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Emergent Bilinguals With Specific Reading Comprehension Deficits: A Comparative and Longitudinal Analysis

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Abstract

This study centered on emergent bilingual (EB) students with specific reading comprehension deficits (S-RCD), that is, with poor reading comprehension despite solid word identification skills. The participants were 209 students in Grades 2 to 4, including both EBs and English monolinguals (EMs) with and without S-RCD. Mean comparisons indicated that EBs and EMs with S-RCD showed weaknesses relative to typically developing (TD) readers in oral language, word identification, inference making, and reading engagement, but not in executive functioning. Longitudinal analyses indicated that across two academic years S-RCD persisted for 41% of EBs and EMs alike. Altogether, the study extends research on EBs with S-RCD by identifying variables beyond oral language that may account for their reading comprehension difficulties and providing insight into the extent to which their reading comprehension and word identification performance levels evolve during elementary school. Furthermore, the findings point to the importance of early identification and intervention for weaknesses in reading comprehension and its component elements in both EBs and EMS.

Keywords

specific reading comprehension deficits, second language learners, longitudinal research

In the United States, emergent bilingual (EB) students are students with the potential of developing their bilingualism (García et al., 2008) who are learning English while continuing to develop their first or home language (Administration for Children and Families, 2013). EBs are a demographically diverse population, varied in home language, geographic distribution, and socioeconomic resources (Hammer et al., 2011). Yet, 77.1% speak Spanish as their home language (National Center for Education Statistics, 2018). Many of these native Spanish-speaking EBs struggle with English reading comprehension, a major life skill needed for academic and employment success (Mancilla-Martinez & Lesaux, 2010; Nakamoto et al., 2007).

Estimates indicate that approximately 10% to 15% of children show specific reading comprehension deficits (S-RCD), or poor reading comprehension despite relatively normal decoding skills (Nation & Snowling, 1997, 2000; Yuill & Oakhill, 1991), with consistency in this percentage across criteria for diagnosing S-RCD (e.g., scoring at least 1.5*SD* lower on reading comprehension than on decoding, Nation & Snowling, 1997; scoring at least 6 months lower in reading comprehension compared to both chronological age and reading accuracy age, Stothard & Hulme, 1995). The proportion of children with S-RCD may be larger among EBs because EBs tend to have marked English oral language deficits in such areas as vocabulary and listening comprehension, weaknesses common among students with S-RCD (Spencer et al., 2014). However, a recent meta-analysis found that oral language weaknesses do not fully account for reading comprehension problems in EBs with S-RCD (Spencer & Wagner, 2017), possibly indicating that other variables may contribute to S-RCD in many EBs and serve as important areas for intervention or remediation in these students.

In this study, we explore contributors to reading comprehension in EBs and English monolinguals (EMs) with S-RCD in comparison with their typically developing (TD)

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counterparts to determine if certain contributors to reading comprehension are idiosyncratic to EBs with S-RCD. We examine formerly explored variables, such as oral language, as well as contributors to reading comprehension unexplored in EBs with S-RCD, such as reading engagement and inference making. Because poor reading comprehension persists considerably over time (Etmanskie et al., 2016), we also investigate whether S-RCD persists over a 2-year period to a similar extent for EBs and EMs or whether EBs' deficits show less persistence relative to EMs', suggesting they could be due to a developmental lag in English oral language skill (Lesaux et al., 2006). Longitudinal research on S-RCD in EBs is particularly limited but is needed to better understand how and when to intervene to promote these students' reading comprehension development (Kieffer & Vukovic, 2013; Spencer & Wagner, 2017).

We examine contributors to S-RCD, framed by a componential view of reading (Aaron et al., 2008), which focuses on identifying subcomponents of reading within ecological, cognitive, and psychological domains that contribute to students' specific reading problems. In the ecological domain—which includes contextual variables such as demographic characteristics and both home and classroom environmental elements—we focus on whether students are EBs or EMs; in the cognitive domain we examine readers' oral language, word identification, inference making, and executive function (EF) skills; and in the psychological domain we examine reading engagement. We compare S-RCD and TD groups' mean levels on the cognitive and psychological variables, and whether language status—EB or EM—interacts with reader group to affect these levels. We also examine the developmental trajectories of students with S-RCD over 2 years to determine whether these students persist in S-RCD status, improve in reading comprehension, or develop new reading difficulties, such as problems with word reading.

Our study adds to the literature in the following ways. First, past studies have largely focused on EBs with S-RCD in Grade 4 and beyond (Spencer & Wagner, 2017). These studies sampled from students with a mixture of first languages despite the prominence of Spanish-speaking EBs in the United States, thus limiting our understanding of this group (Kieffer & Vukovic, 2013; Lesaux et al., 2006). We attend to these limits by focusing on a group of students in Grades 2 to 4 with and without S-RCD, who are either native EMs or EBs predominantly from Spanish-speaking families, to identify contributors to S-RCD earlier in EBs' development. Furthermore, limited work has examined the persistence of S-RCD patterns over time. Thus, we examine development of students with S-RCD across 2 years to investigate potential heterogeneity of the S-RCD group's development, by examining how reading skill profiles vary over time. Furthermore, because some reading disabilities emerge later in development, around Grade 4 (Etmanskie et al., 2016), we wanted to examine children younger than Grade 4 to determine whether there were changes in reading disability status across the transition from Grade 2 to 4. Such analysis will also provide insight into whether S-RCD in many EBs may be due to developmental lags—or deficits—in key contributors to reading comprehension. We organize our discussion of focal variables according to the theoretical domains of interest in the componential view of reading.

Ecological Domain: Language Status

Although word reading, oral language, and general cognitive processes in S-RCD have been examined since the 1980s, only a small proportion of this research has focused on processes underlying S-RCD in EBs. A recent meta-analysis identified 16 such studies, among which English was the second language in all but one (Spencer & Wagner, 2017). This limited research is surprising, given the considerable evidence that EBs, particularly Spanish-speaking EBs, often fit the S-RCD profile, beginning around Grade 3. For instance, in a study that followed Spanish-English EBs longitudinally from Grades 1 to 6, EBs' word reading performance was in the average range compared with national norms throughout this span, but their reading comprehension began to lag at Grade 3 (Nakamoto et al., 2007). Similarly, in a study that compared EBs from varied home language backgrounds and their EM peers in Grades 1 and 4 to 6, the groups showed comparable word reading skills at all time points, and equal reading comprehension at Grade 1; EBs, however, showed weaker reading comprehension in Grades 4 to 6, with the gap widening over time (Farnia & Geva, 2013). Comparing EBs with S-RCD to (a) students of the same language background without S-RCD and (b) EMs with S-RCD may yield critical insights into the bases of EBs' S-RCD, which may potentially help prevent and diminish this expanding achievement gap.

Consistent with this notion, findings from Spencer and Wagner's (2017) meta-analysis on S-RCD in EBs suggest two critical differences that deserve further study. First, EBs with S-RCD, in comparison with EBs without S-RCD, performed more poorly in reading comprehension ($d = -2.47$, based on 25 comparisons). Second, EBs with S-RCD were lower in oral language skills than EBs without S-RCD, but the difference in oral language skills ($d = -0.80$, based on 46 comparisons) was not large enough to account for the disparity in reading comprehension between EBs with and without S-RCD. Thus, we agree with Spencer and Wagner's conclusion that differences in other, unexamined processes must contribute to EBs' S-RCD. It is important to acknowledge, though, that we are investigating potential characteristics *on average* of EBs (and, specifically, of primarily Spanish-English EBs who were receiving pullout oral English-language

instruction) with S-RCD; given the heterogeneity in EBs' language backgrounds (e.g., the dominance of their first language vs. their second, the type of English-language instruction they have received), EBs likely vary considerably in the areas related to English reading comprehension in which they show weaknesses and strengths.

Cognitive Domain: Linguistic and Higher-Order Cognitive Variables

Oral Language Predictors: Listening Comprehension and Vocabulary. Limited oral language knowledge and facility is established as a marker of S-RCD (e.g., Landi & Ryherd, 2017), though in the few studies including EBs, it has been more commonly assessed with word—than sentence—or passage-level measures (Spencer & Wagner, 2017). Thus, we incorporated multiple oral language indicators to create a fuller profile of students with S-RCD. First, at the sentence level, we assessed listening comprehension, employing a measure on which EBs with S-RCD across Grades 1 to 4 have shown lower performance than their EM counterparts (Kieffer & Vukovic, 2013). Second, at the word level, we assessed both vocabulary breadth and depth. Evidence has accrued that vocabulary breadth, which is commonly assessed with tests that require matching of words to pictures, is commonly a weakness in EBs with S-RCD (Geva & Massey-Garrison, 2013; Kieffer & Vukovic, 2013; Lesaux & Kieffer, 2010; Li & Kirby, 2014). Vocabulary depth, which involves demonstrating knowledge of multiple meanings of words (Zipke et al., 2009), has been less studied in EBs. One study with Grade 7 EBs showed that vocabulary depth contributed to reading comprehension beyond vocabulary breadth and other cognitive variables (Logan & Kieffer, 2017), supporting Perfetti and Hart's (2001) lexical quality hypothesis that the quality of representations of words, including depth of understanding, is a critical factor in reading comprehension. In addition, in the one known study to examine vocabulary depth specifically in EBs with S-RCD, Grade 8 EBs with S-RCD had shallower vocabulary than those without S-RCD on one of the two measures employed (Li & Kirby, 2014).

Word Identification. Average or above word identification skill is a defining feature of S-RCD; nevertheless, latent word decoding difficulty may contribute to S-RCD (Spencer & Wagner, 2017). In one study comparing EMs and EBs from varied first language groups, Grade 4 TD comprehenders outperformed those with S-RCD on two word recognition measures, including the same measure employed in our study (Woodcock–Johnson [WJ] Letter-Word Identification; Lesaux et al., 2006), though effect sizes indicated the differences were not statistically meaningful, and there were no main or interaction effects involving language group. EBs may also be adequate decoders but not demonstrate fluent word reading in their second language (Ronberg & Petersen, 2016).

Inference Making. Inference making involves integrating text-based information with other information from the text (local inferences) or outside the text (global inferences), with both inference types necessary for establishing coherent text representations (Graesser et al., 1994). Inference making appears to play a causal role in S-RCD (Cain & Oakhill, 2009), with research comparing EMs with and without S-RCD (matched in age, word reading accuracy, and vocabulary) finding weaknesses for those with S-RCD (e.g., Cain & Oakhill, 2006). Study of inference making in EBs with S-RCD is far more limited, with the one known study of fifth graders showing that TD readers outperformed those with S-RCD (Geva & Massey-Garrison, 2013).

Executive Functioning. EFs are domain-general skills necessary for guiding behavior toward a goal or coordinating complex task performance (Luria, 1966), such as reading comprehension. We adopt the unity-by-diversity (tripartite) view (Miyake et al., 2000) that EF consists of related but separable core components: inhibition, working memory, and cognitive flexibility (Diamond, 2013). The tripartite cognitive structure of EF typically does not emerge until mid-to-late adolescence (Lee et al., 2013; Xu et al., 2013), with a unitary structure typical of younger children up to 12 years of age (Wiebe et al., 2008; Xu et al., 2013). EFs contribute to reading comprehension beyond word reading and listening comprehension (e.g., Locascio et al., 2010; Sesma et al., 2009). Individuals with S-RCD have difficulties in the three core components of EF, with the research focusing mostly on general populations with respect to language background—rather than EBs—and, of the three components, mostly on working memory (Carretti et al., 2009; Landi & Ryherd, 2017), which is critical for storing and integrating information during reading (Cain et al., 2004). Inhibition supports suppression of information irrelevant to comprehension (Barnes et al., 2004) and is significantly lower in individuals with S-RCD (Borella et al., 2010). Finally, cognitive flexibility enables readers to shift among text elements and reading processes, such as shifting from decoding to meaning-making, which those with S-RCD particularly struggle with (Cartwright et al., 2017; Conners, 2009).

Psychological Domain: Reading Engagement

Reading motivation facilitates reading engagement, which in turn may augment reading skills and knowledge that enable deeper, more accurate reading comprehension and thus reading achievement (Guthrie & Klauda, 2016). Reading motivation refers to the beliefs, values, and goals that energize and enable reading, while reading engagement

encompasses students' behavioral, cognitive, and affective involvement in reading, as manifested through their effort, social interactions, and expressions when reading. While reading engagement, measured with various assessments, predicts reading comprehension across Grades K–12 (e.g., De Naeghel et al., 2012; Taboada et al., 2009), limited research has examined its role in reading comprehension for students with S-RCD, let alone EBs with S-RCD. To our knowledge, two studies exist, both indicating lower reading engagement in students with S-RCD than in TD readers (Cain & Oakhill, 2011; Ronberg & Petersen, 2016).

Research Questions

Consideration of the extant research on EBs with S-RCD led to the following questions:

Research Question 1 (RQ1): Do students with S-RCD differ from TD readers in their levels of reading, oral language, EF skills, and reading engagement at a given time point? Furthermore, are there any differences within the S-RCD and TD subgroups on any of these variables based on language status (EM, EB)?

Research Question 2 (RQ2). To what extent does S-RCD persist over a 2-year period (Time 1 to Time 2)? Specifically, what profiles of reading comprehension and word identification performance are exhibited at Time 2 by students who met the criteria for S-RCD at Time 1, and are language status (EB or EM) and grade level associated with the persistence of S-RCD at Time 2?

Method

Procedure

Data were collected in fall 2016 (Time 1) and spring 2018 (Time 2). Institutional Review Board approval, parental consent, and teacher consent were obtained, and research activities were carried out in accord with APA ethical guidelines. Research assistants administered all individual measures in one-on-one, 1-hr sessions at each time point. They also administered one measure (the Gates-MacGinitie Reading Comprehension Test) in a large-group setting. Teachers completed one measure, the Reading Engagement Index. EBs had sufficient knowledge of English to understand all task instructions, which were in English.

Participants

The participants were 133 students (81 EBs and 52 EMs) who fit criteria for S-RCD and 76 students (23 EBs and 53 EMs) who fit criteria for the TD group. These students were drawn from a sample of 641 Grades 2 to 4 students attending three suburban schools in a U.S. Mid-Atlantic school district participating in a broader project exploring cognitive and motivational predictors of reading comprehension. Following Cutting et al. (2009), students were identified as having S-RCD at Time 1 if they scored at or below the 25th percentile, based on national norms, on at least one of the two reading comprehension measures and at or above the 40th percentile for word identification. TD readers scored at or above the 40th percentile on both reading comprehension measures and at or above the 40th percentile for word identification. Second graders were the youngest students included, as second grade is typically when involvement of oral language emerges as important for reading comprehension, versus first grade, when word identification plays a greater role (Kim et al., 2012).

Consistent with past work (e.g., Kieffer, 2014; Spencer & Wagner, 2017), language status was also used to group students. Students were designated EBs if school records showed they had ever participated in English as a second language (ESOL) services in the district and if they reported speaking a language other than English at home. Students were designated EMs if school records indicated no participation in ESOL services and students reported English was the primary or sole language spoken at home. The proportion of students identified with S-RCD from the larger sample (21%) is consistent with other work with low-income samples including a mixture of native English and developing or bilingual Spanish-English speakers (e.g., 27% in Kieffer, 2014, which focused on Grade 6 students).

Table 1 summarizes sample demographics. Across groups, the majority of students were from low–socioeconomic status (SES) homes, based on the receipt of Free and Reduced Meal Subsidies (FARMS; the only SES indicator available), and all students were largely from ethnic/racial minority backgrounds. Of the EBs, 88% were Spanish-speakers.

For all students, reading instruction included phonics daily and reading comprehension instruction, with emphasis on comprehension strategies, 3 days a week. The Fountas and Pinnell system of A to Z reading levels was used in conjunction with guided reading lessons, which occurred 3 to 5 times a week. Children receiving ESOL services received them in a pullout format, 3 to 4 times a week for about 15 to 20 min each session. The focus of these lessons was oral English instruction.

Measures

Times 1 and 2

Reading comprehension. The two reading comprehension measures were the passage comprehension subtests of the WJ-IV Tests of Achievement (WJ-IV; Schrank et al., 2014) and the Gates-MacGinitie Reading Tests (MacGinitie et al., 2000). The WJ-IV test includes 52 items of increasing difficulty including matching picture symbols with actual pic-

Table 1. Sample Demographics at Time 1.

Variable	Total (%) (N = 209)	S-RCD (%)			TD (%)		
		Total (n = 133)	EBs (n = 81)	EMs (n = 52)	Total (n = 76)	EBs (n = 23)	EMs (n = 53)
Grade							
Second	24.9	17.3	16.0	19.2	38.2	43.5	35.8
Third	43.5	48.1	51.9	42.3	35.5	34.8	35.8
Fourth	31.6	34.6	32.1	38.5	26.3	21.7	28.3
FARMS status							
FARMS	71.3	77.5	85.2	64.6	60.3	78.3	52.0
No FARMS	28.7	22.5	14.8	35.4	39.7	21.7	48.0
Gender							
Female	47.5	45.7	48.1	41.7	50.7	52.2	50.0
Male	52.5	54.3	51.9	58.3	49.3	47.8	50.0
Ethnicity/race							
Asian	3.5	3.1	3.7	2.1	4.1	13.0	0.0
Black	37.6	34.1	2.5	87.5	43.8	13.0	58.0
Hispanic	46.5	58.1	90.1	4.2	26.0	73.9	4.0
Native Hawaiian/Pacific Islander	0.0	0.0	0.0	0.0	0.0	0.0	0.0
White	9.9	3.9	3.7	4.2	20.5	0.0	30.0
Multi-racial	2.5	0.8	0.0	2.1	5.5	0.0	8.0

Note. S-RCD = specific reading comprehension deficits; TD = typically developing; EB = emergent bilingual; EM = English monolingual; FARMS = Free and Reduced Meal Subsidies.

tures, identifying pictures that correspond to one to three written words, and silently reading one to two sentences and providing missing words. Total correct scores were converted to *W* scores using the WJ online scoring program (Schrank & Dailey, 2014), which link scores across test forms (Form C was used at Time 1; Form B at Time 2). Cronbach's alpha was .88 to .90 at the two testing points. According to the WJ-IV publisher's manual (McGrew et al., 2014), WJ-IV reading comprehension correlates well with other established reading comprehension measures; for example, it correlated .81 with the Wechsler Individual Achievement Test (WIAT-III) in Grades 1 to 8.

The Gates-MacGinitie contains narrative and expository passages, each three to 15 sentences long, followed by three to six multiple choice items answered with the passage in view. Students completed the test level designated for their grade level, with Form S employed at Time 1 and Form T at Time 2. Extended scale scores were used in analyses. Cronbach's alpha ranges from .91 to .93 and alternate form reliability from .80 to .87 across levels (Maria & Hughes, 2008). Gates-MacGinitie reading comprehension correlated .79 with the WIAT-III Reading Comprehension subtest in Grades 1 to 10 (Cutting & Scarborough, 2006).

Word identification. The WJ-IV Letter-Word Identification subtest (Schrank et al., 2014) includes a list of 78 letters and English words that students are asked to read aloud. Total correct scores were converted to *W* scores (Mather & Wendling, 2014). Internal consistency (Cronbach's α) was .80 to .88 at the two testing points. This subtest is one of the two measures comprising the WJ-IV's basic reading composite, which correlated strongly (r = .94) with the comparable WIAT-III indicator for Grades 1 to 8 (McGrew et al., 2014). This subtest also correlated strongly with WJ-IV reading comprehension (rs = .88–.90) in both EBs and EMs in Grades 1 to 4 (Taboada Barber et al., 2020), supporting its validity as a predictor of reading comprehension.

Time 1 only

Listening comprehension. The WJ-IV Oral Comprehension subtest (Schrank et al., 2014) includes 33 passages missing a final word that students must supply based on syntactic and semantic clues (e.g., "Water looks blue, and grass looks ___.") Total correct scores were converted to *W* scores (Mather & Wendling, 2014). Cronbach's alpha was .84. This subtest is one of the two measures comprising the WJ-IV's listening comprehension composite, which correlated .60 with the WIAT-III oral language composite for Grades 1 to 8 (McGrew et al., 2014). Furthermore, this subtest correlated .66 and .42 with WJ-IV reading comprehension in EBs and EMs, respectively (Taboada Barber et al., 2020).

Vocabulary breadth. The WJ-IV Picture Vocabulary subtest (Schrank et al., 2014), including 54 items, requires naming pictures using single words. The task becomes increasingly difficult as less common objects are displayed.

Total correct scores were converted to *W* scores (Mather & Wendling, 2014). Cronbach's alpha was .83. This subtest is one of the two components of the WJ-IV's oral expression cluster, which correlated .57 with WIAT-III oral language for Grades 1 to 8 (McGrew et al., 2014). In addition, this subtest correlated .69 and .64 with concurrent WJ-IV reading comprehension in EBs and EMs, respectively (Taboada Barber et al., 2020).

Vocabulary depth. For the Homonym Definition Task (Zipke et al., 2009), students must state as many meanings as they can for each of 10 words presented orally (e.g., *bank, can*). They are asked "Does it mean anything else?" if they state just one meaning. The number of unique, correct definitions given is the total score (Logan & Kieffer, 2017). Cronbach's alpha was .81. In a study of low-SES, primarily EM Grade 3 students, homonym definition scores correlated .53 to .55 with a task requiring expressing multiple meanings of sentences rather than words, and .39 to .59 with Gates-MacGinitie reading comprehension and the WJ reading comprehension subtest (Zipke et al., 2009).

Inference making. The inference making task (Language and Reading Research Consortium [LARRC] & Muijselaar, 2018; Oakhill & Cain, 2012) assessed ability to make *local coherence inferences*, which integrate information from different story parts, and *global coherence inferences*, which incorporate students' background knowledge to fill in missing details and help formulate a globally coherent representation of the whole story. Students listened to two recorded stories of three paragraphs. Six questions requiring local coherence inferences and four requiring global coherence inferences followed each story. The score was the total number of points earned, up to 40 (0, 1, or 2 points were possible per question, based on whether the answer was *wrong, partially correct*, or *fully correct*). Cronbach's alpha was .67. Inference making correlated moderately to strongly with three standardized measures of listening comprehension in preK to Grade 3 students (LARRC & Muijselaar, 2018), and .58 and .51 with WJ-IV reading comprehension in EBs and EMs, respectively (Taboada Barber et al., 2020).

Executive functioning. EF was measured with three tasks: working memory, inhibition, and cognitive flexibility. Following the unity-by-diversity framework (e.g., Miyake et al., 2000), these three components of EF were combined in a latent variable called EF skills (see Results). *Working memory* was assessed with the Letters Backward Subtest of the Test of Memory and Learning–2 (TOMAL-2), which includes 16 items that require immediately repeating backwards a list containing two to nine letters. The total score is the number of letters recalled in correct order across all lists. Cronbach's alpha was .81. According to the publisher, this test correlated moderately to strongly with standardized measures that require working memory (Reynolds & Voress, 2007). *Inhibition* was assessed with a NEPSY-II subtest (Korkman et al., 2007) that requires naming a series of 40 objects (e.g., circles and squares) as quickly as possible and then providing the opposite names for a series of the same objects (e.g., "square" for circle); two trials are given. Cronbach's alpha for our sample was .71. Performance on this test correlated well with the Delis–Kaplan Executive Functioning System Color-Word Interference subtest (Brooks et al., 2010). *Cognitive flexibility* was assessed with a card sorting task comprised (a) two general trials, involving sorting two sets of 12 pictures of objects based on both color (e.g., red or yellow) and type (e.g., fruit or flower) into a 2 $\times$ 2 matrix (Cartwright et al., 2010) and (b) two reading-specific trials involving sorting two sets of 12 printed words by initial phoneme (e.g., /b/ or /t/), and word meaning (e.g., vehicle or animal). Cronbach's alpha was .67. Performance on this measure has correlated significantly with that on other measures of cognitive flexibility, like the Dimensional Change Card Sort (Bock et al., 2015). Furthermore, composite EF performance correlated .67 and .65 with concurrent WJ-IV reading comprehension for EBs and EMs, respectively (Taboada Barber et al., 2020).

Reading engagement. The Reading Engagement Index (Guthrie et al., 2007) asks teachers to rate each of their students based on their overt manifestation of engaged reading as reflected in their behavior, cognitive involvement, and affect while reading. It includes eight items, answered on a scale ranging from *not true* (1) to *very true* (4); thus, total scores may range from 8 to 32 points. The measure is scored by reverse coding one item (*is easily distracted in self-selected reading*) and then summing all item ratings. Cronbach's alpha was .88. Index scores correlated moderately to strongly with ratings of reading motivation based on student self-report and researchers' coding of interview data (Guthrie et al., 2007) and correlated .36 and .42 with concurrent WJ-IV reading comprehension for EBs and EMs, respectively (Taboada Barber et al., 2020).

Results

Comparison of S-RCD and TD Readers

First, we examined whether S-RCD and TD groups differed in reading, language, EF skills, and reading engagement, and whether there were language status differences within the S-RCD and TD subgroups at Time 1. Multiple linear regression was used for analyses, except latent mean modeling was used for the latent EF variable. Descriptive statistics are given in Table 2.

For the variables used in the eight regression analyses predicting Gates-MacGinitie reading comprehension, WJ-IV reading comprehension, word identification,

Table 2. Means and Standard Deviations for Key Study Variables.

Group	RC-GM	RC-WJ	WI	LC	VB	VD	IM	RE	EF
S-RCD									
M	436.99	467.84	489.14	479.82	475.50	11.08	25.93	28.85	99.81
SD	35.45	11.57	14.62	14.34	11.86	2.82	6.63	6.52	8.49
TD									
M	480.61	488.41	498.55	492.27	484.99	12.66	29.61	34.75	101.45
SD	36.93	10.18	15.67	9.86	11.58	3.59	5.87	4.68	7.47
EB									
M	446.09	469.20	490.78	479.25	472.81	10.64	26.03	30.71	99.98
SD	34.34	13.81	14.79	14.15	11.50	2.77	6.41	5.94	7.67
EM									
M	460.78	481.13	494.40	489.38	484.75	12.68	28.50	31.21	100.80
SD	46.191	13.61	16.47	12.42	10.91	3.27	6.53	7.17	8.56
S-RCD/EB									
M	438.75	464.99	488.49	476.23	469.88	10.40	25.32	29.55	99.99
SD	30.70	11.36	13.03	13.31	10.15	2.47	6.48	5.84	7.84
S-RCD/EM									
M	435.82	472.36	490.17	485.43	483.96	12.16	26.88	27.64	99.54
SD	40.78	10.59	16.98	14.34	8.97	3.01	6.86	7.38	9.47
TD/EB									
M	474.00	486.05	500.00	491.20	484.50	11.60	28.85	35.25	99.93
SD	33.77	9.13	17.95	10.86	9.00	3.66	5.33	3.85	7.18
TD/EM									
M	484.79	489.73	498.55	493.19	485.54	13.19	30.08	34.58	101.92
SD	37.79	10.40	14.97	8.82	12.60	3.46	5.82	5.06	7.57
All									
M	453.24	475.30	492.56	484.40	478.92	11.66	27.27	31.04	100.42
SD	41.68	14.86	15.65	14.19	12.59	3.21	6.59	6.55	8.14

Note. RC = reading comprehension; GM = Gates-MacGinitie; WJ = Woodcock–Johnson; WI = word identification; LC = listening comprehension; VB = vocabulary breadth; VD = vocabulary depth; IM = inference making; RE = reading engagement; EF = executive function; S-RCD = specific reading comprehension deficits; TD = typically developing; EB = emergent bilingual; EM = English monolingual.

listening comprehension, vocabulary breadth, vocabulary depth, inference making, and reading engagement, the missing rate ranged from 2% to 4%. In the analyses, reader group (TD = 0, S-RCD = 1) and language status (EM = 0, EB = 1) were included as predictors, with grade level as a covariate. The interaction between reader group and language status was also included. All results were evaluated using the Bonferroni-adjusted alpha value of .006 (.05/8, since there were eight outcome variables). Full statistics are available in the supplemental results (Table S1), and summarized below.

Controlling for grade level, there was one significant interaction between reader group and language status, for vocabulary breadth, $\beta^* = -.50$, $p < .001$. Specifically, the S-RCD/EB group was lower in vocabulary breadth than the TD/EM group by 13.09 points, but did not significantly differ from the S-RCD/EM or TD/EB subgroups. For all other variables—focusing on the models excluding the interaction terms, because they were not significant (Aiken & West, 1991)—there was a significant main effect for reader group favoring the TD group ($p < .001$ for all). From largest to smallest magnitude, the standardized beta coefficients were −.68 (WJ-IV reading comprehension), −.62 (Gates-MacGinitie reading comprehension), −.45 (reading engagement), −.41 (listening comprehension), −.40 (word identification), and −.22 (vocabulary depth and inference making). There were also significant main effects for language status favoring EMs for three variables, all with $p <$ .001: WJ-IV reading comprehension, listening comprehension, and vocabulary depth.

To examine differences among groups with regard to EF, structural equation models were used. However, prior to main analyses, following the unity-by-diversity view (Miyake et al., 2000), an EF skills latent variable was created based on performance on the inhibition, cognitive flexibility, and working memory tasks, in accord with Wiebe et al. (2008). The missing rate for each variable varied from 0.5% to 12%. Assuming missing at random, all models were fitted with full information likelihood estimation (FIML). There were seven continuous indicators for the variable: two for inhibition (scores on the two trials), four for cognitive flexibility (scores on the four trials), and one

for working memory (the total score on the test). MPlus Version 8.1 (Muthén & Muthén, 2018) was used to fit and compare three measurement models. The best-supported model was a unidimensional confirmatory factor analysis (CFA) model with all indicators loaded on the EF factor, the four cognitive flexibility items fully correlated with each other, and the two inhibition items correlated with each other. Measurement invariance analyses indicated that all loadings were invariant for the TD and S-RCD groups (see Tables S2 and S3 in the supplemental online materials). These two latent factors were the ones used in subsequent analyses. To ascertain whether EF varied across groups, two latent mean models were fitted with language status and grade level as covariates. Model 1 constrained paths from language status to EF and grade to EF to be the same whereas Model 2 set the path from language status to EF free. The nested model comparison index, $\Delta\chi^2_{(1)} = 1.3$, $p = .25$, was nonsignificant indicating Model 1 fit significantly better than Model 2, and there was no interaction between language status and reader group. Model 1 indicated mean latent EF did not differ significantly for the TD and S-RCD groups, $\ell = 0.97$, $SE = 0.52$, $p = .06$, controlling for language status and grade level. Also, language status did not significantly affect EF, $\ell = -0.059$, $SE = 0.19$, $p = .75$ (see Table S4 in the supplemental results).

Reader Profiles at Time 2

Our second research question concerned S-RCD's persistence over a 2-year period. We inquired whether reading comprehension and word identification changed over time for students with S-RCD at Time 1, and whether these changes were associated with language status (EB or EM) and/or grade level (3–5) at Time 2. Of the 133 students with S-RCD at Time 1, 95 were available for analysis. These students did not differ significantly from the 38 attrited students in Time 1 word identification or reading comprehension performance.

Following our Time 1 classification criteria, we first assigned students to groups based on their reading comprehension and word identification performance at Time 2. Students were categorized as reading disabled (RD), lower achieving but not disabled (LA), or typically developing (TD) for each skill. Thus, there were nine possible groups (i.e., 3 reading comprehension categories × 3 word identification categories = 9 combinations). Specifically, for word identification at Time 2, students were identified based on their scores on the WJ Word Identification subtest as RD if they performed at or below the 25th percentile, TD if they performed at or above the 40th percentile, or LA if they performed at the 26th to 39th percentile. For reading comprehension, in agreement with prior established criteria used at Time 1 (Cutting et al., 2009), students were identified as RD if they performed at or below the 25th percentile on at least *one* measure of reading comprehension (either the WJ passage comprehension or Gates-MacGinitie reading comprehension subtests), and as TD if they performed at or above the 40th percentile on *both* reading comprehension measures, consistent with the criteria used at Time 1. The remainder, who either scored in the 26th to 39th percentiles on both measures *or* in the 26th to 39th on one measure *and* at the 40th or above on the other, were classified as LA.

To produce a more parsimonious schema, the nine groups were condensed into six profiles. As at Time 1, an S-RCD profile included those with RD comprehension but TD word identification. Students with RD comprehension and LA word identification were designated as Approaching S-RCD. Students with RD word identification and RD reading comprehension were designated Poor Readers. The other three profiles represented the students who improved in reading comprehension from Time 1 to Time 2. As at Time 1, a TD profile at Time 2 included students who were TD for both reading comprehension and word identification. An Approaching TD profile consisted of the three groups of the original nine that were either LA in both reading comprehension and word identification *or* LA in one dimension but TD in the other. The last profile, Approaching S-Word Identification Deficit (S-WID), included students LA in reading comprehension and RD in word identification. No students showed TD comprehension alongside RD word identification, so the profiles do not incorporate this possible combination.

As shown in Table 3, at Time 2, 41% of the 95 students—in the overall sample as well as in each language subgroup—persisted in the S-RCD profile. The percentage of students with S-RCD was also similar across grade levels, ranging from 38% to 44%. Across the overall sample, an additional 20% continued to show RD comprehension, that is, were either Approaching S-RCD (15%) or Poor Readers (5%). Similarly, across language status, an additional 18% to 23% continued to show RD comprehension, with 15% each of the EBs and EMs with S-RCD at Time 1 Approaching S-RCD at Time 2, and 8% of EBs and 3% of EMs fitting the Poor Readers profile. Across grade levels, the proportions of students Approaching S-RCD was similar, with a range from 13% to 19%, while the proportions of Poor Readers varied more, from 0% to 16%.

Of the 95 students initially with S-RCD, 38% fit one of the three profiles of improved reading comprehension. The largest proportion was Approaching TD, followed by TD, and then Approaching S-WID. This distribution pattern was consistent across language status and grades.

Discussion

This study was designed to compare the experience of S-RCD by Spanish-English EBs who received oral pullout

Table 3. Reader Profiles at Time 2 for Students With Specific Reading Comprehension Deficit (S-RCD) at Time 1.

	Students with disabled reading comprehension at Time 1 and Time 2				Students with improved reading comprehension from Time 1 to Time 2			
Students with S-RCD initially	Total	S-RCD	Approaching S-RCD	Poor Readers	Total	TD	Approaching TD	Approaching S-WID
Total sample (N = 95)	61% (59)	41% (39)	15% (14)	5% (6)	38% (36)	13% (12)	20% (19)	5% (5)
Lang. status								
EB (n = 61)	64% (39)	41% (25)	15% (9)	8% (5)	37% (22)	10% (6)	20% (12)	7% (4)
EM (n = 34)	59% (20)	41% (14)	15% (5)	3% (1)	42% (14)	18% (6)	21% (7)	3% (1)
Grade level (T1/T2)								
2/3 (n = 16)	63% (10)	38% (6)	19% (3)	6% (1)	38% (6)	13% (2)	19% (3)	6% (1)
3/4 (n = 47)	55% (26)	40% (19)	15% (7)	0% (0)	45% (21)	15% (7)	26% (12)	4% (2)
4/5 (n = 32)	73% (23)	44% (14)	13% (4)	16% (5)	28% (9)	9% (3)	13% (4)	6% (2)

Note. Percentages for each language status and grade level may not sum to 100 due to rounding. S-RCD = specific reading comprehension deficit; TD = typically developing; S-WID = specific word identification deficit; EB = emergent bilingual; EM = English monolingual.

English-language instruction and their EM peers, both with respect to variables known to contribute to reading comprehension performance and to S-RCD's persistence. Four major findings emerged. First, we found that both EBs and EMs with S-RCD showed weak oral language skills compared with TD readers, corroborating prior findings (Spencer & Wagner, 2017); however, the EBs and EMs with S-RCD in this sample did not differ significantly in oral language skills from each other. Our second major finding showed that students with S-RCD, regardless of whether they were EBs or EMs, were also weaker than TD readers in three reading comprehension predictors we examined that had not been included previously in studies of Spanish-speaking EBs with S-RCD—word identification, inference making, and reading engagement. Third, we found that mean levels of EF skills differed neither across language groups nor reader groups. This suggests future directions for research on the role of EFs in S-RCD, given the mixed findings in this area (e.g., Carretti et al., 2009; Geva & Massey-Garrison, 2013), as discussed below. Fourth, we found that 41% of the students in our sample initially determined to have S-RCD persisted in showing S-RCD after 2 years, whereas 38% of students initially with S-RCD showed improved reading comprehension. These patterns, which were consistent across language groups and grade levels, extend previous longitudinal studies of S-RCD (Etmanskie et al., 2016; Kieffer & Vukovic, 2013), as also detailed below. Altogether, the current analyses shed light on how variables within the ecological, cognitive, and psychological domains of the componential view of reading contribute to S-RCD in EBs and EMs (Aaron et al., 2008).

Components of S-RCD in EBs and EMs

Oral language. Overall, consistent with past work (e.g., Landi & Ryherd, 2017; Spencer & Wagner, 2017), our regression analyses indicated that both EBs and EMs with S-RCD experience difficulties with various aspects of oral language in comparison with TD readers. We included three indicators of oral language: listening comprehension, vocabulary breadth, and vocabulary depth. For listening comprehension and vocabulary depth, there were significant main effects for both reader group and language status, but no interaction between them. The absence of an interaction between language status and reader group, in relation to these two oral language outcomes, indicates that within each language group TD readers showed stronger listening comprehension and vocabulary depth than students with S-RCD, and, likewise, that within each reader group, EMs showed stronger performance than EBs. The finding for vocabulary depth is particularly notable in indicating that weakness in this component of comprehension for EBs with S-RCD appears at least as early as the elementary years and occurs in Spanish-English EBs. The one previous study that examined this element in EBs with S-RCD focused on Grade 8 Chinese-English EBs (Li & Kirby, 2014). For vocabulary breadth, there was only a significant interaction effect; specifically, the S-RCD/EB subgroup differed only from the TD/EM subgroup in this component.

Altogether, the current findings add to prior evidence showing that oral language difficulties are disproportionately common among EBs and thus likely to *partially* explain EBs' challenges with reading comprehension (e.g.,

Kieffer & Vukovic, 2013; Nakamoto et al., 2007). Evidence, however, that EBs' growth in oral language does not narrow the gap with their EM peers on reading comprehension (Kieffer & Vukovic, 2013) and the meta-analytic finding that EBs with S-RCD have reading comprehension weakness that is substantially greater than their oral language weakness (Spencer & Wagner, 2017) leave room for several other variables to explain the disparity in reading achievement between EBs and EMs. As we discuss next, word identification, inference making, and reading engagement are likely some of these variables.

Word identification. Our regression analysis indicated that TD students were significantly stronger in word identification than those with S-RCD, with the effect moderate in magnitude, despite adequate word identification being a defining feature of S-RCD. Language status did not have a main or interaction effect, consistent with past research in which EBs demonstrated early strengths in word identification; however, in prior studies, EBs fell below national norms starting in later grades (e.g., Grade 4; Kieffer & Vukovic, 2013). Thus, the current findings cannot be interpreted as evidence that instruction for EBs with S-RCD should prioritize comprehension at the expense of attention to word identification.

Inference making. Our findings indicated that within both language groups, students with S-RCD were weaker in forming inferences compared with their TD peers. There were no differences in inference making based on language status. The fact that inference making differentiates between students with and without S-RCD is not surprising. Inference making has been causally linked to reading comprehension difficulties in English native speakers (e.g., Cain & Oakhill, 2006, 2009) and in EBs with S-RCD (Geva & Massey-Garrison, 2013). Our measure of inference making was based on that of LARRC and Muijselaar (2018), which has been found to be a valid measure of discourse-level listening comprehension. It is intriguing, given that this task requires discourse-level (oral) comprehension, that performance on it did not differ significantly for the two language groups. However, the fact that students with S-RCD were statistically lower on inference making indicates that, as noted in prior studies, the task demands skills that are directly involved in the act of reading comprehension, such as the ability to encode details and maintain cohesion by integrating ideas presented in text and generating inferences using background knowledge (Cain & Oakhill, 1999). Students with S-RCD struggle with both these skills, irrespective of language status. Given how little is known about inference making in EBs, a consideration for future research is whether EBs and EMs who struggle with inference making do so for similar reasons, such as difficulty retrieving relevant knowledge to make inferences and/or integrating that knowledge with textual information (Cain et al., 2001). Alternatively, or in addition, we do not know whether some EBs' challenges with inference making are rooted in their developing language proficiency and if these are linked to language retrieval difficulties.

Reading engagement. Teachers rated TD readers higher in reading engagement—based on their observations of students' behavioral, cognitive, and affective involvement in reading over at least a 3-month period—than those with S-RCD, with the difference moderately sized and not affected by language status. This finding concurs with past work, which represented reading engagement with indicators of students' reading frequency (Cain & Oakhill, 2011; Ronberg & Petersen, 2016). The current and past findings support engagement's relevance for predicting reading comprehension across language groups (De Naeghel et al., 2012; Taboada et al., 2009) and suggest more attention is needed to increase reading engagement in students with S-RCD. Such attention is warranted given engagement's established malleability in response to instructional practices among students of varied ethnic and language backgrounds (Taboada Barber et al., 2018; Wigfield et al., 2014).

Executive functioning. Our findings for EF were unique among the other variables currently examined in indicating no statistically significant difference either between reader groups or language groups. The finding of similarity in EF performance across language groups does not concur with prior findings that bilinguals perform more strongly on some EF measures (e.g., Calvo & Bialystok, 2014; Carlson & Meltzoff, 2008). However, it aligns with findings suggesting that bilingual and monolingual differences in EF are limited to certain contexts and it depends on the EF tasks and processes assessed (e.g., Bialystok, 2015). In particular, stronger bilingual performance on EF tasks has been related to degree of bilingualism (Bialystok & Barac, 2012) and to nonverbal EF tasks that require cognitive control of attention associated with language switching (e.g., Bialystok, 2015; Luk et al., 2012). Had we collected more data on exposure and use of the first language (Spanish), and thus degree of bilingualism, for the EBs in our sample, we may have been better able to understand the present findings for EF. Also, had we considered EF tasks that were more specific to control of attention with less reliance on linguistic factors, differences between the language groups may have appeared. Furthermore, given past findings of weaknesses in particular elements of EF for those with S-RCD compared with TD readers (e.g., Cartwright et al., 2017; Cutting et al., 2009), it seems surprising that the S-RCD and TD groups were similar overall in EF performance. This finding is consistent, however, with that of Geva and Massey-Garrison (2013), who found no differences in working memory related to reader group or language status in Grade

5 students, including EBs with several (non-Spanish) native languages. Given varying findings regarding EFs in students with S-RCD, and increasing evidence that EF is an important predictor of reading comprehension in broad samples of readers (Follmer, 2018), future work should examine connections among language status (e.g., whether students are balanced bilinguals or dominant in one language), EFs, and reading comprehension.

Profiles of EBs and EMs Over Time

This study also examined the persistence of S-RCD over 2 academic years. As a positive outcome, our analyses indicated that our sample of largely Spanish-English EBs with S-RCD appeared to be keeping pace with their EM counterparts in terms of the proportions showing improved reading comprehension at Time 2: 37% of EBs and 42% of EMs performed above the 25th percentile at Time 2, effectively exiting RD status for reading comprehension. However, the majority of each language group (64% of EBs and 59% of EMs) continued to show RD comprehension at Time 2, suggesting that many students in both groups had comprehension deficits rather than developmental lags. A small portion of both groups (3%–8%) also developed difficulties with word recognition. Exactly the same proportion of each language background persisted at Time 2 in the S-RCD profile (41%) and showed the Approaching S-RCD profile (15%). This consistency of reader profiles across language groups conforms with Lesaux et al.'s (2006) study of fourth graders. By grade level, the proportions of students who persisted in S-RCD status were also similar, though there was a slight increase in the percentage who continued to show S-RCD characteristics as grade level increased (see Table 3).

These findings extend past research, demonstrating that EBs identified with S-RCD at Grade 4 were weak in some contributors to reading comprehension, namely, vocabulary and oral comprehension, across Grades 1 to 4 (Kieffer & Vukovic, 2013) by showing that the S-RCD pattern itself, and, more generally, poor reading comprehension, may often persist in EBs across at least two elementary grades. Furthermore, we agree with Kieffer and Vukovic (2013) that the persistence of weaknesses in oral language—and, as we found, the persistence of S-RCD itself—across the elementary grades in EBs challenges the widely held assumption that EBs can catch up to their on- or above-grade EM peers in reading comprehension merely by being exposed to more English at school; rather, early and continuing instruction focused on oral language and other cognitive variables (e.g., cognitive strategies) that play a role in reading comprehension is needed.

The current findings also complement that of a study of S-RCD's persistence from elementary to middle school in a sample comprising 80% native English speakers and 20% EBs with varied first languages conducted in Canada (Etmanskie et al., 2016). Etmanskie et al. found a similar rate of persistence of reading comprehension difficulties as in this study, as 65% of Grade 7 students identified with S-RCD in Grades 2 and 3 were below average comprehenders. However, they did not separate those who were below average into groups or examine word identification alongside reading comprehension at Grade 7 as we did in this study, nor did they investigate whether there were differential persistence rates by language background (Etmanskie et al., 2016). Altogether, the present longitudinal findings and this past research substantiate the importance of early identification and intervention for reading comprehension difficulties, given that reading comprehension has been found to be a malleable variable, amenable to intervention in the elementary years (e.g., Wigfield et al., 2014) and in EBs as well as EMs (e.g., Taboada Barber et al., 2018) While a full discussion of potential foci and specific strategies for intervention is beyond the scope of the present article, we believe interventions for EBs and EMs with S-RCD should take a multi-pronged approach, focused on both cognitive and psychological constructs known to contribute to reading comprehension in general samples and particularly those demonstrated to be relative weaknesses for students with S-RCD. Distinct approaches, as a rule, for EBs and EMs with S-RCD do not appear warranted. Rather, interventions should be formulated that emphasize different component skills and aspects of reading engagement and motivation in accord with early and continuing assessment of the needs of particular students or groups of students.

Study Limitations and Conclusion

In addition to research directions already suggested, future studies should assess the current findings' generalizability, especially with larger samples and with groupings based on other ecological variables, such as first language, degree of bilingualism (e.g., emergent bilingualism versus balanced bilingualism), the proportion of time at home that English, and/or other languages are spoken, and the duration and type of English-language instruction. In addition to the reading instruction shared with their EM counterparts, EBs in this study received pullout oral English instruction 3 to 4 times a week for about 15 to 20 min each session. Our findings, thus, should be contextualized within an English-only instructional framework; these findings may have differed if EBs (and EMs) had been in a bilingual immersion setting. For instance, it is plausible that EBs' reading comprehension difficulties may not have persisted as much had these children received consistent phonological awareness, phonics, and oral language instruction in both languages, possibly leading to cross-language benefits for these skills and, thereby, to gains in their reading comprehension in

English (and in Spanish). Another possibility is that in a bilingual instructional setting—in contrast to the monolingual instructional setting of the current study—both language groups, but EBs in particular, would have leveraged the benefits of balanced bilingualism to strengthen their EF skills over time—a development that is aligned with the differences in bilingual and monolingual cognitive processing posited by Bialystok and others (e.g., Calvo & Bialystok, 2014).

Other predictors of reading comprehension, particularly other indicators within the motivation domain, should also be a focus of future study, especially to determine their interaction or lack of thereof with cognitive skills associated with S-RCD. In addition, assessments of EBs' native or first language, such as vocabulary, word identification, and reading comprehension, should be included to discern whether students are experiencing S-RCD in both languages and whether EBs show stronger, age-appropriate vocabulary when knowledge of both languages is considered, as recent work indicates (Mancilla-Martinez et al., 2020). Furthermore, while we were able to include some information on the validity of the employed measures for EBs, in-depth examination of the validity of all measures for EBs in both their languages should be conducted. Future work is also needed to understand the role of EFs in S-RCD across language groups who vary in degree of bilingualism.

Altogether, this study highlights the value in combining predictors of reading comprehension and longitudinal data to understand characteristics of students with S-RCD, especially those who are EBs. Our findings indicate that challenges of students with S-RCD, including Spanish-English EBs and EMs, encompass difficulties with oral language (listening comprehension, vocabulary breadth, and vocabulary depth) as well as word identification, inference making, and reading engagement. Our findings also reveal the persistence of S-RCD across language groups, suggesting the importance of early intervention for all students with poor reading comprehension in the elementary years. Importantly, language status did not emerge as the sole determiner of the struggles experienced by students with S-RCD, and accordingly, instruction for these students should be differentiated on the basis of other, multiple variables that may be affecting their reading comprehension.

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Supplemental Material

Supplemental material for this article is available on the *Journal of Learning Disabilities* website with the online version of this article.

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