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ABSTRACT

The effects of a cooperative learning program, Bilingual Cooperative Integrated Reading and Composition (BCIRC), on the Spanish and English reading, writing, and language achievement of second and third graders of limited English proficiency in Spanish bilingual programs in El Paso (Texas) were studied. BCIRC was expected to improve student achievement during the transition from Spanish to English by giving students daily opportunities to use language to find meanings and solve problems, and by applying well-established principles of cooperative learning to increase student motivation and achievement. A comparison of standardized test scores in three BCIRC and four comparison schools generally supported these expectations. On the Spanish Texas Assessment of Academic Skills, second graders scored significantly better than comparison students in writing and marginally better in reading. On the English Norm-referenced Assessment Program for Texas third graders scored better than comparison students in reading, but not language. Third graders in BCIRC for 2 years scored better than control students on both scales, and BCIRC third graders met criteria for exit from bilingual education at a significantly higher rate than did comparison students. Qualitative evidence shows that students in cooperative groups are making meaning for themselves, enjoying the program and having success in writing contests. (Contains 6 tables and 43 references.) (Author/SLD)

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CRESPAR

EFFECTS OF BILINGUAL COOPERATIVE INTEGRATED READING AND COMPOSITION ON STUDENTS TRANSITIONING FROM SPANISH TO ENGLISH READING

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Report No. 10 / February 1997

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CENTER FOR RESEARCH ON THE EDUCATION OF STUDENTS PLACED AT RISK

Johns Hopkins University & Howard University

EFFECTS OF BILINGUAL COOPERATIVE INTEGRATED READING AND COMPOSITION ON STUDENTS TRANSITIONING FROM SPANISH TO ENGLISH READING

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Report No. 10

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The Center

Every child has the capacity to succeed in school and in life. Yet far too many children, especially those from poor and minority families, are placed at risk by school practices that are based on a sorting paradigm in which some students receive high-expectations instruction while the rest are relegated to lower quality education and lower quality futures. The sorting perspective must be replaced by a "talent development" model that asserts that all children are capable of succeeding in a rich and demanding curriculum with appropriate assistance and support.

The mission of the Center for Research on the Education of Students Placed at Risk (CRESPAR) is to conduct the research, development, evaluation, and dissemination needed to transform schooling for students placed at risk. The work of the Center is guided by three central themes — ensuring the success of all students at key development points, building on students' personal and cultural assets, and scaling up effective programs — and conducted through seven research and development programs and a program of institutional activities.

CRESPAR is organized as a partnership of Johns Hopkins University and Howard University, in collaboration with researchers at the University of California at Santa Barbara, University of California at Los Angeles, University of Chicago, Manpower Research Demonstration Corporation, WestEd Regional Laboratory, University of Memphis, and University of Houston-Clear Lake.

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Abstract

This study evaluated the effects of a cooperative learning program, Bilingual Cooperative Integrated Reading and Composition (BCIRC), on the Spanish and English reading, writing, and language achievement of limited English proficient second- and third-graders in Spanish bilingual programs. BCIRC was expected to improve student achievement during the transition from Spanish to English by giving students daily opportunities to use language to find meanings and solve problems, and by applying well-established principles of cooperative learning to increase student motivation and achievement. A comparison of standardized test scores in matched BCIRC and comparison schools generally supported these expectations. On the Spanish TAAS, second-graders scored significantly better than comparison students in writing and marginally better ($p<.06$) in reading. On the English NAPT, third-graders scored significantly better than comparison students in reading but not in language. Third-graders who were in BCIRC for two years scored much better than control students on both scales. Also, BCIRC third-graders met criteria for exit from bilingual education at a significantly higher rate than did comparison students. Qualitative evidence showed that students within cooperative groups were actually making meaning for themselves and others, enjoyed the program, and won writing contests at a high rate.

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Introduction

Hispanic students, especially those who enter school with little or no skill in speaking English, are at great risk. Although there are important differences among Hispanic subgroups (Baratz-Snowden et al., 1988), Hispanic students in general, especially those from Mexican American and Puerto Rican families, perform less well than Anglos in school (Mullis et al., 1991), and drop out at three times the Anglo rate. Although the achievement gap between Hispanic and Anglo students is slowly diminishing (Mullis et al., 1991), much remains to be done to develop effective instructional programs for limited English proficient students, especially as continuing immigration brings more such students to our nation's schools (GAO, 1994).

During the 1970s and 1980s, debate about effective educational practices for LEP students centered on questions about the effectiveness of bilingual education (Ramirez, 1986; Padilla, Fairchild, & Valadez, 1990) and on the length of time that students should receive instruction in their home language (Collier, 1989; Fradd, 1987). In general, research on the achievement effects of bilingual education for limited English proficient students whose home language is Spanish finds that students first taught to read in Spanish ultimately become better readers in English (and, of course, in Spanish) than do similar students who are taught to read in English only (Garcia, 1991; Willig, 1985; Wong-Fillmore & Valdez, 1986). More recently, attention has shifted to a more significant question — How should bilingual programs be organized to ensure the success of LEP students in their home language and ultimately in English? (See Garcia, 1994.) Clearly, the effectiveness of bilingual education depends on the degree to which students learn in their home language in the first place — for example, there is evidence that the better students in Spanish bilingual programs read in Spanish, the better they will later read in English (Garcia, 1991, 1992).

The renewed focus in the late 1980s on the *quality* of bilingual programs has led to numerous observational and descriptive studies of effective bilingual programs (Fleishman & Hopstock, 1993; Leighton et al., 1993; Garcia, 1987). However, with the exception of a study by Rivera and Zehler (1990), few studies have directly compared innovative bilingual education models to each other or to "traditional" bilingual models in terms of actual student learning in Spanish and English.

One innovation that has been frequently suggested for use in bilingual classrooms is cooperative learning (Calderón, 1990; California State Department of Education, 1986; Cummins, 1986; Slavin, 1990). There are many reasons that cooperative learning seems particularly appropriate for bilingual education. First, cooperative learning should be effective

in improving students' reading performance in their home language. Reviewing ninety-nine studies that compared cooperative learning and control methods on measures of achievement over periods from four weeks to five years, Slavin (1995) concluded that the achievement effects of cooperative learning methods incorporating group goals and individual accountability were substantial and consistent. These studies involved many academic subjects, students of many ages, in many types of schools, in several countries. There is no reason to doubt that these methods would be as effective in teaching Spanish reading to speakers of Spanish as they have been in teaching English reading to speakers of English.

Cooperative learning is likely to be particularly beneficial to Students Acquiring English (SAE) in transitional bilingual programs at the point when they are making a transition to English reading. Research on second-language learning finds that for students to reach high levels of proficiency, they must engage in a great deal of oral interaction, jointly negotiating meaning and solving problems (Krashen, 1985; Long, 1990; Chamot & O'Malley, 1987). Cooperative learning routinely provides opportunities for students to work together to construct meaning and share understandings (Durán & Szymanski, 1993; Prado-Olmos et al., 1993). Research in Israel (Sharan et al., 1984) and in Turkey (Acikgoz, 1991) has shown positive effects of cooperative learning on learning English as a second language, and another study in Israel found substantial effects of cooperative learning on the Hebrew reading of Arabic-speaking children (Hertz-Lazarowitz et al., 1992; Schaedel et al., 1994). A study of Cambodian American students acquiring English in the Philadelphia schools also showed positive effects on these students' English proficiency of a program based on cooperative learning (Slavin & Yampolsky, 1991; Slavin, 1995).

The most extensively evaluated form of cooperative learning designed for elementary reading instruction is a program called Cooperative Integrated Reading and Composition, or CIRC (Stevens, Madden, Slavin, & Farnish, 1987). In CIRC, students are assigned to four-member heterogeneous learning teams. Following a lesson, students work in their teams on a variety of cooperative activities including partner reading, identification of main story elements, vocabulary and summarization activities, practice of reading comprehension strategies, and creative writing using a process writing approach. Research on CIRC in monolingual English reading classes, grades 2-8, has found consistent positive effects of the program on student reading achievement, especially on measures of reading comprehension and metacognitive awareness (Stevens et al., 1987; Stevens & Durkin, 1992; Stevens & Slavin, 1995). In addition, Hertz-Lazarowitz et al. (1992) and Schaedel et al. (1994) found positive effects of a CIRC adaptation on the Hebrew reading and writing achievement of monolingual Hebrew-speaking children.

The present study evaluated an adaptation of CIRC to bilingual classes in the Ysleta School District in El Paso, Texas. The adaptation, which we called Bilingual Cooperative Integrated Reading and Composition, or BCIRC, was designed to help students succeed in reading their home language, Spanish, and then to make a successful transition to English reading. In Ysleta, as in many districts, Spanish-dominant students receive reading instruction in Spanish in kindergarten, first, and second grades. In the middle of second-grade, a transitional English reading program is introduced, while instruction in Spanish reading continues. By fourth-grade, students are expected to be reading and writing proficiently in English as well as Spanish. The BCIRC program was used in grades 2-3, the time of transition from Spanish to English in most bilingual programs. This study is the first to evaluate cooperative learning in a transitional bilingual program over these crucial years.

Method

Setting and Design

The study of Bilingual Cooperative Integrated Reading and Composition took place in the Ysleta Independent School District, a large district within the city of El Paso, Texas and adjoining the Mexican border. In the district as a whole, 79.4% of students are Hispanic, 26.5% are categorized as limited English proficient, and 32.7% of students qualify for Title I services.

The study compared students in bilingual programs in three experimental and four comparison schools, all of which were among the highest-poverty schools in the district. Table 1 summarizes information on these schools. The BCIRC and comparison schools were very similar to each other in demographic characteristics. All served almost entirely Hispanic student bodies, and all had very high percentages of limited English proficient students. As a group, BCIRC schools were somewhat smaller than comparison schools and had higher percentages of Title I students.

The Ysleta BCIRC project began with a pilot cohort of second-graders in 1989-90 and then followed second grade cohorts in 1990-91 and 1991-92. Test scores were collected for all students in spring, 1992, when one of the research cohorts had completed the third grade and one had completed the second grade.

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Table 1
Demographics of BCIRC and Comparison Schools

	Percent Hispanic	Percent LEP *	Percent Title I	Total Enrollment
BCIRC				
School A	96.6	51.9	42.2	645
School B	97.6	47.6	39.8	546
School C	94.6	34.4	55.2	973
Comparison				
School W	94.1	59.3	21.6	1178
School X	99.5	31.6	14.8	921
School Y	98.0	37.9	25.6	759
School Z	96.2	55.8	49.2	971
Overall District	79.4	26.5	32.7	

* Limited English Proficient

Treatments

Comparison Group. Teachers in the comparison group used traditional reading methods emphasizing round-robin oral reading and independent workbook practice activities. They used the Macmillan *Campanitas de Oro* Spanish basal reading series (Tinajero et al., 1987), and starting in the middle of the second grade, the Macmillan Transitional Reading Program in English (Tinajero & Long, 1989), alternating daily between the two texts. Comparison group teachers received training in cooperative learning but not in CIRC or BCIRC, and while they did occasionally use cooperative learning methods, none did so on a regular or sustained basis. Comparison group students received one and one-half hours of reading/language instruction each day plus a daily 30-minute ESL class.

BCIRC. Students in the Bilingual CIRC classes also used the stories from the Macmillan *Campanitas de Oro* Spanish basal reading series but taught through the BCIRC process. In the middle of second grade they began to alternate every two weeks with the Macmillan transitional reading program basals in English. BCIRC classes incorporated the 30-minute ESL period, so students were taught in an uninterrupted two-hour time block each day.

BCIRC is an adaptation of Cooperative Integrated Reading and Composition (CIRC), originally developed at Johns Hopkins University for use with monolingual English students (Stevens et al., 1987). It consists of a variety of instructional practices which develop social, academic, and communication skills. The CIRC program consists of three principal elements:

direct instruction in reading comprehension, Treasure Hunt activities, and integrated language arts and writing. Treasure Hunts are worksheets that include comprehension questions, prediction guidelines, new vocabulary to be learned, story retell, and story-related writing suggestions. In all of these activities, students work in four-member heterogeneous learning teams. All activities follow a series of steps which involve teacher presentation, team practice, independent practice, peer preassessment, additional practice, and testing (Stevens et al., 1987).

CIRC was selected as the model to be adapted to bilingual instruction because of its highly interactive nature and because it was expected to enable bilingual teachers to manage their English, Spanish, and transitional literacy activities in an effective and efficient manner.

In adapting the CIRC model for bilingual instruction, several factors had to be considered: (a) extensive teacher staff development, from a constructivist approach in which the teachers became researchers and collaborators in all adaptation phases; (b) integration of first language development principles, theories, and practices; (c) integration of second language acquisition principles, methods, strategies, and techniques; (d) integration of principles, methods, and techniques for transitioning students from Spanish to English reading and writing; and (e) adoption of a student-centered, constructivist philosophy, focusing on student and teacher empowerment.

BCIRC and Primary Language. The key elements of BCIRC and of the original CIRC model are the same. As in original CIRC, teachers in Bilingual CIRC assign students to four-member, heterogeneous learning teams in which they work together to help each other learn academic material. However, several instructional strategies which have been found effective in teaching reading and writing in both Spanish and English to bilingual students have been incorporated into the bilingual CIRC model. BCIRC took a view of learning which integrated student experiences with literature directed at developing high levels of reading and writing proficiency (Calderón, 1990; Cummins, 1990).

CIRC for ESL and Transition into English. As students began to transition from Spanish to English reading, an adaptation of CIRC was used. The CIRC strategies were combined with innovative transitional and ESL strategies. The combined sequence of activities offered students rich language experiences that integrated speaking, listening, reading, and writing. Because the activities focused on the students' cultural backgrounds, these experiences became meaningful, relevant, and interesting to them. The interaction and practice with peers helped students develop fluency and comfort with English. Because students were learning the CIRC process, protocols, reading, and learning strategies in Spanish first, they were easily transferable to the ESL context. As students began reading in English, they could relax and

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enjoy the stories because they knew the routines and their roles and functions within each instructional event.

CIRC for Developing Critical Thinking. During CIRC activities, Students Acquiring English (SAE) students learn how to solve problems, study together, help each other, solicit opinions, present rationales, defend, synthesize, listen to others, and ask relevant questions. After each activity, SAE students learned how to talk about their thinking strategies and how to improve for next time. The students modeled new patterns of thought when they engaged in dialogues with their teachers; then they used these patterns with their peers. The verification of ideas, the planning of strategies for task completion, the protocols of politeness, consensus seeking, compromising, and the symbolic representation of other intellectual acts are enacted through peer communication (Palincsar, 1987; Vygotsky, 1978). The more a child is exposed to cooperative peer exchange, the more the child's own thinking becomes refined. Bilingual CIRC allows for this type of interaction in both Spanish and English.

Bilingual CIRC Strategies. Bilingual CIRC uses a set of activities that take place before, during, and after reading. These are described below.

1. *Building Background and Vocabulary*

BCIRC materials were developed to facilitate the reading and writing process of basal stories in Spanish and English. Vocabulary that might be difficult or strange or simply absolutely necessary to learn was identified as part of a "Treasure Hunt" set of activities the students would use throughout a five-or-more days cycle. To provide appropriate background for student comprehension and ease of text interaction, teachers were also asked to survey each selection and identify content and language that may be unfamiliar to students. Some teachers conducted a brainstorming activity with the whole class, others wrote a word on chart paper and developed a semantic map with the students. Students' responses indicated how much knowledge they possessed about the topic and the areas that needed development. The maps were displayed on a wall and became word banks for later use during reading, discussion, and writing activities.

Team-building activities were always incorporated into the background-building activities. For example, for a story about a hummingbird, the student team-building activity was to develop a team poster on birds and team names to match the poster. The team-building task generated discussion around the topic of birds and gave students the opportunity to display their knowledge about and experiences with birds.

2. Making Predictions

Whereas the CIRC process includes making whole-class predictions with the teacher, the BCIRC process takes a more detailed procedure. First, the teacher models extensively how to make and confirm predictions. Then students, in teams of four, work with the title of a story and its illustrations and "put their heads together" to predict elements of the story. Sometimes the students are asked to "quick draw" their predictions — that is, give immediate oral responses — other times they are asked to write words or phrases. These are shared with the whole class. Later on in the BCIRC process, students are asked to read a story up to a certain point and then stop to make predictions before reading the remainder of the story. At this point, students do quick draws, one or more word responses, or even a paragraph about their prediction, after ample discussion time.

3. Reading a Selection

The teacher first reads aloud the first part of a story as students track what the teacher is reading. As the teacher reads aloud, students hear the flow of the language and listen to its rhyme and natural rhythm. During a subsequent reading, students are encouraged to "whisper-read" with the teacher. These two activities help trace a road through the text, to develop oral fluency and a sense of confidence before the real performance.

4. Partner Reading

In the original CIRC, students read silently before proceeding with partner reading. However, in BCIRC, students do partner reading first. In partner reading, students sit in pairs, side by side or ear to ear, taking turns reading aloud. At first, partners read the story alternating sentence by sentence. After a few weeks, they alternate paragraph by paragraph. The smaller units ensure greater success, confidence, and engagement with partner and text. Often, after the first reading, they switch their starting point and reread so that each partner reads the sentences that he or she skipped the first time. Sometimes partners sit side by side, facing in the same direction, with only one book so that they can track the text for one another using their index fingers. Through multiple variations of partner reading, students learn to assist each other with the pronunciation and decoding of words. The final step is for each student to read the assigned text silently.

5. Treasure Hunt: Story Comprehension

After partner reading, pairs discuss the answers to Treasure Hunt questions about the story grammar. Story grammar refers to the key elements of a narrative — main idea,

characters, sequencing of events, conclusion. Students work together and help each other understand the questions, look up the answers if necessary, look for clues to support their answers, make inferences, and synthesize and reach consensus. They are not allowed to write the answer but they can write a word or two during the English cycles if this helps them during the discussion that follows with the rest of their team.

Next, students come together in teams of four. At this point the teacher conducts a Numbered Heads Together activity. That is, students in each group count off from one to four. The teacher then asks a question and gives the students time to discuss the answer. Each team of four makes sure that everyone in the group knows the response to the question. The teacher then calls out a number — two, for example. All the number twos stand up. The teacher calls on any one of the standing students to answer the question. Where Partner Reading ensures oral fluency for all students, the Numbered Heads Together activity ensures comprehension of the story elements by all students. Because they do not know who will be asked to represent their group, students must make certain that all group members know the material. The group study activity also exposes students to a broader variety of opinions, discourse patterns for saying the same thing, and new vocabulary. After this, the answers they write to the Treasure Hunt questions are much more elaborate and on target than what they would have been if they wrote them without this peer and teacher assistance.

Sometimes, the students are asked to make up questions. They are taught how to write different types of questions and their responses. After extensive modeling by the teacher, the teams are asked to compose questions to test the other teams. A Numbered Heads Together, or Concentric Circles, or other cooperative learning strategy is used for the students to test other teams. This not only helps them formulate questions, but also to develop higher order thinking skills as they set out to compete with other teams.

6. Story Mapping

After the Treasure Hunts have been completed, each team of four proceeds to map the story. A story map is a visual aid used to organize the story elements. Using this graphic organizer, the students work in small groups to map out the story. The names of characters, the setting, the main idea, the events of the story, problem, and conclusion are first discussed in the team and then represented creatively through a map.

Although sometimes time consuming, story mapping has its advantages: (1) it engages students in a variety of mental processes as they discuss and organize the story; (2) students find labels for concepts more readily; (3) it anchors the story grammar; (4) it provides visual clues for students to practice retelling the story during the Story Retell phase

(which flows more smoothly and becomes progressively longer and more accurate when students do their story maps); and (5) students learn to use mapping strategies for their story-related writing and creative writing later on in the cycle.

7. Story Retell

Students retell stories to partners within their teams, who use story outlines to evaluate their partners' verbal summaries. Afterwards, students discuss with their partners what they liked about the story. Storytellers can go to the podium and tell the stories to the whole class. This helps the storytellers fine tune their speech skills and also model for other students the art of storytelling. Parent Listeners (volunteers at school) or parents/family at home are asked to listen to the "Story Tellers" as often as possible.

8. Story-Related Writing

This part of the lesson cycle calls for students to engage in a variety of writing activities that are related to the selection that students have been reading all week. With a partner or in a team of four, students produce writing in different genres. When students experiment with writing in pairs or teams, they produce higher quality writing, they experience less "writers' block;" they learn to help each other develop storylines, characters, and sequence events; they give each other feedback; and they internalize the process of drafting, revising, rewriting, editing, and publishing.

9. Words Out Loud and Spelling

Words from the story become the word bank to be used throughout the week and ultimately mastered in meaning, pronunciation, and spelling. The Treasure Hunt includes 10-12 words from the story that students must be able to read fluently, spell, and use correctly in meaningful sentences. Through a variety of interactive activities, students help each other to master the new words. For example, students pretest each other on the spelling words using a "disappearing list" strategy — that is, they test each other, make a new list of misspelled words after each assessment, and repeat this process as many times as necessary until the list disappears. Then, they use color-coded cards and other games to teach each other. After the practice, they discuss strategies for remembering the spelling and meaning of words.

10. Partner Checking

After students complete the activities listed above, their partners initial a Student Assessment Form indicating that they have completed and achieved specific criteria on that

task. Students are given daily expectations about the number of activities to be completed, but they can learn at their own rate and complete the activities earlier if they wish, creating additional time for independent reading of other books on the same theme or their own favorite readings. As students progress through the partner checking activities, they discuss their assignments, assess whether or not the various tasks have been completed, and plan how they will proceed. The partners have a vested interest in making sure all students complete their work correctly, because their individual scores are totalled to produce the team's score.

11. Meaningful Sentences

The meanings of five or more carefully selected words in the story are discussed and used as a basis for writing meaningful sentences that show the definition and provide a clear picture of the meaning of the word. For example, "An octopus grabbed the swimmer with its eight long legs," is a meaningful sentence; "I have an octopus," is not.

Writing meaningful sentences often requires a great deal of discussion, modeling, and practice for students acquiring English. First, students practice writing one meaningful sentence in a team of four. After the team "writes and polishes" the sentence, it is transferred onto a sentence strip and displayed on the wall until replaced by the next lesson's sentence strips. After a few weeks, meaningful sentences are written by pairs of students and, eventually, they are written individually.

12. Tests

At the end of three class periods, students are given a comprehension test on the story. They are asked to write meaningful sentences for each vocabulary word and to read the word list aloud to the teacher. Students are *not* permitted to help one another on these tests. The test scores and evaluations of the story-related writing are the major components of students' weekly team scores. These tests are the culmination of a variety of interactive strategies which involve students in day-to-day activities of the CIRC process while providing them with the means to participate fully in every learning event.

13. Direct Instruction in Reading Comprehension

Throughout the lesson cycle, the teacher conducts direct instruction in reading comprehension skills such as identifying main ideas, drawing conclusions, and comparing and contrasting. Students practice these skills in their teams and take individual quizzes on them to contribute to team scores.

14. Writing Workshops

These workshops consist of a series of mini-lessons on the writing process. The teacher provides step-by-step explanations and ideas for completing a writing assignment. Students work closely with their peers and then with the teacher through prewriting, writing, revising, and editing phases. Even the most limited English proficient student can write extensively, if not always correctly, after having interacted in the cycle of the fourteen learning experiences described thus far.

15. Independent Reading

For independent reading, students are asked to read a trade book of their choice every evening for at least 20 minutes. Parents are encouraged to discuss the readings with their children and to initial forms indicating that students have read for the required time. Students earn points for their team if they submit a complete form each week. Students who complete at least one book report every two weeks can earn additional points. Independent reading and book reports replace all other homework in reading and language arts.

In summary, BCIRC allows for a variety of interactive activities which build upon reading, writing, speaking, listening, and thinking skills in two languages. Phonology, orthography, morphology, syntax, semantics, and pragmatics are always simultaneously present and interacting in any instance of language use in context and in learning communities with peers. Language and concept development are being integrated all the time. Additionally, students create meaning with peers as they share their valuable background knowledge and experiences.

Measures

1. BSM

Upon entering school and for several years afterwards, Ysleta students who spoke or heard Spanish in their homes were administered the Bilingual Syntax Measure (BSM), oral language assessments in English and Spanish which yield scores from one to five. BSM scores determined whether students were assigned to bilingual or monolingual education classes. The great majority of students in our sample had BSM scores in English and Spanish from the end of kindergarten and first grade. As kindergarten or first grade BSM scores were the earliest available standardized language data on students, we used the BSM scores as covariates in analyses of test scores received later.

2. TAAS

At the beginning of third grade, all students took the Texas Assessment of Academic Skills (TAAS), a state mandated criterion-referenced assessment of reading, writing, and mathematics. The TAAS was administered in Spanish to all the Spanish-dominant students in this study.

3. NAPT

At the end of third grade, all students (except a very small number lacking adequate English skills) were given the Norm-referenced Assessment Program for Texas, or NAPT. The NAPT yields scores in reading, writing, mathematics, science, and social studies.

Results

BCIRC and comparison second-graders were compared on reading and writing scales from the English TAAS using analysis of covariance, with kindergarten English/Spanish BSM scores as covariates. Similarly, reading and language scales from the third-grade NAPT were compared using analyses of covariance with kindergarten BSM scores as covariates.

Table 2
End-of-Kindergarten Bilingual Syntax Measures for BCIRC and Comparison Students

	BCIRC	Comparison	t
Second-Grade Cohort			
Spanish	4.19	4.27	<1.
(SD)	(0.79)	(1.25)	(N.S.)
English	2.53	2.74	<1.
(SD)	(1.06)	(1.40)	(N.S.)
N	65	55	
Third-Grade Cohort			
Spanish	3.95	4.39	2.30
(SD)	(1.04)	(0.71)	(p<.02)
English	2.91	2.55	1.42
(SD)	(1.21)	(1.37)	(N.S.)
N	64	38	

Before the ANCOVA's were carried out, analyses were conducted to test the comparability of the BSM Spanish scores at the end of kindergarten to be used as baseline data for the second- and third-graders. Table 2 summarizes these analyses. There were no significant differences between BCIRC and comparison students in the second-grade cohort at the end of kindergarten, although comparison students scored slightly higher on the Spanish and English measures. However, comparison students in the third-grade cohort scored significantly higher than BCIRC students on the Spanish BSM at the end of kindergarten, while BCIRC students scored non-significantly higher on the English BSM.

Table 3
Spanish TAAS Scores for BCIRC and Comparison Second-Graders, Controlling for Kindergarten BSM

	BCIRC	Comparison	F	ES
READING	1522	1434	3.44	+0.31
Mean	(200)	(246)	(p<.06)	
Adj. Mean	1528	1453		
N	51	42		
WRITING	1512	1441	5.44	+0.54
Mean	(240)	(179)	(p<.02)	
N	51	42		

Table 3 summarizes the findings for second-graders. On the Spanish TAAS, BCIRC students scored marginally higher (p<.06) than comparison students on the reading scale. The effect size for this comparison (the difference in adjusted means divided by the unadjusted standard deviations) was +0.31. A larger, statistically significant difference (p<.02) was found on the TAAS writing scale, with an effect size of +0.54.

Third-graders in BCIRC schools could have experienced the program for one year (in second or third grades) or for two years. Table 4 presents data comparing students who were in the program at least one year to those who were in the comparison schools. On the NAPT reading scale, BCIRC students scored significantly higher (p<.01) than comparison students, with an effect size of +0.63. However, differences on the NAPT language scale were not statistically significant (ES=+0.29).

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Table 4
English NAPT Scores * for BCIRC and Comparison Third Grades, Controlling for Kindergarten BSM

	BCIRC	Comparison	F	ES
READING				
Mean	32.36	23.54	7.14	+0.63
(SD)	(15.44)	(14.98)	(p<.01)	
Adj. Mean	33.16	23.83		
N	52	33		
LANGUAGE				
Mean	35.42	30.77	1.67	+0.29
(SD)	(15.69)	(15.91)	(N.S)	
Adj. Mean	34.90	30.36		
N	52	33		

* Normal curve equivalents

Another way to look at the third grade data is to separate the outcomes according to the number of years students experienced BCIRC. Table 5 summarizes the results of this comparison. As would be expected, students who were in the program for two years scored better in reading than did students in the program for one year, and they in turn scored better than control students. This difference was statistically significant (p<.01). A similar trend occurred for language scores but was not significant. However, the difference in language scores between students who experienced BCIRC for two years and those in the control group was statistically significant (p<.05).

Table 5
English NAPT Scores* for Third-Graders in BCIRC One or Two Years or in a Comparison School, Controlling for Kindergarten BSM

	BCIRC Two Years	BCIRC One Year	Comparison	F	ES 2 yrs. vs. Comp.	ES 1 yr. vs. Comp.
READING						
Adj. Mean	36.83	28.83	23.83	4.27	+0.87	+0.33
N	26	26	33	(p<.01)		
LANGUAGE						
Adj. Mean	36.27	33.73	30.21	(N.S.)	+0.38	+0.22
N	26	26	33			

* Normal curve equivalents

At the end of third grade, students could exit from bilingual education if they scored above the 40th percentile on NAPT reading and language tests in English. Table 6 shows the number and percentage of students who met this criterion in each condition. In reading, four times more BCIRC students than comparison students met the exit criterion ($\chi^2 = 7.11$, $p<.01$). In language, twice as many BCIRC as comparison students met the exit criterion ($\chi^2 = 3.53$, $p<.06$).

Table 6
Number and Percent of Third-Graders Meeting Criteria for Exit form Bilingual Education*

	BCIRC	Comparison	χ^2
READING	21 (32%)	5 (10%)	7.11 ($p<.01$)
LANGUAGE	26 (39%)	11 (21%)	3.53 ($p<.06$)
N	66	52	

* Exit criterion is an NAPT score at or above the 40th percentile

Tests for gender by treatment interactions found that girls benefitted more than boys from the BCIRC program in second grade. However, no such trend was seen in third grade scores.

Qualitative Evidence

Several qualitative studies have examined the operation of the BCIRC program in detail. The findings of these studies provide both additional evidence of the program's effectiveness (and limitations) and insight into the processes that might underlie its effectiveness.

Calderón (1991) conducted a qualitative study of BCIRC in Ysleta in the second implementation year. She noted several important outcomes. First, nine of twelve BCIRC classes had students who ranked first, second, or third in schoolwide writing contests, which means that these students in bilingual classes were out-performing students in regular English classes.

Other qualitative studies support the quantitative findings of improved reading and writing in Spanish and English, and also provide evidence of improved social skills and self-confidence. Hertz-Lazarowitz and Calderón (1993) examined children's letters about their

experience in BCIRC and found both very positive responses and sophisticated understanding of their experiences. In a study of BCIRC in bilingual third grates in Goleta, California, Prado-Olmos, Smith, and Szymanski (1993) recorded and analyzed students' discussions in Spanish around Treasure Hunt activities. Their analysis shows how one teammate's errors often provided opportunities for the entire team to activate background knowledge, metacognitive awareness, and other higher-order strategies to search not only for a correct answer, but also for evidence to support their reasoning. Durán and Szymanski (1993) studied students in the same classes as they transitioned from Spanish to English. Working from a constructivist, Vygotskyan perspective, they analyzed conversations among students who were assessing and correcting each other's language terms, grammatical elements, lexical choice, and semantic content, as well as assessing each other's task progress, understanding of story content, and personal responses to stories. These activities, they maintain, contribute to students' skill at sense-making and engage students in using English to solve complex problems.

Qualitative studies of BCIRC provide valuable support for the quantitative findings. They document ways in which cooperative learning activities engage students in higher-order, meaning-rich interactions, which are likely to contribute to sophisticated understandings of what it means to be literate. The quantitative measures — standardized tests — are summative indications of program outcomes. The qualitative evidence suggests that much more is going on in BCIRC than is tapped by these tests.

Discussion

The evaluation of Bilingual Cooperative Integrated Reading and Composition (BCIRC) in the Ysleta Independent School District found that students in transitional bilingual programs gained in Spanish and English reading performance as a result of experiencing cooperative learning in second and third grades. The more years students were in the program, the better their English reading performance; students who experienced a full two years of BCIRC in second and third grades scored almost a full standard deviation higher than comparison students in reading (ES =+0.87). Further, third-graders who had been in BCIRC were significantly more likely than comparison group students to meet criteria for exit from bilingual education in reading and language. Second-graders taught primarily in Spanish also scored significantly better than comparison students on a Spanish writing scale and marginally better on a Spanish reading scale ($p<.06$).

Qualitative evidence further supports the proposition that BCIRC increased the quality and quantity of task-focused interactions among students. Qualitative researchers noted complex, insightful discussions among students in both Spanish (Prado-Olmos et al., 1993) and English (Durán & Szymanski, 1993). Other indicators, such as outstanding performance in writing competitions (Calderón et al., 1991), further support the depth of change brought about by the cooperative learning program.

Because cooperative learning engages students in frequent cognitively complex interactions around the solution of real problems and because of its demonstrated achievement effects in both monolingual and ESL settings, the effectiveness of cooperative learning for bilingual education has often been assumed. This is the first quantitative study of the effects of cooperative learning in U.S. bilingual classes, and the results generally support this expectation. Qualitative as well as quantitative evidence showed that one form of cooperative learning, Bilingual Cooperative Integrated Reading and Composition, is an effective means of improving the performance in Spanish and English of students in transitional bilingual programs at the critical point of transition from their home language to English.

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