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Article

English Learner and Non-English Learner Students With Disabilities: Content Acquisition and Comprehension

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Abstract

This study investigated the effects of Promoting Adolescent Comprehension Through Text (PACT), a content knowledge and comprehension treatment for English learner and non–English learner students with disabilities who were provided instruction in general education social studies classrooms. Eighth-grade students with disabilities in the treatment condition (n = 59) scored significantly higher than students with disabilities in the comparison condition (n = 89) on a measure of content knowledge (effect size = .51). Students with disabilities in both study groups scored similarly on measures of content reading comprehension and general reading comprehension. In addition, the effect of treatment did not differ between English learner and non–English learner students with disabilities. Overall, the findings support the use of the instructional practices for improving content acquisition in general education social studies classes for English learner and non–English learner students with disabilities.

Many students with disabilities are included in general education for one or more content areas. In fact, 94% of students with learning disabilities in the secondary grades are included in general education classes for at least one content area (Newman, 2006). In districts with highly diverse populations, many of these students with disabilities are also English learners (ELs). Students with disabilities who are ELs have been under-studied. A recent synthesis revealed 15 studies across elementary and secondary grades that met the What Works Clearinghouse causal validity standards (Baker et al., 2014).

Although there are large numbers of students with disabilities, including some who are also ELs, in general education content area classes, students with disabilities are less likely to actively participate or engage in classroom activities (Newman, 2006) and are more likely to report failing a class (Geisthardt & Munsch, 1996) than peers without disabilities. One of the most common content areas for inclusion of students with disabilities is the social studies, with 71% of students with learning disabilities receiving their social studies instruction in general education settings (Newman, 2006). The unique needs of EL and non-EL students with disabilities can create an exceedingly diverse student makeup in general education social studies classrooms. Identifying instructional approaches for effective classroom instruction for these students is one key area of need (McCardle, Mele-McCarthy, Cutting, Leos, & D'Emilio, 2005).

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Features of Effective Instruction in Diverse Classrooms

Syntheses of the research on content area instruction indicate that students with disabilities can benefit significantly from instruction that includes clear identification of instructional objectives, high levels of student engagement in practice or application of the material, concrete and meaningful learning opportunities, opportunities for active thinking, reading comprehension strategy instruction, vocabulary development, and content enhancements, such as graphic organizers or mnemonics (Gajria, Jitendra, Sood, & Sacks, 2007; Scruggs & Mastropieri, 2003; Swanson et al., 2014). Students with disabilities who are also ELs require additional attention to their language needs. ELs often have particular difficulty in acquiring content area knowledge due to inadequate relevant background knowledge and unfamiliarity with academic language and discourse skills (Francis, Rivera, Lesaux, Kieffer, & Rivera, 2007). Oral and written language instruction that is integrated in content area teaching and targeted instruction in academic vocabulary have been identified as the two key recommendations, with strong research evidence for improving outcomes for ELs (Baker et al., 2014). Specific to students with disabilities who are also ELs is a recommendation for targeting vocabulary and background knowledge as well as active use of cognitive strategies, such as summarizing, clarifying, or question generating to facilitate dialogue, use of vocabulary, and engagement in learning (Rivera, Moughamiam, Lesaux, & Francis, 2008).

Thus, addressing the instructional needs of students with disabilities, with considerations for those students who are ELs, requires a set of instructional practices that provide opportunities for students to acquire academic vocabulary, integrate new background knowledge with their existing knowledge, apply strategies to understand the written language of the discipline, and have opportunities to practice and apply content knowledge through discourse-based activities that provide structured interactions with peers. Wormeli (2006) adds that *formative feedback*—allowing students to compare what they have done with what they were supposed to have done and then allowing time to revise the task—is particularly effective among middle school students.

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The social studies provide opportunities to engage students with a range of learning needs in instruction that is connected to students' lives and incorporates critical thinking (National Council for Social Studies, 2008). Unfortunately, much of social studies instruction is not well aligned with these views of instruction. Social studies teachers identify lecture as the most frequently implemented and most effective instructional technique and report discussion as the least frequently implemented instructional activity (Bolinger & Warren, 2007). An overreliance on lecture and worksheet completion (Chiodo & Byford, 2004; Swanson, Wanzek, McCulley, et al., in press) may also be difficult for students with disabilities, particularly those who are also ELs, given the general lack of student engagement, opportunities for active thinking and dialogue, or language support within these activities. A recent report of interviews of students with disabilities about their middle school classroom experience related that 89% reported that they would like to understand what they are being taught but they "can't figure it out" (Sullivan et al., in press).

Promoting Adolescent Comprehension Through Text (PACT)

PACT is a set of instructional practices intended to be integrated into middle and high school general education social studies instruction. PACT comprises six components that focus on improving understanding of concepts

while reading text, providing opportunities for students to engage in learning and apply newly learned content through written text and oral instruction and activities, and connecting new learning to prior learning (Vaughn et al., 2013). These components include (a) a unit introduction to activate background knowledge and engage students in the content, (b) introduction of essential words students will need to support learning the new content, (c) review of essential words through application activities, (d) critical reading of text with teacher support for comprehension, (e) individual and collaborative team checks of content understanding, and (f) team-based application activities for integrating the content learned in the unit. Overall, PACT is designed to facilitate engagement in the new content, opportunities for interaction and discussion with peers through team-based learning, and ongoing assessment to guide teacher support for learning.

PACT focuses on improving understanding of concepts while reading text, providing opportunities for students to engage in learning and apply newly learned content through written text and oral instruction and activities, and connecting new learning to prior learning.

For this study, PACT was integrated with several research-based instructional features to improve outcomes for ELs in the middle grades (August, Branum-Martin, Cardenas-Hagan, & Francis, 2009; Baker et al., 2014; Francis et al., 2007; Lesaux & Kieffer, 2010; Mancilla-Martinez, Kieffer, Biancarosa, Christodoulou, & Snow, 2011): (a) essential academic vocabulary that was taught explicitly and then reinforced within the critical reading of text, discourse-based team activities, and written responses to text and application activities, providing repeated practice in a variety of contexts; (b) informational text reading that included the target vocabulary; (c) a focus on academic vocabulary use in oral and written instructions and responses (e.g., academic vocabulary for comparing and contrasting, and recognizing cause-and-effect patterns of information); and (d) multiple opportunities for ELs with disabilities to participate in structured academic discussions and written activities with peers to facilitate dialogue, build knowledge, use vocabulary, and engage in learning. For example, in critical reading activities, the target vocabulary was incorporated in the text, teachers provided a context for the reading while reviewing targeted words, and students responded orally and in writing to the text throughout the reading using learned academic vocabulary with feedback from the teacher. In addition, the comprehension canopy, essential words, and critical reading instruction was supplemented with brief videos, visuals, and graphic organizers in order to provide students the necessary background information required to participate in academic discourse. By including design features that support the differentiated needs of EL and non-EL students with disabilities, PACT is particularly suited for the differentiated instruction required in diverse general education social studies classrooms. However, the effects of PACT for these students have not yet been fully examined.

Efficacy of PACT

Several studies have examined the effect of PACT practices on the content knowledge acquisition and reading comprehension of students in participating classes. Two separate randomized control trials have been conducted in general social studies classes at the eighth-grade level (Vaughn et al., 2013, 2015). In the first trial, 27 eighth-grade social studies classes were randomly assigned to receive either PACT or business-as-usual (BAU) instruction. PACT practices were implemented over the course of 30 lessons. Findings indicated that PACT instruction made a statistically significant impact on students' content knowledge (effect size [ES] = 0.17), content reading comprehension (ES = 0.29), and standardized reading comprehension (ES = 0.20). Thus, students in the PACT classes significantly outperformed

students in typical instruction by the end of three units, not only in their content knowledge of social studies but also in their reading comprehension of novel social studies text and their general reading comprehension. Findings from a replication study (Vaughn et al., 2015) conducted in 85 eighth-grade classes of students randomly assigned to PACT or BAU resulted in statistically significant differences in favor of the treatment group on measures of content knowledge that were sustained 4 and 8 weeks after the conclusion of the treatment (ES = 0.32, 0.29, 0.26, respectively). This study demonstrated that the students in the PACT classes not only learned more content than students in the typical instruction, but their superior content knowledge was maintained over time. However, no statistically significant differences on either reading comprehension measure were reported, and thus the comprehension effects were not replicated in this second study. The effects in both studies occurred when both the PACT and BAU classes were taught by the same teachers and covered the same content such that differences were solely attributable to the use of the PACT instructional practices.

PACT efficacy has also been investigated among special populations of students. In the most recent investigation (Vaughn et al., in press), PACT was implemented in 94 social studies classrooms that were identified and randomized to treatment or control conditions purposively selected because student participants included ELs in the classes. The authors reported differential effects in favor of the treatment group on measures of content knowledge acquisition (ES = 0.40) and content reading comprehension (ES = 0.17), but no differences were noted between treatment and comparison groups in general reading comprehension. In addition, the proportion of ELs in the class mediated student outcomes on content knowledge acquisition such that decreases in content knowledge occurred in classes with a higher proportion of ELs, with ELs most negatively affected.

In an examination of PACT's effects on outcomes for students with disabilities (Swanson, Wanzek, Vaughn, Roberts, & Fall, in press), results from an analysis of two cohorts of eighth-grade students with disabilities (n = 130) indicated that students in the treatment condition scored statistically higher than students in the comparison condition on content knowledge acquisition (ES = 0.26) and content reading comprehension (ES = 0.34) but not standardized reading comprehension. Overall, PACT has demonstrated consistent, small effects for significantly increasing content knowledge across general populations, ELs, and students with disabilities. In several studies, small, significant effects for content reading comprehension have also been noted (Vaughn et al., in press; Vaughn et al., 2013; Swanson, Wanzek, Roberts, et al., in press).

Purpose of Study

The current study was designed to inform the effects of PACT for EL and non-EL students with disabilities who are provided instruction in general education social studies classrooms. Further, we wanted to determine if differential effects existed for EL and non-EL students with disabilities. The following research questions were investigated:

1. What are the effects of PACT instruction, modified to meet the instructional needs of ELs, among students with disabilities included in eighth-grade social studies class, on content acquisition, reading comprehension of content text, and general reading comprehension?
2. Do effects differ for EL students with disabilities?

Method

This article reports on a subgroup of students from a larger study examining the efficacy of PACT within schools that serve large numbers of ELs (Vaughn et al., in press). Institutional review boards at all participating universities approved the study prior to its implementation. All participating teachers were eighth-grade social studies teachers whose class sections were randomly assigned to treatment (PACT) or comparison (BAU) conditions blocking on

teacher. When a teacher had an odd number of class sections, the additional class was assigned to the treatment. Teachers taught the same social studies topics and content in both PACT and BAU classes. In the PACT classes, teachers taught the content with the PACT instructional practices. In the BAU classes, teachers taught the content using their typical practices. For the current study, we examined the outcomes for students with identified disabilities who participated in these general education classes. We were also able to disaggregate data for students who were identified with disabilities who were also designated as EL.

Participants

Students. The study included 160 students with disabilities whose special education identification labels included learning disabilities, intellectual disability, autism spectrum disorder, and speech or language impairments, with the majority of students identified with learning disabilities (74%). All students participated in general education social studies classes with the general education teacher providing instruction. Special education services for the social studies content area consisted mainly of consultation from the special education teacher on accommodations (e.g., extra time for tests). Two teachers also had paraprofessional assistance during their classes, and one teacher had the assistance of the special education teacher during class time. Students received a variety of support for other content areas, such as English language arts and mathematics, via resource rooms, reading intervention courses, and co-teaching.

Fifty-two (32.5%) of these students with disabilities were also identified by their schools as current ELs or had held an EL status within the preceding 2 years. The sample ethnicity was 75% Hispanic. Sample race was a majority White (60.6%), with most of the Hispanics identifying as White race. Sample race also included American Indian (11.9%), Black (11.9%), and multiracial (3.8%). Sixty-three percent of the sample received free or reduced-price lunch. There were no differences between students with disabilities in the PACT and BAU groups on any of the demographic variables (p = .19 to .82)

Teachers. Students were taught by 18 eighth-grade certified teachers (nine male) in seven schools in three districts in two states. These teachers taught a total of 58 class sections (32 PACT, 26 BAU) with a range of 1 to 9 (M = 2.76) students with disabilities included in the classes. The teachers had between 0 and 34 (M = 10.13) years of teaching experience. In addition to continued professional development in their content area, 11 teachers reported continued professional development in reading instruction. Fifteen of the teachers reported their ethnicity as non-Hispanic. Fourteen teachers reported their race as White, one teacher was multiracial, and two teachers reported ethnicity only. All of the teachers were certified and held bachelor's degrees. Five of the teachers also held master's degrees.

PACT Components

PACT consists of six components implemented in each 10-day instructional unit. On Day 1, teachers implemented the comprehension canopy (~10 min) and essential words (~15 min) components. On Days 2, 4, 6, and 8 of the unit, teachers implemented the warm-up (~5 min) to review essential words. On Days 3, 5, and 7, critical reading of text (~20 min) was implemented as well as a 2- to 3-min review and discussion of the comprehension question. On Days 4 and 8, the team-based learning (TBL) comprehension checks (~15 min) were implemented. On Day 9, the TBL knowledge application (~40 min) was implemented along with a 5-min summary to answer the comprehension question. The critical reading component was implemented two to three times per week for an additional 12 weeks. We integrated enhancements for ELs within the PACT components to address academic vocabulary, background knowledge, oral and written language in the content, and discourse-based engagement with the content.

Comprehension canopy. The comprehension canopy introduces each unit by engaging

students in the upcoming content, building background knowledge, and providing a purpose for learning the new content. A brief (2- to 4-min) unit introduction video, selected to provide students with requisite background information before encountering the unit material, is provided followed by peer and class discussion of the video content. Students are provided a purpose for viewing the video (e.g., "As you watch the video, write two reasons why the colonists called the Frist Continental Congress") and discuss the information with a peer following the video (e.g., "What would threaten your freedom enough to make you rebel? What are some ways to achieve victory without using force?"). Teachers then present a unit level comprehension question (e.g., "Was the American Revolution inevitable? Why or why not?") to be revisited and addressed throughout the unit as students learn the content. Each comprehension canopy question in this study was designed to develop students' academic language of social studies by focusing on compare and contrast, cause and effect, or perspective taking.

Essential words. For each unit, five key words that are essential to the unit topic and connected to multiple social studies topics (e.g., revenue) are introduced on the first day of the unit. The purpose of the essential words component is to teach the meaning of concepts that are tightly connected with the content and support new learning in the unit. Teachers provide a student-friendly definition (e.g., money a government collects in the form of taxes, fees, or fines), a visual representation (e.g., picture of money), related words (e.g., *income, taxes*), several examples (e.g., parking fines) and nonexamples (e.g., refunds) of the word use, and a related discussion question (e.g., "In your community and across the country, how does our government use the revenue that is collects?") for students to address with a partner. Students are provided many opportunities to review and apply the essential words orally and in writing throughout the unit in the warm-up activities, critical readings, TBL comprehension checks, and TBL knowledge application.

Warm-up. The essential words are reviewed throughout the unit via short questioning and problem-solving activities that require students to apply the word meaning. Students complete the activities individually at the beginning of class and share their thoughts and responses during a brief class discussion of the activity facilitated by the teacher.

Critical reading. During the critical reading routine, students read primary or secondary source text with support. Teachers provide context for the upcoming content using video, maps, or other resources. During this introduction, the teacher also reinforces essential words students will encounter as well as connects the reading to the comprehension canopy question. Students then read the text in a variety of formats, including whole class, paired, small group, or independent reading. During the reading, the teacher reviews essential words in the text and facilitates comprehension questions at stopping points throughout the text. Students answer these comprehension questions verbally and in writing.

TBL. TBL (Michaelsen & Sweet, 2011) is designed to provide students opportunities to socially construct knowledge via interaction and discourse with others, problem solve, confront misconceptions, consider perspectives of others, and apply collaborative work skills. Teachers strategically organize heterogeneous teams of students that remain permanent throughout the content learning. There are two subcomponents to the TBL in PACT, the comprehension check and the knowledge application.

TBL comprehension check. Two comprehension checks occur during each unit as a check on student understanding of the content taught thus far. For each comprehension check, a 10-item, multiple-choice quiz is provided to the students. Each student takes the quiz and turns it in to the teacher for a check on individual understanding. Following the individual quiz, students get into their teams. For this study, students worked in pairs for the comprehension check. The teams take the quiz

again together using class resources, such as readings, notes, or handouts. The team must come to consensus on the answer for each question, citing the evidence for the answer. Each team receives immediate feedback on its answer by using a scratch-off card keyed to the quiz. If students select the correct answer, a star appears. If students select an incorrect answer, they discuss the question and evidence further to determine the answer. Following the comprehension check, the teacher uses information from individual and team quizzes to determine students' understanding of the content. Teachers use this information to provide targeted reteaching, addressing any misunderstandings.

TBL knowledge application. At the end of each unit, students complete a problem-solving or perspective-taking application activity to incorporate the content from the unit. For this study, two pairs joined to form a team of four for each application activity. Students engage in discussion of the unit content to address the application task, recording content and text evidence to support their responses. Team responses are then presented to the class. The teacher facilitates team discussion, use of evidence, and connection of the responses across teams, including providing feedback to students and teams. Finally, the teacher assists students in synthesizing key information from the unit to address the unit comprehension question.

The teachers in the current study implemented three consecutive 10-day instructional units (i.e., Colonial America, Road to Revolution, Revolutionary War) to students in both the PACT and BAU classes.

Teacher Training

All teachers attended a 1-day workshop prior to the start of the school year. The workshop was provided by the research team that developed PACT, and it covered PACT implementation, relevant research in content and reading comprehension, supported lesson planning, lesson design features for ELs, and study design features, including maintaining PACT implementation in the treatment class sections only. Each of the components of PACT instruction were described, modeled, and practiced by the teachers during the workshop. Teachers received semiscripted lesson plans and student materials to implement the PACT components. Using these materials, teachers completed initial planning for the first unit of study and met with research staff who would later provide in-class follow-up support during implementation.

Teachers used the PACT instructional practices to teach the content in the treatment classes. Classes met 45 min daily or 90 min every other day. Each teacher received follow-up support from one research team member during implementation. Support included modeling of PACT components, co-teaching, assistance with planning, and observation and feedback. Follow-up support was provided a minimum of five times in Unit 1, four times in Unit 2, three times in Unit 3, and once a week during the additional 12 weeks of critical reading. Additional support provided based on need. A booster workshop session (3 hr) was held after the first unit, and a second booster (1 hr) was held after the second unit, to provide additional practice in PACT components with low fidelity and to discuss challenges and successes with PACT implementation. Following the three units of PACT implementation, teachers attended a 1-hr booster session on the critical reading implementation, which was continued in PACT classes for an additional 12 weeks.

Fidelity of Implementation

Data were collected to evaluate the fidelity of implementation of PACT instruction as well as the strength of the intervention relative to BAU. For each teacher, one PACT and one BAU class were randomly selected for data collection. These class periods were audio-recorded each day of instruction, and recordings for two units of instruction were coded for each class period.

The fidelity measure used to code the audio recordings was aligned with the components of PACT instruction described earlier. For each

component, coders rated the extent to which the required elements were implemented on a scale from 1 to 4, ranging from not implemented (*low*) to completing all of the expected aspects of the component (*high*). Because the components of PACT are implemented on different days of the unit, if a component was not required or expected in the treatment for the day, a *not applicable* rating was assigned.

Six researchers were trained to code the audio files. Prior to coding, each researcher independently coded a lesson to at least 90% interrater agreement with a gold standard coding prepared by two senior researchers with experience developing and implementing the PACT intervention. In addition, to avoid observer drift during the coding process, each coder reestablished reliability (90% or higher) with the gold standard at two additional checkpoints throughout the coding process.

Table 1 provides the fidelity data. PACT implementation in treatment classes was at a mid-high level ($M = 3.18$; range 2.77–3.62). Critical reading was the only component with a lower implementation ($M = 2.77$). Teachers did not consistently implement all elements of this component, which included making connections to essential words, prompting students to write connections to essential words, and facilitating note taking in response to stopping point questions.

The BAU classes included very few elements of the PACT intervention. The mean implementation rating of elements of PACT in the comparison classes was at the low or not-observed level ($M = 1.12$; range 1.01–1.40), demonstrating the relative strength of the treatment condition. There were a few instances of teachers including warm-up-type review activities and reading of text without the PACT support elements as would be expected in a BAU condition. For example, a teacher may assign independent reading without the PACT reading routine elements, such as stopping points or making connections to essential unit vocabulary. These findings align with previous studies demonstrating few PACT elements in typical social studies classes (Swanson, Wanzek, McCulley, et al., in press; Vaughn et al., 2013, 2015). Thus, the findings from this study provide information on the impact for students with disabilities who are included in these types of BAU classes when compared to those who are included in classes where the majority of PACT elements are embedded in the content instruction.

Measures

Three measures were administered by trained research team members blind to condition prior

Table 1. Implementation Fidelity and Comparison Group Observation Data.

	CC		EW		WU		CR		TBLC		TBLK	
Implementation	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Treatment classrooms	33		36		139		115		71		36	
4 = *high*	15	45.5	17	47.2	111	79.9	7	6.1	14	19.7	5	5.6
3 = *mid-high*	12	36.4	12	33.3	7	5.0	80	69.6	47	66.2	29	80.6
2 = *mid-low*	5	15.2	5	13.9	17	12.2	22	19.1	3	4.2	2	13.9
1 = *low*	1	3.0	2	5.6	4	2.9	6	5.2	7	9.9	0	0
Comparison classrooms	291		291		291		291		291		291	
4 = *high*	0	0	2	0.7	26	8.9	0	0	0	0	0	0
3 = *mid-high*	0	0	2	0.7	0	0	12	4.1	0	0	0	0
2 = *mid-low*	10	3.4	6	2.1	39	13.4	38	13.1	2	.7	3	1.0
1 = *low*	281	96.6	281	96.6	226	77.7	241	82.8	289	99.3	288	99.0

Note. CC = comprehension canopy; EW = essential words; WU = warm-up; CR = critical reading; TBL = team-based learning; TBLC = TBL comprehension check; TBLK = TBL knowledge application.

to and following treatment: Assessment of Social Studies Knowledge (ASK) Knowledge Acquisition (Vaughn et al., 2013), Modified Assessment of Social Studies Knowledge (MASK) Reading Comprehension (Vaughn et al., 2015), and Gates-MacGinitie Reading Comprehension (MacGinitie, MacGinitie, Maria, Dreyer, & Hughes, 2006). Trained research personnel who were uninformed of the study condition (PACT or BAU) to which students were assigned administered all assessments.

ASK (Vaughn et al., 2013). The ASK Knowledge Acquisition assessment is a 42-item, untimed, multiple-choice, group-administered measure of content knowledge in the three units that composed the intervention (Colonial America, Road to Revolution, and Revolutionary War). The measure was developed, with permission, from items on released state social studies tests and released Advanced Placement tests in social studies. Researcher-developed vocabulary items were also included in the item set. A series of pilot tests was conducted to validate the provided difficulty parameters, refine instruction for test administration, and estimate the amount of time necessary for administration. The final set of items was selected following a series of item-level confirmatory analyses to evaluate model fit and estimate item parameters (Vaughn et al., 2013). The internal consistency for the sample of students in this study's eighth-grade classes was .93.

MASK (Vaughn et al., 2015). The MASK Reading Comprehension assessment is a 21-item, four-option, untimed, multiple-choice, group-administered test that measures reading comprehension. The assessment consists of the three reading passages of the reading comprehension subtest of the ASK (Vaughn et al., 2013) with modifications to the Lexile levels (Lexile range = 1090–1140; word count range = 312–349). The novel passages provided are related to the content covered in the three 10-day units. Students read each passage silently and immediately answer seven multiple-choice questions about the passage. The internal consistency for the sample of students in this study's eighth-grade classes was .92.

Gates-MacGinitie Reading Tests, Fourth Edition (MacGinitie et al., 2006). We administered the Gates-MacGinitie Reading Comprehension subtest. The assessment is group administered and consists of expository and narrative passages ranging in length from 3 to 15 sentences. Students have 35 min to read each passage silently and answer three to six multiple-choice questions related to the most recently read passage. Internal consistency reliability ranges from .91 to .93, and alternate form reliability is reported as .80 to .87.

Data Analysis

Due to nesting structures present in our research design, we adopted a multilevel modeling approach. Specifically, we tested differences between the PACT and BAU conditions on posttests by fitting a series of three-level regression models in Mplus 7.2, nesting students in classes and classes in teachers. In all of these models, grand-mean-centered pretest scores served as covariates and were entered at Level 1 (student level) of the model (Enders & Tofighi, 2007). The effect of treatment (0 = BAU, 1 = PACT) was modeled at Level 2 (classroom level). A significant treatment effect indicated a reliable difference in the dependent variable for students in the treatment versus the BAU condition, controlling for pretest differences. We calculated effect sizes as Hedges' g, using the coefficient corresponding to the treatment effect as the numerator and the posttest pooled standard deviation as the denominator.

Attrition. To establish the presence of differential attrition, we conducted a two-way analysis of variance on the primary outcome variables (i.e., ASK Knowledge Acquisition, MASK Reading Comprehension, Gates-MacGinitie Reading Comprehension). The factors in the analysis were treatment condition, completer status at posttest, and the interaction of condition and completer status. A significant interaction signified systematic group differences

in the characteristics of students who remained in the study. Results suggested no significant main effects for completer status for any of the measures (p values ranged from .31 to .71) and no significant condition by completer status interaction effect (p values ranged from .43 to .99), indicating that attrition among groups did not differ systematically and was unlikely to influence the observed effects of the treatment.

Results

Three-level analysis of pretest scores showed that students in the PACT and BAU groups were equivalent at the time of the pretest on the ASK Knowledge Acquisition ($\gamma_{010} = -.32$, $SE = .99$, $p = .75$) and MASK Reading Comprehension ($\gamma_{010} = -.42$, $SE = .71$, $p = .55$). Groups did differ at pretest on Gates-MacGinitie Reading Comprehension ($\gamma_{010} = 4.61$, $SE = 1.47$, $p = .00$). To control for differences at pretest between students in the PACT and BAU groups, and to improve the power of the analyses involving the ASK and MASK, pretest scores were entered as Level 1 covariates.

Effects of the Intervention

Pretest and posttest means and standard deviations for students assigned to PACT and BAU groups are presented in Table 2 for the ASK Knowledge Acquisition, MASK Reading Comprehension, and Gates-MacGinitie Reading Comprehension measures. We summarize results of the regression analyses in Tables 3 and 4. At posttest, students in the PACT group significantly outperformed students in the BAU group on the ASK Knowledge Acquisition ($\gamma_{010} = 3.58$, $SE = 1.23$, $p = .00$). This difference is equivalent to an effect size of .51. Because pretest scores were grand-mean centered, this finding suggests that students with disabilities who participated in PACT outperformed similar students in the BAU at posttest by over one half of a standard deviation, on average.

For the MASK Reading Comprehension test ($\gamma_{010} = .12$, $SE = .73$, $p = .87$; ES = .04) and for the Gates-MacGinitie Reading Comprehension test ($\gamma_{010} = .28$, $SE = 2.43$, $p = .91$; ES = .02), there were no significant differences between students in the PACT and BAU groups at posttest.

Table 2. Pretest and Posttest Descriptive Data by Study Condition.

	Pretest				Posttest			
Measure	*M*	*SD*	*n*	Range	*M*	*SD*	*n*	Range
ASK Knowledge Acquisition								
Treatment	11.52	4.12	89	0–25	17.49	8.06	82	5–38
Comparison	12.10	4.27	59	1–22	14.30	5.26	56	4–27
Non-EL	11.91	4.52	100	0–25	16.03	6.88	92	5–38
EL	11.42	3.39	48	6–22	16.52	7.88	46	4–37
MASK Reading Comprehension								
Treatment	4.54	2.71	87	0–14	6.43	3.06	68	1–14
Comparison	5.02	2.61	51	1–11	6.50	3.52	42	1–16
Non-EL	4.51	2.340	94	0–14	6.36	3.207	72	1–16
EL	5.16	3.28	44	0–14	6.63	3.315	38	1–14
Gates-MacGinitie Reading Comprehension								
Treatment	80.95	10.90	90	65–118	82.95	11.20	68	65–123
Comparison	76.29	9.99	52	65–100	81.20	11.81	46	65–104
Non-EL	79.54	10.65	93	65–118	83.52	12.09	75	65–123
EL	78.67	11.10	49	65–108	79.78	9.72	39	65–97

Note. ASK = Assessment of Social Studies Knowledge; EL = English learner; MASK = Modified Assessment of Social Studies Knowledge.

Table 3. Fixed Effects for Outcomes.

Predictor	Estimate	*SE*	Effect size
ASK Knowledge Acquisition			
Intercept	14.381***	1.05	
Pretest	0.91***	0.13	
Intervention	3.58***	1.23	.51
MASK Reading Comprehension			
Intercept	6.42***	0.57	
Pretest	0.47***	0.13	
Intervention	0.12	0.73	.04
Gates-MacGinitie Reading Comprehension			
Intercept	82.23***	2.03	
Pretest	0.64***	0.10	
Intervention	0.28	2.43	.02

Note. ASK = Assessment of Social Studies Knowledge; MASK = Modified Assessment of Social Studies Knowledge.
***$p < .001$.

Random effects for the three models are presented in Table 4. For the ASK Knowledge Acquisition measure, 9.2% of the variance in posttest scores was at the classroom level, 5.3% of the variance was at the teacher level, and the remaining 85.5% of the variance was evident at the student level. On the MASK, 6.3% of the variance was at the classroom level, 2.3% of the variance was at the teacher-level differences, and the remaining 91.4% of the variance was at the student level. On the Gates-MacGinitie Reading Comprehension measure, 22.5% of the total variance was at the teacher level and 77.5% at the student level. Variation at the classroom level did not differ from 0.

Student-Level Differences in Treatment Effect

To address Research Question 2, differences in the treatment effect between EL and non-EL students were tested. The main effect of EL status was not significant for any of the measures (p values ranged from .27 to .67). The coefficient for the interaction of EL status and treatment condition also did not differ from 0 for the Gates-MacGinitie Reading Comprehension measure ($\gamma_{100} = -1.40$, $SE = 3.22$, $p = .66$), the ASK Knowledge Acquisition measure ($\gamma_{100} = 2.42$, $SE = 2.98$, $p = .42$), or the MASK Reading Comprehension measure ($\gamma_{100} = 2.05$, $SE = 1.37$, $p = .14$), suggesting that the effect of treatment did not differ between EL and non-EL students with disabilities.

Discussion

We sought to examine the effects of PACT instruction for EL and non-EL students with disabilities who were included in general education social studies classes. We first examined student outcomes in content acquisition. Several features of PACT instruction were designed to improve student content acquisition, including (a) integrating content around a central question; (b) explicitly teaching, reviewing, and applying key vocabulary for understanding the content; (c) checking content understanding during the unit, allowing students opportunities to use resources to process their content understanding with peers, providing immediate feedback on understanding, and incorporating targeted reteaching for misunderstandings; (d) reading and discussing relevant text in the content area with support; and (e) applying newly learned content to meaningful problem-solving situations.

Overall findings suggest students with disabilities included in general education social studies classes who received the PACT

Table 4. Random Effects for Outcomes.

Measure	Variance	*SE*	%
ASK Knowledge Acquisition			
Level 1	45.08***	10.30	85.5
Level 2	4.86	14.03	9.2
Level 3	2.81	7.28	5.3
MASK Reading Comprehension			
Level 1	9.62***	2.44	91.4
Level 2	0.74	1.50	6.3
Level 3	0.01	0.47	2.3
Gates-MacGinitie Reading Comprehension			
Level 1	101.49***	24.42	75.49
Level 2	0.97	37.55	0.1
Level 3	29.67	17.47	22.5

Note. ASK = Assessment of Social Studies Knowledge. MASK = Modified Assessment of Social Studies Knowledge.
***$p < .001$.

intervention significantly increased their content acquisition over students with disabilities in the general education BAU classes. The moderate effect size of .51 provides additional confidence that the increases were practically meaningful. Students in the PACT treatment accurately answered an additional four content questions on average. This effect size is similar to the effects noted for peers in the same classes (ES = .40; Vaughn et al., in press), suggesting the students with disabilities in these classes were maintaining progress with their typical peers in the new knowledge acquired. Thus, the data suggest that incorporating components of instruction designed to increase student engagement, supported text reading, and application of newly learned content is beneficial to EL and non-EL students with disabilities. However, the students with disabilities had lower pretest scores in content knowledge than their typically developing peers, representative of their lower vocabulary and background knowledge going into the unit instruction. The students in the treatment classes did not fall further behind their peers in content knowledge but still require additional support to achieve grade-level expectations.

The effects from the current study are in line with previous research on other interventions for students with disabilities in social studies classes that have reported effects from 0.26 to 1.14 for content knowledge measures (Gersten, Baker, Smith-Johnson, & Dimino, 2006; Lederer, 2000; Scanlon, Deshler, & Schumaker, 1996; Swanson, Wanzek, Roberts, et al., in press). Two of these studies examined an intervention implemented by the classroom teachers (Scanlon et al., 1996; Swanson, Wanzek, Roberts, et al., in press). This research suggests that content acquisition can be improved for students with disabilities who are included in general education social studies classes when the components of PACT are implemented.

We also examined student outcomes in two areas of reading comprehension, content-specific reading comprehension and general reading comprehension. PACT instruction also incorporates components to specifically target reading comprehension in the content area of social studies. Supported reading of primary and secondary sources with oral and written comprehension checks along with explicit instruction, review, and application of key vocabulary for understanding the written content was provided. However, in this study, the text-reading portion of the intervention was implemented with the lowest fidelity. Student outcomes in reading comprehension of content area text, as measured by the MASK, did not differ between students with disabilities in the PACT classes and BAU classes. This result differs from findings reported by Swanson,

Wanzek, Roberts, et al. (in press). Swanson and colleagues reported a significant difference in reading comprehension for students with disabilities included in PACT classes versus BAU classes, with an average effect size of .34. The major difference between the current sample and the sample examined by Swanson and colleagues is the percentage of ELs served in the classes. Swanson and colleagues did not specifically report on EL status, but only 14% of their sample was of Hispanic ethnicity, whereas the current study included 75% Hispanic ethnicity and 33% recent EL status. Students in the current sample also had mean pretest scores lower than the pretest scores noted in the previous study (Swanson, Wanzek, Roberts, et al., in press). It is possible that the implementation of the reading component of PACT in this study was not at a high enough threshold to affect student outcomes in the area of reading comprehension for this sample and that additional support is needed.

General education teachers implementing PACT instructional practices yielded significant benefits in content acquisition for students with disabilities with no differences in outcomes for students who were also identified as EL.

The PACT intervention does not provide specific components of instruction in general reading comprehension. Although reading comprehension in the content area is addressed and some of the instructional strategies (e.g., summarizing) could generalize to other text, the focus on content-specific knowledge is unlikely to implicitly generalize to broader aspects of reading comprehension, particularly for students with disabilities. As has been noted in previous studies of PACT (Swanson, Wanzek, Roberts, et al., in press; Vaughn et al., in press; Wanzek, Swanson, Vaughn, Roberts, & Kent, 2015), general reading comprehension, as measured by the Gates-MacGinitie Reading Comprehension assessment, was not significantly affected by participation in PACT instruction for students with disabilities. As a result, we do not believe implementation of PACT is the most effective way to improve general reading comprehension.

Given the school populations targeted in this study, we also sought to examine whether there were differences in the outcomes of EL and non-EL students with disabilities. EL status did not moderate the effects of treatment on any measure. Although the sample of EL students with disabilities was small (n = 52), the means at pretest and posttest demonstrate no trends toward differential outcomes, providing further confidence that the lack of moderation is not simply a problem of statistical power. Thus, in the area of content acquisition, both EL and non-EL students with disabilities were able to significantly benefit from the PACT intervention provided in general education social studies classes.

Conclusions

Overall, the findings support that general education teachers implementing PACT instructional practices yielded significant benefits in content acquisition for students with disabilities in those settings, with no differences in outcomes for students who were also identified as EL. Although the students with disabilities maintained their level of content learning with their typical peers, the gaps in overall scores between EL and non-EL students with disabilities and the previous research on their peers without disabilities (Vaughn et al., in press) suggest that additional supports, perhaps beyond the general education classroom (e.g., specialized reading supports), are needed to assist students with disabilities in meeting grade-level expectations in the social studies content area. Continued research on the supports EL and non-EL students with disabilities require to succeed in their inclusion placements could provide valuable information for educators.

Limitations

In the current study, intact classes that included students with and without disabilities were randomly assigned to condition. Though we had access to a large number of EL and non-EL students with disabilities who were included in

general education, the students with disabilities were not randomly assigned to study condition, generating a quasiexperimental design. We did examine multiple demographic variables of the participants, finding no differences between the study conditions on any variables. In addition, we examined pretest scores on knowledge acquisition, content reading comprehension, and general reading comprehension, with differences between study conditions noted only on the general reading comprehension, which was incorporated as a covariate.

The fidelity of implementation by the social studies teachers was not at the highest possible level in all areas and could be considered an additional limitation to the examination of PACT effects. On the one hand, we do not report findings when PACT is implemented perfectly in all lessons; however, the study was conducted with school personnel who would ultimately be implementing such interventions in practice, and thus, current findings represent effects more typical of levels of implementation in practical settings. It seems from the data the PACT practices with well-specified instructional procedures, including partial scripting, were implemented at the highest levels (e.g., warm-ups, essential words). In contrast, PACT practices that required an emphasis on student discussion with facilitation of student thinking and problem solving (e.g., critical reading, TBL knowledge application) were more challenging for teachers. Additional research examining new ways in which to support teachers in facilitating student discussion and critical thinking of content and text in middle school settings is needed.

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