the small group directed by their teacher, and a fantasy about woodland creatures during partner reading.

Since the teachers in the Brenner et al. study (2009) were expected to stay with the guidance in the teachers' guides of the core reading programs, Brenner and Hiebert (2010) examined recommendations for opportunities to read within these guides. The third-grade editions of six leading core reading programs provided an average of 15 minutes of reading volume per day, ranging from approximately 10 to 24 minutes. The findings of the observational study, then, reflected the recommendations in the teachers' guides.

When students do have opportunities to read silently, there appears to be little scaffolding of the task. As the report of the NRP (NICHD, 2000) concluded, opportunities to read that lack structure and support often fail to produce the hoped-for outcomes. Without appropriate structure

and support, students often engage in what some teachers have called “fake reading” during SSR (Griffith & Rasinski, 2004). While the structuring of recreational reading is critical to its success, scaffolding the processes of proficient silent reading would be expected to occur during reading periods, not recreational reading times.

In their examination of opportunities to read recommended in these programs, Brenner and Hiebert (2010) also analyzed teachers’ guides for differences in types or amounts of reading opportunities for students of different proficiency levels. We might expect that at the third-grade level—the focus of that analysis-- particular forms of scaffolding might be provided for struggling readers. For example, students who are not adept at reading on their own might be assigned accessible texts and monitored more frequently by the teacher. That was not the case in the core reading programs. Low-performing students were given the same texts for the same periods of time as their higher-performing peers.

When differentiations are made within interventions, it appears that practices can discourage attention to comprehension-based silent reading rate. Rather, an underlying assumption appears to be that it is decoding skills, especially as represented by phonological deficits that require attention (see, e.g., Wexler et al., 2008). The assumption that low-performing students lack decoding abilities leads to mandates such as that of the California State Board of Education (2006). Curricular materials adopted by that state for interventions aimed at struggling readers in grades four through eight must provide approximately 9,000 words of decodable text, including two decodable reading selections for each of the 44 sound-spelling correspondences. Such texts are typically short and the instructional routines emphasize oral reading (Wexler et al., 2008). For example, in one of the currently approved programs for struggling middle-school readers in California, the texts in the comprehension component are

typically 60-80 words long (Engelmann, Osborn, & Hanner, 2002). Participation with such texts is unlikely to develop the strategies of proficient, independent reading. When reading is tedious, students are less likely to read outside of school as well (Anderson, Wilson, & Fielding, 1988). At the same time, their more proficient peers are enriching their knowledge and vocabularies. As Stanovich (1986) described it, the rich get richer and the poor get poorer.

Experimental Evidence on the Instruction of Comprehension-Based Silent Reading Rates

There are increasing indications of the kinds of scaffolds that can support the development of effective silent reading habits among readers. This research literature is not extensive by any means but, over the last several years, a handful of studies have been conducted. We have chosen three studies—one from each of three developmental levels--primary, middle and high-school, and young adult/college—to illustrate the emerging evidence of how silent reading proficiencies can be guided through instruction.

Study with primary-level students

A study by Reutzel, Fawson, and Smith (2008) indicates that guidance in silent reading in the primary grades can have efficacious effects on fluency, vocabulary, and comprehension. Conducted in the wake of the NRP (NICHD, 2000), Reutzel et al. were interested in whether a well-designed silent reading treatment could produce comparable results to the guided repeated oral reading (GROR) that the NRP had identified as the gold standard for promoting fluency, comprehension, and vocabulary. Since the studies within the meta-analysis had primarily used oral reading measures in establishing effects on students' rate, comprehension, and vocabulary, Reutzel et al. used oral reading measures as outcomes. This emphasis on oral reading measures seems like an appropriate one at this transition point in the primary grades when students move

from predominantly oral reading to silent reading. Further, this study is the only experiment with a focus on reading modes that has been conducted since the NRP's report.

The study involved 4 third-grade teachers and their 72 third-grade students. The schools had approximately 35-50% African-, Asian-, and Latino-American students and over half of the students in the schools qualified for free or reduced lunch. Students were randomly assigned to one of two treatment conditions: Scaffolded Silent Reading (ScSR) with monitoring and wide reading of different genres at students' independent reading levels or GROR of grade-level texts with feedback from teachers and peers.

The ScSR and GROR treatments were similar in four ways. First, an equivalent amount of time was spent on core reading instruction and in the experimental conditions. Second, teachers in all four classrooms used the same instructional materials and procedures. Third, all four classrooms used a take-home reading library, records for which were reviewed by teachers weekly to ensure that students were reading 15 minutes daily outside of school. Finally, teachers in both conditions began daily sessions by modeling fluent reading of a text and discussing with students various characteristics of fluent reading.

The two treatments in this study, ScSR and GROR were differentiated on six dimensions: mode of reading, nature of reading, frequency of feedback/monitoring, social nature, source of texts, and text difficulty. On these six dimensions, respectively, the characteristics of the ScSR treatment were silent, wide, weekly, isolated, student-selected, and independent, while those for the GROR treatment were oral, repeated, daily, collaborative, teacher-assigned, and grade-level.

Quantitative results indicated no significant differences between these two forms of reading practice on third grade students' fluency, accuracy, comprehension, or expression with the exception of one significant difference favoring ScSR on expression of a single passage. For these primary-

level students, then, silent reading experiences that had been carefully designed and executed could produce results as efficacious as the guided, repeated oral reading that the NRP (NICHD, 2000) recommended as the means for increasing reading proficiency.

These effects cannot be attributed only to the mode of reading in that five additional variables distinguished the two interventions. Other variables, such as self-selection/teacher-assignment of texts, have been shown to influence students' interest in reading and their sense of agency as readers (Guthrie, Wigfield, Humenick, Perencevich, Taboada, & Barbosa, 2006) and wide reading has been shown to be more efficacious than repeated reading (Kuhn, 2005; Kuhn, Schwanenflugel, Morris, Morrow, Woo, Meisinger et al., 2006). At the same time, the silent reading condition had components that could be argued to be potential challenges for primary-level students such as less teacher monitoring and less opportunity for social interaction. Overall, the components of the silent reading condition describe the typical act of silent reading where readers choose texts to read that are appropriate for them (including text difficulty), read them a single time in a solitary fashion and without continual monitoring. In contexts where teachers worked to ensure that the expectations and conditions were appropriate, primary-level students were able to benefit from time devoted to typical silent reading venues to the same degree as students who spent equivalent amounts of time in highly prescribed reading contexts.

Study with middle- and high-school students

The Reutzel et al. study provides information on the efficacy of silent reading scaffolds that are provided at an appropriate developmental time. This support can be provided in classrooms. As the review of the NAEP data indicated, there are many students who have passed this transition point and have less than efficacious patterns. A search on the internet indicates a variety of programs in digital contexts that have been offered as providing scaffolding for

struggling readers. Features of digital contexts such as the ability to instantaneously change the difficulty of the text in response to comprehension performances allow for precision in scaffolding that is difficult to achieve in a classroom setting or even a tutoring one. While the claims of these programs have, by and large, not been validated, studies are beginning to be conducted, as illustrated by Rasinski, Samuels, Hiebert, Petscher, and Feller (in press). The Rasinski et al. study indicates that consistent participation in a digital context over a school year can result in improved performances on high-stakes assessments—both a norm-referenced test (NRT) and a criterion-referenced test (CRT).

The study was conducted in a large, urban school system. To deal with the historically poor performances of students in this district, schools were offered several supplementary reading programs. The study was conducted in 23 schools with students in grades four through ten where a web-based reading intervention, Reading Plus (RP) was implemented. In some of these schools, only the low performing students were assigned to RP. Other schools chose to use RP with specific sub-populations or grade levels. Students not assigned to RP may have used Scholastic's Read 180 and/or Renaissance Learning's Accelerated Reader. The study had a significant portion of African-American (46%) and Latino-American (50%) students. Sub-populations in the sample included Learning Disabled (LD) (6%) and English Language Learning (ELL) students (3%).

Over the six months of the study, students participated in either two 45-minute sessions or three 30-minute sessions weekly. Since students move through lessons in individual computer environments, differences in length of the individual sessions do not influence content coverage. During their first RP session, students complete an assessment that determines their independent silent reading rates, comprehension, and vocabulary with texts at varying difficulty levels.

Performances on these assessments form the basis for the instructional paths that students then follow in the intervention.

A typical lesson contains two warm-up activities that are intended to build foundational skills such as attention, left-to-right tracking, perceptual accuracy, and visual memory. The heart of each lesson is a structured silent reading activity where students read texts at their instructional reading level from a database of 600 selections ranging from preprimer to adult level texts. Each reading of a text is followed by comprehension questions (literal understanding, interpretation, analysis, evaluation and appreciation). The digital environment ensures that adjustments in instructional experiences are made continually based on student performances. For example, the lengths of segments within texts are increased or decreased based on a student's comprehension and silent reading rate.

Since the aim is for students to participate in the program for a minimum of 30 hours (approximately 40 45-minute sessions), students were divided into two groups: those who received 40 or more lessons over the course of the school year and those who received 39 or fewer. While there are serious limitations to employing gain scores to test for differences between groups, Rogosa (1995) has shown that the gain score is as reliable as a covariance-adjusted score, and is more appropriate to use in quasi-experimental studies than posttest only. For all grades but Grade 9, the 40+ lesson intervention students had significantly higher performances on the NRT and for all grades but 4 and 10, significantly higher performances on the CRT. Effect sizes were established in relation to performances of students within the same schools who did not participate in this particular intervention. Effect sizes by grade level ranged from .03 to .34 (small to moderate in magnitude [Cohen, 1988]).

In relation to the CRT, mean gain scores for students who received 40+ RP lessons were

greater than the statewide and district level gains at each of the seven grade levels. In several cases, the gains were substantial in their magnitude as was the case in grades 6, 7, and 8 where mean gains on the CRT were more than double the gains of nonparticipating students. Typically, low achieving students growth for a years worth of instruction is less than what is expected for average and high achieving students. Middle- and high-school students who are struggling readers are often inconsistent in their performances on transfer measures after an intervention (Torgesen, Myers, Schirm, Stuart, Vartivarian, Mansfield, Stancavage, Durno, Javorsky, & Haan, 2007; Wexler et al., 2008). That was not the case with this intervention where students performed substantially better on the high-stake tests of their state that were conducted in typical paper-and-pencil, large-group contexts. The fact that the yearlong gains made by the primarily low-achieving students in this silent reading intervention were substantially larger than the mean overall gains at the state and district levels is noteworthy.

Study with college students

The final study that we present as support for the thesis that comprehension-based silent reading skills can be supported was conducted with college students. Radach, Vorstius, and Reilly (2010) initiated this study after identifying a proliferation of speed reading programs promoted on the internet but finding that the few available studies on these programs typically had arrived at unfavorable conclusions (e.g., McNamara, 2000). The proliferation of programs, Radach et al. argued, illustrate a fascination by the general populace with improving their reading rates. Of claims within 12 programs promoted on the internet, Radach et al. al. identified two that have some substantiation in research on reading processes and designed an intervention around these processes: decreasing inter-word regressions and attending to meaning units.

The experimental group received acoustic feedback following inter-word regressions. To support attending to meaning units, a word group (typically a phrase) of two to three words was highlighted by alternating the color of the text on the computer screen. A comparison group was simply told to increase their reading speed. After a session of establishing baseline comprehension-based silent reading rates, the two groups participated in four training sessions. Each session consisted of two cycles of learning and practice. In the learning part of the cycle, students received feedback (acoustic feedback and phrasing support in the experimental group and encouragement to slow down or speed up in the comparison group). The feedback was intended to support a 20% speed increase during each of the four sessions. This feedback was provided during the learning cycle at the end of each page of text when comprehension questions were also provided. In the practice phase of a cycle, feedback was not provided.

The pre- and posttest consisted of eight passages of texts, each about 400 words long (3200 words in all). All were nonfiction pieces on popular science topics. To assess comprehension, eight statements per passage (64 in all) were presented for verification of three levels of text representation: verbatim, paraphrases, and inferences.

On average, participants had baseline reading rates of approximately 198 words per minute (wpm) (comparison) and 185 wpm (experimental). In the posttest, wpm were 365 (comparison) and 350 (experimental). The comprehension of the experimental group increased approximately 3%, while the comprehension of the control group decreased about 6%. In the specific training group, regressive saccades back to earlier words dropped by 50%, indicating that this aspect of the training was very effective. However, the specific speed training techniques produced no advantage over the group with the unspecified fluency training (i.e., “read faster”).

A point to be emphasized is that reading speed of even the fastest reader in the sample did not exceed 700 words. Approximately one in five of the participants (22%) read at 400 wpm or higher. But overall, the students read at approximately 350 wpm. Another observation is that the college students' baseline rates of approximately 190 wpm was considerably lower than the average rate reported by Taylor, Frankenpohl, and Pettee (1960) for college students—280 wpm and considerably below the optimal rate that Taylor et al. claimed could be attained with training—480 wpm. The training brought the college students in 2010 to the range of college students *before* training in 1960.

Comprehension-Based Silent Reading Rates:

Emerging Answers and Remaining Questions

Comprehension-based silent reading rates, Radach et al. (2010) argue, represent a nexus in understanding the roles of and relationships between word recognition and comprehension. Knowledge about this topic is of more than theoretical interest. This knowledge is also critical in understanding how students can be brought to the levels that are required for careers and community participation. The review of research showed that answers are emerging on this topic. Even so, information on how comprehension-based silent reading rates develop and also on the nature of comprehension-based silent reading performances of students of different proficiency levels is limited. The only consistent form of evidence on the latter comes from the NAEP. Since that assessment provides only a single text level and does not distinguish across different kinds of tasks in the report of results, we know what it is that below-basic and basic students cannot do but we do not know what it is that they can. To create viable instructional programs that support readers' silent reading capacities, descriptions of the tasks and texts with which students are successful also require attention.

Another consistent finding from the research is a consistently high correlation between wcpm from oral reading assessments and performances on silent reading tests. This finding has been the justification for a heavy emphasis on oral reading activities and assessments in instruction. While oral and silent reading share processes, there are also distinctions in the two processes. Further, the heavy emphasis on oral reading has not resulted in the needed increases in comprehension-based silent reading rates.

Systematic instruction that supports students' capacities as readers who comprehend texts at optimal reading rates is not evident in typical classrooms or in the guidance for teachers within the core reading programs that have been promoted as part of state and federal mandates. A recent, albeit small, group of studies is beginning to show how such systematic instruction can be provided. While the evidence is limited in scope and size at this point, these studies indicate that there are instructional mechanisms that can support students in developing the comprehension-based silent reading rates needed for the 21st century.

While the handful of studies that have emerged over the past several years point to potential solutions, the questions regarding comprehension-based silent reading rates far outweigh the answers. These questions need to be addressed before widespread changes in practice can occur. While there is clearly a serious gap in current levels of comprehension-based silent reading rates relative to the demands of the digital-global age, moving swiftly to implement solutions such as increased silent reading time or interventions that encourage students to "read faster" are unlikely to make the changes that are needed. While most students would likely benefit from higher allocations of time devoted to silent reading during the school day, silent reading events require careful design. In the Reutzel et al. (2008) study, students were not simply told to sit at their desks and to read silently for extended periods of time. Their

teachers made numerous shifts in the design of reading events to support students' silent reading. Further, Reutzel et al.'s intervention took a very different form than that of Rasinski et al. (2010) with middle and high-school students. The struggling readers in the Rasinski et al. study participated in a program with an underlying platform that made it possible to change levels of text within a single session based on students' comprehension and reading rate. This pattern is quite unlike the "one size fits all" perspective that is often promoted by mandates or guidelines, as was the case with the SSR model of Hunt (1970) where students, regardless of developmental or proficiency level, were given the same treatment.

While the research to date is insufficient to provide guidelines for practices, the initial findings suggest questions on which research programs can be built. We describe the basis and potential directions for two critical questions: (a) what are optimal comprehension-based silent reading rates that are fairly consistent across tasks and texts? and (b) when and in what contexts should comprehension-based silent reading rates be developed?

What are optimal comprehension-based silent reading rates?

There appears to be a strong tendency among people to want to "break the barrier" in tasks where speed is involved, as is the case with silent reading. Evidence from well-designed studies by reputable researchers can help to guard against this tendency in instruction on silent reading proficiencies. In the digital-global age where the amount of information has increased incredibly, the ability to sustain comprehension-based silent reading rates over extended text is a necessity. But the emphasis needs to be on sustaining meaningful comprehension at appropriate rates across numerous settings, not simply the rate at which students are reading. Carver (1990) emphasized the need for considering how readers' adapted processes and rates to different kinds

of texts and in different tasks. However, few definitive descriptions are available, particularly in the form of norms.

Levels of comprehension with different texts and tasks also require attention. The level of acceptable comprehension in the Rasinski et al. (in press) study was 70%. If students fell below that level, the architecture of the digital platform was such that they were moved to somewhat easier text or text was presented at a slower speed. In the Radach et al. (2010) study, the students in the “read faster” group fell below this percentage. Comprehension levels of 70%, for some tasks, may be insufficient, while for other texts and tasks entirely adequate. The sacrifices in comprehension as a function of rate is, as Radach et al. have noted, a critical area that requires further study.

When and in what contexts should comprehension-based silent reading rates be developed?

In a domain such as playing the piano, which, like reading involves both a cognitive and physical component, practice and development occurs over an extended period of time and as a result of substantial experience. Similarly, support for optimal comprehension-based silent reading rates needs to be viewed as a long-term endeavor with different emphases at different points. In this section, we speculate about when and where scaffolds might be put in place for such a long-term endeavor. We use Chall’s (1983) six reading stages, provided in Table 1, as the basis to distinguish between different phases in reading development.

During Chall’s stage zero, frequent conversations between adults (e.g., parents, kindergarten and preschool teachers) and children about reading likely occur, including the reading of books such as *I can read with my eyes shut* (Dr. Seuss, 1978). However, systematic experiences in attending to silent reading strategies and rates would not be expected to be a focus until children begin formal instruction. As students move into the first of Chall’s stages, short

periods of time would be devoted to reading “just with your eyes.” These periods would be carefully paced and monitored and would not be expected to stretch for the long periods of time that advocates of readers’ workshop (Hagerty, 1999) or SSR (Hunt, 1970) recommended. As students’ reading proficiency increases in stage two, silent reading episodes would be expected to increase somewhat (although, again, not to the extremes recommended in the readers’ workshop and SSR literature). As Reutzel et al. (2008) demonstrated, there are numerous elements of these events that require attention, including (but not limited to) the length of time, teacher monitoring, appropriate texts, and clarity about the anticipated outcomes of the event.

It is in stages 3 and 4 where the careful orchestration of silent reading events in classrooms is likely to have the greatest pay-off in terms of supporting optimal reading rates. Third to fourth grade has been described as the point where silent reading processes have developed sufficiently to be more efficient than oral reading (Juel & Holmes, 1981). For students who are vulnerable as readers, earlier in this span of time is likely to support their development of appropriate comprehension-based silent reading rates rather than later. In addition to the careful crafting of texts and tasks in classroom settings, the digital contexts that have added demands on literacy proficiencies may be one of the primary means for supporting more efficacious silent reading proficiencies. The architecture of digital programs can be designed so that the length of time, the accessibility of text, and the tasks can be carefully adjusted to students’ growing capacity as readers.

While to date, it is frequently the struggling readers who participate in digital contexts, the effects of such participation for students who are proficient readers require attention, particularly when silent reading rates are beginning to stabilize. Once individuals reach stages 5 and 6, making changes to baseline comprehension-based silent reading rates is likely challenging

and difficult. Consequently, projects that determine different configurations of experiences in such contexts, especially at stages 3 and 4, should be a priority in research on reading for understanding. Such an emphasis is particularly needed during a time when a theme within the private and public sector is to increase the preparedness of individuals for the marketplace and communities of the digital-global economy (Common Core Standards Initiative, 2010).

Conclusion

The need for efficient silent reading habits for success in the digital-global age is unarguable. There is emerging evidence that these habits can be enhanced through scaffolding, both on the part of teachers and from digital supports. These supports look quite different than the SSR that Hunt (1970) advocated. This structuring can begin when students are in the early stages of reading (Reutzel et al., 2008). Further, it is highly likely that the process is an on-going endeavor, extending through the elementary grades and into middle and high schools as students encounter new genres and content. At least for the students who depend on schools to become literate, good silent reading does not just happen as a result of an emphasis on oral reading fluency training. For many students, good silent reading habits require that they participate in structured silent reading experiences that model efficient reading.

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Footnote

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Table 1

Chall's (1983) Reading Stages

Stage	Primary Task	Grade Span
0	Prereading	Through kindergarten
1	Initial reading or decoding	Grades 1-2
2	Confirmation, fluency, ungluing from print	Grades 2-3
3	Reading for learning the new	Grades 4-8
4	Reading for multiple viewpoints	High school
5	Construction and reconstruction: A world view	College