EXPLORING DUAL-LANGUAGE BOOKS AS A RESOURCE FOR CHILDREN'S BILINGUALISM AND BILITERACY DEVELOPMENT

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ABSTRACT

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Given the multilingual population of the United States, dual-language books (DLBs), or books with the complete text written in two languages, are often recommended for teachers to use in their classrooms to validate students' language and culture, facilitate language learning, and support (bi)literacy development. These recommendations are based on theory with few empirical studies investigating how children make meaning from DLBs. Research related to reading DLBs has largely focused on adults reading to or with students, and none of it has been conducted in the United States. Therefore, this study sought to answer two questions related to (1) DLBs' learning opportunities for students to make connections across languages to develop biliteracy (i.e., literacy skills in more than one language) and (2) how bilingual students from Spanish-speaking homes with English literacy skills but not formal Spanish literacy instruction read DLBs to develop biliteracy.

To answer these questions, I completed two studies. First, I engaged in verbal protocols/think-alouds with 68 Spanish-English bilingual third and fifth graders from two schools with Spanish immersion programs. Students explained their strategies when translating English and Spanish words and retelling texts. I analyzed their verbal protocols using discourse analysis techniques to determine codes that described students' strategies to translate words (i.e., make metalinguistic connections) and retell passages (i.e., make conceptual connections). I analyzed these codes quantitatively to determine trends in students' strategy use.

The second study was a qualitative study of students' reading strategies. I focused on five students who came from Spanish-speaking homes and had received formal English literacy instruction but not Spanish. I analyzed their verbal protocols, interviews with them and their teachers, and video recordings and observational notes of their readings. I engaged in initial and second-cycle coding to determine patterns in the ways in which these students read DLBs to develop biliteracy. I compared students' readings, responses, and strategies not only to each other, but also to the other students in the large mixed methods study. The similarities and unique characteristics led to themes that organized the findings.

Across both studies, students who were younger and had lower oral reading accuracy scores tended to use strategies that were more text-based (focused on text features) to translate and retell texts whereas students who were older and had higher accuracy scores tended to use more language-based strategies (informed by their knowledge of languages). For the second study, students also used English to help them read the Spanish text. They used English phonology to decode the Spanish, relied on their memory of the English text to activate their Spanish oral language knowledge, and looked at the English to help them decode the Spanish.

These studies' findings contribute to linguistics research by describing *how* children translanguage and make connections across languages. The findings can also inform teachers' instruction with recommendations to increase students' metalinguistic awareness by asking students to compare and analyze the ways in which DLBs are translated. Finally, the findings have significance for book publishers in that publishing texts with fewer words on the page has the potential to support students in using one of the text's languages to decode the other. Understanding how students make connections across languages while reading helps researchers and practitioners consider additional ways to support students' biliteracy development.

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CHAPTER 1 – INTRODUCTION AND THEORETICAL FRAMEWORK

Statement of the Issue

There are increasing numbers of multilingual children in the United States. Over 20% of school-age children speak a language other than English at home (KIDS COUNT Data Center, 2018), and each year, attendance increases in language immersion programs (Center for Applied Linguistics, 2011, 2016a, 2016b) where students develop bilingualism as well as biliteracy (i.e., the ability to read and write in multiple languages; Hornberger, 1990). Bilingualism helps children develop cognitively through divergent thinking and linguistic analysis, personally through increased cultural awareness and social interactions, and economically through more job opportunities in the global economy (O. García, 2009a). However, bilingual abilities alone do not guarantee academic success. Data from the National Assessment of Educational Progress (NAEP) (2017) reveal that students learning English as an additional language consistently score below their English-proficient peers creating an English reading achievement gap. Most of these students are enrolled in programs that focus almost exclusively on developing English proficiency, not bilingualism or biliteracy (Christian, 2011). However, research has found that students in language immersion programs promoting biliteracy development, regardless of their English proficiency, have higher English reading scores than peers with similar language backgrounds in monolingual programs (e.g., Lindholm-Leary & Hernández, 2011; Steele et al., 2017). Therefore, becoming biliterate strengthens all students' literacy skills, but the question becomes how students can develop biliterate abilities whether enrolled in language immersion programs or not.

Dual-language books (DLBs)—which place the same text in two languages side-by-side on the same page or two-page spread (Naqvi, Thorne, McKeough, & Pfitscher, 2010)—create

comparative conditions that are theoretically ideal for biliteracy development because knowledge of one language supports language and literacy acquisition in another (e.g., Cummins, 1979; Goldenberg, 2011). Having the story in two languages makes DLBs suited for monolingual and multilingual classrooms. However, even though DLBs are frequently recommended for classroom use (e.g., D. Freeman & Freeman, 2007; Y. Freeman, Freeman, & Ebe, 2011; Maxwell, 2013), little is known about how children actually read and engage with DLBs as a resource to support their biliteracy.

There have been articles describing family literacy programs that featured DLBs as providing increased opportunities for parents with limited or no English skills to participate in literacy activities with their children (e.g., Rodriguez-Valls, 2009; Rodríguez-Valls, 2011; Rowe & Fain, 2013; Wessels & Trainin, 2014). In addition, Cummins and various colleagues (e.g., Chow & Cummins, 2003; Cummins, 2005; Cummins et al., 2005; Cummins, Chow, & Schecter, 2006; Cummins, Hu, Markus, & Montero, 2015) have shared observations of the identity affirmation and language learning that occurred when children *wrote* DLBs or as they called them, "language identity texts." However, these studies do not investigate or focus on what happens when children read DLBs. The few studies conducted have focused primarily on adults helping children make meaning across the languages in DLBs (i.e., Ma, 2008; Naqvi et al., 2010; Sneddon, 2009). Yet, adults are not always present to help children make these connections, particularly in programs that focus primarily on promoting English proficiency where teachers may not speak, read, or write in one of the languages of the DLB text.

Given the positive correlation between biliteracy and English reading achievement, it is critical to understand how these texts may be a resource to support students' bilingualism and biliteracy development. In particular, this descriptive study focused on how a large sample of

bilingual students process DLB texts to support vocabulary and comprehension development. Using mixed methods, I analyzed observations of 68 Spanish-English bilingual third and fifth grade students as they read DLBs and explained their reading strategies by thinking aloud (i.e., engaging in verbal protocols; Pressley & Afflerbach, 1995). I also analyzed the reading strategies of five students who grew up in Spanish-speaking homes and had developed English literacy skills but had not received formal literacy instruction in Spanish. These studies sought to answer the following research questions:

1) What learning opportunities do DLBs afford for students to make cross-linguistic connections to develop biliteracy?
2) How do bilingual students, from Spanish-speaking homes who have received formal English literacy instruction but not Spanish, use DLBs to develop biliteracy?

Theoretical Framework

With the focus on multilingual reading, these studies draw on theories of reading and language. First, I describe the RAND model of reading comprehension (RAND Reading Study Group, 2002) which is used to broadly conceptualize the components of reading comprehension before presenting specific characteristics of second language reading, which is inherently cross-linguistic.

RAND Model of Reading Comprehension

The RAND Model (RAND Reading Study Group, 2002) of reading comprehension defines reading comprehension "as the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (p. xiii). It views reading comprehension as an interaction between a reader and a text through an activity, or the reader's purpose for reading the text. All of this is nested within a larger sociocultural context.

When conceptualizing the reader, the RAND Model (2002) considers both cognitive aspects such as knowledge, strategies, attention, and memory and affective aspects such as motivation and self-efficacy. For this study, I paid particular attention to reader characteristics that included their home languages, languages of literacy instruction, and what the reader said and did in response to the activity. In this case, the activity involved reading a Spanish-English DLB and answering my questions regarding words' translations and retellings of the page's events. Not only did I ask students to translate words and retell passages, but I also asked them to explain to me how they determined their answers, probing into their cognition. The text was also important because I hypothesized that the nature of DLBs, with the close proximity of languages, fostered contexts that could promote readers to make connections across languages. In addition, analysis of text characteristics such as the placement of words on the page, placement of punctuation, italicization of words, use of cognates, and so on could play an important role in the strategies students used to read DLBs.

Finally, while this study focused most on the interactions between the reader, text, and activity, the larger sociocultural context was important because as the RAND Study Group (2002) said, "Learning and literacy are viewed partly as cultural and historical activities, not just because they are acquired through social interactions but also because they represent how a specific cultural group or discourse community interprets the world and transmits information" (p. xvi). In this study, the privileging of English and certain literacy skills in schools and society can impact students' biliteracy development (e.g., Hornberger & Skilton-Sylvester, 2000)—not only in the languages children feel comfortable reading and wish to read, but also in the ways they make connections across languages.

Second Language/Multilingual Reading

While the RAND Model presents a broad conceptualization of reading comprehension, there are additional considerations when people read in languages other than their home language. When students read both languages of a DLB, they are engaging in what linguistics research calls "second language reading" because at least one of the book's languages is an additional language which they are learning/have learned. Even though this is referred to as "second language reading" in linguistics literature, I recognize that often there is not a clear first or second language in the case of simultaneous rather than sequential bilinguals; therefore, I will refer to this as "bilingual" or "multilingual reading" from this point forward.

Multilingual reading is different than monolingual reading. Grabe (2009) described multilingual reading as "an ability that combines L2 [second language] and L1 [first language] reading resources into a dual-language processing system" (p. 129). In other words, reading in an additional language involves a complex, constant interplay between varied literacy skills and knowledge encoded in different languages. While the degree of interplay between specific components of reading has received much attention in research, less focus has been given to how readers process entire texts and the ways in which they use linguistic knowledge (Jared, 2015).

Considerations related to multilingual reading are different if readers learn their languages simultaneously or sequentially (Reyes, 2012). (Most of the children in this study were developing their biliteracy sequentially.) For people learning languages sequentially, Grabe (2009) described some of the complexities inherent in multilingual reading: namely that learners often have less-developed vocabularies in their additional language and less print exposure and perhaps encounter unfamiliar text structures when they begin reading in their additional language as opposed to their home language due to less time spent learning the language. In this case,

bilinguals "must develop linguistic resources at the same time that they develop reading comprehension skills" in their additional language (Grabe, 2009, p. 131). Sequential bilinguals also often have slower reading rates in their additional language due to linguistic differences and less processing practice, but they may have increased metalinguistic awareness or knowledge of how languages work if they are successful readers. However, Grabe cautioned that students who are less successful readers in their additional language may not have developed the required metalinguistic awareness yet or be able to leverage it to support reading comprehension.

Grabe (2010) also synthesized research that generally supports Cummins's language threshold hypothesis, that readers' linguistic knowledge in their additional language is more important at the beginning than their reading skills in their home language, defined as "L1 [first language] reading strategies, metalinguistic knowledge, L1 task success, L1 word learning skills" (p. 94). Grabe explained that readers need a large enough vocabulary in the additional language to read it successfully in order to apply their home language reading *skills*.

Cross-Linguistic Connections and Translanguaging in Multilingual Reading

The constant throughout the discussion of multilingual reading is that there is continual interaction between readers' languages during reading. As Koda (2007) described, this linguistic interaction involves "incessant adjustments in accommodating the disparate demands each language imposes. For this reason, L2 [second language] reading is crosslinguistic and, thus, inherently more complex than L1 [first language] reading" (p. 1). Grabe (2009) described the interaction between languages during multilingual reading, or during bilingual reading in Grabe's example, as a "dual-language processing system" that is "dynamic, changing, and shifting in response to the reader, task, topic, goal, training, context, and so on" (p. 149).

Because multilingual reading involves dynamic interactions between languages, it involves cross-linguistic connections and translanguaging.

In linguistics research, these connections are often nested under a larger concept called cross-linguistic transfer, which means the transfer of knowledge and skills across languages. Historically, cross-linguistic transfer has been defined as the application of first language skills to second languages (Jarvis & Pavlenko, 2008; Koda, 2012). However, scholars have also noted reverse or bidirectional cross-linguistic transfer where second language skills influence first languages (Dworin, 2003; Gottardo, Javier, Farnia, Mak, & Geva, 2016; Pavlenko & Jarvis, 2002), but currently, scholars (e.g., G. E. García & Godina, 2017; Jarvis & Pavlenko, 2008) advocate for a less linear view of cross-linguistic transfer that instead situates it within understandings that bilingualism is dynamic (O. García, 2009b) and holistic (Grosjean, 1989) where languages continually interact without clear distinctions or acquisition orders. Because of associations with behaviorism and monolinguistic ideologies that the term "transfer" connotes, scholars often use the term "cross-linguistic influence" instead, which Jarvis and Pavlenko (2008) define as "the influence of a person's knowledge of one language on that person's knowledge or use of another language" (p. 1). However, the current studies do not analyze how one language influences students' knowledge or use of another language, instead the studies analyze how students make connections—both metalinguistic (using their knowledge about language) and conceptual, as illustrated through students' translation and retelling strategies. Therefore, I employ the term "cross-linguistic connections" throughout my presentation of the current studies because connections are multifaceted, dynamic, and multidirectional as is multilingualism (O. García, 2009a).

The current studies also differ from work on "languaging" as defined by Swain (2006) because Swain's use of the term "languaging" focuses on linguistic production and how multilinguals produce language in order to make meaning. Instead, the current studies focus on students' reading and receptive language skills and how they make connections across their knowledge and what they read in various languages. In studying how students make cross-linguistic connections, the current studies more closely align with Ofelia García's (2009b) use of the term "translanguaging":

> Translanguaging is the act performed by bilinguals of accessing different linguistic features or various modes of what are described as autonomous languages, in order to maximize communicative potential. It is an approach to bilingualism that is centered, not on languages as has often been the case, but on the practices of bilinguals that are readily observable in order to make sense of their multilingual worlds. (p. 140)

The current studies analyze students' strategies or practices as they access linguistic features to make metalinguistic and conceptual cross-linguistic connections in support of vocabulary and comprehension development. Students' strategies are not unidirectional or static; instead, like the emphasis on dynamic bilingualism and translanguaging, the current studies take into account the dynamic, contextually influenced nature of linguistic practices, especially as related to changes in text features, reader backgrounds, and the translation and retelling activities readers are asked to do. In these ways, the current studies are grounded in theories of translanguaging, or "the multiple discursive practices in which bilinguals engage in order to make sense of their bilingual worlds" (O. García, 2009a, p. 45).

The issues of readers making cross-linguistic connections and translanguaging are especially pertinent to DLBs because DLBs are printed with the story/content in both languages

on the same page or two-page spread. This side-by-side positioning of languages makes it opportune for readers to use one language to help them read another—a phenomenon supported by Goldenberg's (2011) literature review of five meta-analyses, all of which concluded that students' ability to read in their first language helps them read in their second (in the case of sequential bilinguals). However, Goldenberg cautioned that students will not automatically use what they know from one language to help them read another, which may be due to them not seeing similarities between languages or lacking language skills/proficiency to support cross-linguistic connections. As Durgunoğlu and Hancin-Bhatt (1992) asserted, the existence of similarities between languages is not sufficient for learners to make connections; instead, learners must be aware of the similarities and differences in order to utilize them, and the type and amount of connections may also depend on their prior linguistic and literacy knowledge. These are important considerations when analyzing how children read DLBs independently.

Goldenberg (2011) called for additional research to determine how to support students in making these connections between languages. Understanding learners' cross-linguistic connections is important because it helps researchers understand the language structures learners have acquired and conditions under which their knowledge of one language may support or cause challenges when learning other languages (Durgunoğlu & Hancin-Bhatt, 1992). While DLBs have the potential to support cross-linguistic connections, research has not examined how or under what conditions DLBs may help students make them.

To describe aspects of linguistic contact, or the types of cross-linguistic connections multilinguals make, Cummins (2009b) identified five areas—(1) conceptual knowledge; (2) metacognitive and metalinguistic strategies, e.g., strategies to foster reading comprehension and language comprehension such as the use of cognates; (3) pragmatic abilities, e.g., the willingness

to take risks and make mistakes when communicating in another language and using and understanding gestures to communicate meaning; (4) specific linguistic elements including morphology; and (5) phonological awareness. Much research related to reading has investigated the last two types of connections and other individual components of reading such as oral language, vocabulary knowledge, and syntactic knowledge. Most of these studies have used correlations or regression analyses to measure the amount of correlation between these components across languages (Jared, 2015; Kuo & Anderson, 2008). Studies across languages and orthographies have found evidence of cross-linguistic influence related to phonological, lexical, and syntactic skills (e.g., Genesee, Geva, Dressler, & Kamil, 2008; Grabe, 2009; Koda, 2008; Verhoeven, 2011). However, Jared (2015) called for the field of multilingual reading to move beyond these correlational studies and "produce more research that elucidates what is happening in the mind of a child who is becoming biliterate" (p. 178). Therefore, the current studies use verbal protocols/think-alouds (Hilden & Pressley, 2011; Pressley & Afflerbach, 1995) to investigate how bilingual students make connections across languages, namely how they leverage and connect conceptual knowledge (as evident in their retellings) and metalinguistic knowledge (as evident in the strategies they use to translate words).

Overview of the Dissertation

Given the increasing numbers of multilingual students in classrooms and the importance of their biliteracy development, it is important to understand how students use their linguistic knowledge to make connections across languages. Dual-language books are often recommended as tools students can use to do just that, but little is known about how students use DLBs to make cross-linguistic connections. Building off of the theoretical knowledge presented in this chapter, Chapter 2 presents the literature related to DLBs and cross-linguistic connections as well as areas

for future research and how the current studies' research questions address some of those areas. Chapter 3 describes the methods used to answer these questions. Chapter 4 presents the findings from a large mixed methods study of the strategies 68 Spanish-English bilingual third and fifth graders used when reading DLBs to translate words (i.e., make metalinguistic connections) and retell passages (i.e., make conceptual connections). Chapter 5 presents the findings of a small qualitative study of five of the 68 students who came from Spanish-speaking homes and were literate in English but had not received formal Spanish literacy instruction. The chapter analyzes the particular ways in which they read DLBs and used them to develop biliteracy, especially in their home language. Finally, Chapter 6 discusses the findings from both studies and relates them to the theories and literature presented in this chapter and Chapter 2. Chapter 6 also describes implications from this research for research, pedagogy, and book publishers, and it presents final conclusions.

CHAPTER 2 – LITERATURE REVIEW

This chapter focuses on the three components of the inner circle of the RAND Model of Reading Comprehension (RAND Reading Study Group, 2002)—the text, activity, and reader. It first presents the prior theoretical and empirical writings about dual-language books and their theorized benefits related to cultural/linguistic validation and/or awareness, language learning, and (bi)literacy acquisition, as well as relationships between DLBs' formatting and these theorized benefits. Because the language and literacy benefits associated with these books rely on the ways in which readers make connections across languages, this chapter also discusses the activity of making cross-linguistic connections, highlighting findings from studies related to cross-linguistic transfer and translanguaging, specifically studies investigating Spanish and English as those are the languages of the current studies. (I focus on Spanish-English DLBs and students because Spanish is the second most spoken language in the U.S. after English (Gonzalez-Barrera & Lopez, 2013) and because I am bilingual and biliterate in Spanish and English.) Furthermore, this literature review attends to the reader, presenting an overview of studies about bilinguals' metalinguistic awareness because not only are bilinguals often described as having better metalinguistic knowledge (i.e., knowledge about language) than their monolingual counterparts (Bialystok, 2006), but dual-language books have also been theorized to support this awareness. Finally, this chapter concludes with a discussion of areas for future research with connections to the current studies and presentation of the research questions.

Dual-Language Books

Dual-language books (DLBs) have been hypothesized to validate and/or heighten students' cultural and linguistic awareness. In addition, they have been hypothesized to promote language learning by providing contexts for cross-linguistic connections. Writings have also

discussed DLBs' potential to support students' learning related to culture and literacy. In the following sections, I describe the ways in which these benefits have been discussed theoretically and examined empirically, focusing especially on the three main empirical studies by Naqvi and colleagues (2010), Sneddon (2009), and Ma (2008). Then I describe the ways in which DLBs are formatted, which could have implications for the ways in which readers read the texts and make meaning.

Cultural/Linguistic Validation and/or Awareness

Because DLBs include two languages, they are often viewed as important for validating language learners by reflecting their language and/or culture which helps students feel included in classrooms. However, DLBs can also provide students—often English monolingual students—with exposure to other languages and cultures. Most of these claims are theoretical (e.g., Agosto, 1997; Hadaway & Young, 2013; Kümmerling-Meibauer, 2013a, 2013b; Leaman, 2008; Semingson, Pole, & Tommerdahl, 2015; Von Drasek, 2005) with statements that reflect Bishop's (1990) idea of windows and mirrors, that students can see their own or learn about other cultures and/or languages through texts. Having and using DLBs in classrooms and libraries can help students "feel significant and included" (Agosto, 1997, p. 39) and can also help them learn about linguistic diversity and clarify misconceptions they may have about various cultures (Leaman, 2008).

Feuerverger (1994) observed many of these claims in her year-long case study of an elementary school in Toronto, Canada that added many books in students' home languages to their library, books which were used in language arts and storytelling lessons in classrooms and the library. While many of these books were bilingual, some were monolingual editions which children read in their home languages and orally translated into English. The school librarian

described how Chinese-English bilingual children read the English portion of a Bengali DLB, which allowed them to enjoy the story and learn about another culture. Feuerverger noted from her observations and descriptions from the librarian and principal that children took pride in being able to read DLBs and other books in their home languages—i.e., reading DLBs increased students' self-confidence and validated their linguistic and cultural identities and knowledge.

More recently, Naqvi, Thorne, McKeogh, and Pfitscher (2010) conducted a two-year longitudinal study beginning with 115 kindergarteners from four schools in Calgary, Canada assigned to either treatment classrooms that read aloud a dual-language book each week for 11 weeks or comparison classrooms that read English-only texts. The 68 students who remained at those schools for first grade continued listening to either DLBs or English-only texts for a 10-week program the following year. In subsequent articles based on this large study (e.g., Naqvi, McKeough, Thorne, & Pfitscher, 2013; Naqvi & Pfitscher, 2011), Naqvi and colleagues noted that teachers used DLBs as part of culturally responsive pedagogy, which involved using students' cultural and prior knowledge and experiences as frames and tools for making learning more relevant and thereby effective (Gay, 2010). In Naqvi's study, DLBs provided a forum in which teachers valued and allowed students to use all of their linguistic capital to interact and make meaning with the texts. Naqvi, McKeough, and colleagues (2013) also described how having parents and community members help read aloud DLBs made them important members of the classroom and allowed them to share their cultural knowledge with students, such as background information about wearing a hijab which connected to a DLB the class was reading.

Similarly, in Pfitscher's description (Naqvi & Pfitscher, 2011) of her experience as a pre-service and first-year teacher reading DLBs, she noted how incorporating DLBs and having the father of a Spanish-speaking student read a Spanish-English DLB to the class seemed to make

two Spanish-speaking second graders feel more included in the classroom and begin to adapt to class routines. Pfitscher noted how the experience of having a relative read aloud a book in one of their languages helped these two students who were often shy and anxious feel more empowered in the classroom. In Pfitscher's class, DLBs "validated the students' unique linguistic identit[ies] and enabled the teacher to build bridges with the various linguistic communities represented in the classroom" (Naqvi & Pfitscher, 2011, p. 241). While it is unclear how much cultural and linguistic validation is due to the fact community and family members read the books versus the books themselves, DLBs seem to provide a context for the discussion of culture and language and a chance for students' knowledge to take the stage.

Descriptive reports of two projects (Cummins et al., 2005; Louie & Davis-Welton, 2016) involving students *writing* DLBs with the help of family and community members had similar findings. This writing process framed students' linguistic knowledge as an asset and validated their identities because their languages were necessary for these curricular projects. As Cummins and colleagues (2005) described, while fourth graders in Toronto created DLBs with a partner and/or family member, their teacher also engaged them in discussions of their native languages and their importance, all of which "communicates respect for students' languages and cultures and encourages students to engage with literacy and invest their identities in the learning process" (p. 42). Practices such as these created a pedagogy of respect for students, not only validating their identities, but also allowing them to draw upon all of their knowledge in any language to learn and express themselves.

Language Learning

While DLBs can validate children's languages, they are also said to expose children to languages, with the implication that this opportunity to see another language on the page helps

children learn or strengthens their linguistic knowledge (e.g., Jeffers, 2009; M. Lee, Shetgiri, Barina, Tillitski, & Flores, 2015; National Center on Cultural and Linguistic Responsiveness (NCCLR), 2012; Schon, 2004). DLBs are said to "stimulate children to reflect upon language(s), thus evoking the acquisition of meta-linguistic abilities" (Kümmerling-Meibauer, 2013b, p. vii). Writings also assert that DLBs "help children transfer conceptual knowledge and skills across languages, and compare and contrast concepts across languages (Taylor, Bernhard, Garg, & Cummins, 2008), and therefore are effective at helping students develop vocabulary across languages" (Semingson et al., 2015, p. 134). This quote claims that DLBs help children engage in cross-linguistic transfer. Semingson and colleagues' (2015) theoretical piece continues that DLBs foster "the comparison of syntactic structures across languages [which] shows how word order varies in different languages" (p. 135). However, all of these claims are theoretical, and we know little about how or whether children develop these linguistic skills using DLBs.

The Multilingual Resources for Children Project (1995) interviewed an unspecified number of teachers and students in four primary schools in the United Kingdom in which at least 60% of the school population spoke languages other than English. They also interviewed teachers and students at five heritage language community schools teaching Bengali, Chinese, Gujarati, Punjabi, and Urdu. Teachers, especially at the heritage language community schools, worried that when children read DLBs, they would ignore the heritage language and focus only on the English because it was easier for them, while other teachers thought the books could be a bridge from one language to the other. When students were asked their opinions of DLBs, several described how people who did not know English could read the book's other language or that the book could be read by two people, one who speaks each language. The Project also briefly mentioned that students were beginning to develop hypotheses about language from

looking at and reading DLBs—namely a group of seven-year-olds believed the book's two languages could be matched word-for-word and that words should be similar lengths in each language.

Naqvi, McKeough, and colleagues' (2013) two-year study of kindergarteners and first graders in a DLB read-aloud intervention mentioned students' developing metalinguistic awareness and skills which included spontaneously translating in other languages, recognizing cognates, and distinguishing between languages. However, these findings were framed to highlight how DLBs provided opportunities for culturally and linguistically responsive teaching and learning, not to explore how students used DLBs to learn languages. While Naqvi and colleagues provided a couple examples of students' developing metalinguistic awareness, the limited number could be due to the group read-aloud context which does not offer as many opportunities for probing individual students' linguistic connections.

In contrast, Sneddon's (2009) multiple case study of six children in the United Kingdom ages six to nine years old allowed for more in-depth exploration of students' linguistic connections and DLBs' opportunities for language learning. For example, Sneddon (2008a) observed two Albanian mothers and their six-year-old daughters detailing what they did as they read DLBs. The daughters did most of the reading, but together parents and children "used both texts to transfer skills from one language to another, to negotiate meaning in both languages and to compare reading strategies" (p. 137). When one of the girls had difficulty with the English word "peeped," she used both the Albanian text and the illustration to determine its meaning, thus engaging in cross-linguistic transfer. Mothers and daughters also often translanguaged, using resources from and fluidly navigating across languages (O. García, 2009a), as they discussed what happened in the story. However, Sneddon noted that sometimes the mothers and

daughters only read one of the languages, and often they did not refer to the book's second language for help translating. They frequently kept the languages separate when reading but mixed them when discussing the text to build understanding. This seemed to be especially true for one of the girls, while the other began using both languages more frequently to check words' meanings and translate them as she had more reading sessions.

Within Sneddon's (2009) multiple case study, she also focused on four children in the U.K. ranging in age from seven to nine years old, in addition to the aforementioned girls and mothers from Albania. Sneddon's description of two eight-year-old boys reading a Turkish-English DLB noted that they rarely used the English text to support their retellings of what happened on the page, even when they struggled. Instead the boys used their prior knowledge of the story and the illustrations and extended each other's ideas to explain the story. In contrast, Sarah, a French-English bilingual nine-year-old would use the English text to check meanings of French words, but often, if a word was unfamiliar in one language, its translation was also unfamiliar, rendering the dual-language aspect of the text unhelpful for defining vocabulary. Sarah's typical strategy upon encountering unfamiliar words in French was to reread the French text using context to determine the meaning and then referring to the English text to confirm her hypothesis. While these case studies begin to describe how children navigate languages in DLBs and make meaning while reading, studies' discussions of cross-linguistic connections and language learning are limited to a few sentences describing observations and students' strategies.

Literacy Acquisition and Biliteracy

More research has focused on how DLBs support literacy acquisition in multiple languages, i.e., biliteracy. Hornberger (1990) defined biliteracy as "any and all instances in which communication occurs in two (or more) languages in or around written material" (p. 213).

Therefore, biliteracy involves more than oral proficiency in multiple languages, i.e., bi/multilingualism, but rather it is the ability to read and/or write in multiple languages in addition to speaking and listening. As Hornberger's continua of biliteracy indicated (Hornberger, 1989; Hornberger & Skilton-Sylvester, 2000), these abilities are multidimensional, fluid, and dependent on power relations between contexts, developmental factors, types of languages and scripts, amounts of exposure, and the ways in which languages are used in various contexts. These contextual factors are also being recognized in more recent definitions of biliteracy. Reyes (2012) noted that biliteracy definitions are beginning to include an awareness and ability to leverage the social and cultural systems in which languages are embedded.

When articles discuss DLBs' potential for promoting biliteracy, some have involved theoretical assertions. For example, Hadaway and Young (2013) mentioned that various publishers in Canada, Australia, and New Zealand created DLBs as resources for literacy instruction in their article describing the ways in which DLBs may build awareness of indigenous languages. Other studies have discussed how *writing* DLBs promotes biliteracy. Cummins (2007) explained how seventh and eighth grade Canadian students' engagement in translation while writing their own DLBs supported biliteracy development. One student commented that having to write the story in Urdu and English made her realize that she had forgotten some Urdu words, so she decided to start reading more Urdu books at home. Another student shared that being able to write in Urdu first helped them generate more ideas in English than they would have been able to if required to write and plan only in English. Other students mentioned how the act of translating between languages spotlighted structural differences between the languages that they then attended to in their writing.

These comments were reinforced by teachers' observations in Louie and Davis-Welton (2016)'s family literacy project that students' desire to share their families' stories in English and their home languages pushed them to rewrite, edit, and focus on communicating the narrative. The project also provided opportunities for children to practice reading and writing in their home languages, which teachers said students often do not have the opportunity to do.

Teachers interviewed in the Multilingual Resources for Children Project (1995) echoed the belief that they could use DLBs to help students develop literacy skills in their first language, and they believed these books provided opportunities for parents and family members who spoke languages other than English to read with their children. Children interviewed also described how their parents would read the home language text while they read the English, similar to Sneddon's (2009) case studies in which family members usually helped children with the home language texts. The idea that DLBs can be used to engage non-English-speaking family members in their children's literacy development is shared by creators (e.g., Rodriguez-Valls, 2009; Rodríguez-Valls, 2011; Rowe & Fain, 2013; Wessels & Trainin, 2014) and advocates (e.g., R. Saldaña, 2009) of family literacy programs using DLBs. These articles do not describe how families and children interact around the books, just that they read them together and that the books provided children with more reading practice at home in two of their languages.

In an empirical study, Ma (2008) observed a mother and her seven-year-old daughter Minnie reading an English-Chinese DLB. They had moved from Hong Kong to the United Kingdom, and Minnie's mother spoke Mandarin and Cantonese but little English, while Minnie's English proficiency had been growing throughout the year that she was enrolled in U.K. schools. Ma began by describing findings from a pilot study of two Chinese children reading DLBs with their parents and indicated that through DLBs, "parents were able to participate in their

children's learning in ways not otherwise available to them" (p. 240), and they helped their children read in their home language as the children helped build their parents' awareness of English. Ma's main study had similar findings. It focused on Minnie and her mother co-constructing knowledge while reading to understand what happened in the story, in addition to the mother scaffolding and extending story meaning and implied cultural knowledge for her daughter. Minnie also clarified English vocabulary terms for her mother when her mother asked. Moreover, Minnie's mother said that if her daughter did not know a word in English, then she read the Chinese translation which helped Minnie make connections with the English text, thus facilitating language learning and literacy.

This opportunity for parents and children to teach each other was a component of Rodríguez-Valls's (2011) monthly afterschool program that focused on 100 families and their first and second graders reading DLBs together, in addition to participating in other related literacy activities, with the goal of strengthening children's proficiency in both Spanish and English. The study focused on the family literacy program as a whole, but based on interviews, Rodríguez-Valls emphasized how through the program, parents realized their Spanish language knowledge was an asset to their children's biliteracy development. They were able to contribute to their children's background knowledge, and they engaged in dialogic reading practices similar to those happening and valued at school.

Finally, while some studies have focused on literacy interventions that solely offered DLBs as a resource (e.g., Hu, Chen, & Li, 2012; Ivey & Broaddus, 2007; Roessingh, 2011), for Naqvi and colleagues' experimental study described previously (Naqvi, Thorne, Pfitscher, Nordstokke, & McKeough, 2013; Naqvi et al., 2010), reading aloud DLBs was the intervention. Naqvi and colleagues found that kindergartners who participated in the DLB read-aloud program

showed significantly greater gains in letter recognition than those in the English-only program. Punjabi- and Urdu-speakers also showed greater alphabet knowledge gains than those who spoke other languages, such as English and French. These findings provide evidence that reading DLBs positively impacts students' literacy knowledge.

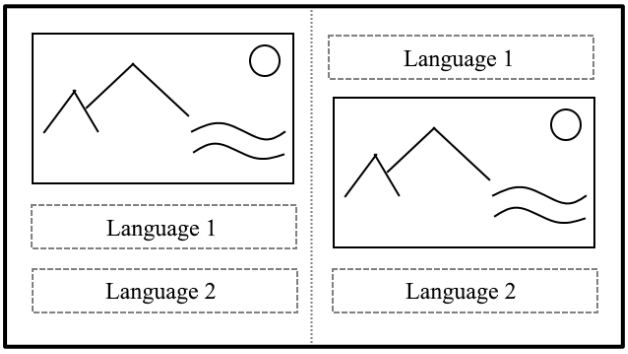
Potential Implications of DLBs' Formatting

While DLBs are thought to support students' cultural and/or linguistic identities, language learning, and literacy acquisition, the ways in which they are formatted have potential implications for these outcomes. For example, when one language is written first on every page, printed bolder, in larger font, and/or in a font that is more readable or clearer, that implicitly communicates that this language is more valued or more important (Ernst-Slavit & Mulhern, 2003). This could have implications for how readers feel their language is valued and/or what they pay attention to when they read DLBs to learn language or develop (bi)literacy skills.

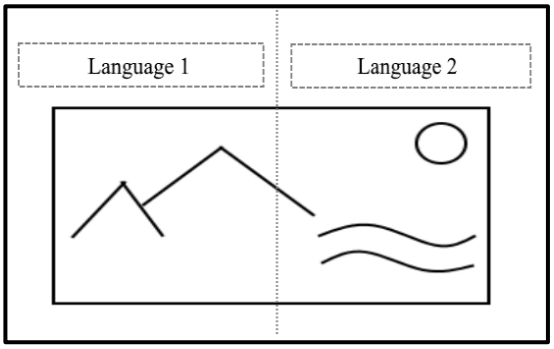
In addition, publishers work to ensure a visual balance between the illustrations and text (P. Lee, 2002), which can be difficult with DLBs since the amount of text to print is doubled. This leads them to create multiple different layouts to balance the text and illustrations (a few of which are presented in Figure 1). If the close proximity of languages on the page facilitates comparisons as is theorized (Semingson et al., 2015), then variable layouts could have implications for the ways in which readers are able to make comparisons. For example, it may be more difficult to engage in word-level comparisons when languages are separated with one on each page as illustrated in Example 2 of Figure 1.

Figure 1

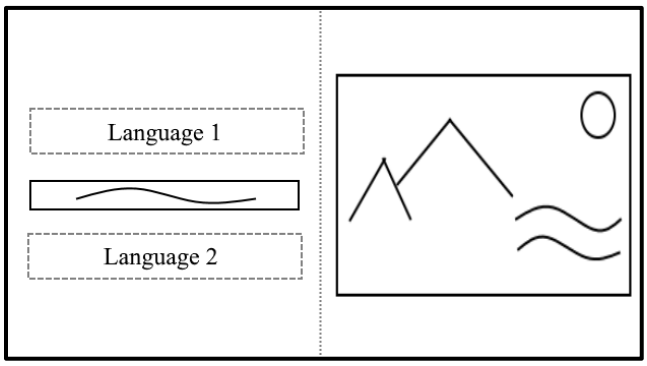
Sample Dual-Language Book Layouts



Example 1



Example 2



Example 3

These are a few examples of the ways in which languages and illustrations are printed on two-page spreads in dual-language books. In Example 1, both languages are printed directly above/below each other, and the illustration may separate the languages. In Example 2, the illustration stretches across the two-page spread with one language printed on each page. In Example 3, the languages are separated by a small illustration or decorative line and are on the page opposite the illustration.

Cross-Linguistic Connections and Translanguaging

In order to capitalize on DLBs' benefits for language and literacy learning, readers must make connections across languages. Linguistics-focused research has demonstrated that there are relationships between languages and that specific aspects or knowledge of languages can transfer or be applied to reading in other languages. This research often uses quantitative

methods to describe correlations between reading skills in various languages. Studies across languages and orthographies have found evidence of cross-linguistic transfer related to phonological, lexical, and syntactic skills (e.g., Genesee et al., 2008; Grabe, 2009; Koda, 2008; Verhoeven, 2011). For example, studies comparing the scores of Spanish-English elementary-age bilinguals—the population of this dissertation study—have found strong correlations between decoding skills in both languages (Nakamoto, Lindsey, & Manis, 2008) and that phonological awareness in Spanish accounted for some of the unique variation of students' English word reading scores, regardless of whether instruction was in Spanish (Durgunoğlu, 1998; Durgunoğlu, Nagy, & Hancin-Bhatt, 1993) or English (Quiroga, Lemos-Britton, Mostafapour, Abbott, & Berninger, 2002; Sun-Alperin & Wang, 2011).

Related to vocabulary, Spanish-English bilingual students' ability to identify cognates, or words with the same meaning spelled similarly in both languages, is an indicator of them making connections across languages (e.g., Dressler & Kamil, 2006; Hancin-Bhatt & Nagy, 1994; Kim et al., 2015). Two additional studies (Carlisle, Beeman, Davis, & Spharim, 1999; Proctor, August, Carlo, & Snow, 2006) have found that elementary students' knowledge of Spanish vocabulary explained a unique, significant portion of their English reading comprehension scores. Finally, other studies have found significant relationships between students' Spanish and English reading comprehension and fluency scores (Dominguez de Ramirez & Shapiro, 2007; Proctor, August, Snow, & Barr, 2010; Royer & Carlo, 1991).

Together, these studies assert that bilingual elementary students can use their knowledge of sounds, words, and spelling as they navigate and make meaning of Spanish and English. Studies have also determined that there are differences in the extent to which children apply this knowledge based on age and language proficiency (e.g., Bialystok, 2006; Hancin-Bhatt & Nagy,

1994; Koda, 2005; Sneddon, 2009). However, little is written about *how* students use this linguistic and literacy knowledge, just that there are statistically significant relationships. As Jared (2015) summarized in her research synthesis of bilingual literacy development, "In the literature on child bilinguals, the focus has been on predictors of reading development in the second language. Only a few studies have investigated how bilingual children represent and process their two languages" (p. 165)—a gap the current studies work to address.

Furthermore, all of the aforementioned studies have analyzed the impact of Spanish on English, focusing only on students for whom English is a second language, with the exception of Kim and colleagues (2015) who also included a subgroup of English-speaking students for whom Spanish was a second language. Therefore, more qualitative and mixed method studies are needed to investigate how students apply their knowledge across languages, and more studies are needed with expanded definitions of Spanish-English bilinguals as the number of foreign language immersion programs continues to grow in the U.S. (Center for Applied Linguistics, 2011).

Reading Strategies across Languages

Ofelia García (2009a) stated that "bilinguals translanguage to include and facilitate communication with others, but also to construct deeper meanings and make sense of their bilingual worlds" (p. 45). However, studies grounded in and/or related to translanguaging are often focused on the first part of this statement—bilinguals' verbal communication—analyzing students' linguistic production through their writing (e.g., Cárdenas Curiel, 2017; Durán, 2017; Gort, 2006; Pacheco & Smith, 2015) and speech (e.g., O. García, Makar, Starcevic, & Terry, 2011; Martínez, Hikida, & Durán, 2015; Worthy, Durán, Hikida, Pruitt, & Peterson, 2013). Few studies have investigated students' receptive translanguaging, describing how students use

multiple languages to make meaning while reading. The studies of reading described below have instead focused more on students' reading comprehension strategy use and whether or not students used similar strategies in both languages as opposed to describing how readers navigate multilingual texts.

Studies using observation, interview, and verbal protocol analysis/think-alouds have found that Spanish-English elementary and middle school bilinguals use similar reading strategies in both languages such as hypothesizing/predicting, rereading, paraphrasing, asking questions, concentrating, and monitoring comprehension (Calero-Breckheimer & Goetz, 1993; G. E. García, 1998; G. E. García & Godina, 2017; Hardin, 2001; Jiménez, García, & Pearson, 1995, 1996; Langer, Bartolome, Vasquez, & Lucas, 1990). Authors assert that this similar strategy use across languages provides evidence of translanguaging and/or students applying their knowledge of metacognitive strategies across languages. Authors also found that bilinguals use strategies that monolinguals do not, including translating texts from one language to another while reading and looking for cognates (Hardin, 2001; Jiménez et al., 1995, 1996).

These studies indicate evidence of cross-linguistic conceptual connections because students claimed to use prior knowledge or showed evidence during interviews of making connections to personal experience/learning when reading in both English and Spanish (Hardin, 2001; Jiménez et al., 1996). García and Godina (2017) provided further evidence of conceptual cross-linguistic connections because students were allowed to use any language or mix of languages to discuss their readings, and often they used one language to explain the text written in another language. These studies begin to demonstrate how bilinguals interact with texts in Spanish and in English, and they indicate that bilinguals can apply reading strategies and conceptual knowledge across languages.

However, when the aforementioned studies investigated Spanish and English reading, they used different texts in each language, not translations. There has been little investigation into the ways in which reading a passage in one language followed by its translation engenders cross-linguistic connections. In fact, there has been little investigation of multilingual reading of entire passages overall; instead, much of the multilingual reading research focus has been at the word- and occasionally sentence-levels (Jared, 2015). Studies that have presented translated passages in succession (e.g., Friesen & Jared, 2007; Raney & Bovee, 2016) have been conducted with university students as opposed to elementary learners. In Friesen and Jared's (2007) study, 100 English-speaking undergraduates learning French read passages that satisfied various conditions (e.g., two identical passages, a translation of the original passage with cognates, a translation with synonyms, a different story in the other language with cognates, and an unrelated story in the other language). Undergraduates read the passages on an eye tracker, and Friesen and Jared used measures of overall reading time and gaze fixation and duration on cognates to determine the presence and amount of cross-linguistic application of knowledge between passages. Raney and Bovee (2016) described several similar studies they conducted with colleagues in which participants read short translated and paraphrased texts in succession and eye trackers measured overall reading time and fixation times on target words. While these studies establish the presence of cross-linguistic connections, they do not provide information as to how readers use the information presented to them in two languages to read texts and make meaning.

Metalinguistic Awareness

Finally, because DLBs are written with both languages in close proximity, not only are they theorized to support cross-linguistic transfer, but they are also theorized to support students'

development of metalinguistic awareness, or their knowledge about how language works (Semingson et al., 2015). Metalinguistic awareness can be divided into syntactic awareness (i.e., sentence structure, word order, and so on) and morphological awareness (i.e., the components of words that contribute to meaning). Studies have found positive correlations between students' metalinguistic awareness (both syntactic and morphological) and their reading decoding and comprehension skills.

For example, two studies speak to the relationship between students' syntactic awareness and reading comprehension. Mokhtari and Thompson (2006) found that fifth-grade English monolinguals' scores on tests to measure their syntactic awareness were significantly correlated with their scores on standardized reading comprehension ($r = 0.82$). In a meta-analysis of bilinguals' reading in sixth grade and older, Jeon and Yamashita (2014) found a strong correlation between syntactic awareness and second-language reading comprehension ($r = 0.85$).

Other studies with a greater focus on morphological awareness have also found correlations with reading comprehension. Gottardo's (2002) study of 92 Spanish-English bilingual first graders found that students' scores on oral cloze tasks measuring morphological and syntactic knowledge (e.g., plural morphemes, tense markers, noun-verb agreement, superlative adjectives, and prepositions) significantly correlated with their word-naming and vocabulary scores within languages (e.g., English word identification $r = 0.31$, English vocabulary $r = 0.67$, Spanish vocabulary $r = 0.47$). Furthermore, using a stepwise regression, English oral vocabulary knowledge was significantly related to English word reading, explaining 3% of the variance in scores. Because students' scores on English oral cloze tasks were correlated with their vocabulary scores, which related to their word reading, this supports the conclusion that students' morphological and syntactic knowledge are important for reading. In a

similar longitudinal study of 131 Spanish-English bilingual first graders moving to second grade, Gottardo and Mueller (2009) used the same oral cloze task to measure morphological and syntactic knowledge and found that English oral language proficiency (composed of receptive vocabulary knowledge and the oral cloze task, both of which had strong individual associations to the overall construct of oral language) was a significant predictor of second-grade English reading comprehension. This finding confirms that morpho-syntactic knowledge (i.e., a component of metalinguistic knowledge) is important for reading comprehension. Finally, Ramírez, Chen, and Pasquarella's (2013) study of 39 Spanish-English bilingual fourth graders and 51 Spanish-English bilingual seventh graders found that students' Spanish derivational awareness (i.e., their knowledge of base words and affixes) contributed uniquely to their English cognate vocabulary, namely that it enhanced their learning of English words with Spanish cognates. They also found that English cognate vocabulary, English derivational awareness, and English word reading "contributed directly to individual differences in reading comprehension" (p. 87). Therefore, morphological knowledge, in this case, derivational awareness of base words and affixes which is an aspect of metalinguistic awareness, is important for reading comprehension.

While metalinguistic awareness is important for reading and while multilingual individuals may be more likely to have heightened metalinguistic awareness, Bialystok (2006) cautioned that the advantage of bilingualism "does not automatically extend to an enhanced awareness of all facets of language structure or to all bilingual children" (p. 595). She continued that differences in bilingual children's performance on metalinguistic tasks depended on their proficiency in each language, their experiences to develop specific metalinguistic knowledge in each language, and task demands. Therefore, while DLBs establish an environment that invites

readers to develop metalinguistic awareness as they compare languages printed in close proximity, it is important to determine the ways and extent to which students are able to capitalize on these opportunities.

Areas for Future Research and Research Questions

While DLBs are frequently touted to support students in validating or broadening cultural and linguistic awareness, acquiring additional languages, and developing literacy skills, I found no empirical studies other than the work of Naqvi, Sneddon, and Ma that studied how *children* read DLBs and leverage DLBs to learn. Of these three studies, none occurred in the United States, with Naqvi's work in Canada and Sneddon and Ma's in the United Kingdom. In addition, other than Naqvi's work, the sample sizes were very small, limited to case studies. Moreover, in the instance of all but one child, Sarah in Sneddon's (2009) study, children either read DLBs with someone else or an adult read to them with this expert-novice interaction scaffolding meaning-making and language development. Therefore, we really do not know how multilingual children read DLBs or what they do with them on their own. And with the majority of the U.S. teaching force comprised of monolingual English-speakers, multilingual children would be expected to interact with DLBs on their own at school unless they are in immersion programs with multilingual teachers. We also do not know how children use DLBs to make meaning and develop literacy and language skills in multiple languages. Do children use the books to make cross-linguistic connections as scholars suggest? Do children leverage knowledge of both languages only in certain circumstances depending on their literacy and language proficiencies or the language that is printed first on the page?

More broadly, there has been little investigation into the ways in which reading a passage in one language followed by its translation engenders cross-linguistic connections. Studies

investigating children's Spanish and English reading (e.g., G. E. García & Godina, 2017; Jiménez et al., 1995, 1996) have used different texts, not translations. Studies presenting translated passages in succession (e.g., Friesen & Jared, 2007; Raney & Bovee, 2016) have been conducted with university as opposed to elementary students and have used eye tracker data such as fixation times to infer the existence of cross-linguistic connections, but not to describe the ways in which readers engage in making cross-linguistic connections. Therefore, understanding *how* children make connections across translated passages in a DLB to develop vocabulary and comprehension is important, and in the current studies, I sought to answer the following questions:

1) What learning opportunities do DLBs afford for students to make cross-linguistic connections to develop biliteracy?
2) How do bilingual students, from Spanish-speaking homes who have received formal English literacy instruction but not Spanish, use DLBs to develop biliteracy?

To answer the first research question, I needed to understand specifically the ways in and conditions under which students leveraged DLBs' two-language design to make cross-linguistic connections. I focused on metalinguistic connections as determined by how students translated words and conceptual connections as determined by how students retold passages of texts. Analyzing the strategies students used while reading DLBs, translating words, and retelling passages helped me determine DLBs' learning opportunities for biliteracy development and how students realized them or not.

As previously mentioned, with many students learning English as an additional language placed in monolingual English classrooms, answering the second research question to understand

how children read DLBs to develop not only English literacy, but also Spanish literacy is important. Chapter 3 will describe methods for answering both research questions.

CHAPTER 3 – METHODS

Given the large number of multilingual students in United States schools (KIDS COUNT Data Center, 2018) and the need to validate theoretical claims of dual-language books' (DLBs) potential for language and literacy learning and cross-linguistic connections, I engaged in a descriptive study to determine (1) DLBs' learning opportunities for students to make cross-linguistic connections to develop biliteracy as well as (2) how bilingual students use DLBs to develop biliteracy in their home languages for which they have not received formal literacy instruction.

To answer the first research question, I engaged in a mixed methods descriptive study with a large group of participants, and to answer the second, I conducted a qualitative study of reading strategies focused on just five students. In the sections that follow, I describe the design and logic, participants, data sources, and analytic strategies for each research question.

Research Question 1: Opportunities for Cross-Linguistic Connections and Biliteracy

Design and Logic

In order to understand the ways in which students leverage DLBs' inherent design to make cross-linguistic connections to develop biliteracy, I engaged in a mixed methods descriptive study using verbal protocols/think-alouds to analyze how children read and made meaning of DLBs. Verbal protocols have a long history of use in literacy research. Huey (1908) described studies of readers reporting the visual and lexical associations they made while looking at random words and connected text. Pressley and Afflerbach (1995) synthesized 37 studies from 1964 through 1993 that asked skilled readers to describe their thinking while reading. Their synthesis led to the identification of comprehension strategies including activating prior knowledge, summarizing, and predicting. Subsequent studies have continued to use these think-

aloud/verbal protocol techniques to build theory and understanding of how readers make meaning of evolving text types such as disciplinary (Shanahan, Shanahan, & Misischia, 2011) and online (Coiro & Dobler, 2007) texts. The method has also been used to study how bilinguals comprehend monolingual texts (e.g., G. E. García & Godina, 2017; Jiménez et al., 1995), but to my knowledge, no studies have investigated the ways young readers make meaning of multilingual texts, including DLBs.

Therefore, to investigate how readers make meaning of multilingual texts, I used verbal protocol/think-aloud techniques as I met three times with Spanish-English bilingual elementary students individually. First, students chose a DLB from a collection of approximately 70 recently published DLBs and read it any way they chose; they could read one or both languages, alternate languages, and so on. I asked students questions about how they read the book, whether they looked at the other language while reading and if and how it helped them read, what makes someone a good reader in Spanish and English, and their language histories such as what language(s) they spoke at home, when they learned to read in each language, and whether they had read a DLB before. This data helped inform my coding and analysis of the subsequent readings/verbal protocols.

Then I met with students two more times. They read two fiction DLBs with similar themes of recycling scraps to make something new—*Francisco's Kites / Las cometas de Francisco* (Klepeis, 2015) and *Rainbow Weaver / Tejedora del arcoíris* (Marshall, 2016). I modified these DLBs so that their Flesch-Kincaid and Fernández Huerta (1959) readability scores would be close to third-grade and fifth-grade scores. (See Appendix A for a table with readability scores across languages.) I recognize that text comprehension is complex and affected by many factors beyond word and sentence counts and lengths, which are the main areas

readability formulas measure (e.g., Hiebert, 2010; Valdés, Barrera, & Cardenas, 1984), but these two formulas were the only ones available that could measure Spanish and English texts in order to make a general determination if the text could be appropriate for each grade level. Other measures such as Coh-Metrix only work for English texts, and Lexile measures are proprietary and cannot be published.

When students read these two DLBs, they read both languages on each page. I manipulated the texts so that one book was written with the English text first on each page and the other with Spanish first on each page. (Students were placed in counterbalanced groups by general reading levels and language proficiencies, as determined by observation and informal discussions with classroom teachers, to mitigate text-order effects on their reading strategies and scores.) As students read, they engaged in verbal protocols (Hilden & Pressley, 2011; Pressley & Afflerbach, 1995) for which I asked them to show me how they determined the translations of certain Spanish and English words on the page. This helped me analyze their metalinguistic connections. On other pages, I asked students to retell the events on the page after they read each language in order to analyze their conceptual connections. I asked students to translate four English and four Spanish words and provide retellings of four pages per story. Understanding how students connect and apply information at the lexical and discourse levels is important in understanding the learning opportunities of DLBs for cross-linguistic connections and biliteracy development.

However, a limitation of verbal protocol analysis is that readers often cannot express everything they are thinking or all of the factors impacting their decision-making while reading, especially younger readers and those for whom reading is more of a challenge (Hilden & Pressley, 2011). Because my study involved younger readers (i.e., third and fifth graders) at a

variety of reading levels, I frequently asked students to show me how they determined words' translations rather than just tell me. I also video recorded them reading and observed their reading behaviors. I could often see students move their head to look at one language at the top of the page and the other language at the bottom of the page (especially during retellings). I then engaged in member-checking, asking students if they looked at a language or the illustration in order to validate my observations.

To avoid privileging one language over another, and to allow students to use their full linguistic repertoires when engaging in these tasks, I asked all questions in English and Spanish, alternating the order of the languages I used depending on the language students had just read. I told students that they could answer in any language or mix of languages they wished. I also reiterated that students could use anything on the page(s) to help them answer the questions because in a pilot study with 18 fifth graders, students sometimes indicated they felt like it was "cheating" if they looked at the other language. The instruction to use anything on the page(s) to help them answer my questions reinforced my stance that I wanted students to use all of the language and information at their disposal.

Participants

I met with 68 elementary students who are bilingual in Spanish and English—33 third graders and 35 fifth graders—from two large school districts, one suburban and one urban, in a Midwestern state. The suburban elementary, Waterside, was a PreK-5 building with approximately 400 students and a section of Spanish immersion at every grade level. Waterside's Spanish immersion program mostly consisted of students learning Spanish as a second language. The elementary also had approximately 50 emergent bilinguals receiving English as a second language (ESL) services, many of whom spoke Spanish as a home language

and about half whose families were migrant farmworkers. The urban elementary, Armstrong, was a PreK-6 building with approximately 300 students and a section of Spanish immersion at every grade level. Its Spanish immersion program had a mix of students learning Spanish as a second language and those who spoke Spanish at home, although the percentages of these students was not even, so it was not a two-way immersion model. None of the students in either elementary spoke languages other than Spanish and/or English at home. See Table 1 for details about the participants.

Table 1

Participants by Elementary, Language Spoken at Home, and Grade

Language Spoken at Home	Elementary	
	Waterside	Armstrong
At least some Spanish		
3rd Grade	3[a]	8
5th Grade	7[b]	6
English only		
3rd Grade	14	8
5th Grade	14	8

[a] 2 of these students lived in homes where Spanish was spoken but were not part of the Spanish immersion program.
[b] 5 of these students lived in homes where Spanish was spoken but were not part of the Spanish immersion program.

I read with third and fifth graders because I wanted to determine if there were differences in how students read DLBs based on age. I chose these particular grade levels because in verbal protocol studies, age has been a concern regarding students' ability to verbalize mental processes, especially when working with students younger than second grade (Hilden & Pressley, 2011). Moreover, second graders are still developing their reading abilities in both languages, and I wanted to work with students whose literacy skills were a little more established in order to more fully understand how they apply knowledge across languages.

Data Sources

Data to answer Research Question 1 came from five main sources—initial interviews, two running records, verbal protocols for two texts, the selected DLBs themselves, and a verbal protocol conducted with a sub-sample of students reading with an eye tracker. These data sources and rationale for their use are described below.

Initial interviews. Each student chose a recently published DLB to read any way they wished. I videotaped this reading and took notes while students read. After students read, I interviewed them about their strategies and choices while reading that book, their linguistic and literacy background, and their conceptions of reading and language. (See Appendix B for the full list of questions.) I asked students to retell the book and what they liked and did not like. I asked them why they chose to read it the way they did and whether the book's other language, if they looked at it, helped them read the text. These questions gave me background information that I used to triangulate my findings from students' verbal protocols.

Then I asked students why people would read DLBs and their experience with them as well as the languages they spoke at home and when they learned to read in English and Spanish. Understanding students' language and literacy backgrounds contextualized the findings and affected the ways I coded students' strategy use. For example, during the verbal protocols, sometimes students claimed their parents told them what a word was in Spanish. I judged the veracity of these claims based on the interview data since students described whether their parents spoke Spanish during the interview.

Finally, I asked students questions related to their conceptions about reading and language—e.g., whether and how reading in English helps one read in Spanish and vice versa, how reading in English and Spanish are the same/different, and what a person needs to know to

be a good English/Spanish reader. These questions came directly from Jiménez, García, and Pearson's (1995) interview protocol used to understand the metacognitive knowledge of a proficient Spanish-English bilingual reader. Students' answers to these questions further contextualized my findings for Research Question 1 and were a critical component that I analyzed in the small qualitative study of reading strategies I conducted to answer Research Question 2.

One limitation of this study is that I do not have language proficiency scores for students. Not only did schools use varying measures to determine students' reading levels across languages, but these measures differed across school districts as well. Districts also did not use a measure of overall language proficiency for their students in Spanish and English.

Running records. As students read the two selected DLBs aloud, I conducted running records (Clay, 1985), recording students' oral reading—namely the words they read correctly and the miscues/mistakes they made. I also wrote observational fieldnotes about any behaviors I noticed the students engaging in while reading. I videotaped and audio recorded these readings for later analysis if needed. This record of students' oral reading and their accuracy in each language helped me create reader profiles based on students' accuracy to look at trends in students' strategy use.

As part of the running record, I also collected additional data including fluency scores, students' retellings of the entire story, and their answers to comprehension questions. While this data was not analyzed to answer Research Question 1, some of the fluency data served to answer Research Question 2.

Verbal protocols. To understand students' strategies while reading DLBs, they engaged in guided verbal protocols/think-alouds in which I asked students to define and translate four

English and four Spanish words in each text (to analyze their metalinguistic connections) and to retell the events that happened on four separate pages in each text (to analyze their conceptual connections). Of the translation questions, for each book I asked three questions concerning vocabulary words that have inverted order across languages, three questions concerning words that violate one-to-one correspondence (i.e., the idea that one word in a language will translate to a single word in another language), and two questions involving words that have similar word orders and one-to-one correspondence across the languages. I asked questions such as

- What does "maybe" mean? / ¿Qué significa "maybe"?
    - How do you say "maybe" in Spanish? / ¿Cómo se dice "maybe" en español?
- ¿Qué significa "alambre"? / What does "alambre" mean?
    - ¿Cómo se dice "alambre" en inglés? / How do you say "alambre" in English?
- How did you figure that out? / ¿Cómo te diste cuenta de eso?
- Show me how you found that word. / Muéstrame cómo encontraste esta palabra.

To analyze students' conceptual connections, I asked them to retell what happened on four pages of each book**.** I stopped them after they read the page's first language and asked, "Tell me what happened on this page. / Dime lo que pasó en esta página." After reading the page's second language, I asked, "¿Hay algo más que puedes decirme que pasó en la página? / Is there anything more you can tell me that happened on the page?" I audio recorded and videotaped students' engagement in the verbal protocols to facilitate later analysis of students' language and gestures as they explained and showed their strategies.

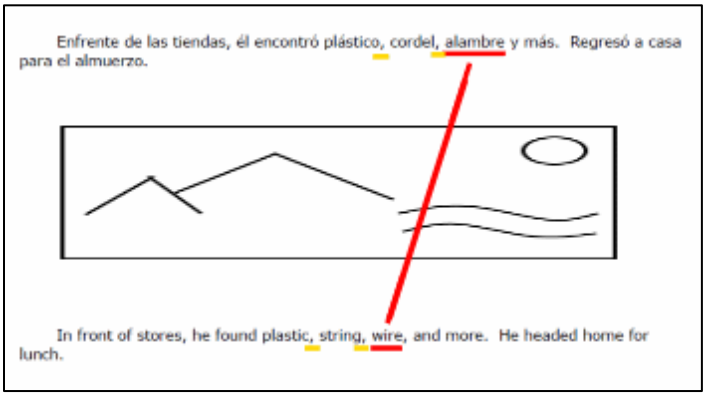
The selected DLBs. The two texts I modified, *Francisco's Kites / Las cometas de Francisco* (Klepeis, 2015) and *Rainbow Weaver / Tejedora del arcoíris* (Marshall, 2016), were important data sources for analyzing the placement of words on a page. According to the RAND

Model of Reading Comprehension (RAND Reading Study Group, 2002), the text itself is a key component when considering how readers interact with texts, and this information was a critical part of my analysis.

Because messages can be communicated implicitly about language value through language order on the page (Ernst-Slavit & Mulhern, 2003), and because I also hypothesized that language order could affect the strategies students used to translate words or retell pages, I modified the texts in these studies so that one was written in English first and one in Spanish first. I also hypothesized that the placement of words on a page could impact students' strategies. While the majority of pages that students read were similar to Examples 1 and 3 in Figure 1 where languages were printed directly above/below each other, I did not manipulate the texts so that the layout was identical within and across books. Instead, as part of my analysis (described further below), I marked and analyzed each page that students read, drawing lines between the word in question and its translation, marking nearby punctuation, and underlining nearby cognates (Figure 2). This helped me analyze the ways in which students used visual text characteristics to make connections between languages.

Figure 2

Example Text Analysis



(Text modified from Klepeis, 2015).

In this example, students were asked to translate “alambre” to English. I underlined “alambre” and its translation “wire” in red and drew a red line connecting them to illustrate the extent to which they lined up vertically. I also underlined nearby punctuation marks in yellow.

Verbal protocols with an eye tracker. Because it is difficult to articulate everything one thinks, and it is also difficult for the human eye to follow another’s gaze, I repeated the aforementioned verbal protocol procedures with a third text on a laptop equipped with a Tobii X2-60 eye tracker. Eleven students from Armstrong Elementary read this additional text answering the corresponding translation and retelling questions—six fifth graders and five third graders, three of whom had parents who spoke Spanish. (Nine of the students were in the original group of 68 students, while two fifth graders attended the Spanish immersion program, but had not been part of the original study.) I analyzed students’ gaze plots as I asked them vocabulary and retelling questions which allowed me to triangulate my findings from my analytic strategies described below.

Analytic Strategies

Due to the limitations of verbalizing complex cognitive processes, interpretations and inferences must be made about not only what students say about their reading, but also what they do as they read. Therefore, I engaged in discourse analysis to analyze and code my data, and in the following paragraphs I justify how discourse analysis allows me to make claims about readers' strategies and the ways in which they apply knowledge across languages. Then I describe my specific analytic strategies and how they align with my theoretical framework. Finally, I detail how I quantitatively analyzed the coding from discourse analysis to identify trends in students' strategy use.

Justification of discourse analysis. Often in verbal protocol analysis, the focus is on the content of what participants say, e.g., what strategies they describe themselves as using to understand a text while reading. However, because people likely engage in some strategies unconsciously, making them difficult to verbalize, especially for young children or children who struggle with reading, other analytic methods are needed. In addition, when people speak, there is always assumed shared knowledge and/or context to afford speed in conveying the message (Gee, 2014). Given the fact that no one can communicate everything they think, Tenbrink (2015) asserted that discourse analysis can be applied to cognitive studies. Tenbrink stated that analysis of how people use language can illuminate unconscious, difficult-to-verbalize processes that would not be present in an analysis of only the content of participants' responses. For example, the use of filler words or pauses indicate uncertainty. The grammatical structures participants use can reflect their subconscious worldview or conceptual representation/understanding. Therefore, according to Tenbrink (2015), Cognitive Discourse

Analysis (CODA) helps researchers attend to not only *what* was said in a think-aloud, but also to *how* it was said to further probe participants' largely unconscious thinking.

In addition, not only does discourse analysis allow researchers to analyze how participants construct their verbal responses, but it also includes analysis of nonverbal elements. As Jaworski and Coupland (2014) said, "Linguistic expression itself (as speech or writing) often needs to be interrelated with other physical, temporal and behavioural aspects of the social situation, such as body movement and the synchronization or sequencing of actions" (p. 11). Language does not occur in a vacuum; other modes such as body language contribute to communication. Gee (2014) stated that body language is an important part of the context which surrounds discourse and that it must be studied. Kress (2011) took this assertion a step further, and defined texts and discourse as not just written or spoken, but as including movement, music, gesture, still and moving images, and so on. Kress asserted that all of these are texts and can be studied using discourse analysis. Therefore, analyzing students' gestures and body language through discourse analysis can provide important information about their strategies which they may not be able to verbalize.

Discourse analysis procedures. Studies involving verbal protocols often begin by dividing the transcripts into specified units of analysis (e.g., Chi, 1997; Cho, Woodward, & Li, 2018; Coiro & Dobler, 2007). To analyze the verbal protocols, I divided students' responses into interactional units, or "a series of conversationally tied message units" (as cited in Bloome, Carter, Christian, Otto, & Shuart-Faris, 2005, p. 22) because the main question and any follow-up questions I asked when requesting students to translate words or retell passages worked together to illuminate a particular strategy/cognitive process. Even if students used multiple

strategies to answer the main question, all of those strategies worked together to accomplish one goal (i.e., translating or retelling), which necessitates larger units of analysis.

Then, in order to analyze what students said, how they said it, their actions, as well as the interactions between the "reader," "text," and "activity" based on the RAND Model of Reading Comprehension (2002), I turned my transcripts for each question into a table with multiple columns. One column contained digital images of the text's pages (Figure 2). I marked the digital images to show words' location relative to their counterparts in the other language as well as their general location on the page and proximity to punctuation marks. (These were strategies I observed while students read and thought aloud which became some of my a priori codes described below.) According to Kress (2011), these images are texts that can be analyzed using discourse analysis. I also had a column for students' gestures and actions, a column for students' verbal responses, and a final column for the code(s) I assigned. The use of columns allowed me to attend to issues of "reader," "text," and "activity" both separately and together, which facilitated my analysis.

To code the data, I used Gee's (2014) Fill in Tool because all communication (but especially children's verbal protocols) assumes some shared knowledge that must be inferred. The Fill in Tool allowed me to "fill in" the gaps between what students did and did not tell/show me by considering context. I viewed the context of the reading activity through the lens of the RAND Model of Reading Comprehension (2002), taking into account aspects of the "reader" such as their language background, the "text" such as the placement of words on a page, and the "activity" or the questions I asked. I used information about each of these areas to inform my inferences.

I first looked at the information in students' verbal response columns, noting what students said they did to figure out the translations/retellings, as well as the content of the information they provided. I considered this information in relation to what I knew about their language and literacy backgrounds. In addition, I looked at students' actions and analyzed how those supported or contradicted what they said. Finally, I compared that information to the content and placement of the text on the page to determine the main strategies used to translate words and retell text, which I listed as "codes." (See Appendix C for the complete codebook.) I coded each translation and retelling with up to three different strategies because often students used multiple strategies at a time.

I first created the codebook with some a priori codes based on my observations while listening to students read and complete the verbal protocols. For example, I noticed that some students counted across the page one word at a time in both languages to find the translation, which led to the code "Text position (one-to-one correspondence)." Other a priori codes included "knowledge of surrounding words," "prior knowledge," "text position (mechanical elements)," "illustration," and "rely on English/Spanish." I determined the remaining codes as I analyzed students' verbal protocol data. I began with a group of eight students, four third graders and four fifth graders, from both schools. I selected these students because they represented a mix of home languages and biliteracy educational backgrounds, as well as a range of reading levels. They also used a variety of strategies that I initially identified when reading with them before coding the data. Focusing on these eight students allowed me to further develop my codebook into its almost final form. As I coded the remaining students, I made minor refinements to the codebook and reanalyzed previously coded data to reflect those changes.

Finally, to validate my codes, I worked with a bilingual research assistant who was a former Spanish immersion teacher. As we independently coded several students' verbal protocols as practice and discussed our coding, I made final refinements to my codebook. Then my research assistant and I independently coded 20% of the data (i.e., both of the readings completed by 14 students). On a straight percentage measure of the number of code matches, we had 83.04% agreement for the translation codes and 90.48% agreement for the retelling codes. Using Cohen's kappa, we had values of 0.74 and 0.84 respectively indicating "substantial" to "almost perfect" (Landis & Koch, 1977, p. 165) or "good" to "very good" agreement (Mahmud, 2010, p. 188). We came to consensus on discrepancies, and I recoded the remaining data to reflect our decisions and the final codebook. This process of having a second coder independently code a subset of the data, the researcher calculating agreement, the researchers/coders discussing codes and coming to consensus, and the main researcher coding the remaining data based on the discussion and consensus replicates previous verbal protocol studies of reading with similar percentages of agreement (e.g., Cho, Han, & Kucan, 2018; Coiro & Dobler, 2007; Kobrin & Young, 2003).

Two coding examples. To illustrate how I coded students' verbal protocol data, I present a translation from Annie, a third grader who spoke Spanish and English at home, and a retelling example from Emily, a third grader who spoke only English at home. When I asked Annie how to say "muebles" in English, she guessed, "Furniture?" When I asked how she determined this, Annie pointed to the English word "furniture," saying "it's over here." Upon further questioning, she pointed to the words "buying furniture" in the English text and said that when the text said "buying furniture. It means comprando muebles," which she pointed to in Spanish. In the book, both phrases were replicated in the same order with direct translation in both

languages. Therefore, because Annie showed the word "comprando" in front of "muebles" which means "buying," it seemed she used her knowledge of Spanish words around the term in question to help her find and identify the English translation. While Annie did not say she used words she knew, the Fill In Tool helped me infer this by considering her knowledge of Spanish and English and her actions, words, and the context of the book. Therefore, I coded this as "knowledge of surrounding words."

To code the retellings, I looked at the content of what students said, what language they had just read, as well as where they seemed to be looking on the page (because often the languages were far enough apart making their head movements distinctly visible as they looked at specific languages). If they repeated specific words and phrases from a language, that helped indicate which language they were relying upon/drawing from to inform their retelling. For example, a third grader, Emily retold a page after only reading the Spanish text. She said that the cloth the character made was "too thick, and too dirty? Because it sort-of looks like there's a lot of, leaves and dirt in it." I coded this first as "rely on English" because after only reading the Spanish, she correctly said that the cloth was too thick, when on the previous page, she did not know that "gruesa" meant thick. She also said this in a questioning tone, indicating some uncertainty. Therefore, I engaged in member-checking and asked if she used the English, Spanish, and/or the illustration to help her. She indicated using both the English and the illustration. Because of this, I also coded her retelling as "illustration." Not only did she confirm that she looked at the picture on the page, but her words said, "it sort-of looks like there's a lot of leaves and dirt in it" which describes the picture and references it by saying "it sort-of looks like." I proceeded in a similar analytic manner for the translation and retelling questions throughout the remaining transcripts.

Quantitative analysis. Finally, I analyzed these codes quantitatively because I wished to determine trends in the types of strategies students were using and the conditions under which they used them. Other verbal protocol studies have employed similar mixed methods approaches (e.g., Cho, Woodward, et al., 2018; Kobrin & Young, 2003), and Chi (1997) asserted the desire to identify and compare trends as rationale for "quantifying qualitative analyses of verbal data," (p. 271), which was also the title of her article. In order to determine statistical trends, I created multiple datasets that I imported into SPSS software. These datasets had the total strategies each student used to translate or retell passages, and they also listed each individual word, passage, or book for each student and the strategies the student used. These datasets allowed me to look at characteristics at the student-, the item-, and the book-level. I then calculated descriptive statistics to determine the frequency of assigned codes/strategies.

To determine how likely the strategies that students used to translate words were to result in correct responses, I split the dataset for each of the strategies students used so I could compare within the group—i.e., I could look at instances only when students used the strategy and then compare whether more of their responses were correct or incorrect. I then calculated nonparametric chi-squares to calculate the significance of the differences between the percentages of correct versus incorrect responses when students used a particular strategy.

To compare students' use of strategies by age, language, and literacy-related characteristics, I engaged various quantitative analyses. When comparing students' strategy use by grade level and home language, I calculated t-tests comparing means for the number of times students used each strategy (for translating and retelling) by the discrete binary categories of grade level and home language groups. To compare students' strategy use by oral reading accuracy, I first counted students' miscues, subtracted those from the total words in the text and

divided that by the total words to determine the percentage of words read correctly. The ranges of accuracies are presented in Table 2.

Table 2

Ranges of Oral Reading Accuracy by Language

Oral Reading Accuracy Range	Number of Readings by Language	
	English	Spanish
20-30%	0	3
30-40%	0	5
40-50%	0	4
50-60%	0	11
60-70%	0	11
70-80%	0	19
80-90%	8	42
90-100%	128	41

For this study, I focused on oral reading accuracy as opposed to words read correctly per minute because studies have illustrated that the speed with which readers read does not always predict their comprehension. For example, in Riddle Bully and Valencia's study (2002), they found that some students who read quickly just accurately called words without attention to meaning while some slow readers accurately decoded and were able to comprehend. Therefore, given the various ways speed and accuracy could interact, I decided to focus solely on accuracy.

When comparing strategy use by monolingual oral reading accuracy, I compared the frequency with which students used strategies by the quartile within which their oral reading accuracy fell for each language. However, because students were translanguaging as they read and made connections across both languages, it was important to compare strategy use based on bilingual reading profiles such as students with high accuracies in both languages, low accuracies in both, or accuracy that was much higher in one language than another. Because students'

English oral reading accuracies were so much higher than their Spanish oral reading accuracy percentages, I could not compare quartiles across languages. Therefore, I ranked students' English and Spanish oral reading accuracies. I determined the students who were highest in both languages as having at least 98% English oral reading accuracy, which placed them in or close to the top quartile, and as having at least 96% Spanish oral reading accuracy. Again, given the overall high English and low Spanish oral reading accuracies, I determined the readings with the lowest English and Spanish oral reading accuracies as having English accuracy below 90% and Spanish accuracy below 50%.

Finally, to determine the readings for which students had a much higher English accuracy versus Spanish accuracy or vice versa, I calculated the mean difference between English and Spanish oral reading accuracies. English accuracy percentages were on average 18 percentage points higher than Spanish. There were only three readings for which students had higher Spanish accuracies than English and the differences in percentages ranged from 0.06% to 3.12%; therefore, I did not compare the strategies used during these readings to those for which students had very low or very high accuracies for both languages. Given the high mean difference between languages, to analyze readings which had much higher English accuracies than Spanish, I looked at readings with differences of at least 40 percentage points between English and Spanish, which yielded 12 readings. The findings for this analysis and the analyses that describe the strategies students used to translate words and retell passages are presented in Chapter 4.

Research Question 2: Students from Spanish-Speaking Homes with English Literacy Reading DLBs

Design and Logic

The majority of students who speak languages other than English at home are placed in ESL pull-out programs where the focus is on learning English literacy skills, rather than being placed in bilingual or dual-language immersion programs which promote varying degrees of biliteracy (depending on the program) (Christian, 2011). Therefore, dual-language books are usually recommended for use in general elementary classrooms to help students who speak languages other than English learn English (e.g., D. Freeman & Freeman, 2007; Maxwell, 2013). However, in my study, I did not have any students who were using Spanish literacy skills to develop English literacy skills. Instead, I had five students who lived in homes where Spanish was spoken and had developed English literacy but had not received formal Spanish literacy instruction. Not only is their biliteracy development rarely prioritized in U.S. schools, but recommendations to include DLBs in classrooms, while important for demonstrating to students that their home languages are valued, also reflect assumptions that students can automatically use their home language to help them develop literacy in another language. Therefore, my goal with this study was to understand how these five students read DLBs and translanguaged or flexibly utilized their Spanish oral language and English literacy skills to develop home language literacy skills in Spanish, as it is infrequently studied how learners attempt to develop biliteracy in a home language with which they have oral knowledge, but not literate knowledge, using a learned school and/or social language and literacy knowledge (e.g., Gottardo et al., 2016; Jarvis & Pavlenko, 2008).

In order to study this process, I engaged in a qualitative study of reading strategies. Similar to Coiro and Dobler's (2007) study of adolescents' online reading comprehension strategies, I chose to focus on a small group of students in order to learn more in-depth about their strategies and processes of developing biliteracy. Therefore, for this study, students read three Spanish-English DLBs—one choice text and two pre-selected texts as described in the design for Research Question 1. Because these students did not have prior instruction in Spanish literacy, I briefly taught them the vowel sounds in Spanish because previous studies (e.g., Sneddon, 2009) found that when students could not decode in one of the book's languages, they could not read them independently. I also helped students if they became stuck on a word (in either language) and often provided correction on miscues. (I did this for all 68 students in the entire study.)

With the focal students, I engaged in think-alouds/verbal protocols (Hilden & Pressley, 2011; Pressley & Afflerbach, 1995), as described for Research Question 1. When students read Spanish-English DLBs aloud, I asked them to explain and show me how they translated words and retold English and Spanish passages in order to determine the strategies they used when applying metalinguistic and conceptual knowledge across languages. There is a history of coupling verbal protocol analysis and a focus on a select few readers (e.g., Coiro & Dobler, 2007; G. E. García & Godina, 2017; Jiménez et al., 1995, 1996; Shanahan et al., 2011) with the goal of understanding how individuals process and comprehend text. In these studies, researchers looked for aspects that made readers' processes unique, as well as similarities across readers, both of which were my goals in this study.

Participants

For this qualitative study, I chose five students—Annie, Luis, Juan, Drake, and Kylie. (All of these names are pseudonyms that either I chose, or students chose themselves.) I chose these five because they are all of the students in my larger study who came from homes where Spanish was spoken but who had not received formal instruction in Spanish literacy either in Spanish immersion or other schooling experiences.

Of the five students, Drake (a fifth grader) had the least Spanish oral language knowledge because he said that he only spoke English at home, but he heard his parents speaking Spanish to each other. In contrast, Kylie (a fifth grader) had the most Spanish oral language and frequently responded to my questions in a mix of Spanish and English. Regarding English reading proficiency, the third graders Annie and Luis made frequent errors when reading aloud and were classified by their ESL and classroom teachers as below grade level, with Luis being much further below grade level than Annie. The fifth graders Drake, Juan (Luis's brother), and Kylie were all at or above grade level for English reading. I describe the students and their backgrounds in greater detail in Chapter 5.

Data Sources

To learn about Annie, Luis, Juan, Drake, and Kylie as readers and their reading strategies, I analyzed my interviews with them after they read their chosen DLB, their running records including observational notes I took as they read, their verbal protocols answering translation and retelling questions and showing and describing their strategies, videos of them reading, and the texts they read, specifically focusing on the texts' layout. All of these data sources were described in detail in Research Question 1. In addition, I interviewed their classroom and/or ESL teachers, and for one student, Annie, I asked her to teach a younger

student how to read a dual-language book in order to create a more naturalistic setting for her to explain her reading strategy use. As I observed and listened to students read DLBs, I engaged in member-checking by asking students if what I observed was correct or by asking probing questions, such as "did you look at the English, the Spanish, the illustration to help you with your retell" to confirm what I noticed students doing without leading them to an answer. This member-checking adds validity to my claims (Merriam, 2002).

I transcribed all data focusing on both students' words and their actions. These multiple data sources not only helped triangulate the data (Merriam, 2002), but more specifically led to crystallization which moves beyond a fixed, two-dimensional way of seeing validity to instead offer a multi-dimensional, dynamic picture of the data that does not lead to a single truth, but rather to a complex way of seeing the data (Richardson, 2000). As Guba and Lincoln (2005) asserted, "The properties of the crystal-as-metaphor help writers and readers alike see the interweaving of processes in the research: discovery, seeing, telling, storying, re-presentation" (p. 208). This intertwined process is an accurate portrayal of my analysis, further described below.

Analytic Strategies

To analyze students' reading strategies, I first read all of the data sources, focusing on each student individually/separately. As I read, I engaged in initial coding (J. Saldaña, 2016) highlighting aspects related to my research question such as "methods for reading," "conceptions about reading," and "conceptions about language." I also analyzed unique aspects related to each student's processes, which included coding "motivation and attitudes," "sociopolitical context," and "personal background." These started as broad/general codes, but as I read each case, I considered what made that students' reading strategies unique as well as compared them

to the entire group of 68 students I read with and the 11 students who read an additional DLB using an eye tracker. This comparison allowed me not only to begin to identify themes, but also to triangulate/crystallize my interpretations throughout my analysis because I continuously checked multiple data sources (Merriam, 2002)—e.g., interviews, verbal protocols/think-alouds, videos, eye tracker data, fieldnotes, and so on—from the focal students themselves, as well as from my larger group of participants, for confirming and disconfirming evidence. However, the comparisons also revealed the particularities and idiosyncrasies of each focal student's processes, thereby leading to crystallization (Richardson, 2000) and more dynamic, nuanced themes.

In this way, the similarities among these focal students that set them apart from the entire sample became my initial themes—e.g., using English for decoding Spanish and the importance of the sociocultural/sociopolitical contexts and affective qualities. I wrote thematic memos and created a meta-matrix summarizing processes and data related to the codes which I used to collect ideas from the developing themes, compare across focal students, and engage in focused coding (J. Saldaña, 2016). This focused coding entailed rereading/reviewing my fieldnotes, written and video records of students' reading, interview transcripts and videos, and my memos and then recoding my data based on initial themes. As I considered the themes, I asked questions (Corbin & Strauss, 2008) such as what types of words or text conditions corresponded with times students used English to decode Spanish text, and I engaged in subcoding (J. Saldaña, 2016) to analyze these instances in greater detail. I engaged in a recursive, reiterative process of adding information to the meta-matrix, memoing, focused coding, and subcoding as I compared the students' processes and synthesized my codes and memos. The findings for this sub-study are presented in Chapter 5 where I describe the five focal students in detail and explore in-depth how they used English to read the Spanish text.

CHAPTER 4 – FINDINGS (LARGE MIXED METHODS STUDY):

RESEARCH QUESTION 1

In this study, I analyzed the strategies students used as they translated vocabulary words and retold passages while reading dual-language books (DLBs) to determine how they made metalinguistic and conceptual cross-linguistic connections. In the following paragraphs, I describe the strategies students used for each type of connection and the characteristics of students who tended to use certain strategies to translate and retell. I also discuss trends in the effectiveness of various metalinguistic strategies. Understanding the ways in and conditions under which students used and did not use the two languages in DLBs helps identify learning opportunities and the ways in which students may and may not capitalize on them to develop biliteracy, which answers my first research question.

Metalinguistic Connections

Overview of Student Strategy Use

For each DLB students read, I asked them to define and translate four Spanish and four English words in order to determine how they made metalinguistic connections across languages. When students translated words, they used a variety of strategies, often employing more than one strategy at a time. (Strategies are listed in descending frequency in Table 3 and described in the codebook in Appendix C.) Students used the three following strategies most frequently, almost 60% of the time: they relied on their knowledge of how to translate words surrounding the one in question, the general alignment or page location of the word in question, and nearby punctuation marks. As an example of "knowledge of surrounding words," when asked to translate "muebles" in *Francisco's Kites / Las cometas de Francisco* (Klepeis, 2015), Jasmine, an English-speaking fifth grader, responded with "furniture," because "in Spanish it said comparar [sic – comprar],

and I know that means buying. And then in English it has buying and then it says furniture. And then muebles and then comida and clothes. Comida y ropa." When students used alignment/page location, they described the words as being in similar locations or how they matched up, drawing a line between the translations with their fingers. Finally, when students used mechanical elements, they described how there were periods, commas, exclamation marks, and/or quotation marks by the word in question. However, this strategy could be misleading. For example, in the text *Rainbow Weaver / Tejedora del arcoíris* (Marshall, 2016), third graders were asked to translate "thread" into Spanish from the sentence, "And there is no extra thread. Y no hay hilo extra." Many students chose "extra" as the translation because "thread" was followed by a period, as was "extra" in Spanish even though "extra" is a cognate in both languages and is in fact spelled exactly the same in both. This previews the finding that some strategies were more effective than others, which I will discuss in the next section.

The gaze plots from the subsample of students who read a DLB on a computer with an eye tracker reinforced these observations. Students tended to look immediately in the corresponding general vicinity of the other language to find the translation of the word in question. Then they looked back and forth between languages at words in the same general vicinity. If the word in question was by a punctuation mark, students tended to look at the word by the punctuation mark in the other language first. Some students just stopped with that word, giving it as their response to the translation question, while others looked at the words around it, seeming to rely on their knowledge of language and understanding that the word by the punctuation mark did not mean the same as the word in question.

Table 3

Frequency of Strategies Used to Translate Words

Strategy	Number of Codes (N = 1592)	Percentage of Codes
Knowledge Surrounding Words	346	21.7%
Text Position (Alignment/Page Location)	318	20.0%
Text Position (Mechanical Elements)	272	17.1%
Knowledge Surrounding Words – Cognates	134	8.4%
Prior Knowledge	108	6.8%
Text Position (One-to-One Correspondence)	94	5.9%
Lexical Inference	54	3.4%
"I Don't Know"	40	2.5%
Illustration	37	2.3%
Grammatical Inference	35	2.2%
Prior Knowledge – Questioned	32	2.0%
Shared Letters	31	1.9%
Similar Sounds	20	1.3%
Unclear	17	1.1%
Context Clues	14	0.9%
Word Length	12	0.8%
Repeated Word	10	0.6%
Guesses Spanish-Like Word	9	0.6%
Guesses English-Like Word	7	0.4%
Translates Similar-Sounding Word	2	0.1%

The next three strategies in Table 3 accounted for 20% of the strategies students used: knowledge of surrounding words—cognates, prior knowledge, and text position (one-to-one correspondence). While students did use cognates rather frequently, they were sometimes misled by punctuation (as described in a previous example) and did not always realize that word order differs across languages. For prior knowledge, students claimed they already knew what the word was in the other language, and for text position (one-to-one correspondence), they literally counted each word across each language to find the translation. If the Spanish word was the

eighth word of the page/paragraph, then students went to the corresponding paragraph in English and counted eight words to find the translation. This shows assumptions that one word in one language translates to only one word in another, which is not the case.

Less frequently, students made inferences, recognizing that words are not always translated literally—such recognizing that translating "villagers" into Spanish is not just "gente" or "pueblo," but rather the entire phrase "la gente del pueblo" because villagers are people who live in a village. They also sometimes recognized that word order changes across languages with an example being that adjectives appear after nouns in Spanish but before nouns in English. (Students often verbalized this as "Spanish is backwards from English.") Students also relied on the book's illustrations; characteristics of the words such as letters, length, and sounds; and their knowledge of what was happening in the story, or context clues.

Interestingly, sometimes students claimed to have prior knowledge of a word's translation because they said their parents told them, even though in prior interviews they said their parents did not speak Spanish. Or sometimes they said their teacher taught them a specialized word such as "hebras." These explanations did not make sense, especially if students did not provide the correct translation, so I coded these responses as "prior knowledge—questioned." Perhaps, students provided these explanations because they did not want to say they guessed or could not verbalize how they determined their answer.

Relatively infrequently did students provide responses coded as "I don't know" (which included guessing a seemingly random word), and they also infrequently guessed Spanish/Spanish-like and English/English-like words not in the book—providing further evidence that students strategically used texts and their knowledge of language to translate words. Interestingly, students from Spanish-speaking households were more likely to guess a

random Spanish word not in the text or make up a Spanish-like word (6 students) as compared to students from households only speaking English (3 students). They were almost equally likely to guess a random English/English-like word (4 students) as students from households where Spanish was not spoken (3 students). While these guesses did not happen often, perhaps the propensity for guessing random Spanish words or making up a Spanish-like word by students from Spanish-speaking households could reflect their greater Spanish proficiency—the fact they had greater facility and creativity with the language. (The characteristics of students who tended to use each strategy are described further in an upcoming section.)

Knowing that students relied heavily on their knowledge of surrounding words, general alignment and page location of words, and nearby mechanical elements, but that they less frequently used cognates or inferred using knowledge of words' meaning or grammatical structures begins to answer my first research question because it provides evidence that students do make connections across languages when asked to translate words while reading DLBs. Sometimes these connections were more language-based (such as when they relied on their knowledge of language and word meanings), and other times the connections were more text-based (such as when they relied on location, mechanical elements, or counting words across a page). Understanding the effectiveness of these strategies, described in the next section, will help further identify DLBs' learning opportunities for cross-linguistic connections and biliteracy development to answer Research Question 1.

Effectiveness of Strategies

As illustrated in a previous example of how students relied on mechanical elements and sometimes ignored cognates (by translating "thread" as "extra" since both were by periods), some strategies were more effective than others. This is represented in Table 4 with strategies

divided by the likelihood that when students used the strategy, it corresponded with a correct translation. (I recognize that translations are not always literal and that words can have multiple meanings. Therefore, when I counted responses as correct or incorrect, I not only considered how the text translated the word, but also other, related translations. For example, some students who spoke Spanish at home translated "muebles" as "shelves," "soft cushions," or other types of furniture, rather than directly stating "furniture." Because these responses show an understanding of the term, I counted them as correct. For the purposes of this analysis, if students provided one word out of a translated phrase, while partially correct, I counted these responses as incorrect because including partially correct responses with correct responses did not clearly represent students' understanding. Translating "scraps" as "reciclé" ("I recycled") does not communicate the same level of understanding as recognizing the entire phrase from the text "basura que reciclé" ("trash that I recycled") as a translation for "scraps.")

As shown in Table 4, when students used their knowledge of words and language, they were more likely to provide correct translations, with statistically significant differences for many of the strategies. These strategies included making grammatical and lexical inferences and relying on their knowledge of the word in question and/or surrounding words. When students relied on the text to orient themselves and the visual elements of words, they more frequently provided incorrect translations, again with statistically significant differences for many strategies. These strategies included relying on general page locations of words, nearby mechanical elements, and shared letters in words. In addition, unsurprisingly, when students guessed, they were more likely to provide an incorrect translation.

Table 4

Strategy Use and Likelihood of Correct Translation

Strategy	Incorrect	Correct	Nonparametric Chi-Square	df
More Frequently Provided Correct Responses				
Repeated Word	1 (10.0%)	9 (90.0%)	6.400*	1
Grammatical Inference	4 (11.4%)	31 (88.6%)	20.829***	1
Prior Knowledge	22 (20.4%)	86 (79.6%)	37.926***	1
Knowledge Surrounding Words – Cognates	46 (34.3%)	88 (65.7%)	13.164***	1
Similar Sounds	7 (35.0%)	13 (65.0%)	1.800	1
Knowledge Surrounding Words	131 (37.9%)	215 (62.1%)	20.393***	1
Lexical Inference	21 (38.9%)	33 (61.1%)	2.667	1
Equally Likely to Provide Correct or Incorrect Responses				
Context Clues	7 (50.0%)	7 (50.0%)	0.000	1
Word Length	6 (50.0%)	6 (50.0%)	0.000	1
Illustration	20 (54.1%)	17 (45.9%)	0.243	1
More Frequently Provided Incorrect Responses				
Text Position (Alignment/Page Location)	180 (56.6%)	138 (43.4%)	5.547*	1
Shared Letters	19 (61.3%)	12 (38.7%)	1.581	1
Text Position (Mechanical Elements)	174 (64.0%)	98 (36.0%)	21.235***	1
Text Position (One-to-One Correspondence)	63 (67.0%)	31 (33.0%)	10.894**	1
Prior Knowledge – Questioned	23 (71.9%)	9 (28.1%)	6.125*	1
Unclear	13 (76.5%)	4 (23.5%)	4.765*	1
“I Don’t Know”	32 (80.0%)	8 (20.0%)	14.400***	1
Guesses English-Like Word	6 (85.7%)	1 (14.3%)	3.571	1
Guesses Spanish-Like Word	9 (100.0%)	0 (0.0%)	--	--
Translates Similar-Sounding Word	2 (100.0%)	0 (0.0%)	--	--

* $p < .05$ ** $p < 0.01$ *** $p < 0.001$

When students relied on context clues or word length, they were equally likely to provide correct as incorrect responses. As an example of a student who relied on word length, Lionel, an English-speaking third grader translated “scraps” in *Francisco’s Kites / Las cometas de Francisco* (Klepeis, 2015) as “reciclé” (literally, “I recycled,” rather than the text’s phrase “basura que reciclé”), explaining, “cause it’s kind-of a bigger word. Than just scraps. S-c-r-a-p-s.

And R-e-c-i-c-l-e. So seven, two more." Lionel counted the letters and determined that the similar word lengths meant they were the corresponding translations. This strategy helped Lionel identify part of the text's translation, but not the entire translation which in this case was a phrase, and this resulted in an incorrect response.

When students relied on the illustrations, they also were almost equally likely to provide correct as incorrect responses. Even though students are often taught to use the illustrations to help them decode texts, as they age and as texts become more complex, illustrations often become more complex and do not directly mirror the text's message. Therefore, illustrations do not fully capture everything the text says and can even introduce additional or conflicting information, which means that relying on them to translate words does not always help.

The fact that students relied heavily on text-based strategies such as general page location, mechanical elements, and one-to-one correspondence, which were significantly more likely to yield incorrect translations, helps answer the first research question related to DLBs' learning opportunities for cross-linguistic connections and biliteracy. It showed that while students did compare across the two languages, they used strategies of varying effectiveness. It seems there are learning opportunities to develop students' use of language-based strategies to help them more effectively translate words when reading DLBs.

Groups Using Particular Strategies

While it is important to know the effectiveness of strategies, that leads to the question of who tended to use them. Learning about who uses specific strategies helps develop understandings about the conditions under which students are more likely to make cross-linguistic connections that will help them develop biliteracy, which answers the first research question. Comparisons of means and overall percentages indicated trends in the types of

strategies particular groups of students relied upon—trends based on grade level, language(s) spoken at home, and students' reading accuracy levels for each language of the text.

Grade. There were great differences in students' strategy use by grade level. As illustrated in Table 5, third graders were significantly more likely to rely on text-based strategies such as the general position of words on the page, one-to-one correspondence counting words across the page, word length, and claiming words had similar sounds (which they sometimes did not). Third graders were also significantly more likely to claim they did not know or to guess a random word. In contrast, fifth graders were more likely to use linguistic knowledge as they were significantly more likely to rely on context clues, their knowledge of surrounding words including cognates, and inferences about words' meanings and grammar. This likely is due to the two additional years they have been learning and using Spanish and English. However, neither grade level was more likely to use mechanical elements.

Fifth graders tended to use more language-based strategies which more frequently yielded correct translations, as opposed to third graders who tended to use more text-based strategies which more frequently yielded incorrect translations. Students who have spent longer learning languages seem more poised to take advantage of the opportunities inherent in DLBs' side-by-side positioning of languages to develop biliteracy.

Table 5

Strategies Used to Translate Words by Grade Level

	Grade Level						95% CI for Mean Difference	t	df
	Third (N = 33)			Fifth (N = 35)					
	M	SD	n	M	SD	n			
Third Grade Significantly More Likely									
"I Don't Know"	0.82	0.92	27	0.37	0.69	13	0.06, 0.84	2.28*	66
Similar Sounds	0.52	1.15	17	0.09	0.37	3	0.01, 0.85	2.05*	38.34
Text Position (Alignment/Page Location)	6.55	2.90	216	2.91	1.96	102	2.44, 4.82	6.09***	66
Text Position (One-to-One Correspondence)	2.70	2.08	89	0.14	0.55	5	1.8, 3.31	6.82***	36.2
Word Length	0.33	0.60	11	0.03	0.17	1	0.09, 0.52	2.84**	36.85
Fifth Grade Significantly More Likely									
Context Clues	0.03	0.17	1	0.37	0.84	13	-0.64, -0.05	-2.34*	37.06
Grammatical Inference	0.27	0.57	9	0.74	1.12	26	-0.9, -0.04	-2.2*	51.34
Knowledge Surrounding Words	3.27	2.11	108	6.80	2.72	238	-4.71, -2.34	-5.95***	66
Knowledge Surrounding Words – Cognates	1.58	1.35	52	2.34	1.71	82	-1.52, -0.02	-2.04*	66
Lexical Inference	0.42	0.75	14	1.14	1.29	40	-1.23, -0.21	-2.83**	55.35
Neither Grade Significantly More Likely									
Guesses English-Like Word	0.12	0.33	4	0.09	0.28	3	-0.11, 0.19	0.48	66
Guesses Spanish-Like Word	0.15	0.36	5	0.11	0.4	4	-0.15, 0.22	0.4	66
Illustration	0.73	0.98	24	0.37	0.6	13	-0.04, 0.75	1.8	52.46
Prior Knowledge	1.42	1.75	47	1.74	2.48	61	-1.36, 0.73	-0.61	66
Prior Knowledge – Questioned	0.67	1.08	22	0.29	0.57	10	-0.04, 0.81	1.8	48.03
Repeated Word	0.15	0.36	5	0.14	0.43	5	-0.19, 0.2	0.09	66
Shared Letters	0.55	0.94	18	0.37	0.6	13	-0.21, 0.56	0.91	53.79
Text Position (Mechanical Elements)	4.09	2.92	135	3.91	2.63	137	-1.17, 1.52	0.26	66
Translates Similar-Sounding Word	0.06	0.24	2	0	0	0	-0.03, 0.15	1.44	32
Unclear	0.24	0.61	8	0.26	0.51	9	-0.29, 0.26	-0.11	66

* $p < .05$ ** $p < 0.01$ *** $p < 0.001$

Language spoken at home. There were also differences in strategy use depending on the language(s) spoken in students' households, but these differences were much less than the differences by grade level. Students from homes where at least some Spanish was spoken (M = 3.17, SD = 2.84), unsurprisingly, were significantly more likely to rely on their prior knowledge of words' translations than students from homes that that only spoke English (M = 0.73, SD = 0.85). In contrast, students from English monolingual homes (M = 2.25, SD = 1.66) were significantly more likely to use their knowledge of surrounding words including cognates, than students from Spanish-speaking homes (M = 1.46, SD = 1.32), $t(66) = 2.02$, $p < 0.05$. They also were more likely to rely on mechanical elements to find the translation (M = 4.48, SD = 2.82) than students from Spanish-speaking households (M = 3.13, SD = 2.44), $t(66) = 1.98$, $p = 0.052$, although this was not quite a statistically significant difference. Perhaps students from households that only spoke English tended to rely more on cognates in order to leverage their English knowledge to make up for less practice/exposure to Spanish. In addition, less Spanish oral language knowledge could also account for why students from households that only spoke English would rely more on mechanical elements to find translations as they would be less likely to automatically know the translation.

Comparison of grade-level and home language strategies. While there were grade-level and, to a lesser extent, home language differences in the strategies students used to make metalinguistic connections, the question is how these characteristics interact—whether one carries more weight than another. To determine this answer, I first compared students from monolingual English-speaking homes and those from homes with some Spanish spoken at each grade level. As evident in Table 6, for each of the grade-level-specific strategies, students at that grade level, regardless of language spoken at home, had higher means for using that strategy.

For example, grade level analysis (Table 5) showed that third graders were significantly more likely to use one-to-one correspondence. When I compared the means of third graders to fifth graders from English-speaking homes for using this strategy and the means of third graders to fifth graders from Spanish-speaking homes using this strategy (Table 6), third graders, regardless of home language, had higher means of using one-to-one correspondence.

The same held true for home language-specific strategies—i.e., grade level did not matter; means for language-specific strategies were still higher by home language (Table 7). For example, in the case of prior knowledge, students from Spanish-speaking homes had higher means of using prior knowledge when compared to students from English-speaking homes at both third and fifth grade.

Table 6

Comparing Grade-Level Differences in Strategy Use by Home Language

	Language Spoken at Home			
	English-Only Home (N = 44)		Some Spanish Home (N = 24)	
	M Third (N = 22)	M Fifth (N = 22)	M Third (N = 22)	M Fifth (N = 22)
Third Grade Significantly More Likely				
"I Don't Know"	.91	.41	.64	.31
Similar Sounds	.59	.09	.36	.08
Text Position (Alignment/Page Location)	6.73	3.27	6.18	2.31
Text Position (One-to-One Correspondence)	2.77	.05	2.55	.31
Word Length	.41	.05	.18	.00
Fifth Grade Significantly More Likely				
Context Clues	.05	.36	.00	.38
Grammatical Inference	.23	.91	.36	.46
Knowledge Surrounding Words	3.09	7.36	3.64	5.85
Knowledge Surrounding Words – Cognates	1.64	2.86	1.45	1.46
Lexical Inference	.36	1.18	.55	1.08

Table 7

Comparing Language Differences in Strategy Use by Grade Level

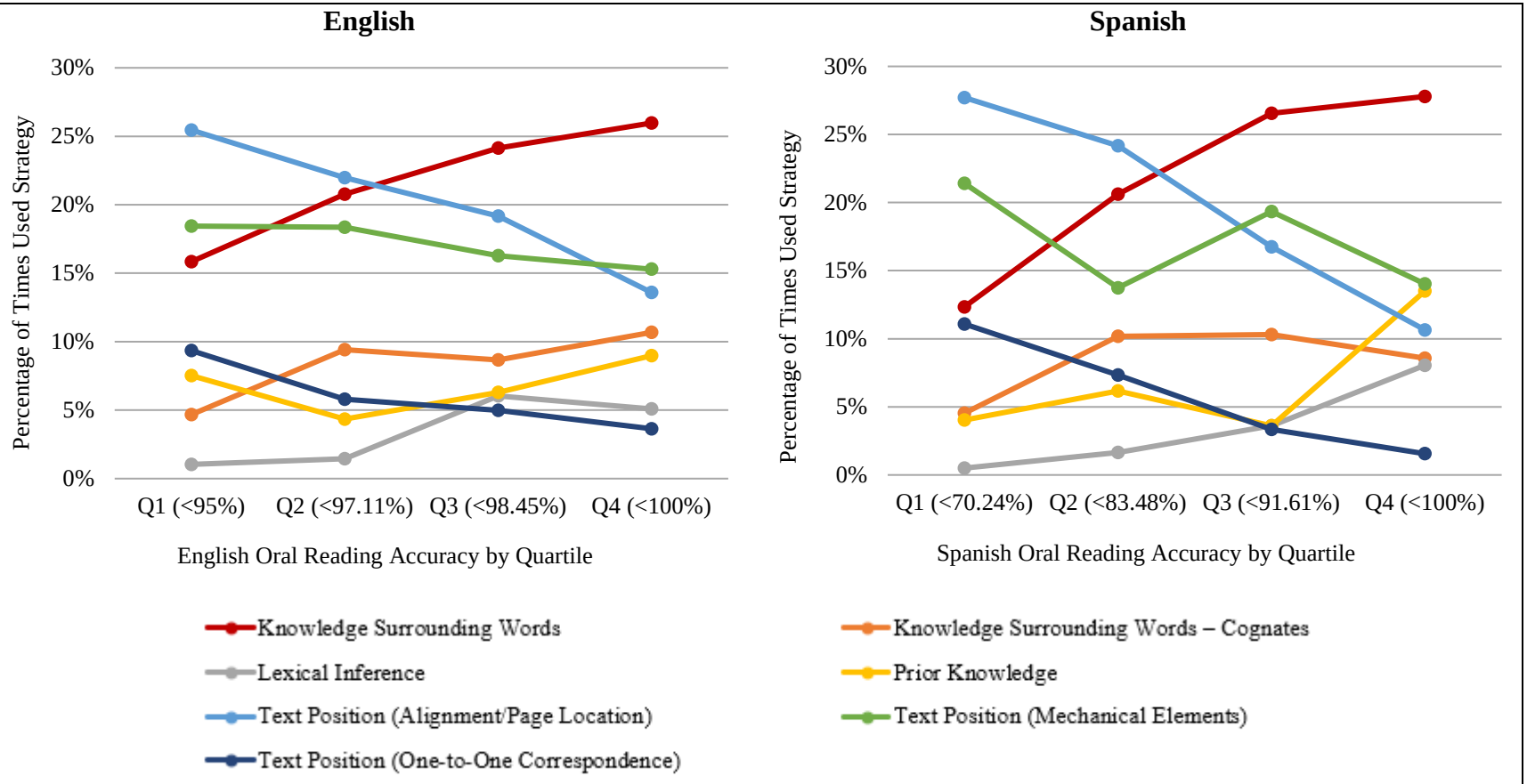
	Grade Level			
	Third (N = 33)		Fifth (N = 35)	
	M English-only home (N = 22)	M Some Spanish home (N = 11)	M English-only home (N = 22)	M Some Spanish home (N = 13)
Students from English-Only Homes More Likely				
Knowledge Surrounding Words – Cognates	1.64	1.45	2.86	1.46
Text Position (Mechanical Elements)	4.95	2.36	4.00	3.77
Students from Homes with Some Spanish Spoken More Likely				
Prior Knowledge	.82	2.64	.64	3.62

With these results, it seems that the more time students spend learning language, the more they use translation strategies that are more likely to yield correct responses. Because strategy use seems to be more strongly correlated with grade level rather than home language, it seems that results could be related to time spent learning language. It seems students more frequently use more effective translation strategies when they have learned the languages longer, which has pedagogical implications for developing students' language skills and helping them learn how to make cross-linguistic connections more effectively and thereby develop biliteracy when reading DLBs, thus helping answer the first research question.

Reading accuracy levels. Finally, there were trends in students' strategies to translate words based on their reading accuracy level, or more specifically, their oral reading accuracy, for each language of the text. These trends reinforced the findings of strategy use based on students' grade level and language(s) spoken at home. Figure 3 shows the seven most frequently used strategies when students translated words and the percentage of times these strategies were used depending on students' English and Spanish oral reading accuracy levels.

Figure 3

Translation Strategy Use by Oral Reading Accuracy in Each Language



These graphs include two readings each from 68 students. Their English and Spanish oral reading accuracy percentages are organized by quartiles to compare the relative frequency with which they used the most popular translation strategies.

Students' strategy use generally showed the same trends across both languages. For example, both usages of text position alignment/page location and one-to-one correspondence decreased as students' oral reading accuracy increased in both languages. It seems that with less developed reading skills in languages, reliance on the text becomes more important. In contrast, students' use of their knowledge of surrounding words, cognates, lexical inferences, and prior knowledge tended to increase as their accuracy increased in both languages. In other words, as students' accuracy improved in both languages, they tended to rely more on language-based, rather than text-based strategies.

Students' use of nearby mechanical elements differed across languages. As students' English accuracy improved, their use of mechanical elements decreased. In Spanish, this was the general trend, but students in the third quartile used mechanical elements more than students with accuracies in the second quartile. It is unclear why this could have occurred.

Students' use of cognates and lexical inference had slight differences in the fourth quartile of each language. For example, students with English accuracies in the fourth quartile relied on cognates more than students in other quartiles, whereas students with Spanish accuracies in the fourth quartile relied on cognates less than those in the second and third quartiles. One possible explanation is that with increased Spanish accuracy, the need to make connections to similar words in English is less important because students can accurately decode all of the Spanish text. In contrast, students' use of lexical inferencing slightly decreased as English accuracies moved from Q3 to Q4 whereas the use of this strategy continued to increase across quartiles in Spanish. Again, it is unclear why this discrepancy occurred.

In addition, I compared students' strategy use to bilingual oral reading accuracy profiles (Figure 4) to determine if there were differences in strategy use not captured by the monolingual

accuracy data. I wanted to determine if there were differences between students' readings that had very low accuracy in both languages, those that had very high accuracy in both languages, and those with accuracy much higher in one language than another. As described in Chapter 3, only three students' readings had Spanish accuracies that were higher than their English accuracies, but these percentages only differed by less than 4 percentage points. Therefore, they are not included in this graph.

The four readings with low accuracies in both languages came from four different students who were all third graders, and all read books written with English first. Two of the third graders came from Spanish-speaking homes. The 12 readings for which the English accuracy was at least 40 percentage points higher than the Spanish accuracy came from eight students. There was an equal distribution of books written in English and Spanish first. All but one of the students were third graders. The one fifth grader came from a Spanish-speaking home, but he did not speak Spanish at home; instead he frequently heard his parents speaking Spanish. Finally, the nine readings with high accuracies in both languages came from five students, all of whom came from Spanish-speaking homes and were fifth graders.

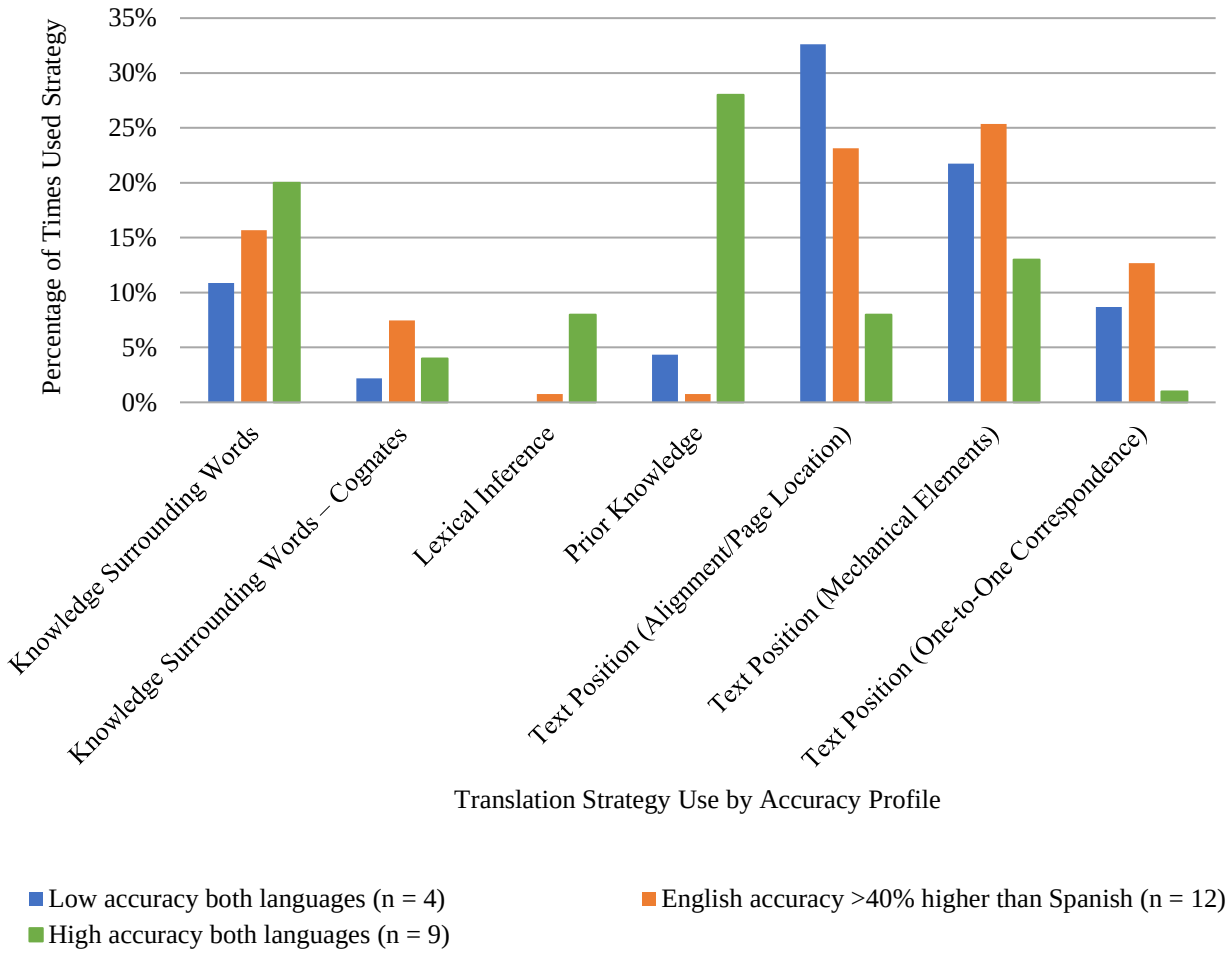
Similar to the monolingual accuracy data (Figure 3), Figure 4 shows that students with high accuracy in both languages more frequently relied on language-based strategies such as their knowledge of surrounding words, lexical inferences, and prior knowledge. Unsurprisingly, their use of prior knowledge was much higher than any other group because all of the students in this group were fifth graders, who have had longer learning language, and all came from Spanish-speaking homes which often increases their Spanish oral language vocabulary.

However, students with much stronger English accuracies relied more on knowledge of cognates than did students with high accuracies in both languages. This, too, is similar to the

Spanish monolingual accuracy data, again, likely because students with high accuracies in both languages already know the words (partially evident from their reliance on prior knowledge), so they do not need to rely on cognates to help them translate words.

Figure 4

Translation Strategy Use by Bilingual Oral Reading Accuracy Profile



This graph compares the translation strategy use of the 4 readings for students who had the lowest oral reading accuracies in both languages (<90% in English and <50% in Spanish), the 9 readings with the highest oral reading accuracy in both languages (>98% in English and >96% in Spanish), and the 12 readings for which their English accuracy was at least 40% higher than their Spanish accuracy. (On average, English accuracy scores were 18% higher than Spanish.)

In contrast, students with low accuracies in both languages relied most heavily on general page location (which is similar to the monolingual accuracy data). However, students with much stronger English accuracies as compared to Spanish relied more heavily on mechanical elements and counting words one-by-one across the page than did students with low accuracies in both languages. Perhaps, their stronger English accuracy led them to try to focus more on the text by looking at mechanical elements or counting rather than generally lining up words on the page, but their bilingual reading skills were not strong enough to rely heavily on linguistic knowledge.

These results from both monolingual and bilingual accuracy data contribute further evidence to answer Research Question 1 because oral reading accuracies can vary across grade levels or home languages. Understanding how children read DLBs at varying levels of oral reading accuracy not only validates the findings from grade-level and home language analyses, but it also provides more nuance and details to understand the learning opportunities DLBs afford and how they may or may not be realized to help students make cross-linguistic connections.

Summary of Students' Metalinguistic Strategies

Students are strategic readers as they translate words when reading DLBs. They use their knowledge of languages as well as page layout to assist them. When students use strategies based on their knowledge of languages (i.e., language-based strategies), they are more likely to translate words more accurately than when they use strategies based on text/page layout (i.e., text-based strategies). Students who are older (and thereby have learned language longer) and who have more exposure at home to Spanish tend to rely more on their knowledge of language rather than page layout. This trend is reflected in students' accuracy when reading DLBs. Students with stronger oral reading accuracy in both languages tend to have a stronger grasp of

the languages and use more language-based strategies, while students with weaker oral reading accuracy in both languages, likely have a weaker grasp of the languages and use more text-based strategies. Understanding these trends provides pedagogical directions to help students more accurately make cross-linguistic connections to develop biliteracy.

Conceptual Connections

To analyze the second type of cross-linguistic connection, conceptual connections, I asked students to retell pages of a dual-language book and determined the strategies students used to retell the text. This provides further evidence to answer the first research question because opportunities for cross-linguistic connections do not occur solely at the lexical level, but also at the discourse level. In the following paragraphs, I present an overview of students' strategies and trends in the strategies they used depending on grade level, language(s) spoken at home, and reading accuracy level for each of the books. Because retellings do not have defined correct/incorrect responses, I do not discuss the effectiveness of the retelling strategies as I did for metalinguistic connections.

Overview of Student Strategy Use

On four pages of each DLB, I stopped students after they read the page's first language to retell what happened on that page. After they read the page's second language, I asked if they wanted to add anything else to their retells. Students read one book with Spanish written first on each page and one book with English written first on each page. If students solely relied on the page's first language to provide information for their retells, then one would expect that they relied on English about half of the time and Spanish half of the time. This was not the case. Students used multiple strategies and relied on English over half of the time followed by relying on the book's illustrations almost a quarter of the time (Table 8). They used the Spanish text

very little, and when they did, they tended to use the English text in conjunction with the Spanish (either sequentially or simultaneously) to support their retellings. In addition, students retold information that happened on other pages, rather than solely the page in question, and they were significantly more likely to do this when the book was written in Spanish first, rather than English, $X^2(1, N = 36) = 9.00, p < 0.01$—which reinforces the conclusion that students rely heavily on the English when retelling texts. This was also evident when reviewing students' gaze plots from the subsample that read a DLB with an eye tracker. They usually looked at the English text when retelling the page and also the illustration.

Table 8

Frequency of Strategies Used to Retell Passages

Strategy	Number of Codes (N = 723)	Percentage of Codes
Rely on English	372	51.5%
Illustration	171	23.7%
Rely on Both Languages – Sequentially	82	11.3%
Other Pages	36	5.0%
Rely on Spanish	33	4.6%
Rely on Both Languages – Simultaneously	23	3.2%
Unclear	6	0.8%

Again, the data regarding students' retelling strategies shows that students are strategic readers, but they infrequently utilize information from both languages on the page, which speaks to Research Question 1 and the learning opportunities for making cross-linguistic connections afforded by DLBs. Some of the reliance on English could be due to students' greater proficiency with English as illustrated by the significantly higher English oral reading accuracy percentages as compared to Spanish presented in the section about metalinguistic connections.

Groups Using Particular Strategies

Grade. Similar to students' use of metalinguistic strategies, students' conceptual (i.e., retelling) strategies varied by grade level (Table 9). Third graders were significantly more likely to use the illustrations, retell other pages, and rely on English than fifth graders. In contrast, fifth graders were significantly more likely to rely on both languages either sequentially or simultaneously, which reflects their more developed language knowledge due to longer exposure to the languages. It also shows that again, fifth graders seem poised to take advantage of the side-by-side placement of languages in DLBs' to make cross-linguistic connections.

Table 9

Strategies Used to Retell Passages by Grade Level

	Grade Level						95% CI for Mean		
	Third (N = 33)			Fifth (N = 35)					
	M	SD	n	M	SD	n	Difference	t	df
Third Grade Significantly More Likely									
Illustration	3.55	2.06	117	1.54	1.54	54	1.12, 2.89	4.52***	59.12
Other Pages	0.94	1.03	31	0.14	0.55	5	0.39, 1.2	3.95***	48.27
Rely on English	6.48	1.68	214	4.51	1.74	158	1.14, 2.8	4.75***	66
Fifth Grade Significantly More Likely									
Rely on Both Languages – Sequentially	0.3	0.64	10	2.06	1.71	72	-2.38, -1.13	-5.66***	43.68
Rely on Both Languages – Simultaneously	0.06	0.35	2	0.60	1.04	21	-0.91, -0.17	-2.91**	42.01
Neither Grade Significantly More Likely									
Rely on Spanish	0.36	0.96	12	0.60	0.95	21	-0.7, 0.23	-1.02	66
Unclear	0.15	0.36	5	0.03	0.17	1	-0.02, 0.26	1.77	44.59

* p < .05 ** p < 0.01 *** p < 0.001

Language spoken at home. When comparing students from English-only homes to students from homes that spoke some Spanish, the only strategy with statistically significant differences between the language groups was students' reliance on Spanish. Unsurprisingly, students from Spanish-speaking homes (M = 1.08, SD = 1.35) were significantly more likely to

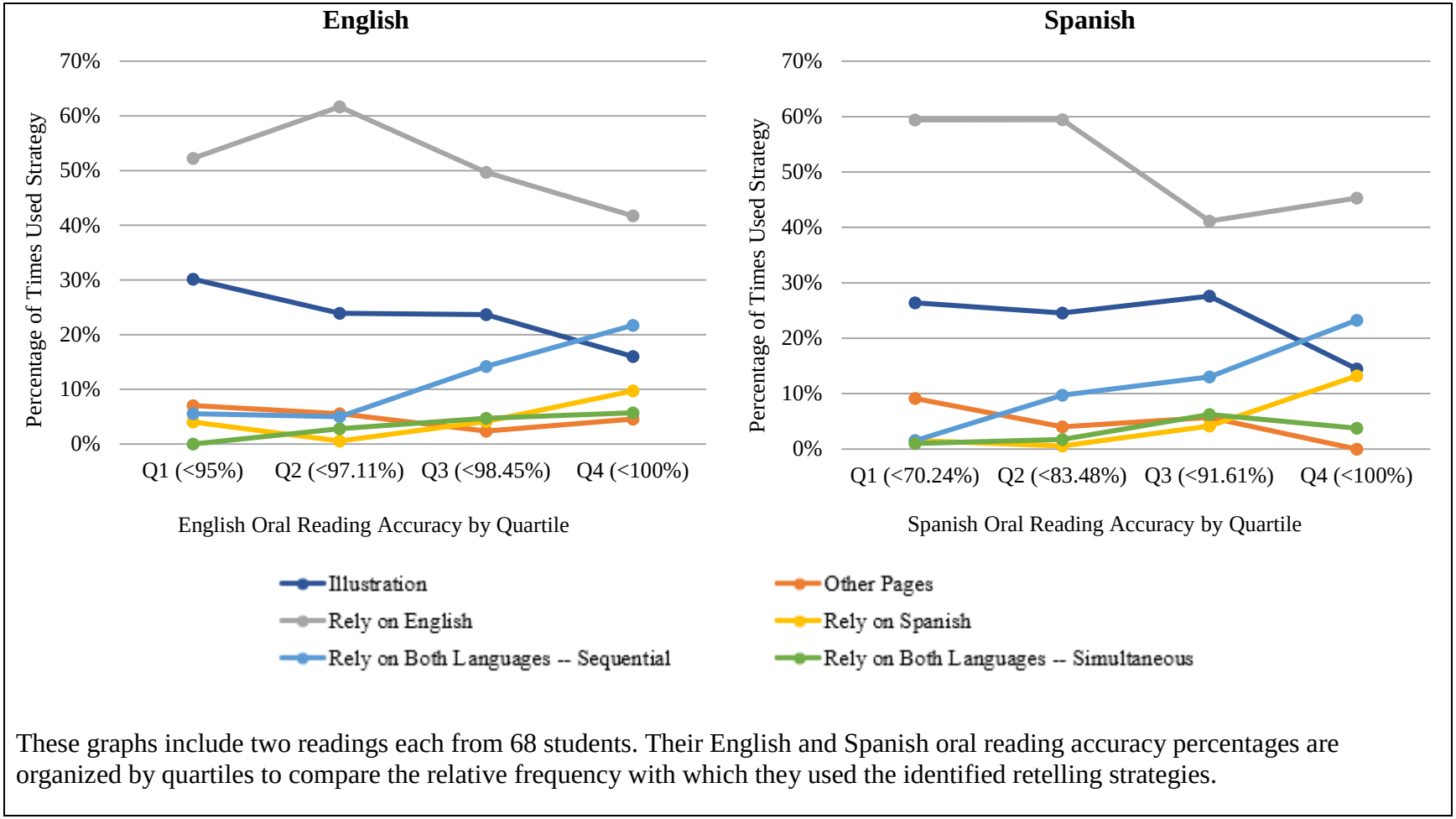
rely on Spanish to retell passages than students from homes that only spoke English ($M = 0.16$, $SD = 0.37$), $t(24.91) = -3.29$, $p < 0.01$. However, no students relied on Spanish when the text was written in English first. Therefore, this difference is only significant (and only exists) when students read books written in Spanish first. Moreover, students never relied on both languages simultaneously when books were written in English first, which further illustrates not only the conditions under which students make cross-linguistic connections while reading DLBs, but also students' comfort with English, regardless of the language(s) spoken in their homes.

Reading accuracy level. Figure 5 depicts how students' strategy use to retell passages changed depending on their oral reading accuracy level in each language. As students' accuracy increased in both languages, they tended to rely less on English as well as illustrations and retelling what happened on other pages rather than the page in question. Conversely, as their accuracy increased in both languages, they relied more on Spanish and both languages either sequentially or simultaneously.

However, there were some slight differences when comparing languages. Figure 5 illustrates that with the strategy of relying on the English text to inform the retelling, students with Spanish reading accuracies in the fourth quartile relied on English more frequently than students in the third quartile. It is unclear why this happened. However, for students with English oral reading accuracies in the second quartile, they relied on English more than another other quartile. This could be because students' accuracies in the first quartile were low enough that they felt they needed to use other sources of information such as from the illustration or other pages to support their retelling.

Figure 5

Retelling Strategy Use by Oral Reading Accuracy in Each Language



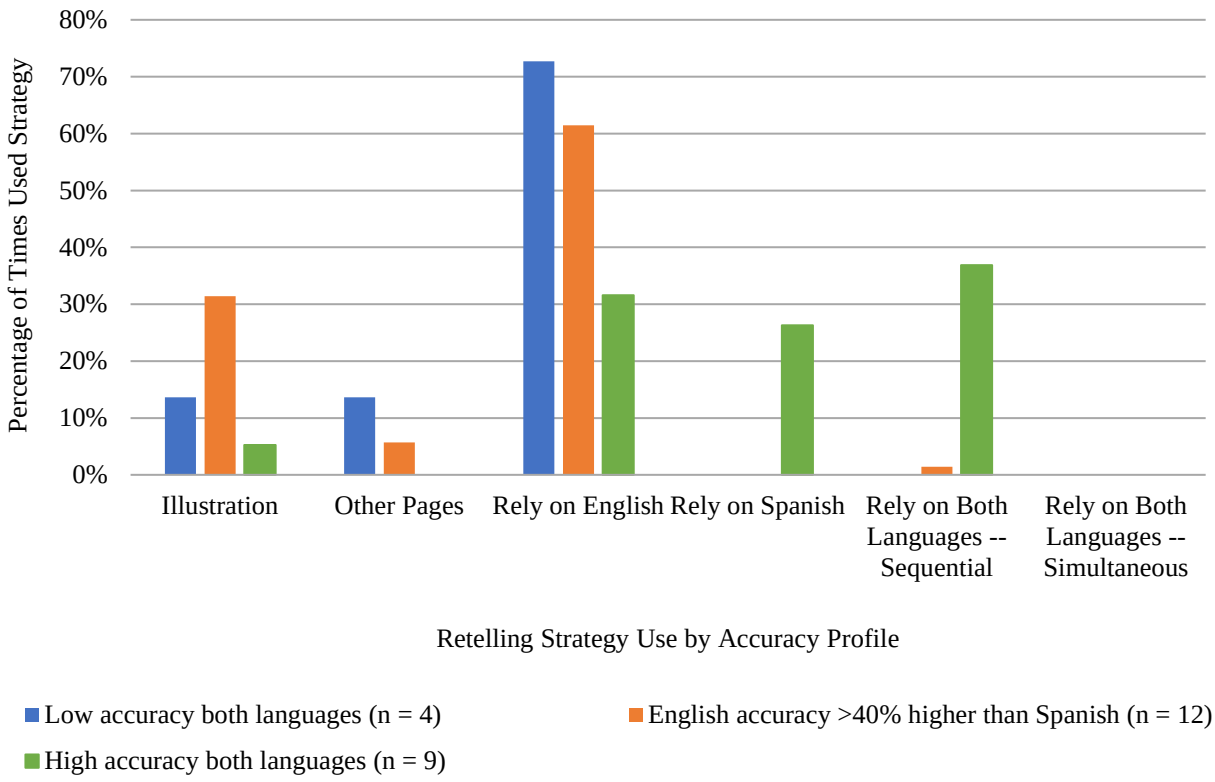
These graphs include two readings each from 68 students. Their English and Spanish oral reading accuracy percentages are organized by quartiles to compare the relative frequency with which they used the identified retelling strategies.

In addition to analyzing trends related to monolingual accuracy percentages, I also analyzed trends related to bilingual accuracy profiles (Figure 6). Similar to the monolingual data, students with high accuracy in both languages more frequently relied on Spanish on its own or both languages sequentially. However, of these groups, none relied on both languages simultaneously, not even the students who had much higher English accuracy percentages than Spanish. Students with high accuracies in both languages likely did not need to rely on both languages at the same time to retell the story because with more accurate decoding, they may have been able to remember more events to retell regardless of language. It is interesting that students with stronger English accuracies did not rely on both languages simultaneously. Perhaps their Spanish accuracies were too low to be able to use some Spanish knowledge to supplement their reliance on English. Interestingly, students with low accuracies in both languages more frequently relied only on English than any other group, but all four readings for this group were texts with English written first.

One would hypothesize that students with low accuracies in both languages would rely on the illustration more than other groups, but students with much higher English accuracies than Spanish relied on illustrations more frequently. Perhaps this is because some of these books were written with the Spanish text first whereas all of the books with low accuracies in both languages were written with English first. Even though students had low English accuracy, it was in the 80% as compared to low Spanish accuracies which ranged from 20-50%.

Figure 6

Retelling Strategy Use by Bilingual Oral Reading Accuracy Profile



This graph compares the retelling strategy use of the 4 readings for students who had the lowest oral reading accuracies in both languages (<90% in English and <50% in Spanish), the 9 readings with the highest oral reading accuracy in both languages (>98% in English and >96% in Spanish), and the 12 readings for which their English accuracy was at least 40% higher than their Spanish accuracy. (On average, English accuracy scores were 18% higher than Spanish.)

These findings answer Research Question 1 because they speak to both book and oral reading accuracy conditions that seem to correlate with the strategies students used to retell DLBs and make cross-linguistic connections.

Summary of Students' Conceptual Strategies

As students retold dual language books and made conceptual cross-linguistic connections, they seemed to rely on the English text and illustrations most frequently; however, there were differences by grade level and students' home language, as well as by reading

accuracy level. Similar to the trends in strategies students used to translate words, as students aged or had more experience with Spanish, they relied more on the languages of the text (specifically Spanish) to retell pages as opposed to textual features such as the illustration. This was also evident in the gaze plots from the eye tracker. When students looked at the Spanish text during their retellings, they tended to be in fifth grade and/or come from homes that spoke some Spanish. The trends in students' strategy use by reading accuracy level further reinforce these conclusions—that students with higher decoding accuracy in both languages used the languages more flexibly and relied on language-based strategies to support their retelling, but as students' decoding accuracy decreased, their reliance on illustrations or retelling what happened on other pages increased. However, the language printed first on each page also had some impact on the frequency with which different groups of students used various strategies. These findings point to the various ways in and conditions under which students make cross-linguistic connections while reading DLBs.

Third and fifth grade bilingual students are strategic readers, but when considered through the lens of the RAND Model of Reading Comprehension (2002), as they engage in the activities of reading a DLB, translating words, and retelling passages, reader-level characteristics (especially related to familiarity with language) seem to correlate with the ways and the extent to which students leverage language-based or text-based strategies to make cross-linguistic connections.

CHAPTER 5 – FINDINGS (SMALL QUALITATIVE STUDY): RESEARCH QUESTION 2

In order to answer the second research question and determine how students from Spanish-speaking homes who had receptive and/or oral Spanish skills and English literacy skills engaged with DLBs to develop Spanish literacy skills, I conducted a qualitative study of the reading strategies of students who fit these criteria. Annie and Luis, third graders, and Juan, Drake, and Kylie, fifth graders, were the focal students in this study. All five had very limited experience with DLBs. Annie claimed she had a book in Spanish and English when she was five that was too long, and she could not read it. Drake claimed his mother read him a book in Spanish and English when he was younger, and Kylie remembered reading a book about César Chávez that had English and Spanish in her ESL teacher's class. Luis and Juan had not read any books written in both Spanish and English before. Therefore, given their limited experiences with DLBs and their fit for the study's criteria, they were ideal students to observe.

First, I describe each of the students and their language and literacy backgrounds because these are important for contextualizing and considering the reading strategies they used. Then I present their conceptions about language and their reading strategies, as how they understand language can also have implications for how they read DLBs. Finally, I focus on the ways in which these students used English to help them read the Spanish text, as the various manifestations of this strategy were often unique to this particular group of students making these findings especially important for answering the second research question.

Descriptions of Focal Students: Language and Literacy Backgrounds

In the following paragraphs I describe the five focal students in order from increasing Spanish (and English) proficiency specifically focusing on their language and literacy backgrounds (also summarized in Table 10)—Drake, Luis, Annie, Juan, and Kylie. Their

language and literacy backgrounds are important for understanding the ways in which they read DLBs and made meaning.

Table 10

Qualitative Study Students' Linguistic and Literacy Backgrounds

	Drake	Luis	Annie	Juan	Kylie
Grade	5th	3rd	3rd	5th	5th
Language(s) Spoken at Home	English, but hears parents speaking Spanish	Mostly Spanish, some English (only English at school)	Mostly Spanish, some English	Mostly Spanish, some English	Mostly English, but Spanish too
Reading Background	Close to grade level in English reading	Well-below grade level in English reading General lack of interest in reading	A little below grade level in English reading Does not seem very invested in reading	At or above grade level in English reading	At or above grade level in English reading
English Fluency Description and Oral Reading Accuracy Percentage Range	Quick, multi-word phrases, little expression 96-99%	Laborious, monotone, word-by-word 85-91%	Monotone, two-three-word phrases 90-91%	Phrases, rather fast 93-100%	Quick and fluid, but generally monotone 94-99%
Spanish Fluency Description Oral Reading Accuracy Percentage Range	Monotone, robotic, decoding sounded like mumbling, difficult to determine where one word ended and the next began 55-63%	Laborious, monotone, word-by-word 43-56%	Monotone, word-by-word except if book written in English first (then occasional phrases) 56-70%	Several-word phrases interrupted by frequent attempts to decode, but more halting and word-by-word when book written in Spanish first 58-73%	Some phrases with frequent hesitations to decode, but more phrase-like when book written in English first 72-82%

Drake

Of the five students, Drake, a fifth grader, had the least Spanish linguistic knowledge, with some receptive skills, but little oral skills. The ESL teacher stated that his family had been in the United States for either three or four generations, and his parents were bilingual. When

asked what languages he spoke at home, Drake replied English. He said, "My mom talks to my dad in Spanish. I can hear a lot about that," but that he and his parents spoke English to each other.

However, of the five students, when given the choice of how to read a DLB (reading either or both languages), Drake was the only one who consistently read both languages throughout the book. Interestingly, he read the English on one page, skipped that page's corresponding Spanish translation, and then read the Spanish on the next page skipping the corresponding English translation. When I asked him why he decided to read both languages, he replied, "Because I'm trying to learn Spanish," but he skipped the corresponding translations "so it won't be long." This mindset about Spanish being something he was trying to learn was also reflected in his answer to why people would want to read a book in Spanish and English: "For if they were learning Spanish, they could learn Spanish."

As Drake read, he usually used English phonology to pronounce Spanish words (e.g., *free-joe-lays* vs. *free-ho-lace* for "frijoles"/"beans")—a commonality across these focal students which will be described in more detail later. However, his pronunciation indicated some words that were in his Spanish repertoire because he pronounced them using Spanish phonology without any correction from me, words like "aquí," "y," "un," and "leches." He also knew his numbers in Spanish, although he counted by tens to reach 20 and by ones to reach 4. This reveals some insight into his Spanish linguistic repertoire. In Spanish, his reading was monotone and robotic as he tried to sound out each word and move on to the next. This often sounded like mumbling and made it difficult to determine where one word ended and the next began. In contrast, Drake's English reading was rather fluent, and he seemed close to meeting grade-level English reading expectations.

Luis

Luis, a third grader, said that he spoke mostly Spanish at home because he spoke Spanish with his mother, Spanish and sometimes English with his father, and English with his older brother Juan (one of the five focal students in this study). The ESL teacher said that Luis did not speak Spanish at school and described him as "English dominant at home." Additional evidence for this could be Luis's response to the question of why people would read books written in English and Spanish: "so they could know how to talk in Spanish." Interestingly, Luis did not claim reading DLBs helped people as bilingual readers, but rather to *speak/talk* in Spanish, perhaps reflecting his own more limited Spanish oral language knowledge. However, Luis had more Spanish oral language knowledge than Drake did. While Drake had stronger decoding strategies that resulted in higher Spanish accuracy scores, there was evidence of Luis looking between languages to help cue his Spanish oral language knowledge—evidence which will be described in more detail in a later section.

When allowed to choose a DLB and read it in any way he wished, Luis only read the English text, claiming he did not know how to read Spanish. Luis even commented that he liked to read English better "because mostly everyone reads English," which speaks to the broader sociopolitical context in the United States. The ESL teacher also described Luis's English reading performance as being well below grade level and that it was not until late October of his third-grade year that he started to show some interest in reading.

Annie

Annie was a third grader whose mother only spoke Spanish, and her father spoke mainly Spanish but some English. She shared that she mainly spoke Spanish but "sometimes English" at home with her older brother and sometimes her father. Annie entered kindergarten as a

Spanish monolingual, but as she described it, "when I grew up, my language was actually Spanish, but then someone teached [sic] me how to do like in English." However, she continued that "…all these years, I like forgot about Spanish because like every day when I go to school, every day I speak English" which illuminates her views of her English proficiency as compared to her Spanish. While Annie responded that reading DLBs would help people practice both languages, she only read the English text stating that she did not know how to read Spanish.

While Annie's English reading scores were below grade level, her classroom and ESL teachers explained that she had made gains in accuracy, fluency, and comprehension. However, her classroom teacher mentioned that Annie's attention frequently wandered during silent reading, and he was not sure how much she really enjoyed reading.

Juan

Juan was Luis's fifth-grade brother. Like Luis, Juan said that he spoke Spanish most at home and some English "with my dad and my friends. And my brother [Luis]." Juan also described how his mother read to him in Spanish when he was little and how she read poems and short texts from Mexico about family members who had died. However, Juan did not consider himself strong in Spanish. When allowed to choose a DLB and read it any way he wished, he read only the English text and explained his rationale "cause, um, I, I don't read the Spanish. Like, I don't understand Spanish that much." He did think that reading DLBs might help people learn both languages.

Regarding English abilities, the ESL teacher said that Juan exited from the ESL program when he was in third grade and was at or above benchmark for various indicators of English reading ability.

Kylie

Kylie was a fifth grader who exited the ESL program at the beginning of fifth grade. Of all five students, Kylie was the only one who engaged in translanguaging, speaking in a fluid mix of Spanish and English; the other four students only spoke English with me even though I asked all of them questions in both languages. However, Kylie chose to read her selected DLB *Are You My Mother?/¿Eres tú mi mamá?* (Eastman, 2016) only in English other than two key sentences in the text—"¿Tendría él una mamá?" ("Did he have a mother?") and "¡Quiero estar con mi mamá!" (translated in the text as "I want my mother!"). When I asked Kylie why she decided to read mainly the English, she explained,

> Porque como en mi casa, ya en, como hablamos poquito de español porque mi mamá era de México. Y también aprendió a hablar inglés, so en mi casa también hablamos inglés y aquí también. So estoy más impuesta hacer en inglés.
>
> *(Because at my house, like, we speak a little Spanish because my mom is from Mexico. And also she learned to speak English, so at my house we also speak English and here too. So I'm more used to doing it in English.)*

Kylie also said that while she spoke both Spanish and English at home, she spoke more English. She spoke both languages to her mother, English to her older brother, and Spanish to her younger brother.

Kylie's English reading was fluent, and she seemed to generally understand Spanish phonology when reading. However, when speaking about when she learned to read English, she said that her mother taught her and that school also helped a lot, but that "yo nací con el idioma de español"; she was born with the Spanish language.

From Kylie's reading, it seems she had some instruction because she was more fluent than Drake, Luis, Annie, and Juan. When asked, she mentioned reading some Spanish books when she was younger, but she never talked about receiving schooling to learn to read in Spanish, as she explicitly described in English. Instead, through the previous quotation about being born with Spanish and the fact that she flexibly used both Spanish and English translanguaging throughout her responses, Kylie seemed to have assumed ownership of and pride in Spanish to a degree that the other students did not exhibit. Students' exposure and facility with Spanish and English seemed to relate to their conceptions about language and the reading strategies they used, which I describe next.

Conceptions about Language and Reading Strategies

Prior research (e.g., Jiménez et al., 1995) has established that bilingual children's conceptions about language, specifically how similar and different they feel their languages are, is related to the strategies they use when reading—the more similar they feel their languages are, the more likely they are to apply ideas and strategies across languages. Therefore, in the following paragraphs, I discuss the focal students' conceptions about language and ensuing reading strategies, and I contextualize these findings within findings from the large mixed methods study presented in Chapter 4 and information about their language backgrounds as linguistic proficiency can also impact cross-linguistic connections (e.g., Durgunoğlu, 2002; Koda, 2012). The reading strategies that students used and the conditions under which they used them begin to answer Research Question 2 by describing how students read DLBs in order to develop biliteracy in Spanish, which is spoken in their homes, but for which they have not received formal instruction.

Drake

Of the group, Drake had the least Spanish oral language proficiency, and this was evident in his response to the question of how reading in Spanish and English were the same, stating that "They're kind-of the same by, by, by words." When I probed further, Drake said certain types of words were similar. I asked how those certain types of words were the same, and he replied, "some of them might have something above them, but some of them doesn't," referring to diacritical marks such as accents and tildes above some letters in Spanish. This does not explain how reading in English and Spanish are the same, but it does show some developing metalinguistic awareness. As Drake read, he continually compared the lengths of the paragraphs of each language commenting on which was shorter and longer, showing emerging recognition that translations across languages are not exact replicas.

When reading aloud, Drake showed some developing awareness that word order in English and Spanish sometimes differs (namely that adjectives come after nouns in Spanish but before nouns in English). In *Francisco's Kites / Las cometas de Francisco* (Klepeis, 2015), Drake read about a kite with colorful streamers (i.e., "serpentinas de colores"). I asked him how to say "streamers" in Spanish. At first, he said that "streamers" was "colores" and "serpentinas" was "colorful," but then he said, "or it's backwards" meaning that "streamers" was "serpentinas" and "colorful" was "de colores." On a later page, after reading about a "Salvadoran restaurant" in English and later a "restaurante salvadoreño" in Spanish, Drake said, "Now I can tell that's backwards." When I asked why, he pointed to and said "restaurant," indicating how he recognized the cognate (i.e., two words spelled almost the same with the same meaning) which showed him that word order was reversed. He remembered and referenced this concept five days later when we read another text, this time without cognates.

It would be interesting to determine where the metalinguistic knowledge about how Spanish worked as a language came from—whether it was because Drake was older, his abilities to draw on his limited Spanish oral language knowledge, or a propensity to engage in analytic thinking. The answer to this question is unclear. Drake used this developing metalinguistic knowledge a little, but when translating words, Drake relied heavily on using nearby punctuation marks to locate the translation. In the larger, mixed methods study, this was a strategy that students from English-speaking homes were more likely to use than those from homes where some Spanish was spoken. This provides additional evidence for Drake's lack of Spanish oral language proficiency and reliance on English. Furthermore, students with much stronger English accuracies than Spanish accuracies, like Drake, used the strategy of locating translations by nearby mechanical elements more frequently than even those with low accuracies in both languages. Given Drake's limited Spanish oral language, unsurprisingly, when retelling texts, Drake overwhelmingly relied on English.

Luis

When asked what was the same about reading in English and Spanish, Luis and the remaining three focal students, all said that both languages mean the same thing. This has implications for the strategies Luis, Annie, Juan, and Kylie used because by recognizing that both languages impart the same information, that made it more likely they would apply information across languages and use both languages to make meaning, as their proficiency allowed.

Even though Luis verbalized that words in English and Spanish "mean the same thing," he did not seem to enact this knowledge until partway through the first book of the verbal protocol. As Luis began reading, he tried to sound out the Spanish words, but he showed little

evidence of saying words that preserved the meaning of the English text he had just read. For example, one page said, "Ixchel found sticks and grass, and she made a loom." Luis read, "Alexcha contro plas de herba e jazo un talar" instead of "Ixchel encontró palos e hierba e hizo un telar." While at first glance, his reading does not look that different from the Spanish text, very few of the words he said retain any meaning. He was also unable to answer translation questions, instead responding that he did not know or that he guessed.

However, after reading the page described above, Luis began to look at the English text while reading the Spanish to decode Spanish words—a strategy that was unique to him, Annie, and Juan which will be described later. Approximately halfway through the book, some of his miscues were actual Spanish words and/or he pronounced some Spanish words correctly that one would not read correctly without Spanish phonics instruction. From that point on, Luis referenced specific words on the page when asked how he translated words; he eventually seemed to recognize and apply his declarative knowledge that both languages on the pages of DLBs "mean the same thing." And this understanding was evident when he read the second text for the verbal protocol. It is unclear what prompted this realization, but like the study by Jiménez, García, and Pearson (1995), Luis's knowledge (and application of that knowledge) that the languages said the same thing facilitated the cross-linguistic connections he made and his biliteracy development.

Annie

Luis and Annie relied on reading strategies that were similar to other third graders and students with low oral reading accuracies in the larger mixed methods study. Both students relied heavily on text position, specifically general page location/alignment, to locate words' translations. However, because both had some Spanish oral language knowledge, they also

relied on their prior knowledge of words' translations and infrequently on their knowledge of surrounding words. When retelling, both relied heavily on English, and Annie occasionally told what happened on other pages, while Luis described the illustrations a few times—similar to other third graders and students with low oral reading accuracies in the larger mixed methods study.

Interestingly, Annie had well-articulated metalinguistic knowledge, but she did not always apply this to her reading. For example, when demonstrating and explaining her reading strategies in the DLB she chose to read at the beginning, *Please, Mr. Panda/Por favor, Sr. Panda* (Antony, 2015), Annie explained that in the text "May I have a doughnut?/¿Me das una rosquilla?" that "May" was "Me," "I have" was "das" and "a" was "una." While she did not recognize that these are not literal translations of each other (with the Spanish more closely saying "Will you give me a donut?"), she did recognize that the words "I have" could be represented by one word in Spanish. When I asked, "How does that work, that the 'I have' is the 'das?'" Annie replied, "Because, when I, if I say, 'I have,' is like 'tengo.'" She was able to generalize from her oral language knowledge that there is not one-to-one correspondence between languages. Later, as she continued to show me her strategies, she showed how "please" is represented by two words in Spanish as "por favor," therefore, it works both ways; sometimes Spanish has multiple words, sometimes English. This was something many students attending Spanish immersion programs, receiving formal instruction in Spanish literacy, did not seem to recognize in the larger mixed methods study.

This knowledge became important when Annie used the English text to help her decode the Spanish, sometimes looking back and forth multiple times between the languages as she read a sentence in Spanish. If she did not recognize that reading one language could help someone

understand the other because they both more or less mean the same thing, then she would not be able to rely on the English text to cue her Spanish oral language knowledge to support decoding. This strategy was unique to Luis, Annie, and Juan, and I will describe it further in a later section.

Juan

While Juan recognized that both languages had similar meanings which allowed him to use the English text to help him decode the Spanish, his metalinguistic knowledge was not as developed as Annie's. For example, Juan did not seem to recognize that word order in both languages differed. In one instance, he used a cognate to help him identify the correct translation, but other than that example, he looked for a word in the same place in the sentence of the other language as the word in question.

However, Juan's strategies to translate words were more nuanced than Luis and Annie's. Like fellow fifth-grader Drake, Juan occasionally used nearby punctuation marks to locate words' translations. He relied on prior knowledge of words' translations like Luis and Annie; however, Juan more frequently also used his knowledge of the surrounding words in the sentence and their translations to engage in a process of elimination to find the translation if he did not already know it. Perhaps this is a combination of Juan's Spanish oral language proficiency and his age. In the larger mixed methods study, fifth graders who had been learning languages and literacy skills longer in both languages were significantly more likely to use their knowledge of surrounding words than third graders. Therefore, the ways in which Juan engaged with DLBs to develop biliteracy depended on his bilingual oral language proficiencies and his age which reflects increased time spent learning language and literacy.

Kylie

Finally, due to Kylie's relatively advanced Spanish oral language proficiency, she relied heavily on her prior knowledge of words' translations and her knowledge of surrounding words, similar to the fifth graders and students with higher oral reading accuracies in the large mixed methods study. When she retold passages, she was the only student out of the five who frequently relied on both languages sequentially when texts were written in Spanish first—again likely because of her stronger Spanish oral language proficiency and her understanding that both languages communicate the same/similar messages. Kylie's metalinguistic knowledge was less clear because she was able to rely on words she already knew, so she did not need to make as many lexical and grammatical inferences which makes it difficult with the given data to determine her metalinguistic awareness.

Knowing the ways in which the five focal students read DLBs and the strategies they used to decode words, translate words, and retell passages helps answer the second research question about how these students used DLBs to develop biliteracy in languages spoken at home but not instructed at school. Understanding the ways in which their Spanish oral language proficiency, reading accuracies, ages, and conceptions about language related to their strategy use provides further information to answer Research Question 2 regarding the conditions under which students use specific strategies to make cross-linguistic connections and develop biliteracy. While the five focal students used many strategies that matched the trends identified in the large mixed methods strategy, some of the ways they used the English text to read the Spanish, which I discuss next, were unique to them.

Using English to Read the Spanish

One key characteristic related to how these five students read DLBs was the ways in which they did or did not use English to help them read the Spanish text. There seemed to be three main ways in which they used English—(1) applying English phonology to Spanish, (2) using memory of the English text to activate Spanish oral language memory, and (3) actively looking at the English to decode the Spanish text. This third strategy of looking at the English while reading the Spanish text to decode it seemed to be unique to these particular students, specifically to Luis, Annie, and Juan. Understanding how the focal students used English to read the Spanish text is critical to answering the second research question since these students have not received formal instruction in Spanish literacy.

Applying English Phonology to Spanish

One similarity across the five focal students was that they frequently applied English phonology to their decoding of the Spanish text. While I briefly reviewed the five Spanish vowel sounds with students before reading and frequently corrected students' miscues/mistakes while reading, the five students did not look at or refer to the vowel chart I had drawn on the nearby whiteboard (e.g., the five vowels with a corresponding image as a sound cue such as "a" with an "abeja" and "e" with an "elefante.") Instead, all five students often applied English phonology to Spanish words, pronouncing the English J rather than an /h/ sound in Spanish, voicing the H in Spanish even though it is silent, and pronouncing the Spanish soft G in "gente" as the English soft G rather than the /h/ sound it should have. This is rather unsurprising, with the similar orthography between the two languages and the fact that all students had received English reading instruction, not Spanish, and claimed greater proficiency in English reading. These were also characteristics that some students in the large mixed methods study displayed,

especially if they had English oral reading accuracies that were significantly higher than their Spanish oral reading accuracies.

Using English Memory to Activate Spanish Oral Language

Annie, Juan, Kylie, and to a somewhat lesser extent, Luis, also seemed to rely on a general memory of what the English text said or what they thought it said (without looking specifically at the text) to activate their Spanish oral language knowledge. For Juan and Annie, this seemed to help explain their significantly higher Spanish accuracy scores for the texts they read with English first on the page (73% for Juan, 70% for Annie) as compared to the text they read with Spanish first on the page (58% and 56% respectively). It is also evident in the descriptions of their fluency while reading. For Annie, I noted that when she read aloud in Spanish, she tended to read word-by-word, except when the text was written in English first, and then she read with occasional phrases, and her reading seemed a little faster. This seems to indicate that she relied on her memory of the English text to help her read the Spanish and partially echoes her claim that being a good reader in a language depends on which language the person reads first—that to be a good English reader, one should read the Spanish first and vice versa so that the reader will know what the text is saying.

Similarly, descriptions of Juan's and Kylie's oral reading fluency showed evidence of how their memory of the English text helped them read the Spanish. For Juan, when the book was written in Spanish first, his fluency was halting and word-by-word, but when it was in English first, his oral reading was more phraselike. This was the same for Kylie, that her reading was more phraselike when the text was written in English first. This indicates that Juan and Kylie were able to decode the Spanish text more easily because they remembered what it had said in English.

Further evidence for how students used their memory of the English text to activate their Spanish oral language was found in Annie and Kylie's miscues. Their miscues in Spanish seemed to reflect how they read or retold the English text. On one page of *Francisco's Kites / Las cometas de Francisco* (Klepeis, 2015), Annie read the English text as "He headed home for lunch" instead of "He headed home and ate lunch." She read the Spanish text as a direct translation of how she read the English: "Regresó a casa para almorzar" instead of "Regresó a casa y comió el almuerzo." As Kylie retold *Rainbow Weaver / Tejedora del arcoíris* (Marshall, 2016), she continually referred to how the main character cut shirts, instead of plastic bags, into strips to weave (as the illustrations looked similar to shirts hung on a clothesline). While Kylie read the word "bags" in the English text, in Spanish, she continually read "blusas" ("blouses") instead of "bolsas." These examples point to students relying on their memory, rather than referring directly to the English text, because what they said was not in the English text. Instead, they used their memory of what it said (or what they thought it said) to draw upon their Spanish linguistic knowledge to read the Spanish.

Analysis of Drake's reading did not seem to indicate that he used his memory of the English text to read the Spanish, likely because he seemed to have the least Spanish oral proficiency of the group. For Luis, while he relied on his memory, it was often related to already having read a word on a page. While Luis's accuracy scores for reading the English text were not incredibly low (85-91%), he read in a very slow, laborious manner, sounding out most words in English. This lack of fluency likely made it difficult for him to generate enough of a sense of the story to use to cue his Spanish oral language. That could help explain why it took several pages for Luis to seem to realize that the English and Spanish text said the same thing in the book he read with English written first on the pages. At the beginning, Luis tried to sound out

the Spanish, but he was basically reading nonsense words, not saying anything that sounded like what he had read in English. However, after several pages, he began to look directly at the English to try to decode the Spanish (which I will discuss in the next section). Eventually, Luis was accurately reading some Spanish words (without evidence of looking directly at the English text), which seems to indicate that he remembered what the English text said. For example, he read the word "sucia" correctly, which would be difficult for someone to decode who is new to reading Spanish not only because the "u" makes an /oo/ sound in Spanish, but also because the "cia" says /see-ah/. The fact that Luis read this word correctly without assistance indicates that he combined his knowledge of what the English text said and his Spanish oral language knowledge. Knowing that students use their memory of the English text to activate their Spanish oral proficiency is important to answering the second research question to understand how students without Spanish literacy instruction use DLBs to develop biliteracy in English and their home language of Spanish.

Looking at the English to Decode the Spanish Text

As previously described, not only did four of the students use their memory of the English text to read the Spanish, but three of them—Annie, Luis, and Juan—looked directly at specific words in the English text as they were reading the Spanish to help them decode. This was something I had first written in my fieldnotes/observations while these students were reading. For example, Luis correctly read "arcoíris" ("rainbow") without sounding it out, which given his low Spanish accuracy percentages, was exciting and noteworthy. As he was reading, I observed that he seemed to look at the English before saying "arcoíris," so I asked, "How did you figure out 'arcoíris' so fast? [Luis shrugged.] Did you look somewhere on the page or did you just know it?" Luis responded, "I just looked somewhere on the page" and then pointed to

the English word "rainbow." Given these observational notes, I rewatched the videos of the five students reading. On many pages of both books, the English and Spanish texts were separated with large spaces or illustrations so I could see their eyes move up and down the page while reading, rather than just the left-to-right sweep. I noted each time I saw their eyes move and found that of the students in this qualitative study, only Annie, Luis, and Juan looked at the English while reading the Spanish to help them decode. They did this regardless of whether the book was written in English first or Spanish first.

Based on what I could observe in the videos, Annie used this strategy most frequently, for 58 words across two books (29 of those words when reading a book with English written first and 29 when reading a book with Spanish first). Luis used it second most frequently for 33 words (18 when reading an English-first text and 13 when reading a Spanish-first text). Finally, Juan used it least frequently for 25 words (17 times when reading an English-first text and 5 for a Spanish-first text). Drake and Kylie did not use this strategy at all.

I sub-coded the words for which students used the English text to decode the Spanish—for parts of speech, number of syllables, location in the sentence and paragraph, and number of lines on the page. There were not any conditions where students seemed to be more likely to look to the English for decoding help. In addition, there did not seem to be any conditions that may have made it more likely for students to read the word correctly when using the English to decode the Spanish. Instead, Annie, Luis, and Juan seem to use this strategy regardless of whether the book was written in English or Spanish first. They also used this strategy when there were many sentences on the page in each language and when there were just two or three. On some of the pages with a few sentences, Annie and Luis looked at the English to help them determine almost every word in Spanish. However, on other pages with just a few sentences,

they infrequently looked at the English, if at all. While having less text on a page likely makes it more conducive to using this strategy, having a page with a lot of text did not deter them either.

I provide these numbers only as rough counts to illustrate the great frequency with which these three students looked at the English text to help them decode specific Spanish words. Watching the videos of them reading and counting visible eye movements is far from an exact science, especially because for some pages, the text of each language was too close together to discern a difference in eye/gaze position. However, as part of the larger study, I had 11 students read a DLB with half of the pages written in English first and half written in Spanish first on a computer fitted with an eye tracker. These students included six fifth graders and five third graders, three of whom had parents who spoke Spanish and all of whom had received Spanish and English literacy instruction. I reviewed the gaze plots recorded for these students as they read aloud. These students rarely, if at all, looked at the English to help them decode the Spanish. One third-grader from a Spanish-speaking home used the book's other language most frequently—for a total of four times. One of these times he looked at the Spanish word "decidió" to help him decode the English "decided." However, the four times he used the English to decode the Spanish is nowhere near as frequent as Annie, Luis, and Juan used this strategy for each book. Moreover, in the larger study of 68 students, this was not a strategy that I noted in my observational fieldnotes or in my analysis other than one instance of a third grader from an English-speaking home looking at the word "project" to help her decode "proyecto." Therefore, it seems that using English to decode Spanish is a strategy relied on heavily by students who have Spanish oral proficiency and English literacy skills to help them read Spanish.

This makes sense because for students from English-speaking homes, even though they attend a Spanish immersion program, they do not have the strong Spanish oral proficiency that

would make this a beneficial strategy for them. They likely know the words in English, but that does not cue them to remember what the word would be in Spanish. Furthermore, by attending a Spanish immersion program, they are receiving instruction in decoding and reading Spanish texts. That means they do not need to rely as heavily on other strategies to help them read; they have already been building their Spanish decoding skills—which would also explain why students from Spanish-speaking homes, but who had formal Spanish literacy instruction, did not seem to rely on this strategy.

If the strategy of looking at the English to decode the Spanish text seems to be reserved for students with Spanish oral language skills and English literacy skills, what could explain the variation in the amount the five students in this qualitative study used this strategy? It seems to relate to their oral proficiency and decoding skills. For Drake, like the students from English-speaking homes in Spanish immersion programs, he likely did not have strong enough Spanish oral proficiency that would make him think that if he looked at the English text, he would know what the Spanish text said and could then read it. For Kylie, she had strong enough decoding skills in Spanish that she likely did not need to rely on the English text to help her—similar to many of the students who had received formal Spanish literacy instruction. Juan likely used the strategy less often than Annie and Luis for the same reason, that he relied on his strong English decoding skills and his Spanish oral language to help him figure out the Spanish words. For Annie and Luis, they struggled with decoding Spanish (and sometimes English—Luis even more so), but they had Spanish oral proficiency to rely on. That made this strategy of looking at the English to decode the Spanish fit within their zone of proximal development (Vygotsky, 1978) as they needed this strategy to overcome their less-developed decoding skills, and they had the oral language knowledge to rely upon.

Furthermore, Luis, Annie, and Juan all recognized that the English text and Spanish text communicated the same meanings. Without this understanding, they would not have looked at the English text to help them. Annie further described how reading the English and Spanish texts could work together when she said that to be a good Spanish reader, "you need to read the English ones first." Conversely, to be a good English reader, "you first starting [sic] with the Spanish ones and then you'll know the English ones and you read more Spanish, more Spanish, and the more that you read Spanish, you're actually reading English." In other words, Annie felt that by starting with Spanish, the reader will know what the text will say, which will help them read English. Since English and Spanish mean the same thing, it reinforces the reader's understanding of the languages and provides more practice.

Summary

In conclusion, these findings answer the second research question of how bilingual students, who have English literacy skills but have not experienced formal Spanish literacy instruction even though they come from Spanish-speaking homes, use DLBs to develop biliteracy. These students engaged in many of the strategies that students with formal literacy instruction in both languages did—e.g., relying on knowledge of surrounding words, general page location of words, nearby mechanical elements, the English text for retellings, and so on. However, these students also used the English text in unique ways to help them read the Spanish text specifically by applying English phonology to decode the Spanish text, using their memory of the English text to activate their Spanish oral language proficiency to support decoding and comprehension, and looking at the English text to decode the Spanish. Students who had received formal literacy instruction did not need to engage in these strategies as frequently, if at all, because they had learned how to decode in Spanish. However, the amount to which bilingual

students engaged in these various strategies depended on their language proficiencies, their oral reading accuracies, and the time they had spent learning languages and literacy skills.

CHAPTER 6 – DISCUSSION, IMPLICATIONS, AND CONCLUSIONS

Discussion

Understanding how children read dual-language books (DLBs) and make connections across languages is important because these books are often recommended to help children develop biliteracy (e.g., Y. Freeman et al., 2011; Maxwell, 2013). In addition to the cognitive, personal, cultural, and economic benefits of bilingualism (e.g., Bialystok, 2011; O. García, 2009a), students who are biliterate (namely those who attend immersion programs whose focus is developing biliteracy) tend to score higher on measures of English reading achievement than their monolingual peers (Lindholm-Leary & Hernández, 2011; Steele et al., 2017). Therefore, with growing numbers of students speaking languages other than English at home and growing numbers of language immersion programs (Center for Applied Linguistics, 2011, 2016a, 2016b; KIDS COUNT Data Center, 2018), understanding how children make connections across languages and develop biliteracy is critical.

To determine the ways in which students navigate languages while reading DLBs, I analyzed students' verbal protocols/think-alouds as they responded to translation and retelling questions. I found that bilingual third and fifth graders strategically read dual-language books (DLBs) as they attempted to translate words and retell text. Very infrequently did they guess random words in either language. Instead, they tended to use two main types of strategies: (1) language-based strategies (i.e., strategies informed by their knowledge of languages) and (2) text-based strategies (i.e., strategies based on page layout or text features such as illustrations). When students used language-based strategies, they tended to accurately translate words more frequently. Usually students who were in fifth grade, who came from Spanish-speaking homes, and/or who had high oral reading accuracy in the languages relied on language-based strategies

more than text-based strategies, both to translate words and to retell passages. While all students relied on English much more than Spanish to retell texts, the aforementioned groups of students tended to utilize the Spanish text more when retelling passages, whereas third graders and students with lower oral reading accuracy in the languages relied more heavily on English in addition to the illustrations, or they retold pages other than the one in question.

In addition to this large-scale mixed methods study, I engaged in a qualitative study of reading strategies focusing on five students from Spanish-speaking homes who had English literacy skills but not formal Spanish literacy instruction. When these students read DLBs, unsurprisingly, they relied on the English text to help them read the Spanish by applying English phonology to pronounce Spanish words, using their memory of the English text to activate their Spanish oral language knowledge, and looking at the English text to decode the Spanish. Students who looked at the English to decode the Spanish text had strong Spanish oral language backgrounds (i.e., they spoke a lot of Spanish at home), but limited Spanish decoding skills. In comparison to the students in the larger study, students from English-speaking homes hardly ever looked at the English to help them decode the Spanish text regardless of their decoding proficiency.

The strategies students used seemed to depend on their literacy and language proficiencies and their ages. Their reliance on text-based strategies—such as assuming that if a word is by a punctuation mark, then its translation must also be by a punctuation mark—and their assumptions that one word in one language translates to one word in another, as evident by the fact many counted across both languages to find the translation, bring to light gaps in their metalinguistic awareness, which DLBs could provide an opportunity to address. I describe these

two themes—trends based on literacy skills, age, and home language and the importance of metalinguistic awareness—in the paragraphs that follow.

Literacy Skills, Age, and Home Language

There were marked differences in students' strategies to translate and retell texts depending on their literacy skills in each language (as indicated by oral reading accuracy) and by their age. There were fewer differences in strategy use depending on home language.

Literacy skills. Across both studies, students' literacy levels, namely their oral decoding abilities, were related to the strategies they used. While oral reading accuracy only captures a portion of students' literacy abilities and is not completely correlated to reading comprehension (Paris, Carpenter, Paris, & Hamilton, 2005), when students struggle to decode, they often struggle with comprehension or must use other strategies to compensate. For example, Riddle Buly and Valencia (2002) compared fourth graders' oral reading fluency and scores on various reading assessments and noted how some students who struggled with decoding words relied on context clues to help them attempt to self-correct and comprehend. Attempts to compensate for decoding difficulties were evident in the current studies. In the smaller qualitative study, when students from Spanish-speaking homes without formal Spanish literacy instruction struggled decoding the Spanish text, they looked at the English text, which they could decode more easily, to help them. In the larger mixed methods study, students with low oral reading accuracy in each language, but especially English, relied more on translating and retelling strategies that were less language-dependent to compensate for their struggles decoding words. They matched words by general page location or counted across the page to find the translation. When retelling, they relied on the illustration or memory of events on previous pages to provide information. These

strategies contrasted with students with higher accuracies who relied more on language-based strategies (i.e., their knowledge of languages).

Similar trends have been described in previous studies. When defining and decoding words, Sneddon (2009) noted how a nine-year-old with strong skills in English and French would often reread the French text to establish context for French words she did not know and then use the English text only to confirm her prediction of meaning. This is similar to how Kylie in the current smaller qualitative study relied on the English text very little to help her decode the Spanish because her decoding skills were rather strong in both languages. It is also similar to how students with higher accuracies in both languages used more of the Spanish text to support their retellings, rather than solely relying on the English text.

In contrast, Sneddon (2008b) described how two eight-year-old boys with limited reading skills in both Turkish and English read a Turkish-English DLB together. Sneddon (2009) detailed how when asked to retell portions of the text, the boys tended to describe the picture or tell what they knew about the story more broadly, rather than refer back to the Turkish text. She wondered whether this was due to a lack of understanding of the Turkish text or difficulty conveying the ideas in English, since she asked the boys to retell the book in English because she did not speak Turkish. However, in Aukerman and Chambers Schuldt's (2016) study, students read and discussed a text in their home language. Aukerman and Chambers Schuldt analyzed the text discussions in a second-grade Spanish-English bilingual classroom, and they noted that students who were less proficient decoders referenced content in the illustrations more and the text less than students who were more proficient decoders. More broadly, studies of bilingual children and adults have noted that readers who are less-skilled focus more on comprehending the language of the text, specifically how it is written, whereas more-skilled readers focus on the

broader information conveyed in the text and how it connects to their background knowledge (e.g., Jiménez et al., 1996; Raney, Obeidallah, & Miura, 2002). This seems to lend further evidence to Grabe's (2010) assertion that the language threshold hypothesis holds true in that readers' knowledge of the non-home-language is more important for their multilingual reading success than their home language reading *skills* because readers cannot apply these skills without fully grasping the language they are reading. (However, in the case of children, their reading skills are developing simultaneously with their bilingual knowledge.)

When translating words, students with low oral reading accuracy in the current studies relied less on their linguistic knowledge which could speak to issues of language proficiency. Sneddon (2009) described how a seven-year-old girl reading an Urdu-English DLB with her mother lacked strong decoding skills in Urdu. She did not refer to the English text to help her decode some of the color and animal words in Urdu in the book because Sneddon found she did not know many of these vocabulary words in Urdu. Instead, she made guesses from the illustrations and was prompted by her mother to remember repeated words/phrases to support her decoding. Sneddon's case is very similar to Drake in the current qualitative study. In the smaller qualitative analysis, I did not observe Drake looking at the English to help him decode Spanish, likely because it would not help him retrieve his Spanish oral language knowledge since that was very limited, as he did not speak Spanish at home and only heard his parents use it. These examples preview the importance of students' language proficiency when considering the strategies they use to navigate multilingual texts.

Age. Similar to the trends in strategies students used based on their oral reading accuracy, there were significant differences in strategies students used based on their ages. Third graders tended to rely on more text-based strategies, looking at words' location on the page and

counting across the page to find translations, while fifth graders were more likely to rely on language-based strategies including context clues, their knowledge of surrounding words and cognates, and inferences about words' meanings and grammar. Similarly, with retellings, fifth graders were more likely to use the Spanish text along with the English text, while third graders were more likely to use the illustrations, retell other pages, or rely on the English text alone.

The similarities with students' strategy use by grade level and by oral reading accuracy make sense since older students have been developing their reading skills longer and would likely be more proficient. However, because there are a variety of literacy skills within a grade level, grouping strategy use by literacy skills/oral reading accuracy reveals more nuances than grouping by grade level.

Another reason for the similarities in strategy use by grade level and oral reading accuracy could be the ways in which students' literacy skills and ages correspond with their metacognitive development. Decades of metacognition research synthesized by Baker and Carter Beall (2009) have found that when "readers have little awareness that they must attempt to make sense of text; they focus on reading as a decoding process, rather than as a meaning-getting process" (p. 376), but as children age, they demonstrate more metacognition. Furthermore, students who are stronger readers are more metacognitive, not only able to use various comprehension processes, but also to evaluate and regulate them while reading, as compared to readers who are less successful or less strong (Baker & Carter Beall, 2009). However, because the current studies involve reading in two languages, linguistic knowledge is also important, and correlations of strategy use by age and oral reading accuracy with metacognition do not account for that.

Language. In the current mixed methods study, there were few significant differences in strategy use by students' home language. Students from Spanish-speaking homes were significantly more likely to rely on prior knowledge to translate words, while students from English-speaking homes were more likely to rely on knowledge of surrounding cognates to translate. When students retold text passages, all relied heavily on English regardless of grade, age, or language spoken at home even though one of the two books they read had Spanish written first on every page and I asked them to retell that portion of text after reading the page's first language and again after reading the second. If students only relied on what they had just read, then half of their retellings should rely on English and half on Spanish. This was not the case. Instead, when students relied on the texts' languages to retell, they relied more frequently on English. Students from Spanish-speaking homes were more likely to rely on the Spanish text when retelling, but only if the book was written in Spanish first.

Perhaps some of the lack of marked differences in strategy use by students' home language is because of the largely bilingual nature of students' households. No student out of the entire group of 68 said that they spoke only Spanish at home. All students replied that they spoke at least some English with some family members, whether immediate or extended. For example, Kylie said that she spoke English to her older brother, both languages to her mother, and Spanish to her younger brother. When asked why, she said that her younger brother "speaks a lot of Spanish to like the whole family, and my older brother, he's a truck driver, so his employees, like they're not all Mexicans." This illustrates complex language dynamics where there is no clear first or second language or even a clear "home" language as many of their homes are multilingual, and language use is governed by the person to whom children speak. Similarly, Sneddon (2009) asked some of the children in her multiple case study in the United

Kingdom to draw the people they spoke to in their families and color arrows to indicate the languages they spoke to that person and the languages that person spoke to them. These diagrams also revealed complex linguistic home environments.

When considering these results through the lens of the RAND Model of Reading Comprehension (2002), the outer circle representing sociocultural context, or in this case, the sociopolitical context, is important. Hornberger and Skilton-Sylvester's (2000) continua of biliteracy represent the various aspects of language, literacy, and society that interact in complex ways influencing people's biliteracy development. In these continua, Hornberger and Skilton-Sylvester assert that the macro context of language and literacy development is traditionally more powerful than the micro context. In the United States, the current study's location, the macro context involves English serving as the dominant language of society and schooling. This is evident in the fact that students' state achievement assessments are administered in English across the country and by the fact that even though the number of Latinxs speaking Spanish at home has increased since 2006, the overall *percentage* has decreased as English proficiency has risen (Krogstad & Lopez, 2017; Krogstad, Stepler, & Lopez, 2015).

Societal privileging of English seems to influence the ways in which students use language to support reading comprehension and biliteracy development. Hornberger (2008) asserted that when learners can "draw from across the whole of each and every continuum [that make up the continua of biliteracy], the greater are the chances for their full biliterate development and expression" (p. 276), which means that when contexts are weighted toward society's more dominant language, that can negatively impact students' biliterate development.

Even elementary students recognize issues of language power in the United States. In the current study, third-grader Luis expressed a preference for reading in English "because mostly

everyone reads English." Third-grader Annie talked about how when she was little (before kindergarten), her language was Spanish, but "all these years, I like forgot about Spanish because like every day when I go to school, every day I speak English." Even though she spoke Spanish at home to her parents, the English environment at school did not support her bilingualism or biliteracy development, especially because Annie was not enrolled in the school's Spanish immersion program. In the case of fifth-grader Kylie, when given the choice of dual-language book to read and method of reading it, Kylie chose to read the English text except for two sentences in Spanish. When asked why, she explained that because her mother is from Mexico, they speak some Spanish at home, but because her mother also learned English, they speak English too. Kylie concluded, "So estoy más impuesta hacer en inglés. *(So I'm more used to doing it in English.)*"

For these three students in particular, Luis, Annie, and Kylie, the emphasis on English at school, and by extension the larger society, is especially evident because they do not attend the Spanish immersion program at their school. However, all but seven of the 68 students in the current larger study attended Spanish immersion programs, and they still relied more heavily on English to support their retellings. Research has found that students in Spanish immersion programs often speak English to teachers and especially to peers even when instruction is in the partner language (Potowski, 2004; Tedick & Wesely, 2015). Even though I asked students interview and think-aloud questions bilingually and alternated the language with which I began my questions, the majority of students' responses were in English. In sum, the larger sociocultural/sociopolitical context emphasizing English might mediate why there are less differences in students' cross-linguistic strategies by language used at home when compared to differences by age or oral reading accuracy.

Metalinguistic Awareness

There are frequent theoretical claims that DLBs "stimulate children to reflect upon language(s), thus evoking the acquisition of meta-linguistic abilities" (Kümmerling-Meibauer, 2013b, p. vii). And there are claims that DLBs support vocabulary learning, "the comparison of syntactic structures," and the transfer of "knowledge and skills across languages" (Semingson et al., 2015, pp. 134–135). However, when research has described these benefits in relation to DLBs, it is often when students write DLBs (Cummins, 2007; Cummins et al., 2005). Sometimes scholars advocate for teachers to engage students in activities that emphasize comparison of languages when reading DLBs (Y. Freeman et al., 2011; Semingson et al., 2015). When students listen to DLBs read aloud to them, researchers documented that they made some comparisons that highlighted their metalinguistic awareness (Naqvi, Thorne, et al., 2013; Naqvi et al., 2010), but these comparisons were not systematic or necessarily widespread.

Metalinguistic awareness is important for reading because children need knowledge of how to translate graphic symbols to sounds as well as of the morphological components of these symbols (Koda, 2005). Sanz (2013) claimed that metalinguistic awareness gives bilinguals "the capacity to focus on form and to pay attention to the relevant features in the language input, thereby increasing the amount of intake (processed input) that feeds into their interlanguage system (internal grammar)" (p. 6). This is similar to the Matthew effects Stanovich (1986) identified for reading, that in this case, the more knowledge about language a learner has, the more they are able to organize the information they gain and focus on linguistic form, which increases their linguistic input, which leads to more learning.

Studies have also found positive correlations between students' metalinguistic awareness—both syntactic (i.e., sentence structure, word order, subject-verb agreement, etc.) and

morphological (i.e., the components of words that contribute to meaning)—and their reading decoding and comprehension skills (e.g., Gottardo, 2002; Gottardo & Mueller, 2009; Jeon & Yamashita, 2014; Mokhtari & Thompson, 2006; Ramírez et al., 2013). However, in the current studies, the potential benefits DLBs offer for developing metalinguistic awareness to support reading comprehension were unevenly realized. Students sometimes compared across languages and used their knowledge of cognates, recognized differences in word order, and realized that one word in one language does not necessarily translate to one word in the other, but there were many missed opportunities to recognize and make these comparisons. For example, when asked to translate "thread" into Spanish from the sentence, "And there is no extra thread. / Y no hay hilo extra," many students chose the word "extra" as the translation because a period occurred after "thread" in English and after "extra" in Spanish—not recognizing the perfect cognates of "extra"/"extra" or recognizing that word order is different in both languages with adjectives placed after nouns in Spanish versus before in English. When asked to translate "villagers" into Spanish, instead of recognizing the entire phrase "la gente del pueblo" as the translation, students often just said "gente" or "pueblo," illustrating the misconception that there is a one-to-one correspondence between translations across languages. The high number of students relying on the strategy of counting across the languages to find the translation further illustrates how frequently students held this misconception.

The current studies illustrated that while bilingual students do use their knowledge of languages to make connections across them, they do not automatically compare and contrast languages and how they work. Other studies have noted students' uneven application of knowledge across languages, specifically their uneven recognition of cognates. For example, Nagy, García, Durgunoğlu, and Hancin-Bhatt (1993) found in a cognate-circling task that their

74 Spanish-English bilingual fourth through sixth graders identified less than half of the cognates as compared to the number they had reported knowing on another task. These students were also less likely to recognize cognates when a few letters were different between the words—although in the current studies, students did not always recognize exact spellings or even repetitions of Spanish text in the English text (e.g., "*tres leches* cake" versus "el pastel de *tres leches*"). This could be related to age and/or reading proficiency. Hancin-Bhatt and Nagy (1994) found that as students aged, their ability to translate cognates increased "beyond any increase in their vocabulary knowledge in Spanish and English" (p. 289). Dressler and Kamil's (2006) research synthesis also noted that cognate awareness developed with both age and reading proficiency.

Bialystok's (2006) review of studies focusing on bilingual students' metalinguistic awareness and literacy development also noted that across studies, bilinguals demonstrated stronger metalinguistic awareness when they had stronger proficiencies in both languages (and language proficiency often increases with age). Sanz's (2013) and Koda's (2005) research syntheses came to similar conclusions—that "young second-language learners, because of limited oral communication experience in the target-language, are likely to be less sensitive to the functional significance of linguistic features" (Koda, 2005, p. 321). Similarly, Grabe (2009) stated that "one of the problems of less successful L2 [second language] readers is that they may not have the requisite metalinguistic knowledge or they are incapable of using this knowledge to support L2 comprehension" (p. 132). Because the current studies focused on young bilinguals, they have not fully developed their metalinguistic knowledge in either language in order to apply it consistently and accurately.

Jiménez and colleagues (1996) also noted differences in the strategies sixth and seventh graders used and their metalinguistic knowledge depending on their levels of success in reading

as defined by their scores on standardized English reading assessments. Students who were less successful readers tended to view Spanish and English as distinct, disparate languages and therefore, rarely looked for/identified cognates between languages or translated text while reading it. Other studies (e.g., G. E. García & Godina, 2017; Hardin, 2001) have noted similar differences in students' use of cognates depending on their reading proficiency.

The connection between age, language/literacy competence, and metalinguistic awareness was evident in the current studies. Students who were older (and therefore had longer time learning both languages) and students with stronger oral reading accuracy in both languages used more language-based strategies (including the use of cognates), thereby demonstrating stronger metalinguistic awareness, than their classmates who were younger and/or had lower oral reading accuracy in one or both languages.

Prior research has also established that not only do students not automatically draw comparisons across languages, but they also may rely on strategies influenced by their first language knowledge. For example, Nagy, McClure, and Mir's (1997) study of 134 fourth and seventh graders who were a mix of Spanish-English bilinguals in bilingual education and English-only education and English monolinguals in English-only education noted that "Spanish-English bilinguals are influenced by their first language syntactic knowledge when they make guesses about the meanings of unfamiliar words in English" (p. 444). In the current studies, students often relied on their syntactic knowledge in English to locate translations of words, and the act of reading DLBs and looking between languages did not always trigger realizations that there are syntactic differences between languages, specifically that word order differs.

The fact that students often relied on strategies that were not as accurate in helping them find translations also shows that the act of reading DLBs independently without instruction likely

does not yield increases in students' bilingual vocabulary. DLBs seem to provide a good *context* and a good *opportunity* for vocabulary development and language learning, but based on the results of these studies, students do not automatically make connections and compare/contrast languages. Instead, students need *instruction* and guidance in making the most of the two languages in DLBs and developing their knowledge of how languages work, i.e., their metalinguistic knowledge/awareness. As Bialystok (2006) noted, "Aspects of these [metalinguistic] skills may be precociously established in bilingual children, but this advantage does not automatically extend to an enhanced awareness of all facets of language structure or to all bilingual children" (p. 595). Because Bialystok did not find significant differences in bilinguals children's overall achievement in various metalinguistic skills compared to monolinguals', she postulated that the advantage bilingual children have is that bilingualism makes "it easier to master these [metalinguistic] skills by giving them [bilinguals] more refined cognitive processes with which to approach them, and the possibility of transferring the effortful learning of these abilities from one language to the other" (p. 597-8). Therefore, bilingual children have a propensity for developing metalinguistic awareness, but they still need instruction, which the current studies found as well.

Studies have documented increases in students' English reading comprehension when they have received instruction to improve their English metalinguistic awareness (e.g., Yuill, 2009; Zipke, Ehri, & Cairns, 2009). Scholars (e.g., Escamilla et al., 2014; Y. Freeman et al., 2011; Semingson et al., 2015) advocate that teachers use DLBs to engage in purposeful instruction to develop students' metalinguistic awareness. Specific ways of doing so are described in the Significance and Implications section.

Considerations/Limitations

There are several important considerations with the current studies. First, because students read in English and Spanish, two orthographically similar languages, the strategies they used to translate words and retell texts will likely differ in type and frequency from students reading in non-orthographically similar languages. For example, students reading English-Spanish DLBs had the opportunity to use cognates to help them translate words, but that would not be an option with orthographically different languages. Koda's (2005) research synthesis described how the distance between languages' orthographies accounts for differential rates of metalinguistic awareness and how language learners rely on different information to decode and process words depending on their home language's orthography. Koda stated that "the development of second-language metalinguistic awareness and decoding skills requires different amounts of print information processing experience among learners with similar, and dissimilar, first-language orthographic backgrounds" (p. 320). In sum, it stands to reason that if students are reading DLBs with two orthographically different languages, they will likely use different cross-linguistic strategies, especially to translate words.

The second consideration is that this large mixed methods analysis of 68 students' verbal protocols to identify their translation and retelling strategies includes seven students who did not attend a Spanish immersion program. Two of those students had received formal literacy instruction in both Spanish and English in other states and/or countries, which would equate to the formal biliteracy instruction students receive in dual-language immersion programs. Including students without formal biliteracy instruction in the study creates a different language/literacy condition and could affect the types of strategies they use causing their strategy use to be outliers in the study. However, the five students who had not received formal Spanish

literacy instruction warranted inclusion in this study because their oral reading accuracies fit within the ranges of students' oral reading accuracies who had attended Spanish immersion programs. Students without formal literacy instruction in Spanish had oral reading accuracy scores in Spanish ranging from 43-82% and in English from 85-96%. Students with formal biliteracy instruction had Spanish oral reading accuracy scores ranging from 26-99% and English from 85-100%. Therefore, students without formal Spanish literacy instruction exhibited similar literacy proficiencies as students with formal Spanish literacy instruction, thus providing support for their inclusion.

Another consideration is the ways in which text layout influenced the strategies students used when translating and retelling texts. Findings indicated that language order impacted students' retelling strategies with students who spoke Spanish at home more likely to rely on the Spanish text when the books were written in Spanish first. When comparing students' translation strategies by oral reading accuracy profiles, interestingly, the four readings with low accuracies in both languages came from four third graders, and all read books written with English first. Additional analyses should attempt to determine other relationships between students' strategy use and their translanguaging with the language written first in the text. Furthermore, while most of the pages students read had one language directly above/below the other, a few pages had the languages spread across two pages, and based on observational notes, it seemed that students often struggled locating translations when this was the case. Further analyses should be conducted to determine the potential impacts of page layout on the ways in which students navigate texts as they translate words and retell DLBs.

A limitation of these studies is that I did not have language proficiency or overall reading achievement/proficiency scores for students. The schools in the study did not have measures of

language proficiency for both languages for all grades. Schools also used different systems for measuring reading proficiency within and between languages. A lack of language proficiency data makes it difficult to ascertain the extent to which language proficiency correlates to the specific strategies students used. Without the availability of consistent scores, the current studies instead focused on students' reading proficiency of the specific texts used in the studies, which can be an affordance because reading assessments use a variety of measures as proxies for reading comprehension, and readers can have different comprehension across texts depending on their background knowledge (Anderson & Pearson, 1984). Focusing on students' reading proficiencies of the texts used in the study helps hold some of the conditions constant thereby facilitating comparisons.

Finally, there were few students with low English reading accuracy scores (in the 80%s or lower) which made it difficult to tease out differences in strategy use when compared to the range of Spanish oral reading accuracies. Having a wider range of English accuracy scores could provide opportunities to determine specific accuracy levels in each language at which students transition from using text-based to language-based strategies. It could also help determine at what levels of English accuracy students can use their English knowledge to compensate for lower Spanish accuracy levels to support meaning making (or vice versa). Therefore, future studies would benefit from having more students with a greater range of English oral reading accuracy levels in order to determine additional relationships between English and Spanish oral reading accuracy and students' strategy use.

Significance and Implications

Theory and Research

The findings from this study advance understandings of cross-linguistic transfer in linguistics research not only by describing how children engage in it, but also by grounding the work in the theory of translanguaging to highlight the dynamic, flexible way in which children utilize all of their linguistic knowledge and resources to make meaning of dual-language texts. Much linguistics research has established correlations of skills across languages, but little is known about *how* learners, especially children, engage in cross-linguistic transfer as they process entire texts and develop biliteracy (Jared, 2015; Koda, 2012). Jared's (2015) synthesis of studies describing bilinguals' literacy development found very few studies investigating adults' or children's processing of entire texts. For adults, most of the research has investigated word reading, while for children, it has focused on predictors of reading achievement.

Some studies (e.g., G. E. García & Godina, 2017; Hardin, 2001; Jiménez et al., 1996; Raney et al., 2002) have determined the strategies bilingual readers use to globally comprehend separate texts in each of their languages—strategies such as inferring, paraphrasing/summarizing, attempting to understand vocabulary, predicting, mentally translating texts, using cognates, and so on. By comparing readers' strategy use when reading in each of their languages, scholars have established the cross-linguistic transfer of these comprehension strategies. However, the current study details not that students use similar strategies in each language, but rather *how* students apply knowledge across languages by analyzing how they translate and retell passages when they read translated passages in succession in a DLB. Therefore, this study begins to create a descriptive picture related to linguistics research of how bilingual children make cross-linguistic connections. Young readers look at general text

position, use nearby mechanical elements, make lexical and/or grammatical inferences, use their knowledge of surrounding words and cognates, rely on prior knowledge, use illustrations, rely on the language they just read or one with which they are more comfortable to retell texts, look at the book's other language to help them decode, apply phonology of one language to the other, and so on. Sometimes students guess or do not engage in cross-linguistic transfer, but often students attempt to make connections across languages when both are present. They make these connections in flexible, dynamic ways, and by grounding the current studies in the theory of translanguaging, the current studies advance understandings of cross-linguistic transfer so that it is not set in fixed directions where knowledge goes from one language to another, but instead the studies demonstrate how children draw upon their entire linguistic repertoire to make meaning across languages.

Furthermore, research grounded in translanguaging often studies learners' productive language (namely their writing and speaking) as evidence of the ways in which they utilize their linguistic repertoires. However, few studies have analyzed how readers translanguage and draw upon their linguistic knowledge when reading. For example, García and Godina's (2017) study of Spanish-English bilingual fourth graders focused on the similarities and differences of the general comprehension strategies students used while reading monolingual texts in each of their languages. Kwon and Schallert's (2016) study of ten Korean-English bilingual adults focused on the oral language structures and vocabulary they used while thinking aloud and later writing a written summary of monolingual texts they read in each language. These studies established that people translanguage when they read, but with the focus on monolingual texts, they were unable to fully demonstrate how people "make sense of their bilingual worlds" (O. García, 2009a, p. 45) as the current studies begin to describe.

Not only do the current studies add to the research base by describing how bilingual readers translanguage and make cross-linguistic connections, but they also add to research and theory by describing when or under what conditions students use these strategies. Research of more global comprehension and metalinguistic strategies has indicated that readers use more sophisticated, meaning-based strategies as they age and/or develop more sophisticated reading abilities (e.g., Bialystok, 2006; G. E. García & Godina, 2017; Hancin-Bhatt & Nagy, 1994; Hardin, 2001; Jiménez et al., 1996; Koda, 2005; Raney et al., 2002; Sanz, 2013). The current studies reinforce these findings because there were greater differences in the types of strategies students used to apply knowledge across languages depending on their oral reading accuracy and age, rather than home language. Greater understanding of *how* children make cross-linguistic connections and the correlations between students' strategies and their age and literacy skills have not only implications for research, but also for teachers and pedagogy.

Teachers and Pedagogy

Developmental trajectory and oral language skills. In describing students' cross-linguistic connections and the differences in their strategy use by students' age and oral reading accuracy, the current studies begin to identify a developmental trajectory of cross-linguistic strategies for translation and retelling. Establishing a developmental trajectory has potential pedagogical implications to help teachers determine instructional goals. For example, knowing that students with low oral reading accuracy tend to rely on words' general page location, which is less accurate than relying on linguistic knowledge, means teachers may want to draw students' attention to print and language, e.g., specifically guiding students to think about the words they know and use their knowledge of surrounding words to find translations. They may also want to develop students' word knowledge as that relates to decoding (Stahl & Hiebert, 2005). This, in

turn, can support students' retellings so that they feel more comfortable relying on information from the text itself rather than retelling other pages or relying on illustrations which may not fully convey the text's ideas.

Building students' word knowledge involves developing their oral language skills and bilingual vocabulary. In dual-language immersion contexts, this means increased attention to opportunities for comprehensible output (Swain, 1985) and especially languaging (Swain, 2006). Research has documented that students often speak English to teachers and peers even when instruction is in the partner language (Potowski, 2004; Tedick & Wesely, 2015), thus missing opportunities to build oral language knowledge that would support bilingualism and biliteracy. Therefore, it would likely benefit teachers to increase the amount of time and opportunities for students to talk, such as through increased use of equitable talk strategies and strategies such as sentence frames to increase students' language production or languaging. These strategies would be helpful not only in dual-language immersion contexts, but in any classroom with students who are language learners. In conclusion, it would be important for teachers to consider both providing more intentional opportunities for oral language development as well as specific strategy instruction to help students move from using text-based to language-based strategies.

Teaching metalinguistic strategies. Helping students use more language-based strategies to translate and retell texts involves teaching them metalinguistic strategies and building their metalinguistic awareness. As the current study and others (e.g., Bialystok, 2006; G. E. García & Godina, 2017; Jiménez et al., 1996; Nagy et al., 1993) have noted, bilinguals do not automatically develop and apply metalinguistic knowledge, and much of their application depends on age and language proficiency. Even having two languages side-by-side does not mean students will automatically compare languages and draw conclusions about how they

work. As the current studies found, sometimes students just focused on the textual elements such as word placement and nearby mechanical marks to help them translate words, rather than considering what each language said or how that meaning was conveyed. Therefore, metalinguistic skills need to be taught explicitly, and dual-language books provide a great opportunity to do that. Freeman and colleagues (2011) stated that DLBs offer opportunities "to engage students in linguistic investigations" where they "can compare and contrast the structures of the two languages" (p. 226). DLBs provide instructional opportunities for linguistic comparison because both languages are in close proximity, which with explicit instruction, can help students begin to see how word orders differ between languages, that translations are not literal word-by-word conversions, and that languages such as Spanish and English share cognates that often support comprehension.

DLBs provide such an opportune context for teaching metalinguistic awareness and strategies for making connections across languages that Escamilla and her co-authors (2014) of the Literacy Squared framework for biliteracy instruction stated, "The use of bilingual books as a method to teach cross-language connections in both Spanish and English is an essential part of the Literacy Squared instructional framework" (p. 70). Escamilla and colleagues emphasized that DLBs provide teachers an opportunity "to show students explicitly how to make use of both their languages to comprehend and create texts" (p. 70). Here, they emphasized that students need explicit instruction, not just exposure to DLBs, to develop metalinguistic awareness and a more sophisticated ability to make cross-linguistic connections.

One way to engage in detailed analysis of DLBs' languages is to engage in translation or a comparison of translations on the page. This does not mean that students engage in concurrent translation or translations exercises similar to the grammar-translation method of language

learning in which students learned language solely by translating texts and learning grammar rules. Instead, scholars such as Cummins (2007), Escamilla and colleagues (2014), and Jiménez and colleagues (e.g., Goodwin & Jiménez, 2016; Jiménez et al., 2015) advocate for engaging students in limited, purposeful translation in which they grapple with the best ways to convey meanings through the words and phrases they choose to use in the translation and the clauses and orders in which they write the words. As students engage in these decisions, they develop their metalinguistic knowledge recognizing that word orders are not the same across languages and that translations are not literal word-for-word representations—ideas which the current studies have found that students tend to take for granted without prior instruction or advanced linguistic development. Before students write their own translations, analyzing the translations authors wrote in dual-language books and the impacts on meaning and hypothesizing why translators made the choices they did can build students' metalinguistic awareness and understanding of how translation across languages works. Specifically, teachers could choose sentences from DLBs that are not literal translations and have students discuss how the sentences were translated and postulate why they may have been translated that way. Teachers could even have students translate a chosen sentence themselves, compare it to the book's translation, and engage in these discussions. Through these translation analyses and comparisons, teachers could draw students' attention to differences in word order, cognates, and how translation is an art that captures overall meanings, not word-by-word literal translations.

Application to dual-language immersion classrooms. Often these types of analytical, focused translation activities or even DLBs themselves are not used in dual-language immersion classrooms because there is the misconception that the two languages students are developing should be kept separate so that there are times of the day/week when students and teachers only

speak/read/write/listen/view in English and only speak/read/write/listen/view in Spanish (or another language) (Cummins, 2007). Even though this is not how bilinguals navigate the world (O. García, 2009a; Grosjean, 1989), Cummins (1995, 2007, 2009a) has explained that the view to separate languages during instruction comes from historical methods of language teaching and from the status differential between the majority and minority languages taught in immersion programs. With little exposure to and/or the lower status of the minority language outside of school, there has been a historical push in immersion education to emphasize minority language exposure and use within the program and thereby keep it strictly separate from majority language use. However, Cummins (2009a) has pushed back against this, stating that helping students make connections across their languages "is consistent with both the interdependence hypothesis and the extensive research supporting the crucial role that prior knowledge plays in all learning (e.g., Bransford, Brown, & Cocking, 2000)" (p. 176). Therefore, in order to support students' metalinguistic awareness and thereby their linguistic and biliteracy development, students need opportunities to compare and contrast languages, otherwise they are unable to fully translate and comprehend texts either mentally or through use of a printed translation on the page. And prior research has established that metalinguistic knowledge is important for reading comprehension (e.g., Gottardo, 2002; Gottardo & Mueller, 2009; Jeon & Yamashita, 2014; Mokhtari & Thompson, 2006; Ramírez et al., 2013), which makes it even more important to foster this.

In the current study, students, usually fifth graders, sometimes mentioned that "Spanish is backwards from English" and cited how their teacher taught them that, but they did not always accurately apply this knowledge when reading the DLBs and attempting to translate words to develop their vocabulary. Therefore, if teachers in dual-language immersion programs strategically used DLBs to engage students in language analysis as described in the previous

section to develop students' metalinguistic knowledge, there is potential to increase students' biliteracy development.

Book Publishers

Finally, there are implications of this study for book publishers as they consider which books to publish as dual-language versions. Not only is it important to have texts with rich language and more complex storylines, but it is also important to have some texts that are shorter, with fewer words on each page to lessen students' fatigue and facilitate their comparison of words as they make cross-linguistic connections. Often DLBs are recommended for teachers to have in their classrooms so that students who are trying to become bilingual/biliterate can use their ability to read one of the text's language to decode and learn the other text's language (D. Freeman & Freeman, 2007; Maxwell, 2013). Several of the students in the current smaller qualitative study of reading strategies did just that, where they looked at and used the English to cue their Spanish oral language knowledge so that they could decode the Spanish. They looked back and forth between the languages for multiple words on the page in order to decode the Spanish text. If the goal is supporting students' early attempts at decoding, then having less text on the page would help students more efficiently look between languages. They would not need to search as much to find their place in each language as they would when there are multiple paragraphs of text on the page. It would also alleviate publishers' documented concerns of trying to have enough space to balance the text of both languages with the illustration (P. Lee, 2002).

Furthermore, in order to conduct this study, I had to cut 50-70% of the words in each language from the original books so that I would have enough time for students to read both languages aloud and answer the verbal protocol and comprehension questions. Even still, it took

many students at least 20-30 minutes to read both languages aloud, (plus additional time to answer the questions). In data collected for this study but not reported in these analyses, when students were allowed to choose a DLB and read it any way they wished, many chose to read only one language on each page so that it would not take as long. Therefore, if book publishers want to support students in using both languages on the page to make meaning, having less text may create a more conducive environment to do so. However, this does *not* mean that publishers should simplify translations or only create DLBs of easy, beginning reader texts. Students still need picturebooks with engaging stories and rich, complex examples of language used in everyday life. It just depends on the purpose for which children are using texts. If the goal to support early attempts at decoding, then DLBs with shorter stories or less text on each page would be beneficial to support cross-linguistic connections for decoding and ease of reading.

Conclusions

The mixed methods study of 68 bilingual third and fifth graders' cross-linguistic strategies when reading Spanish-English DLBs provides descriptions of how children translanguaged and made cross-linguistic connections to translate words and retell passages. The qualitative study of five Spanish-speakers' applications of English literacy knowledge to develop Spanish literacy while reading DLBs describes how students use their English knowledge specifically to decode Spanish. Both studies examine how students' strategy use depends on other factors such as literacy skills, age, and home language. These studies have found that as students age and develop stronger literacy skills, they use strategies that are more language-based (and usually more accurate) rather than text-based strategies. However, they still need explicit instruction to develop metalinguistic awareness and more effectively use their knowledge of languages. Just handing students a DLB to read does not ensure that they will accurately

compare and use the languages on the page to develop vocabulary and comprehend. Instead, DLBs seem to provide excellent opportunities for teachers to provide explicit instruction in helping students compare and contrast languages and analyze the ways in which ideas are translated and languages work.

However, there is much work to be done in this field. Very little is known about how adult or child bilinguals comprehend entire texts (Jared, 2015). Therefore, it will be important to understand how the strategies children use to translate and retell correlate with overall story comprehension, as well as how children choose to read DLBs when given independent choice. Since children seem to need instruction in order to maximize the effectiveness of their cross-linguistic strategies, it will also be important to investigate specific pedagogical strategies teachers can use to support students as they make cross-linguistic connections when reading DLBs because the more students know about language and utilize this knowledge, the more their biliteracy develops. With the cognitive/academic, economic, and emotional benefits of bilingualism and biliteracy (Bialystok, 2011; O. García, 2009a; Lindholm-Leary & Hernández, 2011; Steele et al., 2017), determining how to help students effectively develop biliteracy is critical.

APPENDICES

APPENDIX A – TEXTS' READABILITY SCORES

Table 11

Readability Scores for Francisco's Kites / Las cometas de Francisco *and* Rainbow Weaver / Tejedora del arcoíris

	Francisco's Kites / Las cometas de Francisco (Klepeis, 2015)		*Rainbow Weaver / Tejedora del arcoíris* (Marshall, 2016)	
	English[a]	Spanish[b]	English	Spanish
Original Text				
Readability Score	82.1	76.4	85.8	83.5
Readability Grade Level	4.1	N/A	3.7	N/A
Words	1444	1477	1018	1979
Sentences	152	150	104	100
5th Grade Version				
Readability Score	82.7	75.9	83.7	82.6
Readability Grade Level	3.9	N/A	4.0	N/A
Words	534	559	469	491
Sentences	59	58	47	49
3rd Grade Version				
Readability Score	91.5	82.5	90	82.0
Readability Grade Level	2.4	N/A	2.4	N/A
Words	298	300	269	274
Sentences	38	37	39	39

[a] I calculated English readability by using Microsoft Word to count the words and sentences and calculate the Flesch-Kincaid readability scores.

[b] I calculated Spanish readability by using Microsoft Word to count the words and sentences. I used the INFLESZ program (available from https://legibilidad.blogspot.com/2015/01/el-programa-inflesz.html) to count the number of syllables in the words. I modified the original Fernández Huerta (1959) formula as follows because I had total word and syllable counts for each book: 206.84 – 0.6*[total syllables/(total words/100)] – 1.02*[total sentences/(total words/100)].

APPENDIX B – INITIAL INTERVIEW QUESTIONS

Questions Related to Chosen DLB:

1.	Tell me about what you read.	Dime sobre lo que leíste.
2.	Why did you choose this book?	¿Por qué escogiste este libro?
3.	What did you like about this book?	¿Qué te gustó sobre el libro?
	What didn't you like about this book?	¿Qué no te gustó sobre el libro?
4.	Questions dependent on their reading behaviors…	
	• Why did you decide to read (just the English/Spanish, both languages)?	• ¿Por qué decidiste leer (solo el inglés/español, los dos)?
	• Did you look at/use the English to help you read the Spanish? Can you show me where? o How did it help you?	• ¿Miraste/usaste el inglés para ayudarte leer el español? ¿Puedes mostrarme dónde? o ¿Cómo te ayudó?
	• Did you look at/use the Spanish to help you read the English? Can you show me where? o How did it help you?	• ¿Miraste/usaste el español para ayudarte leer el inglés? ¿Puedes mostrarme dónde? o ¿Cómo te ayudó?
5.	Did anything make this book easy to read? What?	¿Había algo que te ayudó leer este libro o lo hizo fácil a leer? ¿Qué?
	Did anything make this book difficult to read? What?	¿Había algo que no te ayudó leer este libro o lo hizo difícil a leer? ¿Qué?
6.	Why would someone read a book like this?	¿Por qué leería una persona un libro como esto?

Background Questions:

7.	What languages do you speak at home? (With whom?)	¿Cuáles lenguajes hablas en casa? (¿Con quién?)
	What language do you speak *most* at home?	¿Qué lenguaje hablas *el más* en casa?
8.	When did you learn to read English?	¿Cuándo aprendiste leer en inglés?
	When did you learn to read Spanish?	¿Cuándo aprendiste leer en español?
9.	*Does being able to read in English help when you read Spanish? How?	¿Leer en inglés te ayuda leer en español? ¿Cómo?
	*Does being able to read Spanish help when you read English? How?	¿Leer en español te ayuda leer en inglés? ¿Cómo?
10.	*How are reading in English and Spanish different?	¿Cómo es diferente leer en inglés y español?

	*How are reading in English and Spanish the same?	¿Cómo es el mismo leer en inglés y español?
11.	*What does a person need to know to be a good English reader?	¿Qué necesita saber una persona para ser un buen lector en inglés?
	*What does a person need to know to be a good Spanish reader?	¿Qué necesita saber una persona para ser un buen lector en español?

*(Jiménez et al., 1995)

APPENDIX C – CODEBOOK

Code	Description (The student…)
	Translations
Context clues	Makes a guess based on what happened overall in the story *(E.g., the book is about kites, so they guess kites, or they just read about the character being tired, so they guess that.)*
Grammatical inference	Talks about languages being backwards and/or infers the grammatical role the words play in the sentence, but doesn't necessarily rely on surrounding words' meanings
Guesses a Spanish/Spanish-like word OR Guesses an English/English-like word	Guesses a word that's either made-up or completely unrelated to the story but sounds kind-of like the word in question
I don't know	Gives a random guess or doesn't give a response. (Doesn't seem like is using any strategies.)
Illustration	References things in the illustration
Knowledge of surrounding words	Knows the meaning/translation of nearby words and may even use a process of elimination to translate the word in question
Knowledge of surrounding words – cognates	Uses cognates, including proper nouns and words from one language that have been inserted in the other language *(e.g., "We can have empanadas and tres leches cake.")*
Lexical inference	Infers using word meanings—e.g., tells meanings of parts of word or phrase and puts them together to get an overall translation or chooses a word with a similar meaning → makes inferences to get to the word on the page *(e.g., scraps = trash, so basura is a translation; sluggishly is a word for slowly, so lentamente is a translation; or entreabiertos = kind-of open, so half-squinting is a translation)*
Prior knowledge	Already knows the word and/or its meaning

Prior knowledge – questioned	Claims they already knew the word, but… • Gives an incorrect response, • Doesn't have a strong knowledge of that language, or • Teacher/parent (who they say told them) doesn't have a strong knowledge of the language
Repeated word	Remembers or notices repeated instances of a word on a page ***This is NOT when the student translates another instance of the word on the page. The student must acknowledge that they are recognizing that there are multiple repetitions of the word on the page or the book and are using that fact to help them.*
Shared letters	Claims words in both languages share some letters, have similar spellings, or look similar/the same. *(usually just based on what the student says)
Similar sounds	Claims words in both languages sound the same/similar. *(usually just based on what the student says)
Text position (alignment/page location)	Uses the relative location of the word on the page to locate its translation. Students may… • Draw a line with their fingers • Say the words are "in the same spot" • Say what line or paragraph the word is in • Talk about the words "matching" (but they didn't count or use mechanics to match them) • Say it's "the last word" (but they don't reference the period and they haven't been using the period throughout the book) AND there aren't words coming after it; there's just a big space. • OR the only way you can determine that the student made the guess is because their guess is in line with the word
Text position (mechanical elements)	Uses mechanical elements such as commas, periods, or quotation marks. Students may… • Say it's at the beginning or end of a <u>sentence</u> (more specific than "last word") • Call out or point to the punctuation marks • OR there are a lot of nearby words, so the only way you could determine how they chose that word is because it's by a period/comma

Text position (one-to-one correspondence)	Student… • Counts across the text (one word at a time) to match • Says and/or points to one word at a time in both languages moving across the page **This is NOT when a student knows some surrounding words and works word-by-word across the sentence to translate. Instead, students use this strategy without attending to word meanings.*
Translates similar-sounding word	E.g. The word in question is "alambre," which sounds like "hambre" which is hungry. The student gives "hungry" as the translation of alambre.
Unclear	You know the student is using some strategies or more than what you've coded, but you can't figure out what else helped them determine their answer
Word length	Says or looks for words with similar lengths in both languages *(usually just based on what the student says)
	Retellings
Illustration	Includes information from the illustration that's not in the text OR Looks at illustration and uses it to generally summarize the page (without repeating many, if any, words from the text)
Other pages	Tells what happened on other pages instead of or in addition to the page in question
Rely on English OR Rely on Spanish	Mainly uses the English or Spanish text to provide the information for the retell. The student… • recycles/repeats phrases from one language, • looks at one language, or • provides details after reading one language (and doesn't use the 2nd language to add more) **These codes cannot be given together.*

Rely on both languages – sequentially	Looks at one language to give retell and then adds more info based on the book's second language (and would have understood the book's second language) **You must be able to tell they're looking at that language, are able to understand it, or are repeating words from that language in their retell.* **This code cannot be given with "Rely on English/Spanish" or "Rely on both languages simultaneously."*
Rely on both languages – simultaneously	Looks at both languages and uses both while giving one retell **This code cannot be given with "Rely on English/Spanish" or "Rely on both languages sequentially."*
Unclear	Multiple strategies could be used, and it is unclear what strategies the student is using.

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