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Building Better Bridges: Teaching Adolescents Who Are Poor Readers in Eighth Grade to Comprehend History Text

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Solving the Dilemma of Time: Special Education Teachers Integrating Reading with U.S.

History

Abstract

This research replicates an earlier study (Author, year) and extends it by shifting instructional responsibility from researchers to special education teachers, who implemented reading instruction that included multisyllabic word decoding, academic vocabulary, and three comprehension strategies (generating main ideas, comparing and contrasting people, and events, and identifying cause and effect relations) with their intact 8th grade history classes, using history text as the reading material. Participants included 73 8th grade students with disabilities (68% with Learning Disabilities; 72% male, 45% English Language Learners) and four teachers. Compared to students with disabilities in typical special education history classes, students in the treatment outperformed controls on researcher-developed measures of word- and text-level reading comprehension, as well as in the history content that students in both conditions studied. Across reading strategies, implementation of "nearly all lesson components" ranged from 72% to 83%.

Solving the Dilemma of Time: Special Education Teachers Integrating Reading with U.S. History

Difficulty implementing research-based interventions effectively in schools is legendary (Durlak & DuPre, 2008; Landrum, Cook, Tankersly, & Fitzgerald, 2008). Obstacles include coordinated and well attended professional development (Brownell et al., 2009; Lawrence, Crosson, Pare-Blagoev, & Snow, 2015), competing goals between school systems and researchers (Leko, Roberts, & Pek, 2015), and time in an already packed school day to implement intensive interventions (O'Connor, Beach, Sanchez, Bocian, & Flynn, 2015). These impediments intensify in secondary schools as teachers attempt to implement new instructional techniques and curricula.

Nevertheless, when substantial proportions of secondary students experience reading difficulties, these obstacles must be overcome. Students with learning disabilities (LD) often have reading difficulties that persist into middle and high school. Without reading intervention, they may fail the content area classes necessary for high school graduation (Swanson & Deshler, 2003), leading to a host of personal lifelong and societal problems (Blackorby & Wagner, 1996). Special education teachers of content area courses are caught in a quandary: Mastering content tends to require strong reading skills in expository text, and secondary teachers may lack the pedagogical knowledge and instructional time for making content area text accessible to students with LD. The study we describe here addresses the quandary by integrating reading skills with U.S. History content and helping teachers to use this integrated instruction in their intact special education history classes.

We selected U.S. History due to its cyclical nature in schools, which most often includes an introduction in the late elementary grades, deepening understanding of key events in middle

school, and linkage between past and present historical events in high school. Thus, we expected

by 8th grade that students would have cursory background knowledge of some historical events

and people for applying taught reading skills and history content to the integrated instructional

package described below. In many school districts, 8th grade is also the last opportunity before

high school to improve students' ability to understand and analyze complex text—skills essential

for passing high school courses.

Researchers have reached some consistency regarding instructional practices that succeed

in improving reading ability of adolescent struggling learners (Kamil, Borman, Dole, Kral,

Salinger, & Torgesen, 2008; Swanson & Deshler, 2003). These practices include strategies for

reading multisyllabic words and understanding what they mean, and also for integrating words,

phrases, and passages to construct mental representations of what they read (Carlson et al., 2014;

Kintsch, 1988). Instruction in preparatory skills students may need, such as letter patterns,

affixes, and morphemes (i.e., meaningful parts of words) need to be integrated with opportunities

to apply these skills to words that are appropriate for students' age and grade (Ebbers & Denton,

2008). Consider history texts. Morphologically, *abolitionist* comprises *abolish-* (destroy)*, -tion-*

(change a verb into a noun), and *-ist* (one who). Nagy and Townsend (2012) suggest that

morphological strategies might help both decoding and comprehension.

Moreover, although middle school materials include exposure to academic vocabulary,

they rarely include the conversational opportunities students who are poor readers need to

acquire and apply new word meanings (Baumann, Kameenui, & Ash, 2003; Hairell et al., 2011),

and these opportunities may be essential for generalization of improved vocabulary to

comprehension (Beck, McKeown, & Kucan, 2013; Harniss, Caros, & Gersten, 2007). When

students acquire information about a word's meaning, connections form to other words and

experiences related to what has been learned (Cromley, & Azevedo, 2007; Perfetti & Stafura, 2014) to improve overall comprehension.

The ability to read and understand expository text is assumed of students in middle school content classes; however, students with LD struggle across multiple dimensions of basic and advanced reading comprehension (Cain, Oakhill, & Bryant, 2004). Several methods of instruction have been developed to teach reading comprehension, and many have been successful for students with LD, such as finding main ideas (Jenkins, Heliotis, Stein, & Haynes, 1987), comparing and contrasting information (Gersten, Baker, Smith-Johnson, Dimino, & Peterson., 2006) and identifying causes and effects of events (Williams, Stafford, Lauer, Hall, & Pollini, 2009). Instruction in comprehension strategies often relies on use of graphics or visual representation to impose structure through organizing and sequencing information (DiCecco & Gleason, 2002). Visual displays help students organize chunks of reading visually (e.g., cause/effect or compare/contrast graphics) and connect implicit relations between ideas and details.

Teaching *processes* for assimilating information involves instructing students directly in how to recognize key text structures and approach problem solving (i.e., generalizing to novel situations) with that process (Gajira, Jitendra, Sood, & Sacks, 2007). The complexity and variety of text structures increase as students advance in school, so strategic choices must be prioritized. Overall, the goal of these strategies is to assist poor readers to interact with expository text in ways that enhance their understanding of approaches to reading in particular content areas—in this case U.S. History--as well as in reading generally.

Over a two-year period, our research team developed a reading intervention, BRIDGES (Building Reading Interventions Designed for General Education Subjects), for improving

reading skills through U.S History content (Author, year). The intervention included strategies for improving decoding of multisyllabic words, academic vocabulary linked to historical events and concepts, and the comprehension strategies of generating main ideas, writing compare and contrast paragraphs, and identifying cause and effect relations, all of which are central to understanding history (Wineburg & Martin, 2009). Following development and testing of each strategy in small groups with instruction delivered by research staff, we asked U.S. History special education teachers to implement 15 minutes of the new strategy for four consecutive days as part of their typical history period. We used our observations of teacher implementation and interviews with the implementing teachers to refine the intervention for feasibility in their classrooms.

The current study takes two forms. In one sense, this work is a replication of the study conducted in the previous year (Author, year) in new schools and classrooms. Replication is an essential step in building a research base of effective practices, both with similar participants and conditions for verifiability, and with extensions to new participants and conditions to understand the extent of generalizability (Cook & Odom, 2013; Lemons, 2009). This study employed the same instructional activities as researchers implemented in the earlier study.

In another sense, this study addresses the research-to-practice gap by testing teachers' use of these procedures in real world classrooms. The ultimate usefulness of this work rests not only on a process for improving reading skills for students with LD (our goal for the first two years of this research), but the suitability of the instruction for teachers in special education (SpEd) classrooms. These teachers are dealing with the dilemma of time: they are required by district and state standards to address U.S. History content; however, their students with LD lack the reading comprehension skills to understand and analyze complex text. By integrating reading

and history instruction (see also Vaughn et al., 2013, in general education classes), we hoped to ease this dilemma by providing teachers with tools that strengthen both reading comprehension and learning of U.S. history during the same instructional period.

During Years 1 and 2 of this 3-year project, following researchers' development of lessons, small-group teaching, and revision phases, SpEd teachers field-tested one target lesson component for four days. This implementation was both short-term (4 days) and focused on only one of the three intended lesson components (i.e., multisyllabic word decoding, academic vocabulary, or one comprehension strategy). As noted earlier, the iterative development of the strategies and lessons during Years 1 and 2 depended on observations and feedback from U.S. history SpEd teachers who piloted segments of the lessons. What we learned was incorporated in the next cycle, promoting continual improvement in lesson feasibility, but not an actual test of lesson feasibility.

In the current study, SpEd teachers implemented three 12-day cycles of instruction, each focused on one strategy for comprehension. All cycles included multisyllabic word decoding and practice with academic vocabulary central to the history unit being studied. Our research questions were concerned with both student and teacher outcomes. We wanted to know the gains made by students in the target reading skills in taught and untaught history contexts, and the degree of fidelity with which minimally coached teachers could implement the lessons in their intact classrooms. These questions address replication (i.e., of student gains in Year 2 when lessons were fully implemented by research staff) and extension to real world contexts (i.e., student gains when lessons are taught by 8th grade special education history teachers).

Method

Participants

      BRIDGES students, schools, and teachers. Eighth grade students were selected from four middle schools (Grades 6 through 8) if they were receiving special education services for U.S. history (i.e., a class that enrolled only students eligible for special education). Three of the four schools had only one 8th grade U.S. history SpEd class period, so schools, rather than classes, were randomly assigned to BRIDGES instruction or business as usual (BAU) conditions. The US history SpEd teacher in each class delivered either BRIDGES or BAU instruction to all students in these classrooms and group-administered measures were completed by all 73 students. Parents were informed of the study and were allowed to have their student opt out of the group assessments. Only one parent exercised this option.

      Although instruction and group assessments were consistent in these five classes, parental consent and student assent were sought for students to receive individualized assessments. For schools assigned to the intervention condition, the percentage of positive parental consent was 58%; schools assigned to BAU had a 38% positive return. Students with positive parent permission who were included in individualized assessments were not significantly different from their classroom peers on reading ability as measured by the Test of Silent Contextual Reading Fluency (described later) $F(2, 72) = 1.48$, $p = .23$.

      Of the 34 students with parental permission for individual testing, 20 were in classes receiving BRIDGES instruction (TX) and 14 were in BAU classrooms. Across conditions, 77% of students were eligible for SpEd under the category of Learning Disabilities. Other categories included Speech/Language (10%), Other Health Impairments (9%), and Autism Spectrum Disorder (4%). Males comprised 72% of the students and slightly under half (45%) were

English Language Learners, with Spanish being their home language. Poor reading ability was verified with the Woodcock-Johnson Tests of Achievement (described later), which yielded a reading comprehension grade-level equivalent score of 3.8. Table 1 details means and standard deviations by condition for the reading subtests of the Woodcock-Johnson and Test of Silent Contextualized Reading Fluency, as well as the Wechsler Abbreviated IQ Scale. The two groups did not differ significantly on any of these measures.

Delivery of Instruction

BRIDGES instruction occurred in three 3-week cycles in the fall, winter and spring of the academic year and was delivered by the U.S. history SpEd classroom teachers to their intact classrooms. The U.S. history periods for both conditions were 50 minutes long, and class size ranged from a low of 12 to a high of 21 students. Lessons were delivered on consecutive days of the week, with one 'off day' to accommodate middle school schedule disruptions. BRIDGES lessons were designed to be delivered in 20-25 minutes; however, teachers were allowed latitude to use more time if students needed additional support.

We provided teachers with support for BRIDGES instruction with four elements: in-school on site teacher training during three one-hour-long meetings; a detailed teachers' manual with suggested scripting for lessons; illustrated PowerPoint slides; and weekly in-class observations with feedback. The teacher training included discussion of the BRIDGES instructional goals, the nature of direct, explicit instruction, and direct modeling and practice using the strategies. This pattern was repeated when observer/coaches met with teachers to discuss lesson delivery and upcoming lesson materials.

The history content of BRIDGES was agreed upon mutually by BAU and BRIDGES teachers in the summer prior to implementation. Teachers compared pacing guides and selected

three broad history units based on the amount of time devoted to each (12 – 14 days) and the key concepts emphasized. Cycle 1 included the creation and structure of the U.S. government; Cycle 2, The Leaders of the New Republic; and Cycle 3, Manifest Destiny and subsequent events. Mutual selection of units helped ensure that all students received comparable instruction in history content.

A predictable pattern was scripted for the daily lessons: five minutes of decoding practice using multi-syllabic words pulled from the text; five minutes of vocabulary instruction in academic words with utility in and outside of the history text; and 10 minutes of a comprehension strategy (i.e., either main idea, compare and contrast, or cause and effect relations) that required reading and responding to brief history paragraphs.   Cycle 1 focused on generating and writing the main idea, Cycle 2 on writing a comparison-contrast paragraph, and Cycle 3 on identifying cause and effect relations. Consistently across strategies, lessons used history texts (primary source, text book, and history websites) that were modified to a lower reading level and T-chart graphics to help students summarize their analysis of the text (Bulgren, Deshler, & Lenz, 2007; Williams et al, 2009). As the lessons within each cycle progressed, the complexity of student response and the difficulty of text increased. Given that ten minutes is a brief time to read, analyze and then respond to a paragraph, students read, marked up and analyzed the paragraph on the first day, then reviewed, summarized and responded to the paragraph(s) on the second day. A brief orientation for each segment of the lessons follows. More extensive descriptions of each part of these lessons may be found in Author (year) and in the on-line appendices.

Word study. Students were taught to break down and blend together multisyllabic words using a combination of "Every syllable has at least one vowel (ESHALOV)" and BEST

(O'Connor, 2014), which share features with Lenz and Hughes' (1990) DISSECT. Students were given a set of four new words and 1 review word each day. At least one of the decoding words had a history context and the others presented a similar pattern of affixes, morphemes, and vowel blends. Students watched a teacher model one word, worked together as a group on the second word, then independently worked through the remaining three words, followed by a group review. Students were encouraged to use this strategy when reading independently. No specific decoding strategy was taught in BAU classrooms; however, BAU teachers encouraged students to use Read180 (Hasselbring, 1999) strategies for decoding.

Academic vocabulary instruction. Selection of vocabulary words was based on words that appeared in upcoming history text and words in teacher and school academic vocabulary lists, cross-referenced with Biemiller's *Words Worth Teaching* (2010) and Coxhead's Academic Word List (2000). Ten words were selected for each of 3 cycles and both BAU and BRIDGES teachers agreed upon the word selection. The instruction was interactive and iterative and included the introduction of the word with a synonym and student friendly definition, meaningful illustrations and scenarios in which to practice the word, and multiple opportunities to use the word in different contexts (sentence stems, forced choice, generating sentences in response to prompts) as recommended by Beck et al. (2013) and Lawrence et al., 2015). These words were not taught explicitly by BAU teachers; however, we observed teacher's real time explanations to students as the words appeared in text.

Main idea. After reading a paragraph of modified text, students analyzed the paragraph to identify the subject and action of *each* sentence. The modified paragraph made these components explicit for the students with consistently named subjects placed in a predictable pattern and concrete actions taken by subjects. After marking their paragraphs, students

transferred this information to a T-chart labeled Subject and Action(s). As lessons progressed and readings began to resemble real texts, teachers modeled for students how to identify inferential references to the subject, abstract subjects, and how to eliminate a subject or action of minor importance.

Students were responsible for combining the subject and actions into one main idea sentence, moving from stem sentence starters to independent sentence generation. BAU teachers did not specifically teach students how to analyze text for the main idea, and tended to address main ideas in a more global fashion: "What is going on here?' or to *tell* students the main idea and provide supporting evidence with specific examples from the textbook.

Compare and contrast. Compare and contrast instruction extended main idea instruction because students needed to identify two subjects and their associated details inb order to compare and contrast actions, characteristics, or events. Two paragraphs about each subject were presented to students to read and analyze, which increased in reading load, so each compare and contrast set was completed over the course of two days, during which students read the two sets of modified paragraphs and then wrote a single compare and contrast paragraph.

Students transferred the information from the marked paragraphs to a 3-column T chart: students labeled the far right and left columns with the subject of each paragraph, then transferred actions/characteristics to the appropriate column. Teachers modeled this process and helped students note in the middle column whether each action was similar or different. As with the main idea, the modified text, with parallel sequence and categories, made the similarities and differences explicit initially for students. The text became more authentic in later lessons (e.g., abstract concepts, non-parallel listings of ideas, distractor facts), which required additional support and modeling from the teacher. Teachers provided samples for a clear model of expected

writing. After multiple opportunities with guided practice, teachers released students to complete paragraphs independently. BAU teachers did not provide direct instruction in this area; however, they sometimes asked students to complete an assignment where two areas or people were compared. In these cases, BAU teachers provided one or two example sentence(s) before requiring independent work.

Cause and effect relations. Cause and effect is often considered the 'heart' of history; however, textbooks rarely explain these relations in a direct manner. Williams et al. (2009) found that 'signal words' provided a means for students to connect these relations. The signal words (e.g., therefore, because, due to) alert the reader to a cause or effect, which can be particularly important when they encounter text that: (1) confuses the temporal relationship by identifying the effect first, then the cause, (2) has multiple causes and one effect, one cause and multiple effects, or multiple causes and multiple effects, (3) has an effect that becomes a cause for later events, (4) provides extraneous information to the cause effect relationship, or (5) presents information about which students have little background knowledge.

Students were taught first to recognize signal words and whether these indicated a cause or an effect. Authentic text was modified to assist in this recognition. Teachers modeled circling the signal words in the text, and then underlining and labeling the cause or effect that preceded or followed. Students marked the paragraphs similarly as a form of concrete analysis, with multiple opportunities for guided practice.

Teachers modeled for students the use of a T-chart labeled with cause and effect. Initial student responses were framed in more familiar questions (if this was the cause, what was the effect? or What was the cause of _____ ?). Students began this task independently by the second week, but as the text and demands became more difficult, scaffolding and additional modeling

from the teacher were still provided. Sample scripts for these procedures are available from the authors. Conversely, BAU teachers used the terms cause and effect; however, they did not teach a specific strategy for identifying cause and effect and in particular did not teach students to identify signal words. However, the language of cause and effect was present in their lesson presentations and in tasks posed to students on a regular basis.

Instructional Fidelity

In this study, instructional observations sought to document the extent to which BRIDGES teachers used (and used well) the essential elements of BRIDGES instruction, and the extent to which BAU teachers used similar elements during their own teaching. All teachers were observed teaching under BAU conditions four times during the academic year. Recall that TX teachers implemented 36 BRIDGES lessons. BRIDGES teachers audio recorded all of their lessons while teaching, and they were observed a minimum of three times for each cycle (e.g. 9 observations). Dual observers participated in 10% of the observations to establish inter-rater reliability.

The observation recording log (described later) that was used for both observed and audio recorded lessons included consistent ratings for word study and academic vocabulary, but also varied by cycle to assess essential elements of each reading comprehension strategy. The logs also included elements of teaching that would be expected in a SpEd classroom: organization, teacher expertise in content, student on-task behavior, positive learning environment, and classroom management.

<div align="center">Measures</div>

The reading portion of the **Woodcock-Johnson Tests of Achievement III** (WJ-III; Woodcock, McGrew, & Mather, 2001) was administered to students prior to intervention to

describe students' reading ability and confirm that participants had severe reading comprehension difficulties. The Word Identification subtest requires students to read aloud from a list words that increase in difficulty. Word Attack measures decoding of increasingly difficult nonwords, Picture Vocabulary requires students to point to pictures and name objects, and Passage Comprehension requires students to read short sentences or passages (increasing in difficulty) and provide a contextually appropriate word for a deletion within the passage. Across subtests, reliabilities ranged from .81-.94.

The Test of Silent Contextual Reading Fluency (TOSCRF; Hammill, Wiederholt, & Allen, 2006) is a norm-referenced test intended to measure general silent reading ability. The TOSCRF was group administered at the beginning and end of the year, alternating between equivalent forms, to students in BRIDGES and BAU classrooms. Students read short sentences arranged in rows without spaces or punctuation between the words, then draw a line between the word boundaries in 3 minutes. Reliability ranges from .82-.99, and validity from .61-.89.

Wechsler Abbreviated Scale of Intelligence (WASI, Wechsler, 2011). The WASI is a norm-referenced intelligence test comprising four subtests: Vocabulary, Block Design, Similarities, and Matrix Reasoning. Two of these subtests (Vocabulary and Matrix Reasoning) comprise the abbreviated scale for an estimate of cognitive ability. Across subtests, reliabilities ranged from .81-.98, with validity of .66. Means and standard deviations for these measures by condition and time are shown in Table 1.

Experimenter Designed Measures

Decoding. The 20-word decoding lists consisted of a sample of specific words taught during the lessons (n = 10), and transfer words with similar patterns (n = 10). Student responses before and after each instructional cycle were tape recorded for accuracy of scoring. Correctly

reading the word earned two points; reading the word with inappropriate inflection or dropping a suffix earned one point. Scorers double scored 10% of the recordings and reliability and across cycles, the Intraclass Correlation Coefficient (ICC) = .899. Taught and tested word lists are available from the author.

Vocabulary. Students completed group administered multiple choice tests and individually administered open response assessments pre and post instructional cycles. For each set of 10 words taught during the cycle, a multiple choice vocabulary test was developed. Three distractors were shown in addition to the correct choice: graphic, semantic, and far afield. Additionally, individually administered open-response items required students to provide an oral definition and a sentence for each of the target words. Student responses were audio taped and transcribed. Similar to others (Cain et al., 2004; van Daalen-Kapteijns, Elshout-Mohr, & de Glopper, 2001), we developed a 3 point scale (0 = incorrect, 1 = partially correct, 2 = correct) to describe the quality of student-generated definitions.

The scoring rubric was developed during Years 1 and 2 of BRIDGES (See Authors, year for details) with two scorers independently co-scoring 20% of definition and sentence responses and discussing all disagreements. Then, all student definitions and sentences were blinded and scored independently. Adequate inter-rater reliability was found across cycles for sentences and definitions (Cycle 1, ICC .964, .891; Cycle 2, 951, .896; Cycle 3, .962, .939, respectively). Word lists and scoring rubrics are available from the author.

Comprehension. For each of the comprehension strategies--main idea, compare and contrast, and cause and effect—we developed assessments to measure students' directed response to a reading passage. These assessments were administered pre- and post-instructional cycle to students in both TX and BAU conditions. Students were given two passages, one of

content taught during the instructional cycle and one of untaught content. All passages were

pulled from U.S. history textbooks. For the main idea assessment, the passages had an average

Flesch-Kincaid grade level of 8.0 and contained an average of 47 words. For the compare and

contrast assessment, the passages had a Flesch-Kincaid grade level of 7.0 and contained an

average of 90 words. For the cause and effect assessment, the passages had a Kincaid grade level

of 6.1 and contained an average of 90 words.

Rubrics for scoring student free responses were developed during Year 2 (see author,

year). Scorers tested the rubrics on 50 randomly selected tests and co-scored 100 tests together to

develop adequate reliability. Across these tests, percent agreement was over 90%. Then, the

scorers completed blind scoring of all student tests stopping after 100 tests to co-score 10% of

each scorer's tests to determine that adherence to the rubric was maintained. ICCs were

computed for scoring of each of the assessments and are reported below.

Main Idea. Students were asked to generate one main idea sentence using their own

words in response to a silently read passage, one with taught history content and one to measure

transfer (untaught content). Students received points for correctly identifying the subject of the

passage and points for correctly stating supporting details. Additionally, student responses were

scored for a complete and clearly written main idea statement. Across the taught and untaught

passages, inter-rater reliability was excellent (ICC = .97, .99, respectively). Kappa values were

adequate for judgment ratings on clarity of response (K = .74, .84).

Compare and contrast. Students were asked to generate a compare and contrast

paragraph in response to a silently read passage, one with taught history content and one to

measure transfer (untaught content). Students received points for correctly identifying the

subjects, similarities, differences, and acknowledging these in their response (using a signal

word(s)). Furthermore, responses were also scored for completeness, clarity, and structure. Inter-rater reliability was excellent across passages (ICC = .990, .993; K =.86).

Cause and effect. Students were asked to identify and write about causes and effects in response to a silently read passage, one with taught history content and one with transfer material. Students received points for correctly identifying the cause, using a signal word to demonstrate the relationship between events, and having a clearly written response. Across both passages, inter-rater reliability was excellent (ICC = .942, .960, K = .884, .726).

U.S. history. At the close of each cycle of instruction, students took a group-administered test that covered the instructional unit taught in both BRIDGES and BAU classes. Each test included between 12 and 15 multiple choice and short-answer items. The questions were drawn from a test item bank assembled from the history tests of all participating teachers. Teachers reviewed these assessments and agreed that the tests were fair and appropriate for the material taught.

<div align="center">

Results

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A series of ANCOVAs were calculated to determine the effect of treatment condition on student post test scores, covarying the effect of pre-test scores. Pre- and posttest means and standard deviations are reported for both conditions across the cycles in Table 2. Pretest scores were significantly related to posttest scores across conditions for decoding and vocabulary; however, not consistently related for the reading comprehension strategies.

Decoding Multisyllabic Words and Academic Vocabulary

The main effect for treatment on decoding accuracy was significant across all three cycles favoring the students in BRIDGES instruction: Cycle 1: $F(1, 30) = 8.67$, $p = .006$; Cycle 2: $F, (1, 30) = 13.66$, $p < .001$; and Cycle 3: $F(1,29) = 67.80$, $p < .001$. For the multiple-choice

vocabulary measure, the effect for treatment was significantly related to posttest scores, favoring students receiving BRIDGES instruction: Cycle 1: $F(1, 71) = 36.23$ $p < .001$; Cycle 2: $F(1, 76) = 41.2$, $p < .001$; and Cycle 3: $F(1, 72) = 19.64$, $p < .001$. For vocabulary expressive knowledge (production of definitions and sentences with the vocabulary word), the main effect of treatment was also significant across all cycles: Cycle 1: $F(1, 29) = 13.70$, $p < .001$, Cycle 2: $F, (1, 31) = 19.897$, $p < .000$, and Cycle 3: $F(1, 28) = 13.69$, $p < .001$.

Reading Comprehension

A series of ANCOVAs were calculated to examine the effect of treatment condition on comprehension strategies. The degrees of freedom are smaller for individually administered tests than for group administered tests.

Reading strategy: Main idea. The main effect for class condition was significantly related to post test scores for the Elastic Clause passage (taught content; $(F(1, 47) = 9.81$, $p = .003$) and the Weapons of WWI passage (transfer to untaught content; $F(1, 45) = 8.23$, $p = .006$.) Students both conditions improved their main idea scores from pre to posttest; however, those in BRIDGES classes made significantly greater gains on the passages.

Reading strategy: Compare and contrast. Pre-test scores were significantly related to post test scores across both conditions and passages. The main effect for class condition was significantly related to post test scores for Passage 1, Thomas Jefferson vs Alexander Hamilton (taught content) $(F(1, 72) = 13.48$, $p < .001$) and for Passage 2, North vs South (transfer to untaught content) $(F(1, 68) = 11.50$, $p < .001$.), with students in BRIDGES classrooms showing greater growth than those in BAU classrooms.

Reading strategy: Cause and effect. The main effect of class condition was significantly related to posttest scores in the identification of signal words and related causes and

effects for taught (F (1, 62) = 6.060, p = .017) and untaught passages (F (1, 61) = 6.053, p = .017). Students in BRIDGES classes (M= 4.78, SD = 2.42) significantly outperformed students in BAU classes (M = 3.47, SD =2.11) on taught passages. Furthermore, BRIDGES students (M = 5.04, SD = 1.91) outperformed BAU students (M = 3.86, SD =2.19) on the untaught content passages.

History tests. Multivariate analysis of variance on the three end-of-cycle tests favored students in BRIDGES classes significantly (F (3, 65) = 6.42, p < .001). The effect size difference (partial eta squared) was 0.23.

Teacher Fidelity of Implementation

The observation log recorded elements of instruction in decoding, vocabulary, and reading comprehension, and also class management and student engagement. For decoding instruction, observers recorded opportunities for student oral reading, teacher direct explicit modeling of decoding, and student guided and independent practice. For vocabulary, instances of student friendly definitions, student friendly context, teacher modeling of vocabulary use, and multiple opportunities for student guided oral and written practice in word usage were noted. Reading comprehension strategies varied slightly by cycle; however, we consistently recorded opportunities for text reading, direct explicit teacher modeling of deconstructing text, modeling and guided practice in use of graphic organizers, and guided practice writing in response to the text. In class management, observers coded for expertise in content, efficient lessons and procedures with appropriate difficulty level, and providing scaffolding and corrective feedback. Student engagement encompassed student on-task behavior, positive learning environment, and active student participation. Three lessons were analyzed in each of the three cycles for the two BRIDGES teachers (18 observations) and one lesson per cycle was observed for the two BAU

teachers (6 observations). In addition, BAU lessons were observed for the BRIDGES teachers before and in between each cycle when they were not using BRIDGES procedures, for a total of 16 BAU lessons.

The log also noted the quality with which BRIDGES or BAU lessons were implemented. Quality was defined as appropriate pacing, clarity of delivery, appropriate student practice, and engagement of students in the lesson. Each of the lesson areas were then rated as to whether all or nearly all, more than half, less than half, or none of the elements had been completed and the quality of delivery in each. Table 4 reports the percentages of each element in the BRIDGES and BAU observations.

Discussion

We designed this study to determine whether using this instructional package would increase students' reading skills *without detriment to their learning of U.S. History*, which some of this instruction supplanted, and how well SpEd teachers could implement a package of instruction that included reading skills appropriate for middle school students with LD (multisyllabic word decoding, academic vocabulary, and reading comprehension) within a U.S. history context.   We hoped to help teachers solve the SpEd dilemma of time by combining the goal of history content acquisition with improving the reading skills their students would need to accomplish that goal.

Reading Improvement

We expected improvement in decoding and vocabulary because gains had been strong in the previous two years when researchers implemented the lessons in small groups. Nonetheless, in the current study *teachers* implemented lessons and their instructional groups were larger than in the earlier years of researcher-delivered lessons, so we did not expect to see gains as large as

we found here, especially since other research that has shifted instruction from researchers to teachers has shown drops in student gains when teachers implement practices with their intact classes (e.g., Flynn & Lo, 2016). Moreover, studies of the effects of group size on student learning have shown advantages for smaller instructional groups (Elbaum, Vaughn, & Hughes, 1999). During Years 1 and 2, we taught BRIDGES lessons in groups of 2 to 9 students. Teacher instructional groups in this study ranged from 9 to 22 students. It is possible that the interactive nature of BRIDGES instruction, both between teacher and students and among students working in small groups, mitigated the effect of the larger group size in the current study.

Comprehension strategies. Most studies of reading comprehension instruction for students with LD have focused on a single strategy, such as main idea (Jenkins et al., 1988; Gajria et al., 2007) or cause and effect (Williams et al., 2009). We included three well documented comprehension strategies for reading expository text. Because we controlled the order in which teachers taught the strategies, we can only speculate on features that may have enhanced learning of each strategy observed at the close of instructional cycles. We chose main idea generation as our first strategy because we viewed it as the most fundamental comprehension strategy and earlier studies have shown it can be taught successfully to students with LD in elementary as well as middle schools (Jenkins et al., 1987; Jitendra, Hoppes, & Xin, 2000) . Without identifying the main idea of what happened, forming the relations needed for comparing and contrasting or finding causes of events would be unlikely.

Distressingly, our observations of history instruction in Year 1 of BRIDGES (Author, year) and also of the BAU classes in the current study, revealed students passively listening, or at their most active copying notes from projected slides. To reduce the passivity common for middle school students with LD (Torgesen, 1988), we introduced graphic organizers on which

students wrote their notes, which may have served to increase engagement and activity, as well as acting as a tool to preserve their thinking in between reading a text and producing a product.

Instruction in main idea required students to read each sentence in a paragraph more than once and to analyze easy passages before tackling longer and more complicated text. As others have recommended (Gajria et al., 2007; Williams et al., 2009), beginning with easy-to read and easy-to-analyze passages allowed students to concentrate on performing the strategy, and also to gain confidence in their ability to complete the task, which may have improved their effort. Notably, though teachers taught main idea for only three weeks, this skill was required, and thus thoroughly reviewed and maintained, throughout the following two cycles addressing compare and contrast and cause and effect.

Transfer. Although we expected students to improve in use of comprehension strategies for the units of history teachers taught, we were surprised with the consistent transfer of comprehension strategies to untaught units of history. One mechanism to encourage transfer is preteaching relevant multisyllabic words and their meanings, as teachers did during each instructional cycle for the taught content. However, we decided against preteaching words because we would not be able to separate effects of improved word-level skills from the effect of the comprehension strategy we wanted students to apply to untaught history content, and so the transfer passages did not contain words we taught students to read and understand during the instructional cycle. Thus, it seems likely that these students attained sufficient mastery of each strategy during the three weeks of instruction to apply the comprehension strategy to novel situations.

Fidelity of Implementation

Prior to implementing BRIDGES and consistently in the BAU classes, our observations revealed that teachers dealt with the problem of their students' poor reading skills by telling the students a story of historical events: a lecture with visuals, that however engaging, did not require students to extract information or respond to information from text. The same texts were used by BRIDGES and BAU teachers; however, aside from BRIDGES instructional days it was used primarily as homework.

BRIDGES instruction required teachers to make profound instructional shifts. Nevertheless, teacher fidelity was reasonably high throughout their implementation, and quality improved after the first instructional cycle. Several features of the professional development (PD) teachers received likely contributed to high levels of implementation. All of the PD was brief (i.e., one hour) and held on the school site at teachers' convenience. These meetings were focused specifically on procedures teachers would implement in the next three weeks.

Three 3-week cycles created a relatively long implementation for classroom-based research, and as Landrum et al. (2007) suggested, the opportunity to try new instructional procedures for more than a few weeks can improve both fidelity to procedures and quality of implementation. Our observations noted that over time teachers relied less on reading the instructional scripts and used a more natural flow of instruction. It is possible that, as Brownell et al. (2009) suggested, ongoing researcher presence and support—in this case, at least weekly— may be needed for these improvements to occur.

We designed BRIDGES instruction to take 20 to 25 minutes; however, lessons went over this time allotment more frequently than under it. In our materials, we included extra examples for teacher modeling and student practice, and teachers often used these activities. Our

observations captured students' engagement as well as teacher fidelity, and we documented more student engagement when teachers used BRIDGES lessons than when they taught history in their usual manner. Moreover, these differences in engagement were within teacher (before BRIDGES implementation and between instructional cycles), as well as between teachers assigned to BRIDGES or BAU. Perhaps teachers recognized students' improved engagement as students volunteered their thoughts during discussions and small group work, which may have influenced the time teachers were willing to devote to BRIDGES lessons.

Knowledge of History Content

We had documented improvement on tests of history content in an earlier study (Author, year); nevertheless, we did not expect to see it here. First, our earlier studies of BRIDGES occurred outside the U.S. history classroom in a small-group, pullout setting. In the current study, BRIDGES teachers were well aware that they were sharing the available instructional time for history by integrating reading with history. Thus, BRIDGES teachers spent less time on the history content than did teachers in the BAU classrooms.

By contrast, teachers taught reading skills that linked directly to the history content of the unit. The reading instruction in multisyllabic words helped students to read key words in the history text independently, and the vocabulary instruction helped students to understand the meanings of key words and concepts enmeshed in the event. Pointedly, the material students read during BRIDGES lessons focused on the event being studied for the history unit, and they read easier and more difficult versions of these events, as well as passages of text more than once to complete the graphic organizers and written tasks. It is possible that all of these features together helped students to understand historical events more clearly; it is also possible that some of these activities played a larger role than others in their improved history knowledge. Our design does

not allow us to infer whether all, or only some of these features were important for improved history test performance.

Limitations

Because this study represents the third year of a development grant, we had only a small number of teachers and schools; thus results are suggestive, but inconclusive. As Cook and Odom (2013) suggest, replications are necessary for determining the reliability of results for similar samples and for samples with differing characteristics. One important student characteristic here was that nearly half the students in this study were English Language Learners; however, our sample size was too small to analyze results by ELL status.

Gains on the words and vocabulary we taught were clear; however, we did not capture commensurate gains on standardized measures. Other studies of middle school students who read poorly (e.g., Vaughn et al., 2013) have documented declines over time in standardized reading scores, even with intervention, and significant differences between groups can be the result of less decline with intervention than in BAU conditions. We noted that standardized reading scores in this study did not decline for students in BRIDGES or BAU conditions. Students' raw scores increased on the standardized reading measure (TOSCRF), but gains in standardized scores were not significant, nor did they differ from students in the BAU conditions.

Last, teachers implemented only 3-week units of instruction at a time, with intervening time to teach as they usually taught. Teachers might not be able to sustain the effort and energy required to integrate reading and history throughout an entire school year, and it is also possible that student engagement might decline across an academic year. These possibilities could be tested with longer studies of the intervention.

Implications and Conclusions

Students in BRIDGES made strong gains in reading skills with each 3-week cycle of instruction, and their history knowledge as measured by unit tests was also stronger than that of their peers in BAU classes, even though the reading instruction came at the cost of time in history instruction alone.   It may be that to learn history content, students with LD require instruction that improves their ability to engage with history text (i.e., to read the words and understand what they mean, and to analyze historical events and relations among events and people), as well as to listen to teachers' telling of historical stories.

As Leko et al. (2015) pointed out, special education teachers need to maintain a balance between working toward students' IEP goals (often remediating core skills) and developing grade level skills including vocabulary and content knowledge. Reconciling these levels of instruction is difficult in any grade, but especially so in secondary schools where the gap between the reading ability of students with LD and their peers can be exceedingly large.

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Table 1: Means and Standard Deviations for Standardized Reading and Intelligence Measures

	BRIDGES Instruction		Business As Usual	
	M	SD	M	SD
WJ Word Attack Skills	86.4	10.6	87.5	10.5
WJ Letter Word Identification	81.5	13.2	82.0	13.7
WJ Picture Vocabulary	83.9	10.	82.2	9.3
WJ Passage Comprehension	76.0	9.8	73.7	6.5
Wechsler	77.5	12.3	78.7	7.9
TOSCRF Fall Pretest	76.57	9.44	78.31	4.29
TOSCRF Spring Posttest	80.80	9.74	80.25	8.17

Note: WJ = Woodcock-Johnson Tests of Achievement; Wechsler = Wechsler Abbreviated IQ

Scale; TOSCRF = Test of Silent Contextualized Reading Fluency

Table 2: Means, Standard Deviations, and Main Effects for Experimenter-Designed Assessments

	BRIDGES		BAU				
	M	SD	M	SD	df	F	p
Decoding Accuracy							
Cycle 1 Pretest	17.21	11.89	14.58	9.38			
Cycle 1 Posttest	27.05	10.15	17.33	10.75	1, 31	8.67	.006
Cycle 2 Pretest	20.33	10.75	14.62	9.42			
Cycle 2 Posttest	28.48	8.17	17.58	8.14	1, 32	13.66	.001
Cycle 3 Pretest	24.25	9.57	20.25	8.94			
Cycle 3 Posttest	29.30	7.89	23.17	6.51	1, 30	5.09	.03
Vocabulary Expressive Usage							
Cycle 1 Pretest	0.45	0.76	0.42	0.99			
Cycle 1 Postest	8.50	7.17	1.83	3.41	1, 32	13.70	.001
Cycle 2 Pretest	3.30	3.16	2.73	1.90			
Cycle 2 Postest	17.71	10.00	6.92	5.56	1, 31	19.90	.000
Cycle 3 Pretest	3.10	2.25	2.92	2.39			
Cycle 3 Postest	15.00	8.927	7.82	5.33	1, 30	13.69	.001
Vocabulary Receptive Knowledge Cycle 1							
Cycle 1 Pretest	3.53	1.80	3.97	2.19			
Cycle 1 Posttest	7.20	1.91	3.85	1.95	1,72	36.23	.001
Cycle 2 Pretest	4.83	1.91	3.95	2.36			
Cycle 2 Posttest	8.24	1.45	6.00	2.45	1, 71	41.2	.001
Cycle 3 Pretest	3.45	2.25	4.86	2.39			
Cycle 3 Posttest	7.45	2.46	5.25	2.38	1, 72	19.64	.001
Reading Comprehension: Finding the Main Idea							
Pretest Cycle 1	0.67	1.13	0.76	1.00			
Posttest Taught Content	3.12	2.47	1.83	2.14	1, 72	9.81	.003
Posttest Transfer Content	4.28	2.35	2.83	2.23	1, 72	8.23	.006
Reading Comprehension: Compare and Contrast							
Pretest Cycle 2	5.65	3.86	5.35	3.59			
Posttest Taught Content	9.76	5.00	5.67	3.85	1,72	13.48	.001
Posttest Transfer Content	8.30	5.18	4.82	3.82	1, 72	11.50	.001
Reading Comprehension: Cause and Effect:							
Pretest Cycle 3	2.78	1.74	2.89	2.12			
Posttest Taught Content	4.78	2.42	3.47	2.11	1, 70	6.06	.017
Posttest Transfer Content	5.04	1.91	3.86	2.19	1, 70	6.05	.017

Note: BRIDGES = Students who received BRIDGES instruction; BAU = Business as Usual

Control.

Table 3. History Content Knowledge Means and Standard Deviations

	BRIDGES		BAU	
	Mean	SD	Mean	SD
Cycle 1	4.03	2.18	2.24	1.34
Cycle 2	9.33	2.89	7.54	2.92
Cycle 3	6.54	1.71	5.71	1.83

Table 4

Fidelity: Mean Percentage of Lessons with BRIDGES Elements and Procedures, and Quality Ratings.

	BRIDGES Lessons: n = 18				Business as Usual Lessons: n = 16			
			Comprehension	Management			Comprehension	Management
	Decoding	Vocabulary	Strategy	/Engagement	Decoding	Vocabulary	Strategy	/Engagement
Nearly all	83.33%	77.78%	72.22%	83.33%				
More than half	16.67%	22.22%	27.78%	16.617%				
Less than half						30%	20%	
Not completed					100%	70%	80%	
High quality	55.56%	66.67%	66.67%	83.33%			10%	70%
Average quality	38.89%	33.33%	33.33%	16.67%		20%	10%	20%
Low Quality	5.56%				100%	80%	80%	10%