READING GROWTH OF FIRST- AND SECOND-GRADE ENGLISH LANGUAGE LEARNERS: ACHIEVEMENT, SUBPROCESSES, AND ATTITUDE

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ABSTRACT

YONGMEI LI: Reading Growth of First- and Second-Grade English-Language Learners: Achievement, Subprocesses, and Attitude
(Under the direction of Dr. Jill Fitzgerald)

The research questions were a) How does first- and second-grade English-language learners' reading growth in Instructional Reading Level compare to their monolingual native-English-speaking peers' growth across two years; b) How does first- and second-grade English-language learners' reading growth in selected reading subprocesses (word- and sound-level subprocesses, Comprehension, Fluency) compare to their monolingual native-English-speaking peers' growth across two years; and c) How does first- and second-grade English-language learners' growth in Attitude toward Reading compare to their monolingual native-English-speaking peers' growth across two years? Using a two-year repeated measures design, data were collected from 746 monolingual native English-speaking students and 154 English-language learners in first and second grade at 16 schools. Students who began Year 1 in first and second grade were followed into second and third grade in Year 2. Five reading assessments were administered at the beginning, middle, and end of each year (except for phonological awareness, which was assessed on students who began Year 1 in first grade in Year 1 only), including *Oral Reading, Basic Sight Vocabulary, Hearing Sounds in Words, Phonics Knowledge,* and *Attitude toward Reading*. A series of hierarchical linear models was conducted. Main conclusions were a) The growth pattern of Instructional Reading Level for the English-language learners was different from that for their monolingual native-English-speaking peers. b) For growth in sound- and word-level reading

subprocesses, the growth pattern of Phonological Awareness for the first-grade English-language learners was different from that for their monolingual native-English-speaking peers. The growth pattern of Phonics Knowledge for the English-language learners was different from that for their monolingual native-English-speaking peers. Similarity or difference in the growth in Reading Words in Isolation for the English-language learners and their monolingual native-English-speaking peers depended on cohort. c) The growth pattern and performance level of Fluency for the English-language learners were similar to that for their monolingual native-English-speaking peers. d) The growth pattern and performance level of Comprehension for the English-language learners were similar to that for their monolingual native-English-speaking peers. e) The growth pattern of Attitude toward Reading for the English-language learners was different from that for their monolingual native-English-speaking peers.

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CHAPTER 1

INTRODUCTION AND RATIONALE

The purpose of the present study is to examine first- and second-grade English-language learners' reading growth as compared to their monolingual native-English-speaking peers'. The research questions were: a) How does first- and second-grade English-language learners' reading growth in Instructional Reading Level compare to their monolingual native-English-speaking peers' growth across two years; b) How does first- and second-grade English-language learners' reading growth in selected reading subprocesses (word- and sound-level subprocesses, Comprehension, Fluency) compare to their monolingual native-English-speaking peers' growth across two years; and c) How does first- and second-grade English-language learners' growth in Attitude toward Reading compare to their monolingual native-English-speaking peers' growth across two years?

For the purpose of the present study, I use the term English-language learners to refer to those students who come from a language background other than English and whose English proficiency is not developed fully enough to benefit from instruction exclusively in English (August & Hakuta, 1997).

Rationale

The number of English-language learners in the U.S. has been increasing dramatically over the past few decades, from approximately two million in 1993-1994 to three million in 1999-2000, representing approximately 7% of the national public school kindergarten through twelfth grade enrollment (National Center for Educational Statistics, 2002). It is

reported that 50% of births at the Women's Hospital at the University of North Carolina at Chapel Hill are to Hispanic mothers and that the Hispanic population in the state of North Carolina has risen from 76,726 in 1990 to 597,382 in 2006 (Fifty percent of UNC babies are Hispanic, 2008). However, there has been a large and persistent gap on academic performance between English-language learners and their monolingual native-English-speaking peers. For example, on the 2007 National Assessment of Educational Progress (NAEP) in fourth-grade reading, only 30% of fourth-grade English-language learners performed at or above the basic level, as compared to 71% of their monolingual English-speaking peers. Only 7% of English-language learners achieved at or above the proficient level as compared to 35% of their monolingual English-speaking peers (National Center for Educational Statistics, 2007).

Learning to read is not an easy task for native speakers, let alone English-language learners who are struggling to learn to read in a language other than their mother tongue while endeavoring to achieve academic success. Developing solid reading skills is especially critical in early grades as it largely predicts reading and academic success in later grades (Allington, Walmsley, 1995; Bartolin, 1995; Hiebert & Taylor, 1994). Those who lag behind in elementary school are likely to fail middle and high school (Carter, 1984; Juel, 1983). English-language learners not only have to make great effort in academic performance, but also go through tremendous and complex processes of psychological and social adjustment to the new environment which is foreign to them (Siantz & Smith, 1994; Suárez-Orozco & Todorova, 2006). Smooth psychological and social transitions may facilitate English-language learners' learning. Otherwise they may become barriers.

Further, the educational experiences for English-language learners may vary across individuals for English-as-a-second-language services being offered, curriculum, and program (bilingual, dual-language, or mainstream English program), and knowledge and professional training their teachers have in teaching English-language learners. Although the majority of English-language learners are being placed in mainstream English classrooms across the United States, many teachers are not prepared to teach English-language learners. They constantly struggle and ask questions like: Do English-language learners acquire English reading proficiency in a similar way as their monolingual native-English-speaking peers? It's likely that English-language learners start at a lower level. Can they catch up? When? Why is it that the lag seems smaller in primary grades than in higher grades? Can both groups be taught with the same instructional methods? What attitude do English-language learners hold toward reading and does it change in the similar pattern as their native-English-speaking peers'?

Theory and Prior Research on English-Language Learners' Development of Overall Reading Achievement and Reading Subprocesses

Theoretical Framework. Promoting English-language learners' reading excellence has become a hot topic among researchers and educators (August & Hakuta, 1997). Various aspects of English-language learners' reading processes and development have been researched. However, to date, a well-developed theory for second language reading to guide the hypothesis of whether English-language learners' reading development should be similar or different from their monolingual English-speaking peers' has not been formulated (Fitzgerald, 2003; Fitzgerald, Amendum, & Guthrie, in press; Lipka & Siegel, 2007; Mitchell & Myles, 2004; Neufeld & Fitzgerald, 2001). Researchers have tended to rely upon reading

theory for native speakers to study English-language learners' reading acquisition, assuming that English-language learners' reading development resembles native English-speakers' (e.g., August & Hakuta, 1997; Chiappe & Siegel, 1999, 2006; Fitzgerald, 1995; Fitzgerald, Amendum, & Guthrie, in press; Geva, Wade-Woolley, & Shany, 1993; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lipka & Siegel, 2007; Neufeld & Fitzgerald, 2001; Verhoeven, 1990; Wade-Woolley & Siegel,1997). Further, two comprehensive reviews of research suggest that English-language learners' reading cognitive processes are substantively more similar than different than native English speakers' (August & Shanahan, 2006; Fitzgerald, 1995). English-language learners read in similar ways as their monolingual native-English-speaking peers, with the differences in that they use reading processes less frequently and they tend to be slow in activating the processes (Fitzgerald, 1995). Therefore, for the present study, it may be reasonable to adopt native-language early-reading theory to situate the hypotheses about young English-language learners' reading development compared to their monolingual native-English-speaking peers'.

According to research-based reading development theory for typically developing native-English-speaking children, three stages pertinent to the present study are Literacy Roots (from birth through kindergarten, age six), Initial Reading (first grade and beginning second grade, ages six through seven), and Confirmation, Fluency, Ungluing from Print (second and third grade, ages seven through eight) (Chall, 1996; Fitzgerald & Shanahan, 2000). First, considerable research suggests that phonological awareness is the most important kind of knowledge during the Literacy Roots stage and is related to early reading success (e.g., Adams, 1990; Chiappe & Siegel, 2006; Cunningham & Stanovich, 1997; Lipka & Seigel, 2007; Perfetti, 1984; Siegel, 2003). Second, perhaps most important to early

reading development with regard to the present study is the next stage, Initial Literacy, with learning about letters and letter-sound correspondence as the main task (Chall, 1996). Research has documented that the Initial Literacy stage revolves around decoding and word recognition (Ehri, 1991). Third, the essential element during the next stage, Confirmation, Fluency, and Ungluing from Print, is that students intensify what they learned (e.g., decoding skills, sight vocabulary, meaning context) during the Initial Literacy stage by reading familiar texts to increase fluency in reading.

Now the question becomes, if English-language learners also go through similar stages in early English reading as their native-English-speaking counterparts, might English-language learners reach approximately the same overall achievement level as well as the same performance level in subprocesses (i.e., word- and sound-level subprocesses [i.e., phonological awareness, phonics knowledge, reading words in isolation], comprehension, fluency) during the same developmental stage? Might they make comparable progress during the same period? That is, might they develop English reading at the same pace as their monolingual native-English-speaking peers? To help us answer the questions, we might begin with considering the role of oral language in English-language learners' reading development. English-language learners' disadvantage in English oral language proficiency might lead us to intuitively assume that their English reading abilities lag behind their English-speaking counterparts'. However, research suggests that English-language learners' English language oral proficiency may not make a substantial and unique contribution to their basic reading skills in English (Arab-Moghaddam & Sénéchal, 2001; Durgunoglu, Nagy, & Hancin-Bhatt, 1993; Geva & Siegel, 2000; Geva, Yaghoub Zadeh, & Schuster, 2000; Geva & Yaghoub Zadeh, 2006; Gholamain & Geva, 1999; Lindsey, Manis, & Biley, 2003).

Further, limited research suggests that first-grade Latino students' English oral language proficiency is not related to overall reading achievement level growth, suggesting that English-language learners' English oral language proficiency does not appear to impede their reading development at least during the early stages (Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). Thus, we can infer that young English-language learners' reading development trajectory might parallel their monolingual native-English-speaking peers'.

On the other hand, a competing hypothesis might be built. It is possible that English-language learners' might have a metalinguistic advantage over monolingual students, an advantage which would support their early dramatic growth in reading, growth significantly different from monolingual peers' growth. Metalinguistic awareness refers to the ability to reflect upon and analyze language structures and functions, such as sentence grammar, lengths and referents of words, and word definition. Evidence suggests that young bilingual children up to age six tended to outperform their monolingual native language-speaking counterparts on tasks of metalinguistic ability in reading (Bialystok, 1997; Bruck & Genesee, 1995; García, 2000; García, Jiménez, & Pearson, 1998; Galambos & Goldin-Meadow, 1990; Göncz & Kodzopeljic, 1991). The hypothesis for the superior metalinguistic awareness among young bilinguals is that developing two languages demands their attention to the structural features of both languages; thus it provides them with more opportunities than their monolingual native language-speaking peers to analyze and reflect on the language forms and functions.

However, despite young bilingual children's metalinguistic advantage, it seems to disappear after the age of six (García, 2000). One speculation is that as they move on in elementary school, English becomes the predominant language of instruction and limits

English-language learners' continued metalinguistic development in both English and their native language (García, 1998).

Thus, with regard to English-language learners' early reading development, we might hypothesize that bilinguals might have advantage in reading than their native-English-speaking peers by the age of six and then the advantage slowly disappears, and that English-language learners in all-English classrooms from elementary school onset might develop their reading in English more slowly than their monolingual native-English-speaking peers without continued support of metalinguistic awareness from their native language.

Prior research. As English-language learners' literacy increasingly draws attention from researchers and educators during the past few decades, extensive research has been conducted on various aspects of the topic. However, in most studies, measures were administered only once or twice. Few longitudinal studies have been conducted to trace English-language learners' reading *growth* trajectory compared to the monolingual native-English-speaking counterparts'. Below I summarize research findings from a small number of studies.

First, only a limited number of studies have documented English-language learners' overall reading achievement development in relation to native-English speakers' (Aruajo, 2002; Fitzgerald, Amendum, & Guthrie, in press; Fitzgerald & Noblit, 1999, 2000; Hutchinson, Whiteley, Smith, & Connors, 2003; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006; Neufeld & Fitzgerald, 2001; Weber & Longhi-Chirlin, 2001). The results of these studies showed that the development in the overall reading achievement for young English-language learners looked much like that of monolingual native-English speakers.

In some studies that used comparison groups, kindergarten through third-grade English-language learners made growth in the overall reading achievement similar to that of typically developing monolingual native-English speakers (Araujo, 2002; Fitzgerald & Noblit, 1999, 2000; Fitzgerald, Amendum, & Guthrie, in press; Hutchinson, Whiteley, Smith, & Connors, 2003; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). When reading development of individual children was examined in case studies, it was found that not all English-language learners made typical progress, just as not all monolingual native-English-speaking children achieved on grade level (Fitzgerald & Noblit, 1999; Neufeld & Fitzgerald, 2001).

Second, few studies have been done on English-language learners' reading subprocess development (i.e., word- and sound-level subprocess, comprehension, fluency). Furthermore, most of the studies employed a qualitative method and data were collected for one year at most. Subprocesses that have been studied and pertinent to the present study are the following: phonological awareness, phonics knowledge, word-recognition strategies, comprehension, and fluency (Chiappe & Siegel, 2006; Chiappe, Siegel, & Wade-Woolley, 2002; Fitzgerald, Amendum, & Guthrie, in press; Geva, Yaghoub-Zadeh, & Schuster, 2000; Hutchinson, Whiteley, Smith, & Connors, 2003; Lesaux & Siegel, 2003; Lesaux, Rupp, & Siegel, 2007; Lipka & Siegel, 2007; Manis, Lindsey, & Bailey, 2004; Muter & Diethelm, 2001; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006; Neufeld & Fitzgerald, 2001). On the whole, the results suggest that English-language learners' reading subprocess growth trajectory resembles monolingual native-English speakers'.

English-Language Learners' Growth in Attitude toward Reading

In addition to the cognitive domain related to early reading that has been discussed above, attitude toward reading in the affective domain is also a critical factor in early reading success. Hypothetically, why should the growth of young English-language learners' attitude toward reading be similar or different from that of their monolingual native-English-speaking counterparts? Might English-language learners' disadvantage in English oral proficiency and/or cultural backgrounds contribute to negative attitude toward reading and thus slow down their progress? Although limited oral reading proficiency remains a commonly reported characteristic of English-language learners, few studies have attempted to describe its relationship with their attitude toward reading.

To date, little is known about English-language learners' growth in attitude toward reading. A few studies that have been located on students' reading attitude growth focused on native-English speakers in fourth grade and above, and usually reading attitude was measured at one time point rather than longitudinally. The findings indicate that children's attitude toward reading exhibits a gradual but steady decline across elementary school years, beginning with relatively positive attitude and ending in indifference (Barnett & Irwin, 1994; Guthrie & Greaney, 1991; Kush & Watkins, 1996; Lazarus and Callahan, 2000; McKenna, Kear, & Ellsworth, 1995; Smith, 1990; Sperling & Head, 2002; Swanson, 1985). Further, young children tend to exhibit more positive attitude toward reading than do older children (Alexander & Filler, 1976; Barnett & Irwin, 1994; Guthrie & Greaney, 1991; Mikulecky, 1976; Smith, 1990; Swanson, 1985). Only one study included children of different ethnic groups (McKenna, Kear, & Ellsworth, 1995). No differences were found among Hispanic, African-American, and White students in relation to the negative trend of reading attitude, regardless of their cultural and linguistic backgrounds.

Relationship between the Control Variables (Student Socio-Economic Status, Gender) and Early Reading Growth

In addition to students' language status presented earlier which was the main hypothesis of interest in the present study, student socio-economic status (SES) and gender were included in the models as the control variables. In the section that follows, I discuss the relationships between the control variables and early reading development.

SES and early reading growth. Hypothetically, why should student SES matter for either English-language learners' or monolingual native-English-speaking children's early reading growth? About 18% of children still live in families with incomes below poverty level across the nation. Children's poverty rates vary greatly across ethnic groups, with Caucasian, Latino, and African American children being 10%, 28%, and 35% respectively (National Center for Children in Poverty, 2007). Approximately 26% of immigrant children live in poor families compared to 16% of children of native-born parents. There is substantial research evidence that consistently shows that SES significantly affects children's health, learning, and development (e.g., Aber, Bennett, Conley, & Li, 1997; Brooks-Gunn, Duncan, & Aber, 1997; Brooks-Gunn, Klebanov, & Duncan, 1996; Fryer & Levitt, 2004; Gershoff, 2003; Klerman, 1991). Low-SES children are more likely than non-low-SES children to exhibit developmental delays (Brooks-Gunn et al., 1997; Klerman, 1991), and begin kindergarten with significantly lower reading achievement (Gershoff, 2003; Lee & Burkham, 2002; West, Denton, & Germino Hausken, 2000).

At the same time, the relationship between student SES and reading development is more complex than is generally perceived. On the one hand, low-SES children increasingly lag behind high-SES ones as they progress through school (Fryer & Levitt, 2005; Rathbun &

West, 2004). On the other hand, although lower-SES children are more delayed in reading than high-SES children, they follow the same developmental trajectory during the school year (Alexander & Entwisle, 1996; Duncan & Seymour, 2000). So the achievement gap between the low-SES children and the high-SES ones persists across time.

A small number of research studies has been found involving both SES and English-language learners in relation to reading achievement at one time point (Abedi, 2003; Brown, 2001; Cobo-Lewis, Pearson, Eilers, & Umbel, 2002; Krashen & Brown, 2005). Interestingly, in some cases, high-SES English-language learners outperform low-SES monolingual native language-speaking peers on reading comprehension (Brown, 2001; Cobo-Lewis, Pearson, Eilers, & Umbel, 2002), suggesting that SES may be a more critical factor in English-language learners reading performance than is language status.

Only one study dealt with the relationship between SES, English-language learners, and reading *growth* (D'Angiulli, Siegel, & Maggie, 2004), in which children in all-English classrooms were followed from kindergarten to grade five with literacy-intensive instruction from onset of kindergarten. Findings from the study revealed complex relationships between SES, language status, and word-reading ability development. That is, word-reading development for English-language learners and their monolingual native-English-speaking peers depended on SES. Specifically, middle-SES English-language learners and monolingual English-speaking children improved similarly as they progressed through grade five. However, although the high-SES/low-SES monolinguals outperformed the high-SES/ low-SES English-language learners at kindergarten onset, the English-language learners made more progress across six years.

To summarize, the relationships among SES, language status, and early reading development are complex. Low-SES students began lower than high-SES students, and the gap might persist or widen over time. High-SES English-language learners might outperform low-SES native-English-speaking counterparts on reading comprehension at one time point. While middle-SES English-language learners' reading growth might be similar to their monolingual English-speaking children's growth, the low-SES/high-SES English-language learners' reading growth might be accelerated compared to their monolingual English-speaking children's growth. Thus, it is important to control for SES when studying the relationship between language status and reading growth.

Gender and reading growth. Relationship between gender and reading development has been well researched and results are mixed. Some researchers argue that girls consistently outperform boys on reading achievement across grade level as well as reading growth across year (e.g., Bond & Dykstra, 1997; Cloer & Dalton, 2001; Klecker, 2006; Lynch, 2002). Others claim that there are significant differences in letter identification and word recognition between boys and girl in kindergarten and first grade, with boys scoring lower, but the gap disappears after first grade (e.g., Siegel & Smythe, 2005). The disappearance of differences might be that girls mature earlier than boys, so they already have more advanced skills when boys are still developing them. By the end of second grade, boys can catch up. If that boys score lower than girls holds for both groups (English-language learners and monolingual native-English-speaking children), would it be possible that girls among English-language learners score equivalently to or even higher than boys among monolingual native-English-speaking children? If so, would the girls' language disadvantage hold them back along the developmental path?

Although information about gender is commonly reported in the methods section of the limited number of studies on English-language learners that have been located (Gerber, Jimenez, Leafstedt, Villaruz, Richards, & English, 2004; Lesaux, Koda, Siegel, & Shanahan, 2006; Lesaux, Rupp, & Siegel, 2007; Manis, Lindsey, & Bailey, 2004; Stuart, 2004; Swanson, Saez, & Gerber, 2006), none of them have included gender as a control variable in the analyses to partial out its potential correlation with reading growth as well as its potential interaction with language status on reading growth. However, because gender is an important factor in early reading, it would be important to control for gender when studying the relationship between language status and reading growth.

Significance of the Study

As mentioned earlier, there is limited research on English-language learners' early reading growth compared to their monolingual native-English-speaking peers'. Missing in the literature of young English-language learners' reading development is time series analysis depicting the patterns of individual English-language learner's reading growth over time, particularly for subprocesses of reading and attitude toward reading. As reading subprocesses have been shown to be critical for young native-English speakers in early reading (Adams, 1990; Siegel, 2003), they are likely to be equally important for English-language learners' early reading development. Therefore, comparing English-language learners' trajectories of reading achievement and subprocesses, as well as reading attitude with their monolingual native-English-speaking peers' might help us better understand English-language learners' early reading development. Researchers and educators might be able to adapt pre-existing theories or perspectives for first language early reading development and apply them to English-language learners. As well, such knowledge might

guide practitioners in making instructional plans. Also, findings regarding growth in attitude toward reading might be interesting by incorporating variables in the affective domain as well as cognitive domain in examining English-language learners' reading development.

Hypotheses for the Present Study

The major hypothesis for the present study is that the English-language learners' reading growth—in reading achievement, reading subprocesses, and attitude toward reading—should parallel their monolingual native-English-speaking peers'.

Definitions

English-language learners refers to those students who come from a language background other than English and whose English proficiency is not developed fully enough to benefit from instruction exclusively in English (August & Hakuta, 1997). For the purpose of the present study, English-language learners were identified by the schools upon entry using measures for proficiency in English speaking, listening, reading, and writing.

Monolingual native-English-speaking peers, in the present study, refers to those students who come from an English language background.

School poverty level, for the purpose of the present study, is defined by the percentage of students who qualify for reduced or free lunch at each school.

Reading growth, for the present study, refers to progressive development in students' reading. Reading, as a multidimensional construct, for the purpose of the present study, includes aspects of cognitive as well as affective domains. The cognitive domain is represented by overall reading achievement, reading subprocesses (word-level subprocesses, comprehension, and fluency). Word-level subprocesses include phonological awareness,

phonics knowledge, and reading words in isolation. The affective domain is represented by attitude toward reading.

Instructional Reading Level refers to overall achievement level during a child's oral reading of increasingly difficult texts.

Phonological awareness refers to the ability to hear and manipulate phonemes, such as to hear words as a whole, chunks in words, and individual sounds in words (Fitzgerald, 2004).

Phonics knowledge refers to the knowledge of sounds and the letters that represent the sounds.

Reading words in isolations refers to sight vocabulary which requires the children to look at and pronounce immediately within three seconds (Fitzgerald, 2004).

Comprehension refers making meaning of text.

Fluency refers to the ability to read text accurately, quickly, and with good prosody so that time can be allocated to comprehension processes.

Attitude toward reading is "a system of feelings which causes the learner to approach or avoid a reading situation" (Alexander & Filler, 1976, p.1).

CHAPTER 2

REVIEW OF LITERATURE

In this chapter, I first synthesize the research literature relevant to the present study. Then, I critique the methodologies used in prior research

Recall that the research questions were as follows: a) How does first- and second-grade English-language learners' reading growth in instructional reading level compare to their monolingual native-English-speaking peers' growth across two years; b) how does first- and second-grade English-language learners' reading growth in selected reading subprocesses (word- and sound-level subprocesses, Comprehension, Fluency) compare to their monolingual native-English-speaking peers' growth across two years; and c) how does first- and second-grade English-language learners' growth in Attitude toward Reading compare to their monolingual native-English-speaking peers' growth across two years? The main hypothesis for the present study was that the English-language learners' reading growth—in the overall reading achievement, selected reading subprocesses, and attitude toward reading—would parallel their monolingual native-English-speaking peers' growth.

Synthesizing Research Literature

In this section, I synthesize limited research that has been done as related to the present study in the following order: (a) prior research on young English-language learners' reading development in the overall reading achievement in relation to monolingual native-English-speakers; (b) prior research on young English-language learners' reading development in the sound- and word-level reading subprocesses in relation to monolingual

native-English-speakers; (c) prior research on young English-language learners' reading development in fluency in relation to monolingual native-English-speakers; (d) prior research on young English-language learners' reading development in comprehension in relation to monolingual native-English-speakers; (e) prior research on young English-language learners' reading development in attitude toward reading in relation to monolingual native-English-speakers; and (f) prior research on SES and gender (control variables) in relation to students' early reading development.

For each of the sections which follow (a through e) I first briefly explain how the participants were assessed. Then, I describe the participants' English oral proficiency (where it was reported) and home language. Next, I present the findings from prior research.

What Might Development in the Overall Reading Achievement for Young English-Language Learners Look Like in Relation to That of Monolingual Native-English Speakers?

Eight studies examined young (kindergarten through third-grade) English-language learners' development in overall reading achievement in relation to monolingual native-English speakers' development (Aruajo, 2002; Fitzgerald, Amendum, & Guthrie, in press; Fitzgerald & Noblit, 1999, 2000; Hutchinson, Whiteley, Smith, & Connors, 2003; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006; Neufeld & Fitzgerald, 2001; Weber & Longhi-Chirlin, 2001). The results of these studies showed that the development in the overall reading achievement for young English-language learners looked much like that of monolingual native-English speakers.

In these eight studies, most participants were assessed on overall reading achievement by orally reading increasingly difficult graded passages. For instance, instructional reading level was matched with the highest level passage for which the child read with at least 90

percent word accuracy. The English-language learners predominantly spoke Spanish as their home language, though other languages groups were also represented (Gujerati, Urdu, Punjabi, Bengali, and Pashto). Their English proficiency levels, where reported, ranged from limited to advanced, according to the *Woodcock-Munoz Language Survey* (Woodcock & Munoz-Sandoval, 2001) (Fitzgerald, Amendum, & Guthrie, in press), *IDEA Proficiency Tests* (Dalton, Tighe, & Ballard, 1991) (Fitzgerald, Amendum, & Guthrie, in press), or *IPTI: Oral English Proficiency* (Dalton, Tighe, & Ballard, 1991) (Fitzgerald & Noblit, 1999, 2000; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006; Neufeld & Fitzgerald, 2001).

In some studies that used comparison groups, kindergarten through third-grade English-language learners made growth in the overall reading achievement similar to that of typically developing monolingual native-English speakers (Araujo, 2002; Fitzgerald & Noblit, 1999, 2000; Fitzgerald, Amendum, & Guthrie, in press; Hutchinson, Whiteley, Smith, & Connors, 2003; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). Specifically, United States first- and second-grade Latino English-language learners made growth in reading achievement comparable to that of their monolingual native-English-speaking peers, and ended at similar reading achievement levels (Fitzgerald, Amendum, & Guthrie, in press; Fitzgerald & Noblit, 2000; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). First- through third-grade English-language learners (primarily Gujerati-speakers) in England performed similarly on graded passages of the Neale Analysis of Reading Ability (Neale, 1997) to their monolingual English-speaking peers (Hutchinson, Whiteley, Smith, & Connors, 2003). In addition, results from two qualitative studies that did not utilize comparison groups indicated that (a) two first-grade Spanish-speaking Puerto Rican students could keep up with their peers in overall reading achievement focused on word reading accuracy across the second

half of first grade (Weber & Longhi-Chirlin, 2001); (b) kindergarten Portuguese-speaking English-language learners in a Portuguese-English bilingual classroom "achieved a high level in literacy" across the year (Araujo, 2002, p. 245); and (c) one first-grade Latino English-language learner made gains similar to typically developing monolingual native-English speakers across one year (Fitzgerald & Noblit, 1999).

When reading development of individual children was examined in case studies, it was found that not all English-language learners made typical progress, just as not all monolingual native-English-speaking children achieved on grade level. For example, two case studies have shown that some first-grade Latino English-language learners lagged substantially behind typically developing monolingual native-English speakers (Fitzgerald & Noblit, 1999; Neufeld & Fitzgerald, 2001). Specifically, in Fitzgerald and Noblit's (1999) study, one of the first-grade Latino English-language learners began lower than the "norm" for monolinguals and ended the year lower than the "norm" on reading achievement. In Neufeld and Fitzgerald's (2001) study, three Latino English-language learner boys in the "low" reading group consistently performed more poorly than typically developing monolingual students.

What Might Development in Sound- and Word-Level Reading Subprocesses for Young English-Language Learners Look Like in Relation to That of Monolingual Native-English Speakers?

Eleven studies examined young English-language learners' word- and sound-level subprocess development in relation to that of monolingual native-English speakers (Chiappe & Siegel, 2006; Chiappe, Siegel, & Wade-Woolley, 2002; Fitzgerald, Amendum, & Guthrie, in press; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lesaux & Siegel, 2003; Lesaux, Rupp, &

Siegel, 2007; Lipka & Siegel, 2007; Manis, Lindsey, & Bailey, 2004; Muter & Diethelm, 2001; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006; Neufeld & Fitzgerald, 2001). Word- and sound-level subprocesses that have been studied and are pertinent to the present study were as follows: phonological awareness, phonics knowledge, and word-recognition strategies. On the whole, the results suggested that English-language learners' development in word- and sound-level reading subprocesses resembled that of monolingual native-English speakers.

What might development in phonological awareness for young English-language learners look like in relation to that of monolingual native-English speakers? Nine studies examined young English-language learners' development in phonological awareness in relation to monolingual native-English speakers' development (Chiappe & Siegel, 2006; Chiappe, Siegel, & Wade-Woolley, 2002; Fitzgerald, Amendum, & Guthrie, in press; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lesaux & Siegel, 2003; Lesaux, Rupp, & Siegel, 2007; Lipka & Siegel, 2007; Muter & Diethelm, 2001; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). On the whole, phonological awareness developed similarly for young English-language learners and monolingual native-English speakers, but there were some exceptions.

The participants were assessed on either a single phonological awareness measure by having the examinee listen to a lengthy sentence and write down letters for any sounds they heard, or a set of measures for phonological awareness, with tasks such as rhyme detection, syllable identification, phoneme identification, and phoneme deletion. The English-language learners predominantly spoke Spanish or Cantonese/Chinese as their home language. Other home languages were also represented, such as Punjabi, Gujerati, Hindi, Urdu, Japanese, Korean, Farsi, Slavi, and French. Their English-proficiency levels, where reported, ranged

from limited to advanced, according to the *Woodcock-Munoz Language Survey* (Woodcock & Munoz-Sandoval, 2001) (Fitzgerald, Amendum, & Guthrie, in press), *IDEA Proficiency Tests* (Dalton, Tighe, & Ballard, 1991) (Fitzgerald, Amendum, & Guthrie, in press), or *IPTI: Oral English Proficiency* (Dalton, Tighe, & Ballard, 1991) (Neufeld, Amendum, Fitzgerald, & Guthrie, 2006).

In some studies, kindergarten through third-grade English-language learners developed their phonological awareness similarly to that of monolingual native-English speakers (Chiappe & Siegel, 2006; Chiappe, Siegel, & Wade-Woolley, 2002; Lesaux & Siegel, 2003; Lesaux, Rupp, & Siegel, 2007; Muter & Diethelm, 2001; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). For example, in Neufeld, Amendum, Fitzgerald, and Guthrie's (2006) study, first-grade Latino English-language learners followed a similar trajectory for phonological awareness as that of their monolingual native-English-speaking peers for the second half of the school year.

Interestingly, in four studies in which phonological awareness was assessed using multiple measures (e.g., rhyme detection, syllable identification, phoneme identification, and phoneme deletion), the development of phonological awareness for kindergarten through fourth-grade English-language learners was similar to their monolingual native-English-speaking peers on all measures except for rhyme detection across two to five years (Chiappe & Siegel, 2006; Chiappe, Siegel, & Wade-Woolley, 2002; Lesaux & Siegel, 2003; Lesaux, Rupp, & Siegel, 2007). Initially the English-language learners performed lower on rhyme detection than their monolingual native-English-speaking counterparts. By the end of they had caught up with their monolingual counterparts. However, their lower performance level

on rhyme detection was not unexpected because it was closely related to their limited English oral proficiency.

While findings from some studies suggested similar developmental trajectories on phonological awareness for the English-language learners and their monolingual native-English-speaking peers, results from other studies revealed different developmental trajectories of phonological awareness for the two language groups. In several studies, English-language learners began the year performing more poorly than their monolingual native-English-speaking peers, and their growth exhibited a steep learning curve, ending the year performing equivalently with their monolingual counterparts (Fitzgerald, Amendum, & Guthrie, in press; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lipka & Siegel, 2007). Specifically, first- and second-grade Latino English-language learners performed lower on phonological awareness than their monolingual peers at Year 1 onset, and by Year 2 end, the two groups performed similarly (Fitzgerald, Amendum, & Guthrie, in press). Similar results were found in the other two studies conducted with first-grade students of predominant South Asian or Chinese ethic groups (Geva, Yaghoub-Zadeh, & Schuster, 2000) or with kindergarten children of predominant Cantonese/Chinese ethnic groups (Lipka & Siegel, 2007).

There was not sufficient information in the three studies to allow for an interpretation of why some English-language learners started lower than their monolingual peers. In any case, the results of all the studies that have been discussed for development in phonological awareness showed that English-language learners could reach the same level in phonological awareness as their monolingual peers.

What might development in phonics knowledge for young English-language learners look like in relation to that of monolingual native-English speakers? Only two studies examined young Latino English-language learners' development in phonics knowledge in relation to their monolingual native-English-speaking peers' development (Fitzgerald, Amendum, & Guthrie, in press; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). In both studies, the English-language learners made similar gains in their phonics knowledge as that of their monolingual native-English-speaking peers, although in one study, the English-language learners began and ended at a lower level.

Participants were assessed on phonics knowledge using different measures in the studies. In one study, the participants were asked to look at letters and letter combinations and then tell the sounds they made (Fitzgerald, Amendum, & Guthrie, in press). In the other, the participants were asked to read increasingly difficult graded passages, and the score for phonics knowledge was the percentage of visual miscues among the total miscues (Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). The English-language learners spoke Spanish as their home language. The English-language learners' English oral proficiency level, where reported, ranged from limited to proficient (for information about the measures, see the earlier section for phonological awareness).

In one study, first-grade Latino English-language learners made similar gains in phonics knowledge as their monolingual native-English-speaking peers across the second half of the school year and both groups ended with "reasonably high scores" (Neufeld, Amendum, Fitzgerald, & Guthrie, 2006, p.46). In the other, the developmental trajectory for phonics knowledge for first- and second-grade Latino English-language learners was the same as that of their monolingual native-English-speaking peers (Fitzgerald, Amendum, &

Guthrie, in press). However, the Latino students began Year 1 performing lower than their monolingual native-English-speaking peers, and consistently scored lower across two years, although regardless of time, the monolingual children outperformed the Latino English-language learners only by a slim margin. By Year 2 end, the respective means were 94.14 percentage points and 89.85 percentage points.

What might development in word-recognition strategies for young English-language learners look like in relation to that of monolingual native-English speakers? Six studies examined young English-language learners' development in word-recognition strategies in relation to monolingual native-English speakers' development over time (Chiappe & Siegel, 2006; Fitzgerald, Amendum, & Guthrie, in press; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lesaux, Rupp, & Siegel, 2007; Manis, Lindsey, & Bailey, 2004; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). On the whole, the findings suggested that the development of word-recognition strategies of young English-language learners was similar to that of monolingual native-English speakers over time, but there was one exception.

The participants were assessed on word-recognition strategies using standardized tests (e.g., *Wide Range Achievement Test-3* [Wilkinson, 1995], *Basic Sight Vocabulary* [Barr, Blachowicz & Wogman-Sadow, 1995], *Woodcock Reading Mastery Tests—Revised*, [Woodcock, 1987], Letter-Word Identification, [Woodcock & Johnson, 1989], high-frequency words, pseudoword reading, environmental print, experimental word recognition task). Spanish was the predominant home language for the English-language learners, although other language groups (Cantonese, Mandarin, Korean, Punjabi, Gujerati, Hindi, Urdu, Polish, Farsi, and Tamil) were also represented. The English-language learners'

English oral proficiency level, where reported, ranged from limited to proficient (for information about the measures, see the earlier section for phonological awareness).

In some studies, the English-language learners followed a similar growth trajectory in word-recognition strategies as monolingual native-English speakers and performed at similar levels on assessments for word-recognition strategies over time (Chiappe & Siegel, 2006; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lesaux, Rupp, & Siegel, 2007; Manis, Lindsey, & Bailey, 2004; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). Specifically, kindergarten through third-grade English-language learners of predominantly Cantonese, Mandarin, or Punjabi language groups made similar gains in word-recognition strategies as monolingual native-English speakers and ended at similar achievement levels (Chiappe & Siegel, 2006; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lesaux, Rupp, & Siegel, 2007). Comparable results were found in studies conducted with kindergarten through second-grade Latino English-language learners (Manis, Lindsey, & Bailey, 2004; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006).

One study, however, found somewhat different results (Fitzgerald, Amendum, & Guthrie, in press). First- and second-grade Latino English-language learners' development in reading words in isolation was different from that of their monolingual native-English-speaking peers. Although the English-language learners had a similar growth pattern as their monolingual native-English-speaking peers, the English-language learners consistently performed lower.

Interestingly, results from all the quantitative studies revealed a linear growth trajectory except one study (Lesaux, Rupp, & Siegel, 2007) in which the growth trajectory was non-linear. If the participants were followed longer in the other studies, a non-linear

growth trajectory might also have been found. As words became more complicated in higher grades and vocabulary demands increased, English-Language Learners struggled more.

What Might Development in Fluency and Comprehension for Young English-Language Learners Look Like in Relation to That of Monolingual Native-English Speakers? Compared to the number of studies which examined young English-language learners' development in the overall reading achievement and sound- and word-level reading subprocesses, few studies were found on young English-language learners' development in fluency and comprehension in relation to monolingual native-English speakers.

What might development in fluency for young English-language learners look like in relation to that of monolingual native-English speakers? Only one study examined young English-language learners' growth in fluency in relation to their monolingual native-English-speaking peers' growth (Fitzgerald, Amendum, & Guthrie, in press). The participants were timed for one minute reading a passage at their instructional reading level from increasingly difficult graded passages. The score was the number of words read correctly within one minute. The findings suggested that first- and second-grade Latino English-language learners had similar growth in fluency as their monolingual native-English-speaking peers, and their performance levels were similar across two years.

What might development in comprehension for young English-language learners look like in relation to that of monolingual native-English speakers? Only three studies examined young English-language learners' growth in comprehension in relation to their monolingual native-English-speaking peers' growth (Fitzgerald, Amendum, & Guthrie, in press; Hutchinson, Whiteley, Smith, & Connors, 2003; Manis, Lindsey, & Bailey, 2004). In all studies, the English-language learners made similar gains in comprehension to that of

monolingual native-English speakers, although in one study, the English-language learners began and ended at a lower level.

Comprehension was measured by having the student read the passage of increasingly difficult graded passages at the student's instructional reading level and answer the listed questions, or fill in a word or phrase that was missing. Spanish was the predominant home language. Other language groups that were represented were Gujerati, Urdu, Punjabi, Bengali, and Pashto. Where the English-language learners' English oral proficiency level was reported, it ranged from limited to advanced, according to the *Woodcock-Munoz Language Survey* (Woodcock & Munoz-Sandoval, 2001) and *IDEA Proficiency Tests* (Dalton, Tighe, & Ballard, 1991) (Fitzgerald, Amendum, & Guthrie, in press).

In two studies, reading comprehension for English-language learners developed similarly to that of monolingual native-English speakers (Fitzgerald, Amendum, & Guthrie, in press; Manis, Lindsey, & Bailey, 2004). Specifically, kindergarten through second-grade Spanish-speaking children in all-English (Fitzgerald, Amendum, & Guthrie, in press) and early Spanish-English early transition bilingual classrooms (Manis, Lindsey, & Bailey, 2004) made comparable gains in reading comprehension, and achieved similar performance levels to monolingual native-English speakers across two or three years.

In another study, the English-language learners made comparable growth as monolingual native-English speakers, but the English-language learners consistently performed lower (Hutchinson, Whiteley, Smith, & Connors, 2003). English-language learners' lower scores on comprehension, as the authors stated, may be partly due to the culture-bound test—the Neale Analysis of Reading Ability (Neale, 1997)—used in the study to measure comprehension.

What Might Development in Attitude toward Reading for Young English-Language Learners Look Like in Relation to That of Monolingual Native-English Speakers?

Only one study was found on the attitude toward reading over time among children of different ethnic groups (McKenna, Kear, & Ellsworth, 1995). In the study, 18,185 first- through sixth-grade students (84.4% Caucasian, 9.4% African-American, and 6.2% Hispanics) were assessed on their attitude toward reading using the Elementary Reading Attitude Survey (McKenna & Kear, 1990). No differences were found among Caucasian, African-American, and Hispanic students in relation to the negative trend of reading attitude, regardless of their cultural and linguistic backgrounds.

Little is known about young English-language learners' development in attitude toward reading in relation to monolingual native-English speakers over time, although considerable research has been done with monolingual native-English-speaking students in their development of attitude toward reading. Perhaps the growth trajectory of attitude toward reading for the monolingual students can shed light on growth for English-language learners. Below I briefly present the findings of the studies with monolingual native-English-speaking students.

The findings from research on monolingual students' growth in attitude towards reading over time were inconsistent. On the one hand, children's attitude toward reading exhibited a gradual but steady decline across elementary school years, beginning with a relatively positive attitude and ending in indifference (Barnett & Irwin, 1994; Guthrie & Greaney, 1991; Kush & Watkins, 1996; Lazarus & Callahan, 2000; McKenna, Kear, & Ellsworth, 1995; Smith, 1990; Sperling & Head, 2002; Swanson, 1985). For example, McKenna, Kear, and Ellsworth (1995) investigated the trend of attitude toward recreational

and academic reading among 18, 185 first- through sixth-grade students. The findings suggested that the students' attitude toward reading was relatively positive (indicated by the smiling Garfield) in Grade 1, but dropped significantly across elementary years. By Grade 6, their attitude had fallen to indifference (between the slightly smiling and slightly frowning Garfields).

On the other hand, some studies have shown no such decline. In one study, fifth-grade students expressed similar attitude toward reading as sixth-grade students (Wallbrown, Levine, & Engin, 1981). In the other, similar attitude was found among students in Grades 1-3, but more positive attitudes for fifth than for fourth graders (Parker & Paradis, 1986).

How might Student Socio-Economic Status and Gender be Related to Young English-Language Learners' Growth Compare to Their Monolingual Native-English-Speaking Peers' Growth as the Control Variables?

SES and early reading growth. There is substantial research evidence that consistently shows that SES significantly affects children's health, learning, and development (e.g., Aber, Bennett, Conley, & Li, 1997; Brooks-Gunn, Duncan, & Aber, 1997; Brooks-Gunn, Klebanov, & Duncan, 1996; Fryer & Levitt, 2004; Gershoff, 2003; Klerman, 1991). Low-SES children are more likely than non-low-SES children to exhibit developmental delays (Brooks-Gunn et al., 1997; Klerman, 1991) and begin kindergarten with significantly lower reading achievement (Gershoff, 2003; Lee & Burkham, 2002; West, Denton, & Germino Hausken, 2000).

At the same time, the relationship between student SES and reading development are more complex than is generally perceived. On the one hand, low-SES children increasingly lagged behind high-SES ones as they progressed through school (Fryer & Levitt, 2005;

Rathbun & West, 2004). On the other hand, although lower-SES children were more delayed in reading than high-SES children, they followed the same developmental trajectory during the school year (Alexander & Entwisle, 1996; Duncan & Seymour, 2000). So the achievement gap between the low-SES children and the high-SES ones persisted across time.

A small number of research studies has been found involving both SES and English-language learners in relation to reading achievement at one time point (Abedi, 2003; Brown, 2001; Cobo-Lewis, Pearson, Eilers, & Umbel, 2002; Krashen & Brown, 2005). Interestingly, in some cases, high-SES English-language learners outperformed low-SES monolingual native language-speaking peers on reading comprehension (Brown, 2001; Cobo-Lewis, Pearson, Eilers, & Umbel, 2002), suggesting that SES may be a more critical factor for English-language learners' reading performance than is language status.

Only one study dealt with the relationship between SES, English-language learners, and word-reading *growth* (D'Angiulli, Siegel, & Maggie, 2004), in which children in all-English classrooms were followed from kindergarten to Grade 5 with literacy-intensive instruction from the onset of kindergarten. Findings from the study revealed complex relationships between SES, language status, and word-reading ability development. Specifically, middle-SES English-language learners and monolingual English-speaking children improved similarly as they progressed through Grade 5. However, although the high-SES/low-SES monolinguals outperformed the high-SES/ low-SES English-language learners at kindergarten onset, the English-language learners made more progress across six years.

To summarize, the relationship among SES, language status, and early reading development is complex. Low-SES monolingual students began lower than high-SES

students, and the gap often persisted or widened over time. High-SES English-language learners sometimes outperformed low-SES native-English-speaking counterparts on reading comprehension at one time point. While middle-SES English-language learners' reading growth might be similar to their monolingual English-speaking children's growth, the low-SES/high-SES English-language learners' reading growth was sometimes accelerated compared to their monolingual English-speaking children's growth. Thus, it is important to control for SES when studying the relationship between language status and reading growth.

Gender and reading growth. Relationship between monolingual gender and reading development has been well researched and results were mixed. Researchers argued that girls consistently outperformed boys on reading achievement across grade level as well as reading growth across year (e.g., Bond & Dykstra, 1997; Cloer & Dalton, 2001; Klecker, 2006; Lynch, 2002). However, in one study, researchers found that there were significant differences in letter identification and word recognition between boys and girls in kindergarten and first grade, with boys scoring lower, but the gap disappeared after first grade (Siegel & Smythe, 2005). The disappearance of differences might be that girls matured earlier than boys, so they already had more advanced skills when boys were still developing them. By the end of first grade, boys caught up.

Although information about gender is commonly reported in the limited number of studies on English-language learners' reading (Gerber, Jimenez, Leafstedt, Villaruz, Richards, & English, 2004; Lesaux, Koda, Siegel, & Shanahan, 2006; Lesaux, Rupp, & Siegel, 2007; Manis, Lindsey, & Bailey, 2004; Stuart, 2004; Swanson, Saez, & Gerber, 2006), none of the studies have included gender as a control variable in the analyses to partial out its potential correlation with reading growth as well as its potential interaction with language status on

reading growth. However, because gender is an important factor in early reading, it would be important to control for gender when studying the relationship between language status and reading growth.

Critique of Methodologies Used in Research Literature

In this section, I critique the methodologies used in the research literature on reading development for young English-language learners in relations to that for monolingual native-English speakers.

First, very limited research has been done on young English-language learners' reading development in relation to typically developing monolingual native-English speakers over time. Eleven studies were included in the present literature review on development of phonological awareness, eight in overall reading achievement, six in word-recognition strategies, three in comprehension, one in fluency, and one in attitude toward reading. Phonological awareness was the most researched area, and fluency and attitude toward reading were the least. Thus, more research is needed for examining young English-language learners' reading development in relation to typically developing monolingual native-English speakers over time, especially in the area of phonics knowledge, fluency, comprehension, and attitude toward reading. In doing so, it might help us better understand how the development in various aspects of reading for young English-language learners progresses relative to that for monolinguals, thus providing a fuller picture of the developmental trajectories in reading for young English-language learners. Also, it might be helpful to inform theory formulation and classroom instruction.

Second, researchers of the quantitative studies have tended to use repeated-measures analyses of variance (RM-ANOVA) or repeated-measures multivariate analyses of variance

(RM-MANOVA) to analyze data. RM-ANOVA and RM-MANOVA require complete data for each participant across all time points and assume homogeneity of variances for the participants in each group. For instance, regarding reading development for English-language learners compared to that of monolingual native-English-speaking peers, the assumption is that all English-language learners progress similarly and so do all monolingual native-English-speaking children. However, in reality, individual students in the same group might not begin at the same level in reading and progress at the same rate. Further, it might be important to include the students in data analysis who had valid data for at least one time point in order to determine if leaving them out of the study might bias the results.

Further, RM-ANOVA and RM-MANOVA do not reflect the potential differences in reading development between students at different schools. When more than one school is involved in a study, the characteristics of the schools might affect the students' academic performance. However, the nested structure (e.g., students nested within schools, time nested within students) has not been taken into account in the prior research that used RM-ANOVA and RM-MANOVA. It would be helpful to incorporate the nested structure to look at the variances among schools as well as among students. One way to reflect individual differences and the nested structure is to use multilevel modeling.

Third, many authors did not describe the school setting where the studies were conducted, such as location, ethnic composition, SES, and other important school characteristics that might impact students' achievement. In some cases, the authors just stated the school setting with one sentence, for instance, the study was conducted in a specified number of schools in an unidentified metropolitan area. More demographic

information about the school setting would provide important information about the characteristics of the schools the participants attended.

Fourth, with regard to participants, some authors did not report the salient features of the participants, such as English oral proficiency, literacy level in their home language, country of birth, length of stay in their new country, amount of English-as-a-second-language services received, SES, mothers' highest educational level, which are important factors that might affect English-language learners' reading acquisition. More information about the English-language learners' characteristics would provide a fuller picture of the participants involved in the studies.

Fifth, most English-language learners' spoke Spanish as their home language, though other minority language groups were also represented. More studies on English-language learners speaking a different home language other than Spanish would be useful to capture similarities or differences of the reading growth among diverse ethnic and linguistic groups compared to the monolingual native-English speakers.

Sixth, type of instruction the English-language learners received was not reported by many authors. Where instruction was reported, the majority was balanced literacy instruction. However, "balanced" was often not described and may have been interpreted differently by various researchers. Reporting details about literacy instruction would provide readers with information about classroom context within which the English- language learners' learning about reading occurs.

Finally, as for the measures used to assess reading skills, a lack of report on validity and reliability estimates of the measures in some of the studies limited the legitimacy of the interpretations of the results.

Summary

In summary, a small number of studies on early reading development for English-language learners in relation to that of typically developing monolingual native-English speakers suggested that, on the whole, the development in reading achievement, reading subprocesses (word- and sound-level subprocesses, fluency, and comprehension), and attitude toward reading for young English-language learners could be similar to that for typically developing monolingual native-English speakers. Additionally, SES and gender might be important factors in English-language learners' reading development as control variables.

More research is needed to examine reading growth for young English-language learners in relation to that of their monolingual native-English-speaking peers, especially in the areas of phonics knowledge, fluency, and attitude toward reading. Further, individual differences in reading development and nested structure (e.g., students nested within schools, time nested within students) need to be taken into consideration.

Additionally, it would be helpful to report sufficient information about the following: school setting, salient features of the participants, reading growth of English-language learners with home languages other than Spanish, instruction the English-language learners receive, and validity and reliability estimates of the measures.

The present study is a moderate step toward helping us better understand English-language learners' early reading development in comparison with their monolingual native-English-speaking peers' development. The present study was designed to address some of the gaps in the current research on early reading development for English-language learners in relation to that for monolingual native-English speakers. Specifically, the present study

examined first- through second-grade English-language learners' reading growth compared to their monolingual native-English-speaking peers' growth across two years. With a two-year repeated measures design, data were collected from 746 monolingual native English-speaking students and 154 English-language learners in first and second grade at 16 high-poverty low-performing schools in the southeastern region of the United States. Students who began Year 1 in first and second grade were followed into second and third grade in Year 2. Five reading assessments were administered at the beginning, middle, and end of each year (except for phonological awareness, which was assessed on students who began Year 1 in first grade in Year 1 only). The five reading measures were a) *Oral Reading of Successively Difficult Passages* (Bader & Weisendanger, 1994; Barr, Blachowicz & Wogman-Sadow, 1995; Clay, 1993); b) *Basic Sight Vocabulary* (Barr et al., 1995); c) *Hearing Sounds in Words* (Clay, 1993; Johnston, 1992); d) *Phonics Knowledge* (adapted from Shefelbine, 1995), and e) *Attitude toward Reading* (Fitzgerald, 2001; Fitzgerald et al., 2002). These assessments were selected, in part, to address the lack of research on English-language learners' fluency, comprehension, and attitude toward reading. A series of hierarchical linear models was conducted.

Findings might inform researchers and educators adapt pre-existing theories or perspectives for first language early reading development and apply to English-language learners. Such knowledge might as well guide practitioners in making instructional plans. Also, findings regarding growth in attitude toward reading might be interesting by incorporating variables in affective domain as well as cognitive domain in examining English language learners' early reading development.

CHAPTER 3

METHODS

In the chapter that follows, I first present the research design. Then, I detail the schools and participants. Finally, I provide data sources, variables, and associated reliability estimates.

Design

The design was a two-year repeated measures design. Data were collected from 746 monolingual native English-speaking students and 154 English-language learners in first and second grade at 16 high-poverty low-performing schools in the southeastern region of the United States. Students who began Year 1 in first and second grade were followed into second and third grade in Year 2. Five reading assessments were administered at the beginning, middle, and end of each year (except for Phonological Awareness, which was assessed on students who began Year 1 in first grade in Year 1 only). The five reading measures were a) *Oral Reading of Successively Difficult Passages* (Bader & Weisendanger, 1994; Barr, Blachowicz & Wogman-Sadow, 1995; Clay, 1993); b) *Basic Sight Vocabulary* (Barr et al., 1995); c) *Hearing Sounds in Words* (Clay, 1993; Johnston, 1992); d) *Phonics Knowledge* (adapted from Shefelbine, 1995), and e) *Attitude toward Reading* (Fitzgerald, 2001; Fitzgerald et al., 2002). Table 3.1 provides information about the year in which the measures were administered by cohort. A series of hierarchical linear models was conducted.

Schools and Participants

Schools

The 16 schools were located in the coastal, southern, and central part of a southeastern region of the United States. Table 3.2 provides selected demographic information for the schools (United States Census, 1990, 2000). The size of the communities where the schools were located ranged from 278 (School 15) to 540,828 residents (School 3), with a median of 7,672. The geographic location and local economies varied across schools. Most schools were located in rural areas where farming (Schools 13, 15, and 16) or factories or textile mills (Schools 1, 2, 4, 6, 9, 10, 11, and 12) was the major industry. The other schools were located in cities (Schools 3, 7, and 8) or a small town known for tourism (School 14), or near a military base (School 5). The median income ranged from $13,700 (School 13) to $40,697 (Schools 4 and 6). The procedure for screening possible school outliers will be described in the analyses section below.

School enrollments ranged from 83 (School 14) to 735 students (School 16), with a median of 400 students. In 10 (Schools 3, 5, 6, 7, 8, 9, 10, 11, 12, 16) out of the 16 schools, African American students comprised the majority of the student population, ranging from 61% (Schools 6 and 7) to 98% (School 10). In two schools, the student population was predominantly comprised of Caucasian of European Descendent (81% and 62% for Schools 14 and School 4, respectively). Four schools (32%, 23%, 22%, and 16% for Schools 1, 2, 3, and 14, respectively) had a relatively higher percentage of Latino students compared to the others.

The ethnic diversity of each of the 16 schools varied, with the Herfendahl Index (Gibbs & Marin, 1962) ranging from 0.0394 (School 10) to 0.6533 (School 2). The Herfendahl Index is an index commonly used in social science research to represent ethnic diversity (ED). It is calculated based on the formula developed by Gibbs and Martin (1962),

$ED_k = 1 - \sum_{1}^{j=J} G_j^2$ where G represents the proportion of the school of ethnic group *j* out of *J* ethnic groups. Then it is subtracted from 1, which makes it a measure of ethnic diversity. A higher value represents a higher degree of ethnic diversity. The possible range was from 0 to 1. Eleven schools were somewhat diverse in ethnicity, with the Herfendahl Index ranging from 0.2478 (School 5) to 0.5414 (School 6), and the majority of the student population being a mixed composition of either Caucasian of European Descendent and African American (Schools 4, 5, 6, 7, 8, 9, 13, 15, and 16), Caucasian of European Descendent and Latino (School 14), or African American and Latino (School 3). Two schools (School 2, 0.6533, and School 1, 0.649) appeared to most ethnically diverse, with the student population being a mixed composition of African American, Caucasian of European descendent, and Latino (School 1, 46%, 19%, and 32, respectively; School 2, 33%, 43%, and 32%, respectively). Three schools tended to be the least ethnically diverse (School 10, 0.0394, School 12, 0.0586, and School 11, 0.0768), with the majority of their students being African American (98%, 97%, and 96%, respectively). The percentage of students who qualified for free or reduced lunch ranged from 68% (School 2) to 97% (School 8).

Participants and Selection

The participants were 900 children from first and second-grade classrooms at 16 schools. Approximately 25% of all of the enrolled children in each participating classroom were randomly selected. Due to missing data and attrition, not all participants were assessed for two consecutive years. Of the 856 children whose information about gender was available, 435 were female, and 421 were male. Ethnicities included African-American (60.6%), Caucasian of European descent (20.8%), Latino (16.8%), multiple ethnicity (0.9%), Asian (0.6%), and Native American (0.2%). Of the 280 children whose information about

their mothers' highest education level was available, 61.8% of the mothers had completed high school, 16.1% had some high school education, 12.5% had some college education, 6.8% held a bachelor's degree, 2.5% did not complete 6th grade, and 0.4% had a master's or doctoral degree. Approximately 79.2% of the children qualified for subsidized lunch.

Among the 900 participants, 746 were monolingual native English-speaking children (375 first graders, 371 second graders), and 154 were English-language learners (73 first graders, 81 second graders). The information about gender, ethnicity, and eligibility for subsidized lunch for each language group is as follows. The gender composition for each group was about the same (for monolingual native English speakers, 49.9% female, 50.1% male; for English-language learners, 55.0% female, 45.0% male). With regard to the ethnic make-up for each group, for monolingual native English speakers, African Americans (71.4%) and Caucasians of European Descendants (24.6%) comprised the major ethnic groups. For English-language learners, Latino children (93.0%) were the predominant ethnic group. About 76.9% of the monolingual native English speakers and 88.6% of the English-language learners qualified for subsidized lunch. All participants in the present study received only English instruction in all mainstream classrooms.

Below I provide information that is unique to English-language learners. About 51.7% of the English-language learners received English-as-a-second-language services. Of the 85 English-language learners whose information about home language was available, 88.2% spoke Spanish, 7.1% spoke English, 3.5% spoke both English and Spanish, and 1.2% spoke Chinese or Laos. Of the 84 English-language learners whose information about country of birth was available, 51.2% were born outside of the United States, with the majority born in Mexico (46.4%). The length of time the foreign-born children had stayed in

the U.S. ranged from less than one year to seven years, with a mean of 2.7 years. Of the 50 English-language learners whose information about native language competence was available, their mean score on the test was 5.63 (*SD* = 1.61), ranging from 2.67 (non-English speaker) to 9.92 (fluent English speaker).

Reading Measures, Validity, Variables, and Associated Reliability Estimates

Five reading measures were selected to assess students' overall achievement level, reading subprocessess, and attitude toward reading. They were the following: a) *Oral Reading of Successively Difficult Passages* (Bader & Weisendanger, 1994; Barr, Blachowicz & Wogman-Sadow, 1995; Clay, 1993); b) *Basic Sight Vocabulary* (Barr et al., 1995); c) *Hearing Sounds in Words* (Clay, 1993; Johnston, 1992); d) *Phonics Knowledge* (adapted from Shefelbine, 1995), and e) *Attitude toward Reading* (Fitzgerald, 2001; Fitzgerald et al., 2002). The measures were individually administered to participants in a counterbalanced fashion.

Although the validity (content, criterion, and construct) of the measures used in the present study had never been evaluated statistically, the measures might have face validity, ecological validity, curricular validity, and/or population validity (Fitzgerald, Amendum, & Guthrie, in press). First, the measures may have face validity and ecological validity as they captured the critical features of early reading development and represented the typical early reading assessments in primary grade classrooms. Second, with regard to curricular validity, the measures were aligned with early reading curricular objectives. Third, the measures might have population validity as the sample in the present study was representative of the population of monolingual native English-speaking children and English-language learners in the mainstream classrooms nationwide.

To determine the interrater reliability estimates, the following procedures were followed (Fitzgerald, 2004). First, to ensure the faithfulness of test administration and scoring, research assistants scored alongside with the assessors for about 35% of all test occasions. Agreements in scoring ranged from .83 to 1.00. Second, approximately 10% of the students within each classroom were selected at each wave of assessments and research assistants re-scored all assessments for the selected children. Reliability estimates were the proportions of times the assessor agreed with the research assistant, ranging from .83 to .98.

Seven reading variables were created: Instructional Reading Level, Phonological Awareness, Phonics Knowledge, Reading Words in Isolation, Fluency, Comprehension, and Attitude toward Reading. In the following section, I describe each variable, the data source from which the variable was created, and the associated reliability estimate. Table 3.3 provides the detailed information about the variables (Fitzgerald, 2004).

Instructional Reading Level. For *Oral Reading of Successively Difficult Passages* (Bader & Weisendanger, 1994; Barr et al., 1995; Clay, 1993), each student was asked to read aloud graded passages with increasing difficulty from the *Bader Reading and Language Inventory* (Bader & Weisendanger, 1994), while the assessor recorded miscues on a separate sheet of the passage (Barr et al., 1995; Clay, 1993). Instructional Reading Level was obtained using Clay's (1993) method, being the highest level at which the student read with at least 90% accuracy in word recognition. A score of "0" indicated that a student did not pass reading passage even at the lowest level; .25 indicated approximately a pre-primer level, for a typically developing child, achieved around the beginning of first grade; .50 indicated approximately a primer level, achieved by a typically developing child around the middle of first grade; 1.00 approximately end-of-first-grade level; 2.00 approximately end-of-second-

grade level; and so on. The interrater reliability estimate for Instructional Reading Level was .86 for perfect agreement, and .95 within one level.

Phonological Awareness (Clay, 1993; Johnston, 1992). On the *Hearing Sounds in Words* (Clay, 1993; Johnston, 1992) test, the assessor slowly read a lengthy sentence containing 37 sounds and asked the students to write down letters for any sounds they heard. An answer was rated correct as long as a letter was written for a sound in a word regardless if the letter was correct or not or order of the letters. For example, the possible raw scores ranged from 0 to 37, and were converted to percent correct scores. The interrater reliability estimate was .86 within 5 percentage points.

Phonics Knowledge (Shefelbine, 1995). On the *Phonics Knowledge* (Shefelbine, 1995) test, students looked at lists of letters and letter combinations while the assessor made statements with prompts such as, "Look at these letters and tell me what sound they make," and "Tell me the short sounds of these letters." The following items were included: consonants, consonant digraphs, long and short vowels, consonant blends, r-controlled vowels, and common phonograms (e.g., in, ine). The possible raw scores ranged from 0 to 67 and were converted to percent correct scores. The interrater reliability estimate was .92 within five percentage points.

Reading Words in Isolation. On the *Basic Sight Vocabulary* (Barr et al., 1995) test, each student was asked to look at lists of words in rank order by difficulty and say them aloud. If the student missed more than two words on a list, he/she was asked to read a lower list (or lists). A word was scored correct if the student said it aloud correctly within three seconds. Raw score was calculated by adding up the number of words read correctly and any unread words on lower lists (assuming that if student could read more difficult lists, they

could also read less difficult lists). The range of possible raw scores was from 0 to 220. The raw scores were converted to percent correct scores. The interrater reliability estimate was .93 within five percentage points.

Fluency (Barr et al., 1995; Clay, 1993). Using the *Oral Reading of Successively Difficult Passages* (Bader & Weisendanger, 1994; Barr et al., 1995; Clay, 1993) at the child's Instructional Reading Level, the assessor timed the student's reading for one minute. The score was the number of words read correctly within one minute. The interrater reliability estimate was .95 within five points.

Comprehension (Barr et al., 1995; Clay, 1993b). Using the *Oral Reading of Successively Difficult Passages* (Bader & Weisendanger, 1994; Barr et al., 1995; Clay, 1993) at the child's Instructional Reading Level, the assessor asked comprehension questions listed in the Bader Reading and Language Inventory (Bader & Weisendanger, 1994). The score for Comprehension was obtained by calculating the percent of correctly answered questions. The interrater reliability estimate was .83 within five percentage points.

Attitude toward Reading (Fitzgerald, 2001; Fitzgerald et al., 2002). On the *Attitude toward Reading* questionnaire, the student looked at a question while listening to the assessor read it (e.g., "How do you feel when it's time for reading in school?"). The student then responded by circling one face from five faces in a row with varying degrees of smiles to frowns. The score was the mean across all items, ranging from 1 to 5. The interrater reliability estimate was .95. (See Appendix A for the questionnaire).

CHAPTER 4

ANALYSES AND RESULTS

In this chapter, I first present the overview of the statistical models and the sequence of analyses for seven sets of statistical models. Then, I detail preliminary analyses including screening potential school outliers, examining normality of distributions and descriptive statistics for each reading variable by language status and cohort, descriptive statistics for each reading variable by gender and SES, between-variable correlations at each time point, linear relationships between time and each reading variable by cohort, and power analysis. Next, I present the results from seven sets of statistical models to address the research questions in order: a) How does first- and second-grade English-language learners' growth in Instructional Reading Level compare to their monolingual native-English-speaking peers' growth across two years; b) How does first- and second-grade English-language learners' growth in selected reading subprocesses (sound- and word -level reading subprocesses, Fluency, and Comprehension) compare to their monolingual native-English-speaking peers' growth across two years; and c) How does first- and second-grade English-language learners' growth in Attitude toward Reading compare to their monolingual native-English-speaking peers' growth across two years? I conclude the chapter with a summary of the findings.

Overview of Statistical Models and Sequences of Analyses

For each of the seven reading outcomes, the main hypothesis of interest focused on the growth patterns for the English-language learners compared to their monolingual native-English-speaking peers, represented by the language status by time interaction. If the growth

patterns were similar, a secondary hypothesis concerned the difference in the performance levels on each reading variable between the English-language learners and their monolingual native-English-speaking peers, represented by the conditional effect of language status.

Seven sets of three-level hierarchical linear growth models (HLM; Raudenbush & Bryk, 2002) were run to address the research questions. Students were nested within schools, and time nested within students. The dependent variables for each set of models were Instructional Reading Level; Phonological Awareness, Phonics Knowledge, and Reading Words in Isolation representing sound- and word-level reading subprocesses; Fluency; Comprehension; and Attitude toward Reading, respectively.

I followed a three-step procedure to formulate the final seven models. First, an unconditional model was estimated. The model was as follows: each reading variable (Instructional Reading Level, Phonological Awareness, Phonics Knowledge, and Reading Words in Isolation, Fluency, Comprehension, and Attitude toward Reading) as the dependent variable; time (six time points total) as the level 1 (within-student) predictor; and random intercept and slope for level 2 (students within schools) and level 3 (between schools), assuming that the individual initial status and reading growth rate varied significantly between students, and the school mean initial status in reading and the mean reading growth rate varied significantly between schools.

Next, a full conditional model was estimated by adding level 2 predictors and selected interactions. Prior to moving on to model specification, it would be helpful to explain why interactions involving cohort were included in the full conditional model. There were two cohorts in the present study. The first-grade cohort involved those students who began Year 1 in first grade and went to second grade in Year 2. The second-grade cohort involved those

students who began Year 1 in second grade and went to third grade in Year 2. For the present study, there was no hypothesis involving cohort. However, if cohort significantly interacts with language status and/or time, it would be necessary to know and not ignore the possibility. Therefore, the three-way interaction (language status by time by cohort interaction) and all the two-way interactions (language status by time, language status by cohort, and cohort by time) involved in it were included in the full conditional model to explore their significance.

The model was as follows: each reading variable as the dependent variable; time as the level 1 predictor; language status (0 = monolingual native-English speaker, 1 = English-Language Learner) as the level 2 predictor, cohort (0 = first-grade cohort, 1 = second-grade cohort), SES (mean centered, -1 = low-SES, represented by students who qualified for free or reduced lunch, 1 = high-SES, represented by students who qualified for full pay for lunch), and gender (mean centered, -1 = female, 1 = male) were the level 2 control variables; language status by time interaction, cohort by time interaction, language status by cohort interaction, language status by time by cohort interaction; and random intercept and slope for level 2 and level 3. In addition, the models for Fluency and Comprehension also had Instructional Reading Level as the level 1 covariate.

Finally, the third sets of final seven models were run. Because the interactions involving cohort were not the hypothesis of interest, in order to get the most parsimonious model for the final analysis, the non-significant three-way interaction and any subsequent non-significant two-way interaction involving cohort were dropped from the full model, assuming that the non-significant interactions were null effects. In the Results section I provide the final statistical model for each of the seven models.

Results

In this section, I first describe the preliminary analyses. The preliminary analyses began with screening potential school outliers. Next I examine whether the variables were conforming to expectations. I examine normality of distributions and descriptive statistics for each reading variable by language status and cohort, descriptive statistics for each reading variable by gender and SES, between-variable correlations at each time point, linear relationships between time and each reading variable by cohort, and power analysis. Then, I present the results for each set of statistical models to address the research questions in order.

Preliminary Analyses

Potential School Outliers

I followed a four-step procedure to screen and analyze possible school outliers. First, demographic descriptive statistics of the 16 school as shown in Table 3.2 were examined. Initially six schools (4, 10, 11, 12, 14, and 15) appeared to be outliers. Schools 4 and 15 had extreme low percentage (46% and 41% respectively) of students eligible for subsidized lunch compared to the other schools. School 14 appeared to have an extreme low enrollment (83 students) as a kindergarten through twelfth grade school. Student population in Schools 10, 11, and 12 tended to be extremely homogeneous in ethnic composition (Herfendahl Index, 0.0394, 0.0768, and 0.0586, respectively). Second, descriptive statistics for each of the reading outcomes (see Chapter 3) by school at each time point were obtained, resulting 672 means and standard deviations. Third, means and standard deviations for the six potential school outliers were examined by comparing them visually with the remaining 10 schools at each time point. All six schools appeared to behave similarly to the others. Consequently, a decision was made to retain the six possible school outliers in the data analysis.

Normality of Distributions

I followed a five-step procedure to examine the normality of distributions for each reading variable at each time point by cohort and language status. Although some reading variables such as the Instructional Reading Level and Attitude toward Reading were actually ordinal variables, for the purpose of the present study, it was plausible to run the statistical models by treating them as continuous variables (Bauer, Personal Communication, 2008). First, a total of 162 sets of skewness (standard errors), kurtosis (standard errors), and the corresponding graphs were obtained for each of the reading variables at each time point by cohort and language status. Second, the normality of each set of skewness and kurtosis statistics and the corresponding graphs were examined.

On the whole, the distributions for Instructional Reading Level appeared to be significantly positively skewed across time—possibly due to the floor effect of the measure for Instructional Reading Level, which artificially restricted how low the score could be (zero in this case).

The distributions for Phonological Awareness appeared to be significantly negatively skewed across time for the monolinguals—possibly due to the ceiling effect of the measure for Phonological Awareness, which artificially restricted how high the score could be (100 percentage points in this case). The distributions appeared to be positively skewed at Time Point 1 and normal at Time Point 2 and Time Point 3 for the English-language learners.

The distributions for Phonics Knowledge appeared to be significantly negatively skewed across time—possibly due to the ceiling effect of the measure for Phonics Knowledge, which artificially restricted how high the score could be (100 percentage points in this case).

On the whole, the distributions for Reading Words in Isolation appeared to be significantly negatively skewed—possibly due to the ceiling effect of the measure for Reading Words in Isolation, which artificially restricted how high the score could be (100 percentage points in this case). The distributions were normal for the English-language learners in the second-grade cohort at Time Point 1 and Time Point 2, and for the English-language learners in the first-grade cohort at Time Point 3. The distributions were significantly positively skewed for the monolinguals and English-language learners in the first-grade cohort at Time Point 1 and Time Point 2—possibly due to the floor effect of the measure for Reading Words in Isolation, which artificially restricted how low the score could be (zero in this case).

The distributions for Fluency were normal at selected time points and significantly positively skewed at the remaining time points—possibly due to the floor effect of the measure for Fluency, which artificially restricted how low the score could be (zero in this case). The distributions were normal at the following time points by language status and cohort: Time Point 1, both language groups in the first-grade cohort, English-language learners in the second-grade cohort; Time Point 2, English-language learners in both cohorts; Time Point 4, English-language learners in the second-grade cohort; Time Point 5, both language groups in the first-grade cohort, English-language learners in the second-grade cohort; and Time Point 6, both language groups in the second-grade cohort and English-language learners in the first-grade cohort.

The distributions for Comprehension were normal at selected time points and significantly negatively skewed at the remaining time points—possibly due to the ceiling effect of the measure for Comprehension, which artificially restricted how high the score

could be (100 percentage points in this case). The distributions were normal at the following time points by language status and cohort: Time Point 1, English-language learners in the first-grade cohort and both language groups in the second-grade cohort; Time Point 3, English-language learners the second-grade cohort; Time Point 4, monolinguals in the second-grade cohort; Time Point 5, monolinguals in the second-grade cohort; and Time Point 6, both language groups in the second-grade cohort.

Attitude toward Reading appeared to be significantly negatively skewed for both language groups in both cohorts across time—possibly due to the ceiling effect of the measure for Attitude toward Reading, which artificially restricted how high the score could be (five points in this case).

The fixed effects estimates obtained from a hierarchical linear model tend to be robust to violation of the normality assumption, as long as the model for the conditional mean is sufficiently linear (additive). The variance and covariance parameters will not necessarily be robust, nor will the standard errors (Tibaldi, Verbeke, & Molenberghs, 2007). Therefore, a decision was made to proceed to analyze data using multilevel hierarchical models.

Means, Standard Deviations, and Correlations

Means and standard deviations for each reading variable by language status and cohort. Tables 4.1-4.7 show the means (standard deviations) and marginal means (standard deviations) for each reading variable by language status and cohort at each time point. On the whole, as would be expected, the students made gains in all reading outcome except Comprehension across time. First, it is notable that the students made remarkable progress in Instructional Reading Level across two years. As shown in Table 4.1, the monolinguals

began Year 1 reading at about end-of-first-grade level (0.92), and ended Year 2 at about February of sixth-grade level (5.66). The English-language learners began at about February of first-grade level (0.65), and ended at about mid-fifth-grade level (4.44). The first-grade cohort performed at a pre-primer level (0.20) at Year 1 onset, and by Year 2 end, they were reading at about a beginning-of-fifth-grade level (4.05). The second-grade cohort performed at about mid-second-grade level (1.58) at Year 1 onset, and by Year 2 end, they were reading at about an end-of-seventh grade level (6.88).

Second, on average, the students made good progress in the sound- and word-level reading subprocesses over time. For Phonological Awareness, as shown in Table 4.2, it was noteworthy that the English-language learners made rapid progress, with 27.52% points at the beginning and 71.38% points in the end. As would be expected, the monolinguals improved from 52.02% points to 79.12% points. For Phonics Knowledge, as shown in Table 4.3, it was amazing that the English-language learners made rapid progress across two years. The monolinguals scored 57.51% points at Year 1 onset, and ended at 90.74% points. The English-language learners began Year 1 at 47.42% points, and ended Year 2 at 86.84% points. The first-grade cohort improved from 41.35% points to 88.82% points. The second-grade cohort improved from 70.57% points to 91.30% points, which was approaching the ceiling level as expected for a typically developing child to achieve by the end of third grade. For Reading Words in Isolation, as shown in Table 4.4, the monolinguals improved from 44.56% points to 93.32% points which was almost the ceiling level and the English-language learners improved from 31.41% points to 85.36% points. The first-grade cohort began Year 1 at 18.62% points and ended Year 2 at 89.09% points. The second-grade cohort began at

68.26% points and ended at 94.74% points, approaching the ceiling level as expected for a typically developing child to achieve by the end of third grade.

Third, for Fluency, as shown in Table 4.5, the unadjusted means for the monolinguals increased from 58.02 words correct per minute to 73.06 words correct per minute—between the 25th (61 words correct per minute) and 50th percentile (89 words correct per minute) for second grade and the 25th percentile (78 words correct per minute) for third grade on the national spring oral reading fluency norms (Hasbrouck & Tindal, 2006). The English-language learners began with 59.62 words correct per minute and ended Year 2 with 64.86 words correct per minute—about the 25th percentile (61 words correct per minute) for second grade and between the 10th percentile (48 words correct per minute) and 25th percentile (78 words correct per minute) for third grade on the national spring oral reading fluency norms. The first grade cohort began Year 1 with 44.29 words correct per minute and ended Year 2 with 66.99 words correct per minute—about the 25th percentile for second grade on the national spring oral reading fluency norms. The second grade cohort began Year 1 with 61.39 words correct per minute and ended Year 2 with 76.21 words correct per minute—about the 25th percentile for third grade on the national spring oral reading fluency norms.

Fourth, the unadjusted marginal means on Comprehension declined slightly by language status and by cohort across time. As we know from the means and ranges for IRL, at Year 2 end, the students were reading more difficult passages that were above their actual grade level. The monolinguals began Year 1 with 64.89% points, and ended Year 2 with 59.27% points. The English-language learners began Year 1 with 68.87% points, and ended Year 2 with 64.60% points. The first-grade cohort began Year 1 with 73.61% points, and

ended Year 2 with 67.44% points. The second-grade cohort began Year 1 with 62.99% points, and ended Year 2 with 53.00% points.

Finally, Attitude toward Reading, on the whole, remained fairly high for the students across two years (range: 4.03 - 4.65, see Table 4.7). The monolinguals began Year 1 with 4.42 points, and ended Year 2 with 4.54 points. The English-language learners began with 4.17 points, and ended with 4.58 points. The first-grade cohort began with 4.28 points, and ended with 4.56 points. The second-grade cohort began with 4.47 points, and ended with 4.53 points.

Examining linear relationships between time and each reading variable by cohort. A graph was created for each of the seven reading variables to examine whether the relationship between time and the means of each reading variable for each cohort looked linear. For each cohort, time was on the x-axis and the mean of each reading variable was on the y-axis. A total of thirteen graphs were created (for phonological awareness, only the first-grade cohort was included in the study). Each graph was visually examined to see if the increasing or decreasing trend of the means of each reading variable for each cohort appeared linear. All graphs appeared to show linear relationships between the reading variables and time for each cohort. A decision was made to conduct linear models.

Means and standard deviations for each reading variable by gender and SES. Table 4.8 shows the unadjusted means and standard deviations for each reading variable and adjusted means and standard deviations for Fluency and Comprehension by SES at each time point. As would be expected, high-SES students scored higher than low-SES students on Instructional Reading Level, sound- and word-level reading subprocesses, and Fluency. However, the unadjusted Comprehension means for high-SES students were lower than low-

SES students at each time point. For Attitude toward Reading, high-SES students scored lower than low-SES students Time Points 2, 4, 5 and 6. That high-SES students scored lower than low-SES students indicates that low-SES surpassed high-SES students at later time points.

Table 4.9 shows the unadjusted means and standard deviations for each reading variable and adjusted means and standard deviations for Fluency and Comprehension by gender at each time point. As would be expected, female students scored higher than male students on Instructional Reading Level, sound- and word-level reading subprocesses, Fluency, and Attitude toward Reading. However, as indicated by the unadjusted means for Comprehension, female students scored higher than male students only at selected time points (Time Points 2, 3, and 6), indicating that male students caught up with female students at the remaining time points.

Correlations. Table 4.10 shows the zero-order correlations between the reading variables at each time point. First, as would be expected, Instructional Reading Level was significantly correlated with the sound- and word-level reading subprocesses, Fluency, and Comprehension at all six time points, with the absolute values of the correlation coefficients ranging from 0.25 to 0.67. All but three were greater than 0.30, indicating medium to strong correlations. Instructional Reading Level was weakly correlated with Attitude toward Reading at three time points, with the correlation coefficients of 0.17, 0.10, and 0.14, respectively, indicating that a child's Instructional Reading Level might not be correlated with one's Attitude toward Reading. Notably, relatively stronger positive correlations were found between Instructional Reading Level and Reading Words in Isolation at each time point, with the correlation coefficients ranging from 0.50 to 0.66. Such a relationship was

expected because Instructional Reading Level was measured primarily based on word recognition accuracy.

Second, the results reveal medium to strong positive correlations between the variables representing the sound- and word-level reading subprocesses (Phonological Awareness, Phonics Knowledge, and Reading Words in Isolation) as expected. The significant correlation coefficients between Phonological Awareness and Phonics Knowledge at each time point were 0.44, 0.30, and 0.54, respectively. The significant correlations coefficients between Phonological Awareness and Reading Words in Isolation were 0.35 and 0.33, respectively. The significant correlation coefficients between Phonics Knowledge and Reading Words in Isolation ranged from 0.34 to 0.62, and the coefficients were greater than 0.5 at four time points. Such correlations were expected because all three reading variables represented the sound- and word-level reading subprocesses.

Third, as Fluency and Comprehension were measured using the passage on a child's Instructional Reading Level, partial correlations were conducted to further examine the relationships between Fluency/Comprehension and the other reading variables. As shown in Table 4.11, Fluency and Reading Words in Isolation were significantly correlated at each time points (partial correlation coefficients: 0.50, 0.51, 0.35, 0.31, 0.16, and 0.17). The decreasing correlation coefficients across time indicate that word recognition affected Fluency more at the earlier time points than later. Fluency and Phonics Knowledge were also significantly correlated at Time Points 2 through 5 (partial correlation coefficients: 0.42, 0.20, 0.22, and 0.12). The decreasing correlation coefficients across time also indicate that Phonics Knowledge affected Fluency more at the earlier time points than later.

Among the six significant partial correlations between Comprehension and the other variables, the only negative significant relationship (-0.36) was between Comprehension and Reading Words in Isolation at Time Point 1. The other significant correlations with Comprehension were mostly weak and inconsistent across time (with Phonological Awareness: 0.37 at Time Point 1, 0.18 at Time Point 4, 0.22 at Time Point 5, and 0.23 at Time Point 6; with Fluency: 0.21 at Time Point 4, 0.15 at Time Point 6). Such weak and inconsistent correlations indicate that most of the other variables did not contribute to Comprehension significantly except Phonological Awareness or Fluency, which was only weakly correlated with Comprehension.

Finally, as shown in Table 4.10, Attitude toward Reading was not significantly related with most of the other reading variables. All seven significant correlation coefficients were less than 0.22, indicating that on the whole, Attitude toward Reading did not contribute significantly to the other reading variables.

Power Analysis

Recall that in Chapter 1, the major hypothesis for the present study was as follows: the English-language learners' reading growth—in reading achievement, reading subprocesses, and attitude toward reading—should parallel their monolingual native English-speaking peers'. A power analysis was conducted using Optimal Design Software (Spybrook, Raudenbush, Liu, Congdon, & Martnez, 2005) to examine whether there was sufficient power to reject the non-trivial effects in order to reject the null hypothesis.

The levels for the effect size, intra-class correlation, and significance level for each reading outcome were as follows: small (0.2), medium (0.5), and large (0.8) effect size; small (0.3), medium (0.5), and large (0.7) intra-class correlation (ICC); and significance level at

0.05. No suggested effect size was found in prior research. So small, medium, and large effects and small, medium, and large ICCs were considered. As ICCs were always higher for longitudinal data than grouped data, relatively higher ICCs were used (Bauer, Personal Communication, 2008).

Because the sample size for the English-language learners (N = 154) was smaller than their monolingual native-English-speaking peers (N = 746) who participated in the present study, and due to randomly missing observations across six time points, the average number of observations for the English-language learners across six time points was used to calculate power. The average number of observations for the English-language learners across six time points was: 106 for Instructional Reading Level; 61 for Phonological Awareness; 106 for Phonics Knowledge; 106 for Reading Words in Isolation; 69 for Fluency; 75 for Comprehension; and 109 for Attitude toward Reading, respectively.

For Instructional Reading Level, the power ranged from 0.39 to 1. With the effect size of 0.2, and ICC of 0.3, 0.5, and 0.7, the power was 0.39, 0.48, and 0.61, respectively. With the effect size of 0.5, and ICC of 0.3, 0.5, and 0.7, the power estimates were 0.99, 1, and 1, respectively. With the effect size of 0.8, and ICC of 0.3, 0.5, and 0.7, the power estimates were all 1.

For Phonological Awareness, the power ranged from 0.25 to 1. With the effect size of 0.2, and ICC of 0.3, 0.5, and 0.7, the power was 0.25, 0.30, and 0.40, respectively. With the effect size of 0.5, and ICC of 0.3, 0.5, and 0.7, the power estimates were 0.89, 0.95, and 0.99, respectively. With the effect size of 0.8, and ICC of 0.3, 0.5, and 0.7, the power estimates were all 1.

For Phonics Knowledge, the power ranged from 0.39 to 1. With the effect size of 0.2, and ICC of 0.3, 0.5, and 0.7, the power was 0.39, 0.48, and 0.61, respectively. With the effect size of 0.5, and ICC of 0.3, 0.5, and 0.7, the power estimates were 0.99, 1, and 1, respectively. With the effect size of 0.8, and ICC of 0.3, 0.5, and 0.7, the power estimates were all 1.

Because the average number of the English-language learners for Reading Words in Isolation was identical with that for Phonics Knowledge, the results for the power analysis for Reading Words in Isolation was identical to that for Phonics Knowledge.

For Fluency, the power ranged from 0.27 to 1. With the effect size of 0.2, and ICC of 0.3, 0.5, and 0.7, the power was 0.39, 0.48, and 0.61, respectively. With the effect size of 0.5, and ICC of 0.3, 0.5, and 0.7, the power estimates were 0.99, 1, and 1, respectively. With the effect size of 0.8, and ICC of 0.3, 0.5, and 0.7, the power estimates were all 1.

For Comprehension, the power ranged from 0.29 to 1. With the effect size of 0.2, and ICC of 0.3, 0.5, and 0.7, the power was 0.29, 0.36, and 0.47, respectively. With the effect size of 0.5, and ICC of 0.3, 0.5, and 0.7, the power estimates were 0.94, 0.98, and 1, respectively. With the effect size of 0.8, and ICC of 0.3, 0.5, and 0.7, the power estimates were all 1.

For Attitude toward Reading, the power ranged from 0.40 to 1. With the effect size of 0.2, and ICC of 0.3, 0.5, and 0.7, the power was 0.40, 0.49, and 0.63, respectively. With the effect size of 0.5, and ICC of 0.3, 0.5, and 0.7, the power estimates were 0.99, 1, and 1, respectively. With the effect size of 0.8, and ICC of 0.3, 0.5, and 0.7, the power estimates were all 1.

Growth in Instructional Reading Level

In the present section, I provide the results for each research question in order. For each reading outcome, I first report the results for the unconditional model. Second, I present the full conditional model. Third, if the full conditional model is not the final model, I provide the results for the final model. I also report the significant results for interactions involving cohort and for the control variables. Sources of variance are provided in the tables for ease of reading.

Addressing the Research Question for Growth in Instructional Reading Level

Unconditional model. An unconditional model was fit to the data. The model was as follows: Instructional Reading Level as the dependent variable; time as the level 1 (within student) predictor; and random intercept and slope for level 2 (students within schools) and level 3 (between schools). There were no predictors for level 2 and level 3.

As shown in Table 4.12, the initial status and growth rate in Instructional Reading Level varied significantly across students. There were significant variances among the intercepts ($ES = 2.47$, $p < 0.001$) and slopes ($ES = 0.32$, $p < 0.001$) between students. The school mean initial score and mean growth rate in Instructional Reading Level also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 0.23$, $p < 0.05$) and slopes ($ES = 0.07$, $p < 0.05$) between schools.

Full conditional model. The predictor of language status, and control variables of cohort, gender, and SES were added to level 2. The full conditional model was Instructional Reading Level as the dependent variable; time as the level 1 predictor; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort by time interaction, language status by cohort interaction, language status by time by cohort interaction; and random intercept and slope for level 2 and level 3.

To determine which cohort interactions may be dropped to obtain the final model, the result for the three-way interaction was examined first. As shown in Table 4.13, the language status by time by cohort interaction was not significant, indicating that the growth patterns of Instructional Reading Level between English-language learners and their monolingual native-English-speaking peers were similar across cohorts.

Next, the results for the two-way interactions involving cohort were examined. The language status by cohort interaction was not significant. Consequently, the language status by time by cohort interaction and language status by cohort interaction were dropped for the final statistical model.

How does first and second-grade English-language learners' growth in Instructional Reading Level compare to their monolingual native-English-speaking peers' growth across two years? The final conditional model was as follows: Instructional Reading Level as the dependent variable; time as the level 1 predictor; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort by time interaction; and random intercept and slope for level 2 and level 3.

The individual initial score and growth rate in Instructional Reading Level varied significantly across students. As shown in Table 4.14, there were significant variances among the intercepts ($ES = 1.34$, $p < 0.001$) and slopes ($ES = 0.22$, $p < 0.001$) between students. The mean initial score and mean growth rate in Instructional Reading Level also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 0.15$, $p < 0.05$) and slopes ($ES = 0.06$, $p < 0.05$) between schools.

The overall growth pattern of Instructional Reading Level for the English-language learners was different from the pattern for their monolingual native-English-speaking peers

across two years. There was a significant ordinal language status by time interaction, γ = -0.22, $p < 0.001$ (see Table 4.14). As shown in Figure 4.1 (averaged across cohorts), on average, the monolingual native-English-speaking children began Year 1 scoring at about an estimated February of first grade level (0.80; also see the actual marginal mean of 0.92 in Row 8 Column 3, Table 4.1) on Instructional Reading Level, while the English-language learners began at a lower level, at about an estimated mid-first-grade level (0.48; also see the actual marginal mean of 0.65 in Row 9 Column 3, Table 4.1). The monolinguals made, on average, about one grade level's (0.90) growth from one time point to the next. The English-language learners persistently scored lower, and made less growth compared to their monolingual peers, about two-thirds of a grade level's (0.68) growth from one time point to the next. By the end of Year 2, on average, the monolinguals performed on Instructional Reading Level at about an estimated October of sixth grade level (5.30; also see the actual marginal mean of 5.66 in Row 8 Column 8, Table 4.1). The gap between the English-language learners and their monolingual peers got wider with the English-language learners reading at about an estimated March of fourth grade level (3.88; also see the actual marginal mean of 4.44 in Row 9 Column 8, Table 4.1). Figure 4.2 show similar patterns by cohorts.

Significant results for interactions involving cohort. Controlling for the other variables, the growth pattern of Instructional Reading Level for the first-grade cohort was different from the pattern for the second-grade cohort. There was a significant cohort by time interaction, $\gamma = 0.28$, $p < 0.001$. As shown in Figure 4.3 (averaged across language groups), while the second-grade cohort began at about an estimated November of second grade level (1.39; also see the actual marginal mean of 1.58 in Row 7 Column 3, Table 4.1), the first-grade cohort began lower, reading at about an estimated lowest grade level (-0.11;

also see the actual marginal mean of 0.20 in Row 4 Column 3, Table 4.1). The second-grade cohort made about one grade level's (0.99) growth from one time point to the next. The first-grade cohort made less, about two-thirds of a grade level's growth (0.65) from one time point to the next. The gap got wider across two years. At Year 2 end, the second-grade cohort performed at about an estimated end-of-sixth-grade level (5.99; also see the actual marginal mean of 6.88 in Row 7 Column 8, Table 4.1), and the first-grade cohort performed at about an estimated beginning-of-fourth-grade level (3.14; also see the actual marginal mean of 4.05 in Row 4 Column 8, Table 4.1).

Significant results for control variables. Controlling for the other variables, as would be expected, on average, high-SES children outperformed low-SES children—by about three fifths of a grade level (0.60). There was a significant conditional effect of SES, $\gamma = 0.30$, $p < 0.001$ (see Table 4.14).

Growth in Selected Reading Subprocesses

In the section that follows, I present the results for growth in selected reading subprocesses in the following order: Phonological Awareness, Phonics Knowledge, and Reading Words in Isolation representing sound- and word-level subprocesses, Fluency, and Comprehension.

Addressing the Research Question for Phonological Awareness

Unconditional model. An unconditional model was fit to the data. The model was as follows: Phonological Awareness as the dependent variable; time as the level 1 predictor; and random intercept and slope for level 2 and level 3. There were no predictors for level 2 and level 3.

The results from the first run showed that the G matrix was not positive definite. A second run was tried by fixing the random slope at both level 2 and level 3. As shown in Table 4.15, the individual initial score in Phonological Awareness varied significantly across students. There were significant variances among the intercepts ($ES = 149.48$, $p < 0.001$) between students. The mean initial score in Phonological Awareness also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 61.54$, $p < 0.05$) between schools.

How does first-grade English-language learners' reading growth in Phonological Awareness compare to their monolingual native-English-speaking peers' growth across one year? The predictor of language status, and control variables of gender and SES were added to level 2 for the full conditional model. Recall that only the first-grade cohort was assessed on Phonological Awareness in Year 1. So cohort was not added to the model as a control variable. Thus, the full model was identical to the final model. The model was as follows: as follows: Phonological Awareness as the dependent variable; time as the level 1 predictor; language status as the level 2 predictor, gender and SES as the level 2 control variables; language status by time interaction; and random intercept for level 2 and level 3.

The individual initial score in Phonological Awareness varied significantly across students. As shown in Table 4.16, there were significant variances among the intercepts ($ES = 119.36$, $p < 0.001$) between students. The mean initial score in Phonological Awareness also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 58.53$, $p < 0.05$) between schools.

The growth pattern of Phonological Awareness for first-grade English-language learners was different from the pattern for their monolingual native-English-speaking peers

across Year 1. There was a significant ordinal language status by time interaction, $\gamma = 8.92$, $p < 0.001$. Table 4.16 shows the parameter estimates. As shown in Figure 4.4, controlling for gender and SES, on average, the monolingual native-English-speaking children began Year 1 scoring at about estimated 54.14 percentage points (also see the actual mean of 52.02 in Row 2 Column 3, Table 4.2). Their initial status was significant, $\gamma = 54.14$, $p < 0.001$. In contrast, the English-language learners began much lower, performing at about estimated 27.78 percentage points (also see the actual mean of 27.52 in Row 3 Column 3, Table 4.2). There was a significant conditional effect of language status, $\gamma = -26.36$, $p < 0.001$. The monolinguals made, on average, about 13.58 percentage points' growth from one time point to the next. There was a significant conditional effect of time, $\gamma = 13.58$, $p < 0.001$. The English-language learners made more growth, about 22.5 percentage points from one time point to the next (see the significant language status by time interaction as reported above). Their growth was accelerated. By the end of Year 1, on average, the monolinguals performed on Phonological Awareness at about estimated 81.30 percentage points (also see the actual mean of 79.12 in Row 2 Column 5, Table 4.2). The gap between the English-language learners and their monolingual peers got much narrower with the English-language learners performing at about estimated 72.78 percentage points (also see the actual mean of 71.38 in Row 3 Column 5, Table 4.2).

Significant results for control variables. None of the parameter estimates for the control variables was significant (see Table 4.16).

Addressing the Research Question for Phonics Knowledge

Unconditional model. An unconditional model was fit to the data. The model was as follows: Phonics Knowledge as the dependent variable; time as the level 1 predictor; and

random intercept and slope for level 2 and level 3. There were no predictors for level 2 and level 3.

As shown in Table 4.17, the individual initial score in Phonics Knowledge varied significantly across students. There were significant variances among the intercepts (*ES* = 269.34, $p < 0.001$) between students. The mean initial score in Phonics Knowledge also varied significantly across schools. There were significant variances among the mean intercepts (*ES* = 37.87, $p < 0.05$) between schools.

Full conditional model. A full conditional model was estimated by adding the predictor of language status, and control variables of cohort, gender, and SES to level 2. The model was as follows: Phonics Knowledge as the dependent variable; time as the level 1 predictor; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort by time interaction, language status by cohort interaction, language status by time by cohort interaction; and random intercept and slope for level 2 and level 3.

To determine which cohort interactions may be dropped to obtain the final model, the result for the three-way interaction was examined first. As shown in Table 4.18, the language status by time by cohort interaction was not significant, indicating that the growth patterns of Phonics Knowledge between English-language learners and their monolingual native-English-speaking peers were similar across cohorts.

Next, the results for the two-way interactions involving cohort were examined. The language status by cohort interaction was not significant. Consequently, the language status by time by cohort interaction and language status by cohort interaction were dropped for the final statistical model.

How does first- and second-grade English-language learners' reading growth in Phonics Knowledge compare to their monolingual native-English-speaking peers' across two years? A final model was estimated. The model was as follows: Phonics Knowledge as the dependent variable; time as the level 1 predictor; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort by time interaction; and random intercept and slope for level 2 and level 3.

The individual initial score and growth rate in Phonics Knowledge varied significantly across students. As shown in Table 4.19, there were significant variances among the intercepts ($ES = 373.25$, $p < 0.001$) and slope ($ES = 7.30$, $p < 0.001$) between students. The mean initial score in Phonics Knowledge also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 30.90$, $p < 0.05$) between schools.

The overall growth pattern of Phonics Knowledge for first- and second-grade English-language learners was different from the pattern for their monolingual native-English-speaking peers across two years. There was a significant ordinal language status by time interaction, $\gamma = 1.75$, $p < 0.001$ (see Table 4.19). As shown in Figure 4.5 (averaged across cohorts), controlling for the other variables, on average, the monolingual native-English-speaking children began Year 1 scoring at about estimated 63.18 percentage points (also see the actual marginal mean of 57.51 in Row 8 Column 3, Table 4.3). The English-language learners began lower, performing at about estimated 51.75 percentage points (also see the actual marginal mean of 47.42 in Row 9 Column 3, Table 4.3). The monolinguals made, on average, about 6 percentage points' growth from one time point to the next. The English-language learners' growth was accelerated. They made more growth, about 7.75

percentage points' growth from one time point to the next. By the end of Year 2, on average, the monolinguals performed on Phonics Knowledge at about estimated 93.18 percentage points (also see the actual marginal mean of 90.74 in Row 8 Column 8, Table 4.3). The gap between the English-language learners and their monolingual peers got narrower, with the English-language learners performing at about estimated 90.50 percentage points (also see the actual marginal mean of 86.84 in Row 9 Column 8, Table 4.3). Figure 4.6 show similar patterns by cohorts.

Significant results for interactions involving cohort. Controlling for the other variables, the growth pattern of Phonics Knowledge for the first-grade cohort was different from the second-grade cohort. There was a significant cohort by time interaction (see the significant disordinal cohort by time interaction as reported above). As shown in Figure 4.7 (averaged across language groups), the second-grade cohort began Year 1 reading at about estimated 69.12 percentage points (also see the actual marginal mean of 70.57 in Row 7 Column 3, Table 4.3), the first-grade cohort began lower, at about estimated 45.81 percentage points (also see the actual marginal mean of 41.35 in Row 4 Column 3, Table 4.3). The second-grade cohort made, on average, about 4.31 percentage points' growth from one time point to the next. The first-grade cohort's growth was accelerated. They made more growth, about 9.45 percentage points from one time point to the next. By Year 2 end, the second-grade cohort performed at about estimated 90.67 percentage points (also see the actual marginal mean of 91.30 in Row 7 Column 8, Table 4.3), the first-grade cohort outperformed the second-grade cohort, scoring at about estimated 93.06 percentage points (also see the actual marginal mean of 88.82 in Row 4 Column 8, Table 4.3).

Significant results for control variables. Controlling for the other variables, on average, high-SES children performed about 4.26 percentage points higher than low-SES children. There was a significant conditional effect of SES, $\gamma = 2.13$, $p < 0.01$ (see Table 4.19). Female students scored 2.32 percentage points higher than male students. There was a significant conditional effect of gender, $\gamma = -1.16$, $p < 0.05$ (see Table 4.19).

Addressing the Research Question for Reading Words in Isolation

Unconditional model. An unconditional model was fit to the data. The model was as follows: Reading Words in Isolation as the dependent variable; time as the level 1 predictor; and random intercept and slope for level 2 and level 3. There were no predictors for level 2 and level 3.

As shown in Table 4.20, the individual initial score and growth rate in Reading Words in Isolation varied significantly across students. There were significant variances among the intercepts ($ES = 854.25$, $p < 0.001$) and slopes ($ES = 24.18$, $p < 0.001$) between students.

How does first- and second-grade English-language learners' reading growth in Reading Words in Isolation compare to their monolingual native-English-speaking peers' across two years? A full conditional model was estimated by adding the predictor of language status, and control variables of cohort, gender, and SES to level 2. The model was as follows: Reading Words in Isolation as the dependent variable; time as the level 1 predictor; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort by time interaction, language status by cohort interaction, language status by time by cohort interaction; and random intercept and slope for level 2 and level 3.

The results from the first run showed that the G matrix was not positive definite. A second run was tried by fixing the random slopes for level 2 and level 3. The growth patterns of Reading Words in Isolation between English-language learners and their monolingual native-English-speaking peers were different for the first-grade cohort than the second-grade cohort. For the first-grade cohort, the growth patterns were similar. In contrast, for the second-grade cohort, the growth patterns were different. As shown in Table 4.21, there was a significant language status by time by cohort interaction, $\gamma = 3.73$, $p < 0.001$. As the three-way interaction was significant, the full conditional model was identical to the final model. The parameter estimates were shown in Table 4.21.

As shown in Figure 4.8, for the first-grade cohort, controlling for SES and gender, the monolingual native-English-speaking children began Year 1 reading, on average, at about estimated 27.77 percentage points (also see the actual mean of 20.40 in Row 2 Column 3, Table 4.4). Their initial score was significant, $\gamma = 27.77$, $p < 0.001$. The English-language learners began lower, performing at about 16.98 percentage points (also see the actual mean of 11.82 in Row 3 Column 3, Table 4.4). There was a significant conditional effect of language status, $\gamma = -10.79$, $p < 0.01$. The monolingual native-English-speaking children made, on average, about 14.20 percentage points' growth from one time point to the next. There was a significant conditional effect of time, $\gamma = 14.20$, $p < 0.001$. The English-language learners made about the same amount (14.34 percentage points) from one time point to the next and scored persistently lower. There was no significant language status × time interaction, $\gamma = 0.15$, $p > .05$. At Year 2 end, the monolingual native-English-speaking children scored at about 98.77 percentage points (also see the actual mean of 90.73 in Row 2

Column 8, Table 4.4), and the English-language learners scored at about estimated 88.68 percentage points (also see the actual mean of 80.68 in Row 3 Column 8, Table 4.4).

In contrast, the second-grade cohort exhibited a different growth patterns in Reading Words in Isolation for the two language groups. The monolingual native-English-speaking children began Year 1 reading, on average, at about estimated 78.46 percentage points (also see the actual mean of 73.47 in Row 5 Column 3, Table 4.4). There was a significant conditional effect of cohort, $\gamma = 50.69$, $p < 0.001$. The English-language learners began lower, reading at about estimated 53.27 percentage points (see the significant conditional effect of language status as reported above; also see the actual mean of 51.33 in Row 5 Column 8, Table 4.4). There was also a significant language status by cohort interaction, $\gamma = -14.40$, $p < 0.01$. The monolingual native-English-speaking children made, on average, about 4.09 percentage points' growth from one time point to the next. There was a significant cohort × time interaction, $\gamma = -10.11$, $p < 0.001$. The English-language learners' growth was accelerated. They made more growth, about 7.96 percentage points from one time point to the next (see the non-significant language status × time interaction and significant language status × cohort × time interaction reported as above). At Year 2 end, the monolingual native-English-speaking children scored at about estimated 98.91 percentage points (also see the actual mean of 96.18 in Row 5 Column 8, Table 4.4), and the English-language learners scored at about estimated 93.07 percentage points (also see the actual mean of 89.22 in Row 6 Column 8, Table 4.4).

Significant results for interactions involving cohort. Controlling for the other variables, the growth pattern of Reading Words in Isolation for the first-grade cohort was different from the second-grade cohort (see the significant ordinal cohort by time interaction

as reported above). As shown in Figure 4.9, the second-grade cohort began Year 1 reading at about estimated 65.87 percentage points (also see the actual marginal mean of 68.26 in Row 7 Column 3, Table 4.4), the first-grade cohort began much lower, at about estimated 22.38 percentage points (also see the actual marginal mean of 18.62 in Row 4 Column 3, Table 4.4). The second-grade cohort made, on average, about 6.04 percentage points' growth from one time point to the next. The second-grade cohort's growth was accelerated. They made more growth, about 14.27 percentage points from one time point to the next. By Year 2 end, the second-grade cohort performed at about estimated 96.07 percentage points (also see the actual marginal mean of 94.74 in Row 7 Column 8, Table 4.4), the first-grade cohort performed almost the same as the second-grade cohort, at about estimated 93.73 percentage points (also see the actual marginal mean of 89.09 in Row 4 Column 8, Table 4.4).

Regardless of time, SES, or gender, the difference in Reading Words in Isolation between the English-language learners and their monolingual native-English-speaking peers for the first-grade cohort was different from the difference between the two language groups for the second-grade cohort. There was a significant language status by cohort interaction, $\gamma = -14.40$, $p < 0.01$. As shown in Figure 4.10, for the first-grade cohort, the monolingual native-English-speaking children scored about 27.77 percentage points, the English-language learners in the same cohort scored 10.97 percentage points lower, at about 16.98 percentage points. For the second-grade cohort, the monolinguals scored at about 78.46 percentage points, while the English-language learners scored about 25.19 percentage points lower, at about 53.27 percentage points.

Significant results for control variables. Controlling for the other variables, on average, high-SES children performed about 6.72 percentage points higher than low-SES

children. There was a significant conditional effect of SES, $\gamma = 3.36$, $p < 0.01$ (see Table 4.21). Female students scored 5.56 percentage points higher than male students. There was a significant conditional effect of gender, $\gamma = -2.78$, $p < 0.01$ (see Table 4.21).

Addressing the Research Question for Fluency

Unconditional model. An unconditional model was fit to the data. The model was as follows: Fluency as the dependent variable; time as the level 1 predictor; and random intercept and slope for level 2 and level 3. There were no predictors for level 2 and level 3.

The results from the first run showed that the G matrix was not positive definite. A second run was tried by fixing the random slope at both level 2 and level 3. As shown in Table 4.22, the individual initial score in Fluency varied significantly across students. There were significant variances among the intercepts ($ES = 297.26$, $p < 0.001$) between students. The mean initial score in Fluency also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 35.15$, $p < 0.05$) between schools.

Full conditional model. A full conditional model was estimated by adding the covariate Instructional Reading Level to level 1, the predictor of language status and control variables of cohort, gender, and SES to level 2. The model was as follows: Fluency as the dependent variable; time as the level 1 predictor, Instructional Reading Level as the level 1 covariate; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort by time interaction, language status by cohort interaction, language status by time by cohort interaction; and random intercept and slope for level 2 and level 3. Fluency means were adjusted.

To determine which cohort interactions could be dropped to obtain the final model, the result for the three-way interaction was examined first. The language status by time by

cohort interaction was not significant, indicating that the growth patterns of Fluency between English-language learners and their monolingual native-English-speaking peers were similar across cohorts.

Next, the results for the two-way interactions involving cohort were examined. The language status by cohort interaction was not significant. Consequently, the language status by time by cohort interaction and language status by cohort interaction were dropped for the final statistical model.

How does first- and second-grade English-language learners' reading growth in Fluency compare to their monolingual native-English-speaking peers' across two years? A final model was estimated. The model was as follows: Fluency as the dependent variable; time as the level 1 predictor, Instructional Reading Level as the level 1 covariate; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort by time interaction; and random intercept and slope for level 2 and level 3. Fluency means were adjusted.

The individual initial score and growth rate in Fluency varied significantly across students. As shown in Table 4.24, there were significant variances among the intercepts ($ES = 96.47$, $p < 0.01$) between students. The mean initial score and growth rate in Fluency also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 53.28$, $p < 0.05$) and slopes ($ES = 3.62$, $p < 0.05$) between schools.

The overall growth pattern of Fluency for the English-language learners was similar to the pattern for their monolingual native-English-speaking peers across two years. That is, the English-language learners and their monolingual native-English-speaking peers performed about the same over time. There was no significant language status by time

interaction, $\gamma = 1.10$, $p > 0.05$ (see Table 4.24). As shown in Figure 4.11, on average, the monolingual native-English-speaking children began Year 1 scoring at about estimated 58.40 words correct per minute (also see the actual adjusted marginal mean of 62.31 in Row 8 Column 3, Table 4.5). The English-language learners began performing about the same, at about estimated 53.58 words correct per minute (also see the actual adjusted marginal mean of 63.26 in Row 9 Column 3, Table 4.5). The monolinguals made, on average, about 2.22 words correct per minute's growth from one time point to the next. The English-language learners made about the same amount of growth from one time point to the next, about 3.32 words correct per minute. By the end of Year 2, on average, the monolinguals performed on Fluency at about estimated 69.50 words correct per minute (also see the actual adjusted marginal mean of 66.88 in Row 8 Column 8, Table 4.5). The English-language learners performed about the same, at about estimated 70.18 words correct per minute (also see the actual marginal mean of 61.71 in Row 9 Column 8, Table 4.5). Figure 4.12 shows similar patterns by cohort.

Significant results for interactions involving cohort. Regardless of language status, SES, or gender, the growth pattern of Fluency for the first-grade cohort was different from the second-grade cohort. There was a significant ordinal cohort by time interaction, $\gamma = -2.98$, $p < 0.001$. As shown in Figure 4.13, the second-grade cohort began Year 1 reading at about estimated 64.43 words correct per minute (also see the actual adjusted marginal mean of 64.94 in Row 7 Column 3, Table 4.5), while the first-grade cohort began lower, at about estimated 47.54 words correct per minute (also see the actual adjusted marginal mean of 51.32 in Row 4 Column 3, Table 4.5). The second-grade cohort made about 1.28 words correct per minute's growth from one time point to the next. The second-grade cohort's

growth was accelerated. They made more growth, about 4.26 words correct per minute from one time point to the next. By Year 2 end, the second-grade cohort performed at about estimated 70.83 words correct per minute (also see the actual marginal mean of 66.65 in Row 7 Column 8, Table 4.5). The first-grade cohort performed about the same, at estimated 68.84 words correct per minute (also see the actual marginal mean of 65.28 in Row 4 Column 8, Table 4.5).

Significant results for control variables. Controlling for the other variables, high-SES children performed about 4.02 words correct per minute higher than low-SES children. There was a significant conditional effect of SES, $\gamma = 2.01$, $p < 0.05$ (see Table 4.24). Female students scored 3.62 words correct per minute higher than male students. There was a significant conditional effect of gender, $\gamma = -1.81$, $p < 0.01$ (see Table 4.24). One grade-level increase in Instructional Reading Level was associated with 2.93 words correct per minute increase in Fluency. There was a significant conditional effect of Instructional Reading Level, $\gamma = 2.93$, $p < 0.01$ (see Table 4.24).

Addressing the Research Question for Comprehension

Unconditional model. An unconditional model was fit to the data. The model was as follows: Comprehension as the dependent variable; time as the level 1 predictor; and random intercept and slope for level 2 and level 3. There were no predictors for level 2 and level 3.

As shown in Table 4.25, the individual initial score and growth rate in Comprehension varied significantly across students. There were significant variances among the intercepts ($ES = 201.69$, $p < 0.001$) and slopes ($ES = 14.21$, $p < 0.001$) between students. The mean initial score in Comprehension also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 49.29$, $p < 0.05$) between schools.

Full conditional model. A full conditional model was estimated by adding the covariate Instructional Reading Level to level 1, the predictor of language status and control variables of cohort, gender, and SES to level 2. The model was as follows: Comprehension as the dependent variable; time as the level 1 predictor, Instructional Reading Level as the level 1 covariate; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort by time interaction, language status by cohort interaction, language status by time by cohort interaction; and random intercept and slope for level 2 and level 3. Comprehension means were adjusted.

To determine which cohort interactions may be dropped to obtain the final model, the result for the three-way interaction was examined first. The language status by time by cohort interaction was not significant, indicating that the growth patterns of Comprehension between English-language learners and their monolingual native-English-speaking peers were similar across cohorts.

Next, the results for the two-way interactions involving cohort were examined. The language status by cohort interaction and cohort by time interaction were not significant. Consequently, the language status by time by cohort interaction, language status by cohort interaction, and cohort by time interaction were dropped for the final statistical model.

How does first- and second-grade English-language learners' reading growth in Comprehension compare to their monolingual native-English-speaking peers' across two years? A final model was estimated. The model was as follows: Comprehension as the dependent variable; time as the level 1 predictor, Instructional Reading Level as the level 1 covariate; language status as the level 2 predictor, cohort, gender, and SES as the level 2

control variables; language status by time interaction; and random intercept and slope for level 2 and level 3. Comprehension means were adjusted.

The individual initial score and growth rate in Comprehension varied significantly across students. As shown in Table 4.27, there were significant variances among the intercepts ($ES = 107.18$, $p < 0.01$) and slopes ($ES = 9.70$, $p < 0.01$) between students. The mean initial score and growth rate in Comprehension also varied significantly across schools. There were significant variances among the mean intercepts ($ES = 45.98$, $p < 0.05$) and slopes ($ES = 3.94$, $p < 0.05$) between schools.

The overall growth pattern of Comprehension for the English-language learners was similar to the pattern for their monolingual native-English-speaking peers across two years. The English-language learners and their monolingual native-English-speaking peers performed about the same. There was no significant language status by time interaction, $\gamma = -0.30$, $p > 0.05$ (see Table 4.27). As shown in Figure 4.14, on average, the monolingual native-English-speaking children began Year 1 scoring at about estimated 54.53 percentage points (also see the actual adjusted marginal mean of 54.12 in Row 8 Column 3, Table 4.6). The English-language learners began performing about the same, at about estimated 52.57 percentage points (also see the actual adjusted marginal mean of 57.82 in Row 9 Column 3, Table 4.6). There was no significant conditional effect of language status, $\gamma = -1.96$, $p > 0.05$ (see Table 4.27). The monolinguals made, on average, about 3.42 percentage points' growth from one time point to the next. There was a significant conditional effect of time, $\gamma = 3.42$, $p < 0.001$ (see Table 4.27). The English-language learners made about the same amount of growth from one time point to the next, about 3.12 percentage points. By the end of Year 2, on average, the monolinguals performed on Comprehension at about estimated

71.63 percentage points (also see the actual adjusted marginal mean of 72.46 in Row 8 Column 8, Table 4.6). The English-language learners performed about the same, at about estimated 68.17 percentage points (also see the actual marginal mean of 71.80 in Row 9 Column 8, Table 4.6).

Significant results for control variables. Controlling for other variables, one grade level increase in Instructional Reading Level was associated with 5.80 percentage points decrease in Comprehension. There was a significant conditional effect of Instructional Reading Level, $\gamma = -5.80$, $p < 0.001$ (see Table 4.27).

Growth in Attitude toward Reading

Addressing the Research Question for Attitude toward Reading

Unconditional model. An unconditional model was fit to the data. The model was as follows: attitude toward reading as the dependent variable; time as the level 1 predictor; and random intercept and slope for level 2 and level 3. There were no predictors for level 2 and level 3.

As shown in Table 4.28, the individual initial score in attitude toward reading varied significantly across students. There were significant variances among the intercepts ($ES = 0.14$, $p < 0.001$) between students.

Full conditional model. A full conditional model was estimated by adding the predictor of language status, and control variables of cohort, gender, and SES to level 2. The model was as follows: attitude toward reading as the dependent variable; time as the level 1 predictor; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time by interaction, cohort by time interaction, language

status by cohort interaction, language status by time by cohort interaction; and random intercept and slope for level 2 and level 3.

To determine which cohort interactions may be dropped to obtain the final model, the result for the three-way interaction was examined first. The language status by time by cohort interaction was not significant, indicating that the growth patterns between English-language learners and their monolingual native-English-speaking peers were similar across cohorts.

Next, the results for the two-way interactions involving cohort were examined. The language status by cohort interaction was not significant. Consequently, the language status by time by cohort interaction and language status by cohort interaction were dropped for the final statistical model.

How does first- and second-grade English-language learners' reading growth in Attitude toward Reading compare to their monolingual native-English-speaking peers' across two years? A final model was estimated. The model was as follows: attitude toward reading as the dependent variable; time as the level 1 predictor; language status as the level 2 predictor, cohort, gender, and SES as the level 2 control variables; language status by time interaction, cohort × time interaction; and random intercept and slope for level 2 and level 3.

The results from the first run showed that the G matrix was not positive definite. A second run was tried by fixing the random slope for level 2 and level 3. The results showed that the estimate for the school level intercept was zero. Consequently, a third run was tried by removing the school level intercept.

The individual initial score in attitude toward reading varied significantly across students. As shown in Table 4.30, there were significant variances among the intercepts ($ES = 0.13$, $p < 0.001$) between students.

The overall growth pattern of attitude toward reading for the English-language learners was different from the pattern for their monolingual native-English-speaking peers across two years. There was a significant relatively weak disordinal language status by time interaction, $\gamma = 0.05$, $p < 0.001$ (see Table 4.30). As shown in Figure 4.15, on average, the monolingual native-English-speaking children began Year 1 scoring at about estimated 4.52 points (also see the actual marginal mean of 4.42 in Row 8 Column 3, Table 4.7). The English-language learners began lower, performing at about estimated 4.33 points (also see the actual marginal mean of 4.17 in Row 9 Column 3, Table 4.7). The monolinguals made, on average, about 0.02 point's growth from one time point to the next. The English-language learners' growth was accelerated. They made more growth, about 0.07 point from one time point to the next. By the end of Year 2, on average, the monolinguals performed attitude toward reading at about estimated 4.62 points (also see the actual marginal mean of 4.54 in Row 8 Column 8, Table 4.7). The English-language learners outperformed their monolingual native-English-speaking peers, with an attitude toward reading of about estimated 4.68 points (also see the actual marginal mean of 4.58 in Row 9 Column 8, Table 4.7). Figure 4.16 shows similar patterns by cohort.

Significant results for interactions involving cohort. Regardless of language status, gender, or SES, the growth pattern of Phonics Knowledge for the first-grade cohort was different from the second-grade cohort. There was a significant ordinal cohort by time interaction, $\gamma = -0.05$, $p < 0.001$ (see Table 4.30). As shown in Figure 4.17, the second-grade cohort began Year 1 with an attitude toward reading of about estimated 4.53 points (also see the actual marginal mean of 4.47 in Row 7 Column 3, Table 4.7), the first-grade cohort began lower, with an attitude of about estimated 4.32 points (also see the actual marginal mean of

4.28 in Row 4 Column 3, Table 4.7). The second-grade cohort made, on average, about 0.03 point's growth from one time point to the next. The first-grade cohort's growth was accelerated. They made more growth, about 0.07 point from one time point to the next. By Year 2 end, the second-grade cohort's attitude toward reading was about estimated 4.68 points (also see the actual marginal mean of 4.53 in Row 7 Column 8, Table 4.7), and the first-grade cohort's attitude toward reading was about the same as their monolingual peers, scoring at about estimated 4.67 points (also see the actual marginal mean of 4.56 in Row 4 Column 8, Table 4.7).

Significant results for control variables. Controlling for other variables, on average, female students' attitude toward reading was 0.12 point higher than male students. There was a significant conditional effect of gender, $\gamma = -0.06$, $p < 0.001$ (see Table 4.30).

Summary of Results

Below I summarize the main results for each research question and remaining significant results that were not of special interest in the study. Table 4.31 provides the summary for the main results. Table 4.32 provides the summary for the remaining results.

Growth in Instructional Reading Level

First, the overall growth pattern of Instructional Reading Level for the English-language learners was different from the pattern for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 lower (by about one-third of a grade level) than their monolingual peers. They consistently scored lower. The gap got wider across two years. By Year 2 end, the English-language learners lagged behind their monolingual peers by about one and a half grade levels.

Second, the overall growth pattern for the first-grade cohort was different from the pattern for the second-grade cohort. The first-grade cohort began Year 1 lower, and the gap got wider across two years.

Third, controlling for the other variables, high-SES students outperformed low-SES students.

Growth in Selected Reading Subprocesses (Sound- and Word-Level Reading Subprocesses Represented by Phonological Awareness, Phonics Knowledge, and Reading Words in Isolation; Fluency; and Comprehension)

Growth in Phonological Awareness. The growth pattern for the first-grade English-language learners was different from the pattern for their monolingual native-English-speaking peers across Year 1. The English-language learners began Year 1 lower than their monolingual peers, and they exhibited a steep growth curve. By Year 1 end, the gap between got much narrower.

Growth in Phonics Knowledge. First, the overall growth pattern for the English-language learners was different from the pattern for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 lower than their monolingual peers, and they exhibited a steep growth curve. By Year 2 end, the gap got much narrower, with the English-language learners performing similarly as their monolingual peers.

Second, the overall growth pattern for the first-grade cohort was different from the pattern for the second-grade cohort. The first-grade cohort began Year 1 lower, and they exhibited a steep growth curve. By the Year 2 end, they caught up with the second-grade cohort.

Third, controlling for the other variables, high-SES students outperformed low-SES students. The female students outperformed the male students.

Growth in Reading Words in Isolation. First, for the first-grade cohort, the growth pattern for the English-language learners was similar to the pattern for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 lower, and they persistently scored lower over time. They made comparable growth as their monolingual peers. In contrast, for the second-grade cohort, the growth pattern for the English-language learners was different from the pattern for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 lower, and they exhibited a steep growth curve. By Year 2 end, the gap got much narrower.

Second, the overall growth pattern for the first-grade cohort was different from the pattern for the second-grade cohort. The first-grade cohort began Year 1 lower, and they exhibited a steep growth curve. By the Year 2 end, they scored about the same as their second-grade cohort.

Third, the difference in Reading Words in Isolation between the English-language learners and their monolingual native-English-speaking peers for the first-grade cohort was different from the difference between the two language groups for the second-grade cohort. The gap increased from the first-grade cohort to the second-grade cohort.

Fourth, controlling for the other variables, high-SES students outperformed low-SES students. The female students outperformed the male students.

Growth in Fluency. First, the overall growth pattern for the English-language learners was similar to the pattern for their monolingual native-English-speaking peers across two years. One group did not outperform the other.

Second, the overall growth pattern for the first-grade cohort was different from the pattern for the second-grade cohort. The first-grade cohort began Year 1 lower, and they exhibited a steep growth curve. By the Year 2 end, they performed about the same as the second-grade cohort.

Third, controlling for the other variables, high-SES students outperformed low-SES students. The female students outperformed the male students. One grade level increase in Instructional Reading Level was associated with 2.93 words correct per minute increase in Fluency.

Growth in Comprehension. First, the overall growth pattern for the English-language learners was similar to the pattern for their monolingual native-English-speaking peers across two years. One group did not outperform the other.

Second, one grade level increase in Instructional Reading Level was associated with 5.80 percentage points decrease in Comprehension.

Growth in Attitude toward Reading

First, the overall growth pattern for the English-language learners was different from the pattern for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 lower, and they exhibited a steep growth curve. By the Year 2 end, they outperformed their monolingual native-English-speaking peers.

Second, the overall growth pattern for the first-grade cohort was different from the pattern for the second-grade cohort. The first-grade cohort began Year 1 lower, and they exhibited a steep growth curve. By the Year 2 end, they performed similarly to the second-grade cohort.

Third, controlling for the other variables, the female students outperformed the male students.

CHAPTER 5

CONCLUSIONS AND DISCUSSION

In this chapter, first, I state the main conclusions relevant to the research questions. Then, I present the limitations of the study. Next, I discuss the main conclusions. Then, I briefly discuss the significant results involving cohort that did not involve language status. Finally, I state implications for classroom instruction, research, and theory.

Conclusions

There were five main conclusions relevant to the research questions. First, the growth pattern of Instructional Reading Level for the English-language learners was different from that for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 scoring lower (by about one-third of a grade level) than their monolingual peers and they consistently scored lower over time. The gap got wider across two years. By Year 2 end, the English-language learners lagged behind their monolingual peers by about one-and-a-half-grade levels.

Second, with regard to growth in sound- and word-level reading subprocesses, the growth pattern of Phonological Awareness for the first-grade English-language learners was different from that for their monolingual native-English-speaking peers across Year 1. The English-language learners began Year 1 scoring lower than their monolingual peers, and they exhibited a steep growth curve. By Year 1 end, the gap got much narrower, with the monolinguals and English-language learners performing at 81.30 percentage points and 72.78 percentage points, respectively.

The growth pattern of Phonics Knowledge for the English-language learners was different from that for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 scoring lower than their monolingual peers, and they exhibited a steep growth curve. By Year 2 end, the gap got much narrower, with the English-language learners performing similarly as their monolingual peers.

Similarity or difference in the growth in Reading Words in Isolation for the English-language learners and their monolingual native-English-speaking peers depended on cohort. Specifically, for the first-grade cohort, the growth pattern for the English-language learners was similar to that for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 scoring lower and they persistently scored lower making similar growth as their monolingual peers. In contrast, for the second-grade cohort, the growth pattern for the English-language learners was different from that for their monolingual native-English-speaking peers across two years. The English-language learners began Year 1 scoring lower, and they exhibited a steep growth curve. By Year 2 end, the gap got much narrower, with the monolinguals and English-language learners performing at 98.91 percentage points and 93.07 percentage points, respectively.

Third, the growth pattern and performance level of Fluency for the English-language learners were similar to that for their monolingual native-English-speaking peers across two years.

Fourth, the growth pattern and performance level of Comprehension for the English-language learners were similar to that for their monolingual native-English-speaking peers across two years.

Finally, the growth pattern of Attitude toward Reading for the English-language learners was different from that for their monolingual native-English-speaking peers across two years. The English-language learners began lower (4.33 points for the English-language learners, a score between the face showing a little bit good feeling and the one showing a very good feeling; 4.52 points for their monolingual native-English-speaking peers, also a score between the face showing a little bit good feeling and the one showing a very good feeling), and they exhibited a steep growth curve. By Year 2 end, they outperformed their monolingual native-English-speaking peers, with 4.68 points for the English-language learners and 4.62 points for the monolinguals, respectively.

Limitations

The conclusions should be interpreted in light of some limitations of the study, some of which are related to the relatively small sample of English-language learners in the present study. For instance, note that several of the limitations point to the need for more control variables. Increasing the number of control variables was not possible in the present study.

First, results might have been different if controls had been included for both global and specific oral English proficiencies. Recall that information about English-language competency was available from only 50 (out of 154) English-language learners, and therefore oral-English proficiency was not included in the present study as a control variable. Study of Latino English-language learners' oral abilities in relation to English-reading *growth* is rare. Briefly, prior correlational studies at single time points suggest: a) For young English-language learners, global oral English proficiency does not tend to correlate with global English-reading achievement. b) Global oral-English proficiency and oral-English vocabulary have been shown to be related to English-reading comprehension, and English-

phonological processing has been shown to be related to English-word reading (Chiappe, Siegel & Gottardo, 2002; Gottardo, 2002; Quiroga et al., 2002). While correlational studies on the relationships among oral-language abilities are informative, it also remains theoretically possible that relationships among oral language processes and English reading might change over time. For instance, young Latino English-language learners' English phonological oral abilities might have an immediate effect, but not a later effect on English reading.

Second, information about the English-language learners' literacy level in their home language was not available in the present study. As English-language learners' knowledge and skill in their native language can be transferred to English (Cummins, 1981), inclusion of native-language literacy level as a control variable, or at least having such information as context for interpreting findings would have been helpful.

Third, the present study included English-language learners who spoke several different native languages (Spanish, Chinese, and Laos), but Spanish was the native language for the vast majority (91.7%) of English-language learners. There is some limited research and much theoretical foundation to support the belief that native-to-new-language orthographic similarity affects ease of learning the new language (e.g., Hamada & Koda, 2008; Wang & Koda, 2007). Accounting for the differences in native-language as a control variable might impact results and help us to better understand the impact of native-language upon English-reading growth.

Also, African-American children comprised the largest ethnic group (60.6%) in the sample used for the present study. Research findings suggest that African-American children who are more familiar with school English (ability to reproduce the School English features

when imitating) tend to perform better in early reading (Charity, Scarborough, & Griffin, 2004). School English refers to the dialect that is used predominantly in written English and often used in classroom instruction (Charity, Scarborough, & Griffin, 2004). However, in the present study, the extent to which the African-American children were familiar with School English was not measured. Such information might have been helpful for us to better understand early reading development comparison between English-language learners and subgroups (African American and Caucasian) of monolingual children.

Fourth, due to the small sample size of schools (N = 16), no predictors were included at school level for the statistical models. School context (e.g., location, instruction, SES, and ethnic composition) might affect students' learning.

Discussion

In this section, I first discuss the main conclusions. Then, I briefly discuss the significant results for interactions involving cohort.

Discussing Main Conclusions

Growth in Instructional Reading Level for the English-Language Learners Compared to Their Monolingual Native-English-Speaking Peers

The growth pattern for Instructional Reading Level for the English-language learners was different from that for their monolingual native-English-speaking peers across two years. The English-language learners scored lower and the gap widened over time. First, documenting the growth pattern of Instructional Reading Level for the English-language learners compared to their monolingual native-English-speaking peers is important, and the present study is among a select few that have examined growth over time. It is certainly among a very few that have statistically examined growth over time.

Second, on the whole, at study's end, students' Instructional Reading Levels were quite high, with October of sixth-grade level (5.30) and March of fourth-grade level (3.88) for the monolinguals and English-language learners, respectively.

Third, notably, the Instructional Reading Level result in the present study was inconsistent with results of prior research documenting English-language learners' overall reading achievement growth, which suggested that young English-language learners' overall reading achievement development looked much like that of monolingual native-English speakers (Araujo, 2002; Fitzgerald, Amendum, & Guthrie, in press; Fitzgerald & Noblit, 1999, 2000; Hutchinson, Whiteley, Smith, & Connors, 2003; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006; Weber & Longhi-Chirlin, 2001).

One explanation for the differences between the present study and the preceding few is that most of the prior studies were descriptive or case studies. Only three (Fitzgerald, Amendum, & Guthrie, in press; Hutchinson, Whiteley, Smith, & Connors, 2003; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006) were time series studies in which outcomes were statistically examined. Comparison of results across descriptive and case studies to statistical studies can sometimes be difficult because the two sets of studies are nuanced in the types of questions raised. The descriptive studies can portray the possibilities of growth in rich ways, while the statistical studies explain aggregated growth without deeply nuanced understandings.

Still, even compared to the prior three statistical studies, different results occurred in the present study. One explanation here is that more English-language learners and considerably more monolingual students were included in the present study than in prior research. Thus perhaps the larger sample size could have resulted in more power to detect

potential significant effects at the .05 level. Specifically, there were 900 participants in the present study, including 746 native English-speaking children and 154 English-language learners. In the prior three statistical studies, there were 47 to 122 participants, with 28 to 67 English-language learners and 19 to 55 monolingual native-English-speaking students (Fitzgerald, Amendum, & Guthrie, in press; Hutchinson, Whiteley, Smith, & Connors, 2003; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006).

Fourth, returning to discussion of the Instructional Reading Level result in the present study, the increasing gap between the English-language learners and their monolingual peers is alarming. At Year 1 onset, the English-language learners lagged behind their monolingual native-English-speaking peers by about one-third-of-a-grade level. At Year 2 end, the lag increased to about one-and-a-half-grade level. What might be worse is that it is likely that if the English-language learners' reading achievement did not accelerate, when they moved to upper grades, with more demanding tasks in reading, their growth rate might be even slower than what was reported in primary grades in the present study. Indeed, they needed to catch up with their peers to close the gap from very early on.

Maybe the English-language learners in the study had not fully developed their knowledge in sound- and word-level reading subprocesses. Perhaps when they had consolidated their phonological awareness, phonics knowledge, and word-recognition strategies, their Instructional Reading Level might begin to accelerate.

One explanation is that a Matthew Effect —"the rich get richer, and the poor get poorer" (Stanovich, 1986) might be in play. That is, the monolingual native-English-speaking students performed better (by about one-third of a grade level) than the English-language learners at the onset of Year 1. While the monolinguals continued to make greater

gains (about one grade level) from one time point to the next, the English-language learners continued to make less progress (about two-thirds of a grade level) than their monolingual peers, and thus they fell farther and farther behind. Thus the initial monolingual advantage may have been a booster.

Another possibility is that teachers taught the monolinguals more effectively than they taught the English-language learners. There is some limited evidence to suggest that at least some teachers believe a reasonably high level of oral English is needed before English-reading instruction can be done (Neufeld & Fitzgerald, 2001). In the present study, we have no way of examining such a possibility.

Yet another explanation is that the monolinguals had more exposure to English-language books and experiences with English-book reading at home than the English-language learners. Although research suggested that access to books (c.f., Koskinen et al., 2000; Elley, 1996; Morrow; 1992) and children's experiences with language and reading at home (c.f., Koskinen et al., 2000; Teale, 1986; Tobin & Pikulski, 1988) were critical factors in early reading development, many English-language learners do not have sufficient books written in English available (Blum et al., 1995) or do not have sufficient opportunities to practice English at home (Elley & Mangubhai, 1983). In the present study, we have no way of examining such a possibility.

Growth in Sound- and Word-Level Reading Subprocesses for the English-Language Learners Compared to Their Monolingual Native-English-Speaking Peers

Growth in Phonological Awareness. The growth pattern of Phonological Awareness for the first-grade English-language learners was different from the pattern for their monolingual native-English-speaking peers across the year, with the English-language

learners scoring lower at the year onset and the gap narrowed in the end. First, it is amazing that the English-language learners who just started to learn the language could make such rapid progress and narrowed the gap with their monolingual native-English-speaking peers so soon. Their rapid growth in Phonological Awareness is encouraging because findings from prior research on emergent literacy for monolingual native-English-speaking children suggested that phonological awareness is critical for preparing children to move on to the next step of learning about word reading (Adams, 1990).

Second, the finding is similar to those in three prior studies, but different from those in six others. The result echoes prior findings documenting different growth patterns for kindergarten through third-grade English-language learners in Phonological Awareness compared to their monolingual native-English-speaking peers, with the English-language learners catching up with the monolinguals (Fitzgerald, Amendum, & Guthrie, in press; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lipka & Siegel, 2007).

The finding is inconsistent with results from six prior studies which suggested similar developmental trajectories on phonological awareness for English-language learners and native-English-speaking peers (Chiappe & Siegel, 2006; Chiappe, Siegel, & Wade-Woolley, 2002; Lesaux & Siegel, 2003; Lesaux, Rupp, & Siegel, 2007; Muter & Diethelm, 2001; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). The growth patterns and performance levels of phonological awareness were similar for the English-language learners and their monolingual native-English-speaking peers. One explanation for the different findings is that, as discussed above for Instructional Reading Level, more English-language learners were included in the present study than in prior research. Perhaps larger sample size for English-

language learners in the prior studies could have resulted in more power to detect the significant effects at .05 level.

Growth in Phonics Knowledge. The growth pattern of Phonics Knowledge for the English-language learners was different from that for their monolingual native-English-speaking peers across two years. The English-language learners scored lower at the year onset and exhibited a steep learning curve ending the year performing about the same. First, documenting different growth patterns of phonics knowledge for the English-language learners compared to their monolingual native-English-speaking peers may be important to the literature as the present study might be among the first of the studies reporting such a different growth pattern.

Second, it is remarkable that the English-language learners who just started to learn the English language could make such rapid progress in Phonics Knowledge and catch up with their monolingual native-English-speaking peers so soon. Well-developed phonics knowledge may prepare them well to move to the next phase of learning to read (Chall, 1996; Fitzgerald & Shanahan, 2000).

Third, the result is inconsistent with the findings of two prior studies on English-language learners' growth in phonics knowledge compared to their monolingual native-English-speaking peers' growth. The two prior results suggested that the growth pattern of phonics knowledge for the English-language learners was similar to that for their monolingual native-English-speaking peers, with either similar performance levels of the two language groups (Neufeld, Amendum, Fitzgerald, & Guthrie, 2006) or the English-language learners consistently performing at a lower level than the monolinguals (Fitzgerald, Amendum, & Guthrie, in press). One explanation for the different findings, again, is that as

discussed above for Instructional Reading Level, more English-language learners were included in the present study than in prior research. Perhaps larger sample size for English-language learners in the prior studies could have resulted in more power to detect the significant effects at .05 level.

Growth in Reading Words in Isolation. First, documenting different growth patterns of word reading may be important for the literature as few prior studies have addressed the reading subprocess.

Second, it is remarkable that the English-language learners could make such rapid progress in reading words in isolation across two years. By the end of Year 2, both first- and second-grade English-language learners' performance approximated their monolingual peers'. The English-language learners' rapid growth in reading words in isolation is encouraging because early reading development theory for monolingual native-English-speaking children suggests that word reading is critical during this period to prepare the students to move into a next phase of learning to read (Chall, 1996; Fitzgerald & Shanahan, 2000).

Third, although both groups performed well by Year 2 end, with the monolingual-English students nearly reaching ceiling as would be expected, the English-language learners were within the monolingual students' reach, but still approximately 10 percentile points below them. We might be concerned if English-language learners would ever able to close the gap.

Fourth, the finding that similarity or difference in the growth in Reading Words in Isolation for the English-language learners and their monolingual native-English-speaking peers depended on cohort is interesting. For the first-grade cohort, the growth pattern was similar for the English-language learners and their monolingual native-English-speaking

peers, with the English-language learners consistently performing at a lower level than their monolingual peers. For the second-grade cohort, the growth patterns for the two language groups were different, with the English-language learners' growth exhibiting a steep growth curve. By Year 2 end, the gap was narrower.

The result for the first-grade cohort mirrors the finding from one for first graders in a prior two-year study following entering first and second graders (Fitzgerald, Amendum, & Guthrie, in press), but differs from other prior studies involving first graders (Chiappe & Siegel, 2006; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lesaux, Rupp, & Siegel, 2007; Manis, Lindsey, & Bailey, 2004; Neufeld, Amendum, Fitzgerald, & Guthrie, 2006). In Fitzgerald, Amendum, and Guthrie's (in press) study, the English-language learners had a similar growth pattern for word-recognition strategies as their monolingual native-English-speaking peers, with the English-language learners consistently performing lower. In the others, researchers found that the English-language learners followed a similar growth trajectory in word-recognition strategies as monolingual native-English speakers and performed at similar levels on assessments for word-recognition strategies over time. Reasons for the differences in results across studies are not apparent.

The result for the second-grade cohort is inconsistent with prior results for English-language learners' growth in sight words involving second-grade graders. In the prior research involving second graders, the growth pattern in sight words for the English-language learners was similar to their monolingual native-English-speaking peers, either with similar performance levels for both language groups (Chiappe & Siegel, 2006; Geva, Yaghoub-Zadeh, & Schuster, 2000) or with the English-language learners consistently performing lower (Fitzgerald, Amendum, & Guthrie, in press).

For the second-grade differences, maybe in the present study the teachers in the second-grade cohort paid special attention to the English-language learners' sight word reading, such as by providing additional intense one-on-one or small group instruction on word recognition, which accelerated the English-language learners' development in word-recognition strategies.

Fifth, note the possible ceiling effects for the sound- and word-level reading subprocesses by the end of Year 2. Such ceiling effects do not necessarily mean that the measures are flawed. Rather, ceiling levels are expected by the end of second or third grade.

Growth in Fluency for the English-Language Learners Compared to Their Monolingual Native-English-Speaking Peers

The finding of similar Fluency growth patterns and performance levels for the English-language learners and their monolingual native-English-speaking peers is interesting. Such a result is consistent with findings of one prior study that suggested that first- and second-grade Latino English-language learners developed fluency in a similar way and achieved similar performance level as their monolingual native-English-speaking peers across two years (Fitzgerald, Amendum, & Guthrie, in press). As only one study was found that examined English-language learners' growth in fluency, to what extent the result of the present study can be generalized to a larger population is not clear.

Both language groups performed well on Fluency at Year 2 end—69.50 words correct per minute and 70.18 words correct per minute for the monolingual native-English-speaking students and English-language learners, respectively. The good performance levels were not unexpected as the students' fluency was measured with the passage on their Instructional

Reading Level. As long as they could read most of the words, they could read the text fluently.

It is important to note that the students' reading rate of approximately 70 words per minute at the end of the study compares favorably to the national norm—about 25th percentile for third graders and 35th percentile for second graders in the spring (Hasbrouck & Tindal, 2006).

Growth in Comprehension for the English-Language Learners Compared to Their Monolingual Native-English-Speaking Peers

The finding of similar growth patterns and performance levels of comprehension for the English-language learners and their monolingual native-English-speaking peers is also interesting. Both groups performed well at Year 2 end—71.63 percentage points and 68.17 percentage points for the monolingual native-English-speaking students and English-language learners, respectively. The high level of comprehension is important because it laid a good foundation for the students in reading comprehension in primary grades and prepared them well for moving to higher grades when the reading tasks became more demanding.

The result is similar to that of two prior studies and different from one other. It echoes findings from two prior studies which suggested that young English-language learners' growth in comprehension was similar to their monolingual native-English-speaking peers' growth (Fitzgerald, Amendum, & Guthrie, in press; Manis, Lindsey, & Bailey, 2004).

On the other hand, the result is different from that of another finding that suggested that the English-language learners made comparable growth as monolingual native-English speakers, but the English-language learners consistently performed lower (Hutchinson, Whiteley, Smith, & Connors, 2003). English-language learners' lower scores on

comprehension, as the authors stated, may be partly due to the culture-bound test—the Neale Analysis of Reading Ability (Neale, 1997)—used in the study to measure comprehension.

One explanation for the different results may be related to the comprehension measures used in the studies. Hutchison and colleagues (2003) used a standardized comprehension test that did not allow students to read on instructional level. Recall that in the present study comprehension was measured using the passage of their Instructional Reading Level—where words were pronounced at least with 90% accuracy. As long as the English-language learners could pronounce most of the words, they could comprehend well.

Growth in Attitude toward Reading for the English-Language Learners Compared to Their Monolingual Native-English-Speaking Peers

One of the most important points about Attitude toward Reading growth is that even at the beginning of the study, on average, students had very positive attitudes—approximately 4.33 and 4.52 out of 5 on the scale for the English-language learners and their monolingual native-English-speaking peers, respectively. So there was little room for growth. Although the growth patterns for the two groups were statistically significantly different, one might suggest that they were not practically significantly different. On the whole, students were very positive about reading from start to finish.

It is especially noteworthy that the English-language learners maintained a positive attitude toward reading from beginning to end. As prior research has documented that attitude toward reading was related to reading achievement (McKenna, Kear, & Ellsworth, 1995), the high attitude level seems particularly important. It seems that their status as English-language learners did not impact their enthusiasm for reading. If we consider the statistically significant result that suggests that the English-language learners' attitudes

actually slightly surpassed their peers', the point might be punctuated even more emphatically.

The statistically significant result is inconsistent with the result from one prior study where there were no differences in attitude toward reading between Hispanic, African-American, and Caucasian students in relation to the negative trend of reading attitude, regardless of their cultural and linguistic backgrounds (McKenna, Kear, & Ellsworth, 1995). Failure to find significant differences in attitude toward reading in McKenna, Kear, and Ellsworth's study, as the authors stated, might be due to that "mere membership in an ethnic group may involve too broad a categorization for meaningful social norms to affect beliefs. Membership in smaller social units…may well exert stronger normative influences" (p. 952). It may also be that the study did not include enough Hispanic students, which might have decreased the power to detect significant differences in the development of attitude toward reading between Hispanic and Caucasian students over time.

Overarching Points

One might question: If English-language learners' performance on sound- and word-level reading subprocesses suggests they are, on average, closing the gap with their monolingual peers, why isn't the gap closing for Instructional Reading Level? One explanation is that maybe the English-language learners needed more time to integrate those subprocesses before Instructional Reading Level could begin to accelerate. Another explanation is perhaps students' knowledge of vocabulary meaning and word recognition strategies (such as how to use context to guess at words) are critical features of overall reading achievement. By failing to measure such reading abilities we can't know if these were major contributing factors to the lack of gap closure for Instructional Reading Level.

Therefore, on average, the English-language learners closed the gap in those subprocesses with their monolingual peers, but not in Instructional Reading Level. Meantime, it is important to keep in mind that such ceiling effects for sound- and word-level subprocesses are expected for students by the end of second or third grade. Such subprocesses are exactly those we expect students to master from early on.

Discussing Significant Results for Selected Interactions Involving Cohort That Did Not Involve Language Status

First, regardless of language status, the overall growth pattern for the first-grade cohort was different from the pattern for the second-grade cohort. The first-grade cohort began Year 1 lower, and made less growth (by about one-third of a grade level) than the second-grade cohort from one time point to the next. By Year 2 end, the gap got wider. Maybe students in the first-grade cohort needed more time to learn and consolidate the sound- and word-level reading subprocesses well during the first- and second-grade, and then they were able to read the words in context well in the third grade.

Second, regardless of language status, the first-grade cohort exhibited much steeper learning curves on Phonics Knowledge, Reading Words in Isolation, and Fluency than the second-grade cohort. The finding suggests that maybe in the first grade, learning about reading focused heavily on sound- and word-level subprocesses, then when the students moved to second- and third-grade, growth in such subprocesses continued but slowed down. Over time, the focus shifted to autonomy in reading and integrating strategies and processes to achieve fluency and comprehension. Such a finding provides evidence to support the early reading development theory for native English-speaking children, which proposes critical

stages in early reading and during different stages some processes and knowledge tend to develop faster than the others (Chall, 1996; Clay, 2001; Fitzgerald & Shanahan, 2000).

Third, regardless of language status, the first-grade cohort's Attitude toward Reading was accelerated and the gap between the first-grade cohort and the second-grade cohort was narrowed across the two years. Such a finding suggests that maybe in first and second grade, students were reading easy materials and they had successful reading experiences. When they moved to third grade, they began to read more texts with more difficult vocabulary and challenging texts in content that required their higher-level thinking skills to comprehend the material. Thus, their attitude toward reading tended to level off.

Instructional Implications

First, with regard to the increasing gap on Instructional Reading Level between the English-language learners and their monolingual native-English-speaking peers, to help the English-language learners catch up with their monolingual peers, teachers may need to provide more intense and supplemental instruction on sound- and word-level reading subprocesses, such as in a small-group setting. In doing so, the English-language learners may be able to accelerate their learning in the subprocesses and then their reading achievement may thrive.

Second, with regard to the sharp English-language learner growth curve for Phonological Awareness, Phonics Knowledge, and second-grade cohort for Reading Words in Isolation, the steep growth could be attributed to teachers' instructional focus upon the subprocesses. If so, then in general, teachers might be especially sensitive to the need to support the English-language learners in sound- and word-level reading subprocesses, and pay special attention to the instruction in such areas from very early on. Additionally, the

persistent gap on Reading Words in Isolation between the English-language learners and their monolingual native-English-speaking peers for the first-grade cohort implies that teachers may provide intense small-group instruction in Phonological Awareness and Phonics Knowledge to help the English-language learners accelerate their knowledge in such areas which are prerequisites to word learning.

Third, as for Fluency and Comprehension, teachers may be aware that although the English-language learners are able to achieve similar Fluency and Comprehension levels as their monolingual native-English-speaking peers in the primary grades, as they move up to higher grades with more demanding reading tasks and complex vocabulary, they might fall behind their monolingual peers in fluency and comprehension.

Finally, the English-language learners' consistent positive Attitude toward Reading implies that although the English-language learners may progress more slowly than their monolingual peers on the overall reading achievement, their Attitude toward Reading may not be affected much. Teachers may take advantage of the students' highly positive Attitude toward Reading and find ways to foster and maintain the attitude.

Implications for Research and Theory

First, one implication for future research is to continue to investigate reading growth for English-language learners compared to that for their monolingual native-English-speaking peers by following the students for a longer period of time, from first grade to upper elementary grade at least. The results would provide a fuller picture of how the English-language learners' reading achievement, reading subprocesses, and attitude toward reading develop in relation to that for their monolingual peers in the long run, as well as how the

components might affect each other. Also, the findings could better inform teachers' instructional decision-making.

Second, the present study only examined development in attitude toward reading in the affective domain for the English-language learners compared to their monolingual peers. How does the growth in other affective factors (e.g., motivation, self-esteem) for the English-language learners compare to that for their monolingual native-English-speaking peers? How does the growth in affective factors interact with reading achievement for the English-language learners compared to that for their monolingual native-English-speaking peers? The answers to such questions might help us better understand the role of affective factors and better understand the interactions between cognitive and affective factors so as to better understand the reading development of the English-language learners.

Third, the present study did not explore the relationship between the English-language learners' oral English proficiency and their reading growth. For future research, researchers might examine how English-language learners' oral English proficiency might be related to their growth in the overall reading achievement, reading subprocesses, and attitude toward reading. Consequently, time-series study of such relationships would be useful, particularly with regard to potential implications for classroom instruction, again, such as for instructional decision points about which reading subprocesses might deserve additional emphasis at different time points. For instance, if oral-English phonological abilities are critically important for early English-reading development, but not later English-reading, then teachers might provide disproportionate instruction (relative to other subprocessses) in both oral and written phonological awareness activities upon English-language learners' arrival.

Fourth, in the present study, all participants received all-English instruction. What does English-language learners' early reading development look like in bilingual classrooms, and how does that compare the development of reading for those in the all-English classrooms? The answers to such questions might be useful in knowing the English-language learners' reading development in different settings and the instructional impact on their reading growth.

Fifth, researchers might investigate how school characteristics (e.g., SES, ethnic composition, program, etc.) might affect English-language learners' reading growth compared to their monolingual native-English-speaking peers' growth. The results from such studies would provide information about the impact of school characteristics on English-language learners reading development and inform the school reform policy as well.

Sixth, with regard to measures, in the present study, vocabulary meaning and selected word-reading strategies (e.g., using context to guess at a word) were not assessed. Inclusion of such measures in future research might provide a fuller picture of reading subprocesses used by students so as to better interpret the increasing large gap in Instructional Reading Level between the two language groups. Also, note that in the present study the sound- and word-level reading subprocesses reached ceiling level, but Instructional Reading Level did not have ceiling. Researchers might use different measures for the sound- and word-level reading subprocesses, such as using multiple indicators for the construct of phonological awareness, which might better inform the results of growth in such subprocesses comparing the two language groups over time.

Finally, more research on early reading development for English-language learners from various language backgrounds would present a fuller picture of reading development of

English-language learners speaking various home languages. The information might help us look into similarities or differences in reading development among English-language learners of different language groups.

With regard to theory development for English-language learners' reading, first, certain results of the present study, such as similar growth patterns and performance levels of word-recognition strategies for the first-grade cohort, fluency, and comprehension for the English-language learners and their monolingual native-English-speaking peers, provide additional evidence for the theoretical perspective that the English-language learners' early reading develops in ways similar to that for their monolingual peers.

Table 3.1
Reading Measures by Cohort and Year

Cohort	Reading measure													
	Instructional Reading Level		Phonological Awareness	Phonics Knowledge		Reading Words in Isolation		Fluency		Comprehension		Attitude toward Reading	
First grade ($1^{st}/2^{nd}$)	Y1	Y2	Y1	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
Second grade ($2^{nd}/3^{rd}$)	Y1	Y2		Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2

Note. Y1=Year 1. Y 2=Year 2. The blank cells denote that the specific reading measure was not administered to the specific cohort during the year.

Table 3.2
Summaries of Selected Demographic Variables for the 16 Schools

School	Community Size	Median Income	Enrollment	Ethnicity (%)				Ethnic Diversity	
				Caucasian	African-American	Latino	Other	Herfendahl Indices[a]	Subsidized Lunch (%)
1	44,917	35,301	606	19	46	32	3	0.649	82
2	12,833	35,706	336	43	33	23	0	0.6533	68
3	540,828	38,553	596	2	76	22	0	0.3736	91
4	11,237	40,697	526	62	29	5	2	0.5286	46
5	121,015	36,287	550	11	86	1	2	0.2478	87
6	11,237	40,697	159	28	61	9	0	0.5414	90
7	66,277	36,924	435	34	61	4	1	0.5106	93
8	66,277	36,924	365	25	73	1	1	0.4044	97
9	692	23,182	565	14	84	0	0	0.2748	83
10	2,347	19,762	536	1	98	1	0	0.0394	90
11	692	23,182	198	4	96	0	0	0.0768	93
12	2,362	21,094	181 (a K-3 school)	2	97	1	0	0.0586	94
13	975	13,700	280	43	53	4	0	0.5326	74
14	769	34,315	83 (a K-12 school)	81	3	16	0	0.3174	--[b]
15	278	20,883	185	46	51	3	0	0.5274	41
16	4,107	17,287	735	21	77	2	0	0.3626	76

Note. All information is from the U.S. Census Bureau, Census 2000 except for the information for School 13, that comes from the U.S. Census Bureau, 1990 Census because it was not available in the 2000 Census. Information from this table was provided by the state department of public instruction for the academic year 2001-2002. Percents for ethnicity do not add to 100% due to rounding.
[a]Herfendahl Index (HI) is used to represent ethnic diversity (ED) at each school. It is calculated based on the formula developed by Gibbs and Martin (1962), $ED_k=1-\sum_{1}^{j=J} G_j^2$ where G represents the proportion of the school of ethnic group *j* out of *J* ethnic groups. Then it is subtracted from 1 which makes it a measure of ethnic diversity. A higher value represents a higher degree of ethnic diversity.

[b]Meals are not offered at School 14.
Adapted from "Project report to the North Carolina Department of Public Instruction: North Carolina Reading Excellence Act External Evaluation," by J. Fitzgerald, 2004. Adapted with permission. The author added the information about Herfendahl Index.

Table 3.3
Variables, Sources, Procedures, and Reliability Estimates

Variable	Source	Procedure	Reliability
Instructional Reading Level	*Oral Reading* (Barr et al., 1995; Clay, 1993; NC DPI K-2 Assessments)	Students read aloud increasingly difficult graded passages (from the *Bader Reading and Language Inventory* [Bader & Weisendanger, 1994]) while the examiner recorded "miscues" on a separate copy of the passage. Using Clay's (1993) method, Instructional Reading Level was the highest level at which the student read with at least 90% word recognition accuracy.	.86 (perfect agreement); .95 (within one level)
Phonological Awareness	*Phonological Awareness* (modified slightly from Wake County, NC, Schools ; NC DPI K-2 Assessments)	This 25-item measure assesses the ability to: hear words as words (e.g., count words in sentences), hear parts in words (e.g., rhyme), and hear individual sounds in words (phoneme segmenting). Examiner provided an example and then student replied. E.g., "I'm going to say two words that rhyme—man, fan. Now it's your turn. Do these words rhyme? Store, more." Possible raw score range 0 to 25, converted to percent correct.	.92 (within 5 points)
Phonics Knowledge	*Phonics* (adapted from Shefelbine, 1995)	Students looked at letters and letter combinations on lists while the examiner prompted with statements such as, "Look at these letters, and tell me how they sound," and "Tell me the long sounds of these letters." Items included consonants, consonant digraphs, long and short vowels, consonant blends, r-controlled vowels, and common phonograms (e.g., ad, ame). Possible raw score range 0 to 67, converted to percent correct.	.92 (within 5 points)
Reading Words in Isolation	*Dolch Basic Sight Vocabulary* (Barr et al., 1995; Dolch, 1936; NC DPI K-2 Assessments)	Students looked at lists of words and said them aloud. Lists were in order of difficulty. If more than two words were missed on a list, then a lower list (or lists) was read. A word was scored correct if the student pronounced it correctly in three seconds or less. Raw score was number of words read correctly plus any unread words on lower lists (assuming that if students could read harder lists, they could also read lower lists). Possible raw score range 0 to 220, converted to percent correct.	.93 (within 5 points)
Comprehension	*Oral Reading* (Barr et al., 1995; Clay, 1993)	First students did the oral reading procedure described above. Then for the instructional reading level passage, the examiner asked the comprehension questions listed in the Bader & Weisendanger (1994) Reading *and Langauge Inventory*. Percent correctly answered questions was computed.	.83 (within 5 points)
Fluency	*Oral Reading* (Barr et al., 1995; Clay, 1993)	During Oral Reading (described above) on the instructional reading level passage, the examiner timed the student's reading for one minute, marking a line after the last word read during the one minute (Deno, 1985; Fuchs, & Fuchs, 1989; Fuchs, Fuchs, & Hamlett, 1989). Score was the number of words read correctly in one minute.	.92 (within 5 points)

Attitude toward Reading	*Attitude toward Reading* (Fitzgerald, 2001; Fitzgerald et al., 2002)	The child looked at a question while the examiner read it (e.g., "How do you feel when it's time for reading in school?") and then circled one face from a continuum of faces with varying degrees of smiles to frowns. Score was the mean across items and could range from 1 to 5.	.95 (within .5 points)

Note. From "Project report to the North Carolina Department of Public Instruction: North Carolina Reading Excellence Act external evaluation," by J. Fitzgerald, 2004. Used with permission.

Table 4.1

Means (Standard Deviations) and Marginal Means (Standard Deviations) for Instructional Reading Level by Cohort and Language Status across Time

Language status	N of participants	Time: Beginning Year 1	Middle Year 1	End Year 1	Beginning Year 2	Middle Year 2	End Year 2
		First-grade cohort ($1^{st}/2^{nd}$)					
Monolinguals	375	0.24 (0.83) (n = 238)	0.42 (0.89) (n = 110)	1.47 (1.93) (n = 246)	2.16 (2.41) (n = 227)	2.78 (2.56) (n = 116)	4.16 (3.02) (n = 216)
ELLs	73	0.04 (0.13) (n = 61)	0.28 (0.63) (n = 60)	0.70 (1.02) (n = 60)	1.66 (1.75) (n = 41)	2.96 (3.42) (n = 34)	3.51 (3.64) (n = 42)
Marginal mean (first-grade cohort)	448	0.20 (0.69) (n = 299)	0.37 (0.80) (n = 170)	1.32 (1.75) (n = 306)	2.08 (2.31) (n = 268)	2.82 (2.75) (n = 150)	4.05 (3.12) (n = 258)
		Second-grade cohort ($2^{nd}/3^{rd}$)					
Monolinguals	371	1.67 (1.84) (n = 217)	2.23 (1.95) (n = 104)	4.02 (2.65) (n = 221)	4.99 (3.29) (n = 195)	6.06 (3.23) (n = 101)	7.32 (3.62) (n =195)
ELLs	81	1.26 (1.75) (n = 61)	1.54 (1.91) (n = 57)	2.53 (2.63) (n = 66)	3.48 (3.28) (n = 55)	4.32 (3.77) (n = 45)	5.21 (3.92) (n =51)
Marginal mean (second-grade cohort)	452	1.58 (1.82) (n = 278)	1.99 (1.94) (n= 161)	3.68 (2.65) (n = 287)	4.66 (3.29) (n = 250)	5.52 (3.40) (n = 146)	6.88 (3.68) (n = 246)
Marginal mean (monolinguals)	746	0.92 (1.31) (n = 455)	1.30 (1.41) (n = 214)	2.68 (2.27) (n = 467)	3.47 (2.82) (n = 422)	4.31 (2.87) (n = 217)	5.66 (3.30) (n = 411)
Marginal mean (ELLs)	154	0.65 (0.94) (n = 122)	0.89 (1.25) (n = 117)	1.66 (1.86) (n = 126)	2.70 (2.63) (n = 96)	3.73 (3.62) (n = 79)	4.44 (3.79) (n = 93)

Note. An Instructional Reading Level score of "0" indicates that a student did not pass even the lowest reading passage; .25 indicates approximately a pre-primer level, which is, for typically developing students, achieved around the beginning of first grade; .50 indicates approximately a primer level, achieved by typically developing students around the middle of first grade; 1.00 indicates approximately first grade level; 2.00 indicates approximately second grade level; and so on. Due to missing data, not all participants were assessed at each time point.

Table 4.2

Means (Standard Deviations) for Phonological Awareness by Language Status for the First-grade cohort across Year 1

		Time		
Language status	N of participants	Beginning Year 1	Middle Year 1	End Year 1
Monolinguals	375	52.02 (25.67) (n = 238)	71.72 (16.96) (n = 111)	79.12 (14.57) (n = 249)
ELLs	73	27.52 (26.12) (n = 63)	57.07 (22.76) (n = 60)	71.38 (18.87) (n = 61)

Note. Only the first-grade cohort was assessed across Year 1. The scores were reported as percentage points. Due to missing data, not all participants were assessed at each time point. ELLs = English-language learners.

Table 4.3

Means (Standard Deviations) and Means (Standard Deviations) for Phonics Knowledge by Cohort and Language Status across Time

Language status	N of participants	Time: Beginning Year 1	Middle Year 1	End Year 1	Beginning Year 2	Middle Year 2	End Year 2
		First-grade cohort ($1^{st}/2^{nd}$)					
Monolinguals	375	43.49 (24.16) (n = 236)	60.04 (26.24) (n = 112)	76.07 (22.54) (n = 248)	79.51 (20.65) (n = 230)	90.02 (15.29) (n = 116)	89.45 (15.99) (n = 217)
ELLs	73	33.35 (22.04) (n = 63)	61.75 (26.85) (n = 60)	75.54 (23.33) (n = 61)	74.55 (24.38) (n = 41)	86.44 (17.74) (n = 34)	85.57 (21.07) (n = 42)
Marginal mean (first-grade cohort)	448	41.35 (23.71) (n = 299)	60.64 (26.45) (n = 172)	75.97 (22.70) (n = 309)	78.76 (21.21) (n = 271)	89.21 (15.85) (n = 150)	88.82 (16.81) (n = 259)
		Second-grade cohort ($2^{nd}/3^{rd}$)					
Monolinguals	371	72.90 (21.74) (n = 215)	77.37 (20.48) (n = 104)	85.00 (15.49) (n = 223)	88.08 (15.76) (n = 195)	92.01 (12.43) (n = 101)	92.21 (13.07) (n = 191)
ELLs	81	62.20 (30.87) (n = 60)	70.44 (24.72) (n = 57)	77.34 (19.72) (n = 67)	81.09 (21.93) (n = 55)	84.85 (23.01) (n = 46)	87.88 (17.95) (n = 51)
Marginal mean (second-grade cohort)	452	70.57 (23.73) (n = 275)	74.92 (21.98) (n = 161)	83.23 (16.47) (n = 290)	86.54 (17.12) (n = 250)	89.77 (15.74) (n = 147)	91.30 (14.10) (n = 242)
Marginal mean (monolinguals)	746	57.51 (23.01) (n = 451)	68.38 (23.47) (n = 216)	80.30 (19.20) (n = 471)	83.44 (18.41) (n = 425)	90.95 (13.96) (n = 217)	90.74 (14.62) (n = 408)
Marginal mean (ELLs)	154	47.42 (26.35) (n = 123)	65.98 (25.81) (n = 117)	76.48 (21.44) (n = 128)	78.30 (22.98) (n = 96)	85.53 (20.77) (n = 80)	86.84 (19.36) (n = 93)

Note. Scores were reported as percentage points. Due to missing data, not all participants were assessed at each time point. ELLs = English-language learners.

Table 4.4

Means (Standard Deviations) and Marginal Means (Standard Deviations) for Reading Words in Isolation by Cohort and Language Status across Time

Language status	N of participants	Time					
		Beginning Year 1	Middle Year 1	End Year 1	Beginning Year 2	Middle Year 2	End Year 2
		First-grade cohort ($1^{st}/2^{nd}$)					
Monolinguals	375	20.40 (25.28) (n = 237)	39.40 (29.57) (n = 111)	64.88 (32.05) (n = 248)	75.09 (29.25) (n = 230)	83.50 (24.60) (n = 116)	90.73 (20.39) (n = 216)
ELLs	73	11.82 (16.33) (n = 62)	34.77 (30.11) (n = 60)	55.47 (35.30) (n = 61)	70.10 (32.76) (n = 41)	76.69 (30.82) (n = 34)	80.68 (28.61) (n = 42)
Marginal mean (first-grade cohort)	448	18.62 (23.42) (n = 299)	37.78 (29.76) (n = 171)	63.02 (32.69) (n = 309)	74.34 (29.78) (n = 271)	81.96 (26.01) (n = 150)	89.09 (21.73) (n = 258)
		Second-grade cohort ($2^{nd}/3^{rd}$)					
Monolinguals	371	73.47 (30.37) (n = 198)	78.39 (26.71) (n = 104)	89.63 (19.87) (n = 222)	92.82 (18.68) (n = 196)	96.07 (13.20) (n = 101)	96.18 (14.06) (n = 195)
ELLs	81	51.33 (36.72) (n = 61)	62.18 (33.96) (n = 57)	70.98 (33.39) (n = 66)	81.98 (28.43) (n = 55)	83.56 (29.29) (n = 45)	89.22 (24.52) (n = 51)
Marginal mean (second-grade cohort)	452	68.26 (31.87) (n = 259)	72.65 (29.28) (n = 161)	85.36 (22.97) (n = 288)	90.44 (20.82) (n = 251)	92.21 (18.16) (n = 146)	94.74 (16.23) (n = 246)
Marginal mean (monolinguals)	746	44.56 (27.60) (n = 435)	58.26 (28.19) (n = 215)	76.57 (26.30) (n = 470)	83.25 (24.39) (n = 426)	89.35 (19.29) (n = 217)	93.32 (17.39) (n = 411)
Marginal mean (ELLs)	154	31.41 (26.44) (n = 123)	48.12 (31.99) (n = 117)	63.53 (34.31) (n = 127)	76.91 (30.28) (n = 96)	80.60 (29.95) (n = 79)	85.36 (26.37) (n = 93)

Note. Scores were reported as percentage points. Due to missing data, not all participants were assessed at each time point. ELLs = English-language learners.

Table 4.5

Unadjusted and Adjusted Means (Standard Deviations) and Marginal Means (Standard Deviations) for Fluency by Cohort and Language Status across Time

		Time					
Language status	N of participants	Beginning Year 1	Middle Year 1	End Year 1	Beginning Year 2	Middle Year 2	End Year 2
		First-grade cohort ($1^{st}/2^{nd}$)					
(unadjusted)		46.26 (22.39)	38.14 (17.27)	51.27 (19.81)	54.98 (22.84)	58.73 (21.83)	67.30 (24.83)
(adjusted)		52.95 (21.35)	46.80 (15.43)	56.73 (18.23)	59.02 (21.17)	61.05 (21.16)	65.49 (22.26)
Monolinguals	375	(n = 34)	(n = 57)	(n = 190)	(n = 204)	(n = 110)	(n = 206)
(unadjusted)		27.50 (20.79)	45.88 (26.73)	46.33 (24.95)	61.39 (38.92)	55.30 (21.04)	65.19 (25.52)
(adjusted)		37.49 (20.25)	54.29 (25.60)	54.42 (22.92)	66.77 (36.24)	56.38 (20.02)	64.11 (26.79)
ELLs	73	(n = 4)	(n = 17)	(n = 43)	(n = 31)	(n = 30)	(n = 36)
(unadjusted)		44.29 (22.22)	39.92 (19.44)	50.36 (20.76)	55.83 (24.96)	58.00 (21.66)	66.99 (24.93)
(adjusted)		51.32 (21.23)	48.52 (17.77)	56.30 (19.10)	60.04 (23.16)	60.05 (20.92)	65.28 (22.93)
Marg. mean (1^{st} gr. cohort)	448	(n = 38)	(n = 74)	(n = 233)	(n = 235)	(n = 140)	(n = 242)
		Second-grade cohort ($2^{nd}/3^{rd}$)					
(unadjusted)		60.81 (25.40)	68.34 (27.70)	70.27 (27.50)	69.88 (25.50)	77.68 (25.28)	79.23 (25.62)
(adjusted)		64.53 (22.60)	71.72 (24.73)	68.66 (26.13)	65.42 (24.35)	70.51 (25.14)	68.38 (24.13)
Monolinguals	371	(n = 143)	(n = 90)	(n = 205)	(n = 178)	(n = 99)	(n = 192)
(unadjusted)		64.56 (18.45)	57.17 (26.74)	55.16 (22.87)	67.02 (28.78)	67.27 (24.26)	64.62 (24.89)
(adjusted)		67.22 (15.26)	60.82 (23.00)	57.17 (19.62)	66.41 (24.32)	64.29 (17.22)	59.99 (21.60)
ELLs	81	(n = 26)	(n = 35)	(n = 55)	(n = 46)	(n = 41)	(n = 50)

(Table 4.5 cont'd)

(unadjusted)		61.39 (24.33)	65.21 (27.43)	67.07 (26.52)	69.29 (26.17)	74.63 (24.98)	76.21 (25.47)
(adjusted)		64.94 (21.47)	68.67 (24.25)	66.23 (24.75)	65.62 (24.34)	68.69 (22.82)	66.65 (23.61)
Marg. mean (2nd gr. cohort)	452	(n = 169)	(n = 125)	(n = 260)	(n = 224)	(n = 140)	(n = 242)
(unadjusted)		58.02 (24.82)	56.63 (23.66)	61.13 (23.80)	61.92 (24.08)	67.71 (23.46)	73.06 (25.21)
(adjusted)		62.31 (22.36)	62.06 (21.12)	62.92 (22.33)	62.00 (22.65)	65.53 (23.05)	66.88 (23.16)
Marg. mean (monolinguals)	746	(n = 177)	(n = 147)	(n = 395)	(n = 382)	(n = 209)	(n = 398)
(unadjusted)		59.62 (18.76)	53.48 (26.74)	51.29 (23.78)	64.75 (32.86)	62.21 (22.90)	64.86 (25.15)
(adjusted)		63.26 (15.93)	58.69 (23.85)	55.96 (21.07)	66.55 (29.12)	60.95 (18.40)	61.71 (23.77)
Marg. mean (ELLs)	154	(n = 30)	(n = 52)	(n = 98)	(n = 77)	(n = 71)	(n = 86)

Note. Scores were reported as number of words read correctly within one minute. Due to missing data, not all participants were assessed at each time point. ELLs = English-language learners.

Table 4.6

Unadjusted and Adjusted Means (Standard Deviations) and Marginal Means (Standard Deviations) for Comprehension by Cohort and Language Status across Time

		Time					
Language status	N of participants	Beginning Year 1	Middle Year 1	End Year 1	Beginning Year 2	Middle Year 2	End Year 2
		First-grade cohort ($1^{st}/2^{nd}$)					
(unadjusted)		74.97 (25.76)	81.17 (25.42)	69.33 (25.01)	73.79 (27.65)	76.74 (26.10)	67.25 (27.93)
(adjusted)		59.52 (21.04)	64.53 (23.84)	59.44 (21.95)	67.05 (22.30)	73.10 (23.16)	71.80 (23.69)
Monolinguals	375	(n = 61)	(n = 67)	(n = 194)	(n = 203)	(n = 110)	(n = 206)
(unadjusted)		63.25 (40.30)	83.87 (18.27)	85.10 (21.02)	77.58 (24.40)	71.27 (32.28)	68.54 (35.30)
(adjusted)		44.60 (40.05)	66.96 (18.17)	70.03 (19.51)	68.52 (19.44)	70.09 (18.02)	71.65 (24.38)
ELLs	73	(n = 8)	(n = 26)	(n = 43)	(n = 34)	(n = 30)	(n = 36)
(unadjusted)		73.61 (27.45)	81.92 (23.42)	72.19 (24.29)	74.33 (27.18)	75.57 (27.42)	67.44 (29.03)
(adjusted)		57.79 (23.24)	65.21 (22.25)	61.36 (21.51)	67.26 (21.89)	72.46 (22.06)	71.78 (23.79)
Marg. mean (1^{st} gr. cohort)	448	(n = 69)	(n = 93)	(n = 237)	(n = 237)	(n = 140)	(n = 242)
		Second-grade cohort ($2^{nd}/3^{rd}$)					
(unadjusted)		61.40 (26.73)	67.77 (22.74)	60.03 (27.68)	57.81 (31.53)	56.30 (30.63)	50.71 (33.25)
(adjusted)		52.25 (24.44)	61.87 (20.86)	64.19 (24.68)	67.26 (25.62)	71.13 (27.05)	73.16 (25.13)
Monolinguals	371	(n = 176)	(n = 91)	(n = 205)	(n = 187)	(n = 100)	(n = 192)
(unadjusted)		69.99 (26.53)	66.95 (27.20)	60.08 (29.47)	71.78 (30.67)	63.91 (34.51)	61.77 (34.64)
(adjusted)		60.46 (20.72)	59.05 (26.13)	57.06 (27.38)	75.54 (29.39)	70.77 (29.37)	71.91 (24.82)
ELLs	81	(n = 40)	(n = 40)	(n = 55)	(n = 48)	(n = 41)	(n = 50)

(Table 4.6 cont'd)

(unadjusted)		62.99 (26.69)	67.52 (24.10)	60.04 (28.06)	60.66 (31.35)	58.51 (31.76)	53.00 (33.54)
(adjusted)	452	53.77 (23.75)	61.01 (22.47)	62.68 (25.25)	68.95 (26.39)	71.03 (27.72)	72.90 (25.07)
Marg. mean (2nd gr. cohort)		(n = 216)	(n = 131)	(n = 260)	(n = 235)	(n = 141)	(n = 242)
(unadjusted)		64.89 (26.48)	73.45 (23.88)	64.55 (26.38)	66.13 (29.51)	67.01 (28.26)	59.27 (30.50)
(adjusted)		54.12 (23.56)	63.00 (22.12)	61.88 (23.35)	67.15 (23.89)	72.16 (25.01)	72.46 (24.38)
Marg. mean (monolinguals)	746	(n = 237)	(n = 158)	(n = 399)	(n = 390)	(n = 210)	(n = 398)
(unadjusted)		68.87 (28.83)	73.62 (23.68)	71.06 (25.76)	74.18 (28.07)	67.02 (33.57)	64.60 (34.92)
(adjusted)		57.82 (23.94)	62.17 (23.00)	62.75 (23.93)	72.63 (25.26)	70.48 (24.57)	71.80 (24.64)
Marg. mean (ELLs)	154	(n = 48)	(n = 66)	(n = 98)	(n = 82)	(n = 71)	(n = 86)

Note. Comprehension means were adjusted. Scores were reported as percent correct. Due to missing data, not all participants were assessed at each time point. ELLs = English-language learners.

Table 4.7

Means (Standard Deviations) and Marginal Means (Standard Deviations) for Attitude toward Reading by Cohort and Language Status across Time

		Time					
Language status	N of participants	Beginning Year 1	Middle Year 1	End Year 1	Beginning Year 2	Middle Year 2	End Year 2
		First-grade cohort ($1^{st}/2^{nd}$)					
Monolinguals	375	4.34 (0.60) (n = 238)	4.52 (0.51) (n = 111)	4.44 (0.59) (n = 249)	4.54 (0.56) (n = 230)	4.56 (0.63) (n = 115)	4.57 (0.47) (n = 216)
ELLs	73	4.03 (1.14) (n = 62)	4.23 (0.65) (n = 60)	4.26 (0.81) (n = 61)	4.59 (0.48) (n = 41)	4.47 (0.71) (n = 34)	4.52 (0.57) (n = 61)
Marginal mean (first-grade cohort)	448	4.28 (0.71) (n = 300)	4.42 (0.56) (n = 171)	4.40 (0.63) (n = 310)	4.55 (0.55) (n = 271)	4.54 (0.65) (n = 149)	4.56 (0.49) (n = 277)
		Second-grade cohort ($2^{nd}/3^{rd}$)					
Monolinguals	371	4.51 (0.53) (n = 217)	4.58 (0.48) (n = 104)	4.54 (0.53) (n = 222)	4.54 (0.54) (n = 196)	4.56 (0.52) (n = 98)	4.50 (0.48) (n = 193)
ELLs	81	4.31 (0.86) (n = 61)	4.58 (0.50) (n = 57)	4.60 (0.40) (n = 66)	4.66 (0.41) (n = 55)	4.60 (0.51) (n = 45)	4.65 (0.36) (n = 51)
Marginal mean (second-grade cohort)	452	4.47 (0.60) (n = 278)	4.58 (0.49) (n = 161)	4.55 (0.50) (n = 288)	4.57 (0.51) (n = 251)	4.57 (0.52) (n = 143)	4.53 (0.45) (n = 244)
Marginal mean (monolinguals)	746	4.42 (0.57) (n = 455)	4.55 (0.50) (n = 215)	4.49 (0.56) (n = 471)	4.54 (0.55) (n = 426)	4.56 (0.58) (n = 213)	4.54 (0.47) (n = 409)
Marginal mean (ELLs)	154	4.17 (1.00) (n = 123)	4.40 (0.58) (n = 117)	4.44 (0.60) (n = 127)	4.63 (0.44) (n = 96)	4.54 (0.60) (n = 79)	4.58 (0.47) (n = 112)

Note. Scores were the average scores across all the items on the questionnaire. Due to missing data, not all participants were assessed at each time point. ELLs = English-language learners.

Table 4.8

Means (Standard Deviations) for Each Reading Variable at Each Time Point by SES

Reading Variable	Time					
	Beginning Year 1	Middle Year 1	End Year 1	Beginning Year 2	Middle Year 2	End Year 2
IRL (low-SES)	0.75 (1.45)	1.05 (1.59)	2.20 (2.41)	2.93 (2.84)	4.13 (3.38)	5.10 (3.69)
IRL (high-SES)	1.26 (1.75)	1.73 (2.07)	3.37 (2.89)	4.50 (3.66)	4.26 (3.63)	6.30 (3.73)
PA (low-SES)	45.85 (27.63)	66.56 (20.92)	76.93 (17.35)	NA	NA	NA
PA (high-SES)	49.05 (27.50)	66.40 (16.73)	77.35 (14.52)	NA	NA	NA
PK (low-SES)	53.76 (27.96)	66.95 (26.21)	78.12 (21.65)	81.81 (20.36)	89.65 (16.55)	88.42 (18.49)
PK (high-SES)	61.37 (27.88)	71.02 (20.97)	83.20 (15.18)	83.11 (18.98)	88.50 (15.43)	91.76 (10.97)
RWI (low-SES)	38.61 (36.97)	53.24 (34.69)	71.07 (32.82)	79.29 (29.21)	86.30 (25.04)	90.24 (21.95)
RWI (high-SES)	54.16 (38.96)	62.93 (34.21)	82.89 (24.63)	87.90 (21.51)	89.15 (20.37)	95.94 (12.45)
FLU (unadj.) (low-SES)	57.58 (25.41)	54.67 (27.37)	58.02 (25.33)	60.86 (26.46)	65.67 (22.75)	69.22 (25.39)
FLU (unadj.) (high-SES)	59.64 (24.21)	60.18 (29.90)	62.80 (27.08)	66.66 (26.90)	68.81 (32.29)	78.44 (26.21)
FLU (adj.) (low-SES)	61.90 (22.32)	60.33 (24.12)	61.03 (22.85)	62.22 (24.33)	63.69 (20.41)	64.23 (23.10)
FLU (adj.) (high-SES)	63.59 (22.03)	64.43 (25.95)	63.12 (23.97)	64.29 (23.68)	67.02 (29.29)	70.94 (23.54)
COMP (unadj.) (low-SES)	67.56 (27.97)	73.60 (24.67)	66.61 (26.81)	69.98 (29.74)	68.34 (29.73)	61.59 (32.26)
COMP (unadj.) (high-SES)	60.35 (25.22)	73.07 (26.03)	63.39 (28.77)	60.65 (30.99)	61.78 (35.02)	56.28 (32.19)

(Table 4.8 cont'd)

COMP (adj.) (low-SES)	55.92 (24.42)	62.12 (22.68)	61.52 (23.34)	68.39 (24.62)	73.12 (24.86)	72.43 (25.18)
COMP (adj.) (high-SES)	51.68 (22.78)	65.61 (21.72)	63.73 (25.06)	66.52 (23.31)	66.28 (25.06)	72.09 (21.98)
ATT (low-SES)	4.39 (0.71)	4.50 (0.55)	4.48 (0.58)	4.55 (0.54)	4.59 (0.53)	4.56 (0.47)
ATT (high-SES)	4.40 (0.62)	4.49 (0.53)	4.50 (0.57)	4.52 (0.53)	4.42 (0.77)	4.51 (0.49)

Note. Both unadjusted and adjusted means and standard deviations for Fluency and Comprehension were reported. Phonological Awareness was assessed in Year 1 only. IRL = Instructional Reading Level. PA = Phonological Awareness. PK = Phonics Knowledge. RWI = Reading Words in Isolation. FLU = Fluency. COMP = Comprehension. ATT = Attitude toward Reading.

Table 4.9

Means (Standard Deviations) for Each Reading Variable at Each Time Point by Gender

Reading Variable	Time					
	Beginning Year 1	Middle Year 1	End Year 1	Beginning Year 2	Middle Year 2	End Year 2
IRL (female)	0.93 (1.54)	1.13 (1.62)	2.61 (2.50)	3.73 (3.11)	4.33 (3.34)	5.98 (3.69)
IRL (male)	0.87 (1.59)	1.17 (1.76)	2.36 (2.64)	3.05 (3.16)	4.00 (3.54)	5.01 (3.78)
PA (female)	48.47 (27.55)	66.30 (20.69)	77.00 (16.47)	NA	NA	NA
PA (male)	47.00 (26.20)	66.88 (19.98)	75.17 (17.58)	NA	NA	NA
PK (female)	56.48 (27.47)	68.34 (24.81)	80.63 (19.41)	83.20 (19.15)	90.46 (15.54)	89.43 (16.23)
PK (male)	55.60 (27.95)	66.89 (26.10)	77.82 (20.25)	80.08 (19.50)	88.16 (17.03)	86.88 (17.88)
RWI (female)	45.51 (37.90)	56.22 (34.80)	77.92 (29.83)	86.95 (23.87)	88.91 (22.26)	95.13 (14.58)
RWI (male)	41.22 (37.79)	52.84 (34.64)	71.77 (31.29)	78.90 (28.73)	84.82 (25.88)	89.45 (22.34)
FLU (unadj.) (female)	58.48 (23.35)	56.26 (28.62)	60.67 (27.40)	64.24 (26.52)	67.50 (24.35)	75.12 (25.05)
FLU (unadj.) (male)	57.99 (26.81)	55.27 (27.24)	57.51 (23.87)	60.44 (26.76)	65.04 (25.62)	67.81 (26.31)
FLU (adj.) (female)	62.95 (20.67)	61.77 (25.68)	62.95 (24.88)	63.93 (24.27)	65.22 (23.01)	68.40 (23.65)
FLU (adj.) (male)	61.89 (23.85)	60.48 (23.17)	59.96 (20.93)	61.53 (24.02)	63.45 (21.95)	63.34 (22.82)
COMP (unadj.) (female)	65.38 (27.63)	74.22 (24.93)	66.19 (27.41)	67.31 (30.15)	65.96 (31.12)	58.66 (32.25)
COMP (unadj.) (male)	65.76 (27.23)	72.65 (24.88)	65.43 (27.22)	67.76 (30.58)	68.13 (30.79)	61.90 (32.33)

(Table 4.9 cont'd)

COMP (adj.) (female)	54.67 (25.25)	63.12 (22.91)	62.45 (24.68)	69.10 (24.11)	71.43 (25.71)	72.93 (23.93)
COMP (adj.) (male)	54.82 (22.74)	62.32 (22.10)	61.60 (22.71)	66.58 (24.43)	72.06 (24.33)	71.71 (24.88)
ATT (female)	4.41 (0.72)	4.53 (0.54)	4.54 (0.56)	4.64 (0.48)	4.64 (0.45)	4.66 (0.40)
ATT (male)	4.38 (0.63)	4.47 (0.55)	4.44 (0.59)	4.46 (0.59)	4.48 (0.69)	4.45 (0.53)

Note. Both unadjusted and adjusted means and standard deviations for Fluency and Comprehension were reported. Phonological Awareness was assessed in Year 1 only. IRL = Instructional Reading Level. PA = Phonological Awareness. PK = Phonics Knowledge. RWI = Reading Words in Isolation. FLU = Fluency. COMP = Comprehension. ATT = Attitude toward Reading.

Table 4.10
Zero-Order Correlations between the Reading Variables at Each Time Point

Reading variable	1.	2.	3.	4.	5.	6.	7.
				Beginning Year 1			
1. IRL	—						
2. PA	.35*	—					
3. PK	.44**	.44**	—				
4. RWI	.66**	.15	.34*	—			
5. FLU	.38*	.05	.04	.60**	—		
6. COMP	-.42**	.17	-.07	-.52**	-.18	—	
7. ATT	.07	.22	.28	.28	.02	.03	—
				Mid Year 1			
1. IRL	—						
2. PA	.25*	—					
3. PK	.40**	.30**	—				
4. RWI	.64**	.35**	.58**	—			
5. FLU	.58**	.23*	.54**	.69**	—		
6. COMP	-.28*	-.02	-.25*	-.30**	-.24*	—	
7. ATT	-.19	.13	-.10	-.19	-.01	.13	—
				End Year 1			
1. IRL	—						
2. PA	.25**	—					
3. PK	.43**	.54**	—				
4. RWI	.63**	.33**	.62**	—			
5. FLU	.41**	.14*	.34**	.53**	—		
6. COMP	-.47**	-.05	-.20**	-.36**	-.24**	—	
7. ATT	.17**	.11	.19**	.22**	.20**	-.01	—
				Beginning Year 2			

(Table 4.10, cont'd)

1. IRL	—						
2. PA[a]	NA	NA					
3. PK	.45**	NA	—				
4. RWI	.57**	NA	.54**	—			
5. FLU	.42**	NA	.37**	.47**	—		
6. COMP	-.61**	NA	-.15**	-.37**	-.11*	—	
7. ATT	.10*	NA	.05	.12**	.07	-.02	—
			Mid Year 2				
1. IRL	—						
2. PA	NA	NA					
3. PK	.38**	NA	—				
4. RWI	.56**	NA	.52**	—			
5. FLU	.44*	NA	.27**	.36**	—		
6. COMP	-.59**	NA	-.06	-.29**	-.26**	—	
7. ATT	.14*	NA	.06	.10	.09	-.09	—
			End Year 2				
1. IRL	—						
2. PA	NA	NA					
3. PK	.40**	NA	—				
4. RWI	.50**	NA	.42**	—			
5. FLU	.43**	NA	.13**	.35**	—		
6. COMP	-.67**	NA	-.11**	-.30**	-.19**	—	
7. ATT	.05	NA	.05	.03	-.001	.02	—

Note. IRL = Instructional Reading Level. PA = Phonological Awareness. PK = Phonics Knowledge. RWI = Reading Words in Isolation. FLU = Fluency. COMP = Comprehension. ATT = Attitude toward Reading.
[a]Phonological Awareness was assessed in Year 1 only.
* $p < .05$. ** $p < .01$.

Table 4.11
Partial Correlations between the Fluency/Comprehension and the Other Reading Variables at Each Time Point Controlling for Instructional Reading Level

Reading variable	FLU	COMP	FLU	COMP	FLU	COMP
	Beginning Year 1		Mid Year 1		End Year 1	
PA	-.09	.37*	.11	.06	.04	.08
PK	-.15	.14	.42**	-.16	.20**	-.01
RWI	.50**	-.36*	.51**	-.16	.35**	-.09
FLU	—	-.02	—	-.11	—	-.06
ATT	-.001	.06	.13	.08	.14*	.08
	Beginning Year 2		Mid Year 2		End Year 2	
PK	.22**	.18**	.12*	.22**	-.06	.23**
RWI	.31**	-.04	.16**	.05	.17**	.52
FLU	—	.21**	—	-.004	—	.15**
ATT	.03	.06	.03	-.02	-.03	.07

Note. Phonological Awareness was assessed in Year 1 only. PA = Phonological Awareness. PK = Phonics Knowledge. RWI = Reading Words in Isolation. FLU = Fluency. COMP = Comprehension. ATT = Attitude toward Reading.
* $p < .05$. ** $p < .01$.

Table 4.12

Unconditional Three-Level Hierarchical Multilevel Model Table for Instructional Reading Level as the Dependent Variable; Time as the Level 1 (within Student) Predictor; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	0.81 (0.15)***	15
Time	0.86 (0.07)***	2802
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	0.92 (0.03)***	
Level 2 (students within schools)		
Individual initial status	2.47 (0.17)***	
Individual reading growth rate	0.32 (0.02)***	
Level 3 (between schools)		
School mean initial status	0.23 (0.12)*	
School mean reading growth rate	0.07 (0.03)*	

Note. * $p < .05$. *** $p < .001$.

Table 4.13

Full Three-Level Hierarchical Multilevel Model Table for Instructional Reading Level as the Dependent Variable; Time as the Level 1 (within Student) Predictor; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction, Language Status by Cohort Interaction, Language Status by Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	0.00 (0.15)	15
Language status	-0.05 (0.21)	2794
Time	0.75 (0.07)***	2794
Cohort	1.61 (0.13)***	2794
Gender	-0.03 (0.05)	2794
SES	0.30 (0.07)***	2794
Language status by time	-0.16 (0.09)	2794
Cohort by time	0.30 (0.05)***	2794
Language status by cohort	-0.52 (0.27)	2794
Language status by time by cohort	-0.11 (0.11)	2794
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	0.98 (0.04)***	
Level 2 (students within schools)		
Individual initial status	1.34 (0.12)***	
Individual reading growth rate	0.22 (0.02)***	
Level 3 (between schools)		
School mean initial status	0.15 (0.08)*	
School mean reading growth rate	0.06 (0.03)*	

Note. * $p < .05$. *** $p < .001$.

Table 4.14

Final Three-Level Hierarchical Multilevel Model Table for Instructional Reading Level as the Dependent Variable; Time as the Level 1 (within Student) Predictor; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	0.05 (0.15)	15
Language status	-0.32 (0.16)*	2796
Time	0.76 (0.07)***	2796
Cohort	1.50 (0.11)***	2796
Gender	-0.03 (0.05)	2796
SES	0.30 (0.07)***	2796
Language status by time	-0.22 (0.07)***	2796
Cohort by time	0.28 (0.05)***	2796
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	0.98 (0.04)***	
Level 2 (students within schools)		
Individual initial status	1.34 (0.12)***	
Individual reading growth rate	0.22 (0.02)***	
Level 3 (between schools)		
School mean initial status	0.15 (0.08)*	
School mean reading growth rate	0.06 (0.03)*	

Note. * $p < .05$. *** $p < .001$.

Table 4.15

Unconditional Three-Level Hierarchical Multilevel Model Table for Phonological Awareness as the Dependent Variable; Time as the Level 1 (within Student) Predictor; and Random Intercept for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	49.01 (2.45)***	15
Time	15.56 (0.68)***	765
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	276.67 (18.17)***	
Level 2 (students within schools)		
Individual initial status	149.48 (22.09)***	
Level 3 (between schools)		
School mean initial status	61.54 (31.60)*	

Note. * $p < .05$. *** $p < .001$.

Table 4.16

Final Three-Level Hierarchical Multilevel Model Table for Phonological Awareness as the Dependent Variable; Time as the Level 1 (within Student) Predictor; Language Status as the Level 2 Predictor, Gender and SES as the Level 2 Control Variables; Language Status by Time Interaction; and Random Intercept for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	54.14 (2.62)***	15
Language status	-26.36 (2.97)***	761
Time	13.58 (0.74)***	761
Gender	-0.85 (0.85)	761
SES	-0.32 (1.30)	761
Language status by time	8.92 (1.64)***	761
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	261.96 (17.38)***	
Level 2 (students within schools)		
Individual initial status	119.36 (19.77)***	
Level 3 (between schools)		
School mean initial status	58.53 (28.86)*	

Note. * $p < .05$. *** $p < .001$.

Table 4.17

Unconditional Three-Level Hierarchical Multilevel Model Table for Phonics Knowledge as the Dependent Variable; Time as the Level 1 (within Student) Predictor; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	60.64 (1.89)***	15
Time	6.44 (0.32)***	2808
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	207.12 (8.37)***	
Level 2 (students within schools)		
Individual initial status	269.34 (19.07)***	
Individual reading growth rate	0.66 (0.98)	
Level 3 (between schools)		
School mean initial status	37.87 (20.56)*	
School mean reading growth rate	0.86 (0.56)	

Note. * $p < .05$. *** $p < .001$.

Table 4.18

Full Three-Level Hierarchical Multilevel Model Table for Phonics Knowledge as the Dependent Variable; Time as the Level 1 (within Student) Predictor; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction, Language Status by Cohort Interaction, Language Status by Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	51.13 (2.16)***	15
Language status	-9.36 (3.22)**	2800
Time	8.62 (0.40)***	2800
Cohort	24.19 (1.94)***	2800
Gender	-1.15 (0.59)*	2800
SES	2.14 (0.80)**	2800
Language status by time	1.50 (0.71)*	2800
Cohort by time	-5.26 (0.43)***	2800
Language status by cohort	-4.10 (4.19)	2800
Language status by time by cohort	0.51 (0.92)	2800
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	167.30 (6.02)***	
Level 2 (students within schools)		
Individual initial status	373.49 (27.86)***	
Individual reading growth rate	7.33 (1.38)***	
Level 3 (between schools)		
School mean initial status	30.22 (16.62)*	
School mean reading growth rate	0.93 (0.69)	

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.19

Final Three-Level Hierarchical Multilevel Model Table for Phonics Knowledge as the Dependent Variable; Time as the Level 1 (within Student) Predictor; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	51.52 (2.13)***	15
Language status	-11.43 (2.43)***	2802
Time	8.57 (0.39)***	2802
Cohort	23.32 (1.72)***	2802
Gender	-1.16 (0.59)*	2802
SES	2.13 (0.80)**	2802
Language status by time	1.75 (0.53)***	2802
Cohort by time	-5.14 (0.38)***	2802
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	167.33 (6.02)***	
Level 2 (students within schools)		
Individual initial status	373.25 (27.83)***	
Individual reading growth rate	7.30 (1.38)***	
Level 3 (between schools)		
School mean initial status	30.90 (16.90)*	
School mean reading growth rate	0.92 (0.69)	

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.20

Unconditional Three-Level Hierarchical Multilevel Model Table for Reading Words in Isolation as the Dependent Variable; Time as the Level 1 (within Student) Predictor; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	47.69 (2.90)***	15
Time	10.00 (0.34)***	2792
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	197.61 (8.45)***	
Level 2 (students within schools)		
Individual initial status	854.25 (55.02)***	
Individual reading growth rate	24.18 (2.78)***	
Level 3 (between schools)		
School mean initial status	88.42 (54.41)	
School mean reading growth rate	0.43 (0.53)	

Note. *** $p < .001$.

Table 4.21

Full (Final) Three-Level Hierarchical Multilevel Model Table for Reading Words in Isolation as the Dependent Variable; Time as the Level 1 (within Student) Predictor; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction, Language Status by Cohort Interaction, Language Status by Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	27.77 (2.53)***	15
Language status	-10.79 (3.49)**	2784
Time	14.20 (0.28)***	2784
Cohort	50.69 (2.13)***	2784
Gender	-2.78 (0.84)**	2784
SES	3.36 (1.16)**	2784
Language status by time	0.15 (0.63)	2784
Cohort by time	-10.11 (0.42)***	2784
Language status by cohort	-14.40 (4.60)**	2784
Language status by time by cohort	3.73 (0.87)***	2784
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	231.18 (7.22)***	
Level 2 (students within schools)		
Individual initial status	443.78 (27.51)***	
Level 3 (between schools)		
School mean initial status	41.10 (27.48)	

Note. ** $p < .01$. *** $p < .001$.

Table 4.22
Unconditional Three-Level Hierarchical Multilevel Model Table for Fluency as the Dependent Variable; Time as the Level 1 (within Student) Predictor; and Random Intercept for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	49.63 (2.05)***	15
Time	4.78 (0.29)***	2105
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	367.67 (13.76)***	
Level 2 (students within schools)		
Individual initial status	297.26 (24.95)***	
Level 3 (between schools)		
School mean initial status	35.15 (19.75)*	

Note. Fluency means were adjusted.
$p^* < .05$. *** $p < .001$.

Table 4.23

Full Three-Level Hierarchical Multilevel Model Table for Fluency as the Dependent Variable; Time as the Level 1 (within Student) Predictor, Instructional Reading Level as the Level 1 Covariate; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction, Language Status by Cohort Interaction, Language Status by Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	49.09 (2.99)***	15
Instructional Reading Level	2.91 (0.22)***	2096
Language status	-0.65 (4.74)	2096
Time	3.80 (0.77)***	2096
Cohort	18.16 (2.42)***	2096
Gender	-1.75 (0.62)**	2096
SES	2.05 (0.80)*	2096
Language status by time	0.75 (1.35)	2096
Cohort by time	-3.05 (0.68)***	2096
Language status by cohort	-6.63 (5.55)	2096
Language status by time by cohort	0.37 (1.60)	2096
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	383.03 (16.42)***	
Level 2 (students within schools)		
Individual initial status	97.14 (36.76)**	
Individual reading growth rate	1.89 (3.06)	
Level 3 (between schools)		
School mean initial status	53.78 (31.50)*	
School mean reading growth rate	3.63 (2.16)*	

Note. Fluency means were adjusted.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.24

Final Three-Level Hierarchical Multilevel Model Table for Fluency as the Dependent Variable; Time as the Level 1 (within Student) Predictor, Instructional Reading Level as the Level 1 Covariate; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	49.96 (2.92)***	15
Instructional Reading Level	2.93 (0.22)***	2098
Language status	-4.83 (3.01)	2098
Time	3.71 (0.76)***	2098
Cohort	16.89 (2.19)***	2098
Gender	-1.81 (0.62)**	2098
SES	2.01 (0.80)*	2098
Language status by time	1.10 (0.86)	2098
Cohort by time	-2.98 (0.61)***	2098
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	383.41 (16.44)***	
Level 2 (students within schools)		
Individual initial status	96.47 (36.74)**	
Individual reading growth rate	1.84 (3.05)	
Level 3 (between schools)		
School mean initial status	53.28 (31.32)*	
School mean reading growth rate	3.62 (2.16)*	

Note. Fluency means were adjusted.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.25
Unconditional Three-Level Hierarchical Multilevel Model Table for Comprehension as the Dependent Variable; Time as the Level 1 (within Student) Predictor; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	69.52 (2.30)***	15
Time	-1.86 (0.52)***	2226
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	480.44 (18.24)***	
Level 2 (students within schools)		
Individual initial status	201.69 (27.51)***	
Individual growth rate	14.21 (2.50)***	
Level 3 (between schools)		
School mean initial status	49.29 (28.83)*	
School mean growth rate	1.58 (1.76)	

Note. Comprehension means were adjusted.
$p^* < .05$. *** $p < .001$.

Table 4.26

Full Three-Level Hierarchical Multilevel Model Table for Comprehension as the Dependent Variable; Time as the Level 1 (within Student) Predictor, Instructional Reading Level as the Level 1 Covariate; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction, Language Status by Cohort Interaction, Language Status by Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	54.87 (2.86)***	15
Instructional Reading Level	-5.83 (0.22)***	2217
Language status	2.74 (4.56)	2217
Time	3.15 (0.81)***	2217
Cohort	-0.65 (2.41)	2217
Gender	-0.01 (0.60)	2217
SES	0.22 (0.80)	2217
Language status by time	-1.17 (1.41)	2217
Cohort by time	0.57 (0.73)	2217
Language status by cohort	-6.90 (5.41)	2217
Language status by time by cohort	1.04 (1.69)	2217
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	445.58 (17.94)***	
Level 2 (students within schools)		
Individual initial status	108.60 (34.99)***	
Individual reading growth rate	9.63 (3.56)**	
Level 3 (between schools)		
School mean initial status	45.90 (27.42)*	
School mean reading growth rate	4.01 (2.38)*	

Note. Comprehension means were adjusted.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.27

Final Three-Level Hierarchical Multilevel Model Table for Comprehension as the Dependent Variable; Time as the Level 1 (within Student) Predictor, Instructional Reading Level as the Level 1 Covariate; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	54.53 (2.59)***	15
Instructional Reading Level	-5.80 (0.22)***	2220
Language status	-1.96 (2.93)	2220
Time	3.42 (0.70)***	2220
Cohort	0.00 (1.32)	2220
Gender	-0.05 (0.60)	2220
SES	0.20 (0.80)	2220
Language status by time	-0.30 (0.92)	2220
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	446.22 (17.97)***	
Level 2 (students within schools)		
Individual initial status	107.18 (34.90)**	
Individual reading growth rate	9.70 (3.54)**	
Level 3 (between schools)		
School mean initial status	45.98 (27.43)*	
School mean reading growth rate	3.94 (2.36)*	

Note. Comprehension means were adjusted.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.28

Unconditional Three-Level Hierarchical Multilevel Model Table for Attitude toward Reading as the Dependent Variable; Time as the Level 1 (within Student) Predictor; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	4.41 (0.03)***	15
Time	0.04 (0.01)***	2807
Random effect	**Variance component (*SE*)**	
Level 1 (within student)		
Temporal variation	0.20 (0.01)***	
Level 2 (students within schools)		
Individual initial status	0.14 (0.01)***	
Individual growth rate	0.00 (0.00)	
Level 3 (between schools)		
School mean initial status	0.00 (0.00)	
School mean growth rate	0.00 (0.00)	

Note. *** $p < .001$.

Table 4.29

Full Three-Level Hierarchical Multilevel Model Table for Attitude toward Reading as the Dependent Variable; Time as the Level 1 (within Student) Predictor; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction, Language Status by Cohort Interaction, Language Status by Cohort by Time Interaction; and Random Intercept and Slope for Level 2 (Students within Schools) and Level 3 (between Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	4.43 (0.04)***	15
Language status	-0.25 (0.08)***	2799
Time	0.05 (0.01)***	2799
Cohort	0.17 (0.05)**	2799
Gender	-0.07 (0.02)***	2799
SES	-0.04 (0.02)*	2799
Language status by time	0.04 (0.02)*	2799
Cohort by time	-0.04 (0.01)*	2799
Language status by cohort	0.17 (0.11)	2799
Language status by time by cohort	-0.00 (0.03)	2799
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	0.17 (0.01)***	
Level 2 (students within schools)		
Individual initial status	0.22 (0.02)***	
Individual reading growth rate	0.01 (0.00)***	
Level 3 (between schools)		
School mean initial status	0.00 (0.00)	
School mean reading growth rate	0.00 (0.00)	

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.30

Final Three-Level Hierarchical Multilevel Model Table for Attitude toward Reading as the Dependent Variable; Time as the Level 1 (within Student) Predictor; Language Status as the Level 2 Predictor, Cohort, Gender, and SES as the Level 2 Control Variables; Language Status by Time Interaction, Cohort by Time Interaction; and Random Intercept for Level 2 (Students within Schools)

Fixed effect	γ coefficient (*SE*)	*df*
Initial status	4.42 (0.03)***	744
Language status	-0.19 (0.05)***	744
Time	0.05 (0.01)***	2072
Cohort	0.21 (0.04)***	744
Gender	-0.06 (0.02)***	744
SES	-0.02 (0.02)	744
Language status by time	0.05 (0.01)***	2072
Cohort by time	-0.05 (0.01)***	2072
Random effect	Variance component (*SE*)	
Level 1 (within student)		
Temporal variation	0.20 (0.01)***	
Level 2 (students within schools)		
Individual initial status	0.13 (0.01)***	

Note. *** $p < .001$.

Table 4.31
Summarizing the Main Results for the Three Research Questions

Main hypothesis	Main results (significance, γ coefficient)
Research Q1: How does first- and second-grade English-language learners' growth in Instructional Reading Level compare to their monolingual native-English-speaking peers' growth across two years?	
Overall growth patterns regardless of cohort	Different (significant language status × time interaction, -0.22***)
Initial status at the beginning of Year 1	Monolinguals: 0.80; ELLs: 0.48
Growth rate	Monolinguals: 0.90; ELLs: 0.68
Final status at Year 2 end	Monolinguals: 5.30; ELLs: 3.88
Research Q2: How does first- and second-grade English-language learners' growth in selected reading subprocesses (sound- and word -level reading subprocesses, Fluency, and Comprehension) compare to their monolingual native-English-speaking peers' growth across two years?	
Q2a: How does first-grade English-language learners' growth in Phonological Awareness compare to their monolingual native-English-speaking peers' growth across one year?	
Overall growth patterns[a]	Different (significant language status × time interaction, 8.92***)
Initial status at the beginning of Year 1	Monolinguals: 54.14; ELLs: 27.78
Growth rate	Monolinguals: 13.58; ELLs: 22.5
Final status at Year 2 end	Monolinguals: 81.30; ELLs: 72.78
Q2b: How does first- and second-grade English-language learners' growth in Phonics Knowledge compare to their monolingual native-English-speaking peers' growth across two years?	
Overall growth patterns regardless of cohort	Different (significant language status × time interaction, 1.75***)
Initial status at the beginning of Year 1	Monolinguals: 63.18; ELLs: 51.75

(Table 4.31, cont'd)

Growth rate	Monolinguals: 6.00; ELLs: 7.75
Final status at Year 2 end	Monolinguals: 93.18; ELLs: 90.50

Q2c: How does first- and second-grade English-language learners' growth in Reading Words in Isolation compare to their monolingual native-English-speaking peers' growth across two years?

Growth patterns by language status across cohorts	Different (significant language status × time × cohort interaction, 3.73***)
First-grade cohort	
Growth patterns by language status	Similar
Difference in performance level	Different
Initial status at the beginning of Year 1	Monolinguals: 27.77; ELLs: 16.98
Growth rate	Monolinguals: 14.20; ELLs: 14.34
Final status at Year 2 end	Monolinguals: 98.77; ELLs: 88.68
Second-grade cohort	
Growth patterns by language status	Different
Initial status at the beginning of Year 1	Monolinguals: 78.46; ELLs: 53.27
Growth rate	Monolinguals: 4.09; ELLs: 7.96
Final status at Year 2 end	Monolinguals: 98.91; ELLs: 93.07

Q2d: How does first- and second-grade English-language learners' growth in Fluency compare to their monolingual native-English-speaking peers' growth across two years?

(Table 4.31, cont'd)

Overall growth patterns regardless of cohort[b]	Similar (non-significant language status × time interaction)
Difference in performance level	Similar (non-significant conditional effect of language status)
Initial status at the beginning of Year 1	Monolinguals: 58.40; ELLs: 53.58
Growth rate	Monolinguals: 2.22; ELLs: 2.32
Final status at Year 2 end	Monolinguals: 69.50; ELLs: 70.18
Q2e: How does first- and second-grade English-language learners' growth in Comprehension compare to their monolingual native-English-speaking peers' growth across two years?	
Overall growth patterns regardless of cohort[c]	Similar (non-significant language status × time interaction)
Difference in performance level	Similar (non-significant conditional effect of language status)
Initial status at the beginning of Year 1	Monolinguals: 54.53; ELLs: 52.57
Growth rate	Monolinguals: 3.42; ELLs: 3.12
Final status at Year 2 end	Monolinguals: 71.63; ELLs: 68.17
Research Q3: How does first- and second-grade English-language learners' growth in Attitude toward Reading compare to their monolingual native-English-speaking peers' growth across two years?	
Overall growth patterns regardless of cohort	Different (significant language status × time interaction, 0.05***)
Initial status at the beginning of Year 1	Monolinguals: 4.52; ELLs: 4.33
Growth rate	Monolinguals: 0.02; ELLs: 0.07
Final status at Year 2 end	Monolinguals: 4.62; ELLs: 4.68

Note. [a]Phonological Awareness was assessed for the first-grade cohort in Year 1 only. [b]Fluency means were adjusted. [c]Comprehension means were adjusted.

Table 4.32
Summary of Significant Results for Interactions Involving Cohort and Control Variables

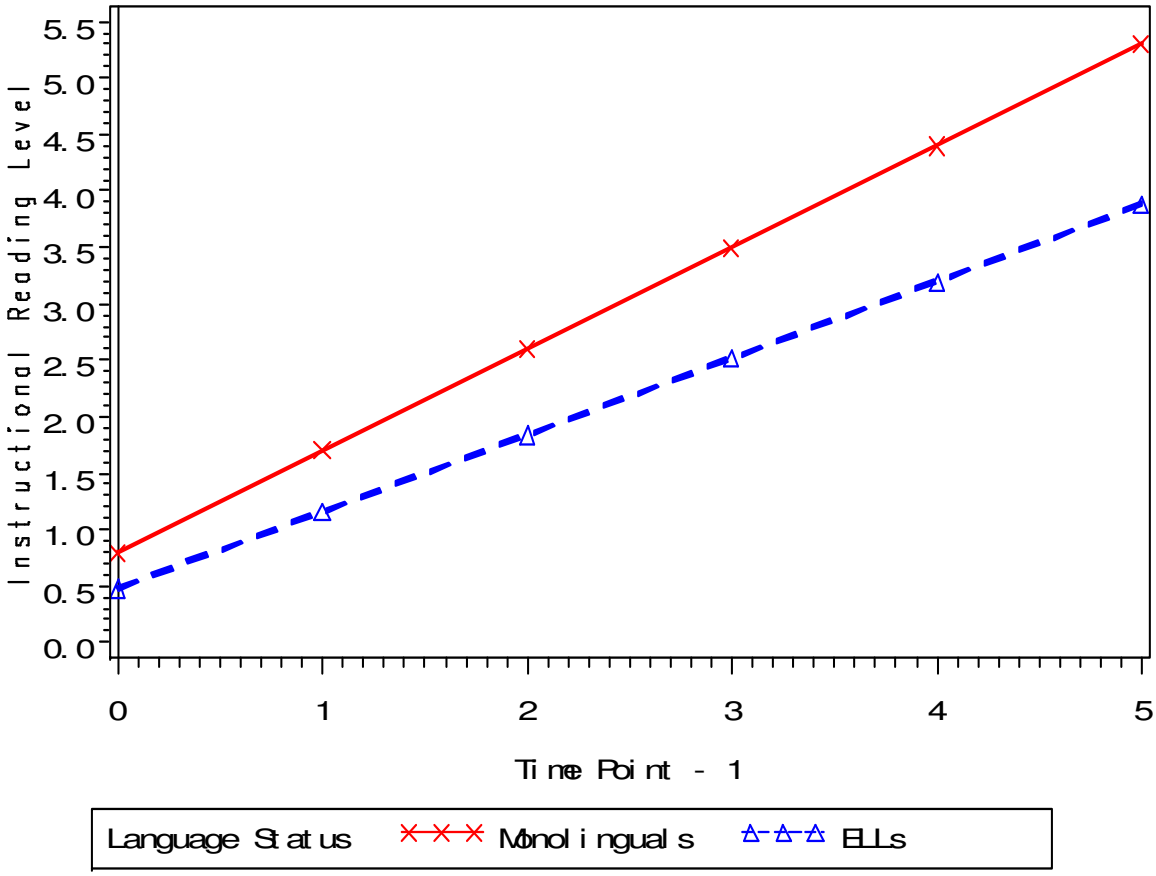
1. Instructional Reading Level	
Growth pattern by cohort regardless of language status	Different (significant cohort by time interaction, 0.28***)
Performance level by SES	Different (significant conditional effect of SES, 0.60***)
2. Selected reading subprocesses	
2a. Phonological awareness[a]	
2b. Phonics knowledge	
Growth pattern by cohort regardless of language status	Different (significant cohort by time interaction, -5.14***)
Performance level by SES	Different (significant conditional effect of SES, 4.26***)
Performance level by gender	Different (significant conditional effect of gender, -2.32***)
2c. Reading words in isolation	
Growth pattern by cohort regardless of language status	Different (significant cohort by time interaction, -10.11***)
Difference between monolinguals and ELLs across cohorts	Different (significant cohort by language status interaction, -14.40**)
Performance level by SES	Different (significant conditional effect of SES, 6.72**)
Performance level by gender	Different (significant conditional effect of gender, -5.55**)
2d. Fluency	

(Table 4.32, cont'd)

Growth pattern by cohort regardless of language status	Different (significant cohort by time interaction, -2.98***)
Performance level by SES	Different (significant conditional effect of SES, 4.02*)
Performance level by gender	Different (significant conditional effect of gender, -3.62**)
Instructional reading level in relation to growth in Fluency	Significant (2.93***)
2e. Comprehension	
Instructional reading level in relation to growth in Comprehension	Significant (-5.80***)
3. Attitude toward reading	
Growth pattern by cohort regardless of language status	Different (significant cohort by time interaction, -0.05***)
Performance level by gender	Different (significant conditional effect of gender, -0.06***)

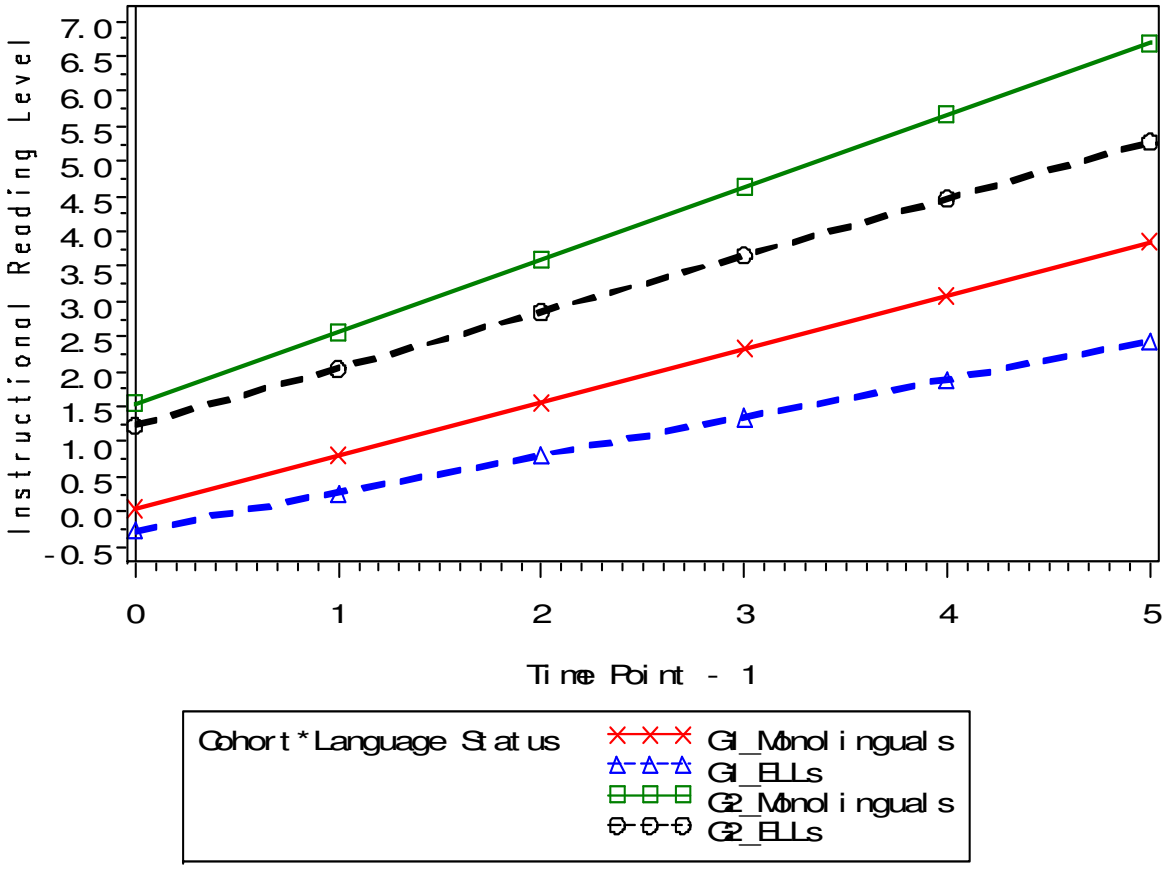
Note. [a]No significant effects for the control variables were reported for growth in phonological awareness.

Figure 4.1. Growth trajectories of Instructional Reading Level by language status regardless of cohort (significant language status by time interaction).



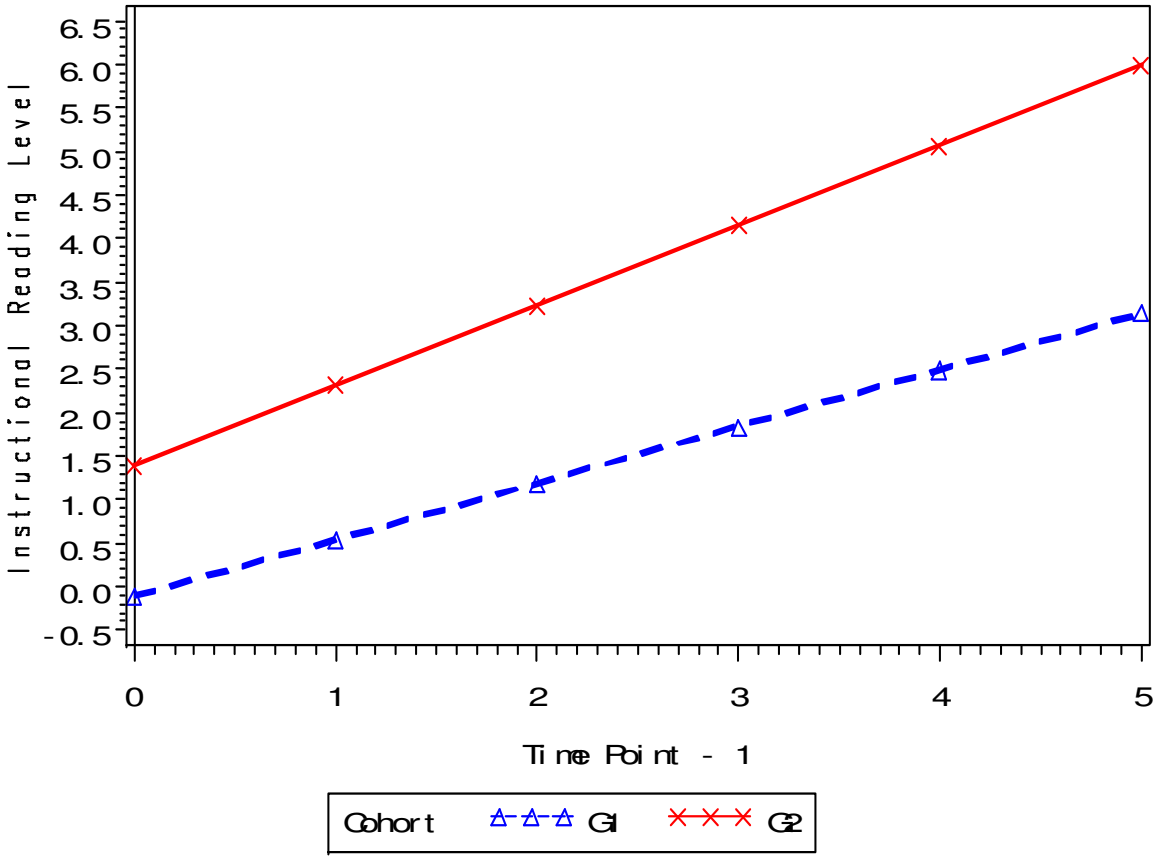
Note. An Instructional Reading Level score of "0" indicates that a student did not pass even the lowest reading passage; .25 indicates approximately a pre-primer level, which is, for typically developing students, achieved around the beginning of first grade; .50 indicates approximately a primer level, achieved by typically developing students around the middle of first grade; 1.00 indicates approximately first grade level; 2.00 indicates approximately second grade level; and so on. ELLs = English-language learners.

Figure 4.2. Growth trajectories of Instructional Reading Level by language status and cohort.



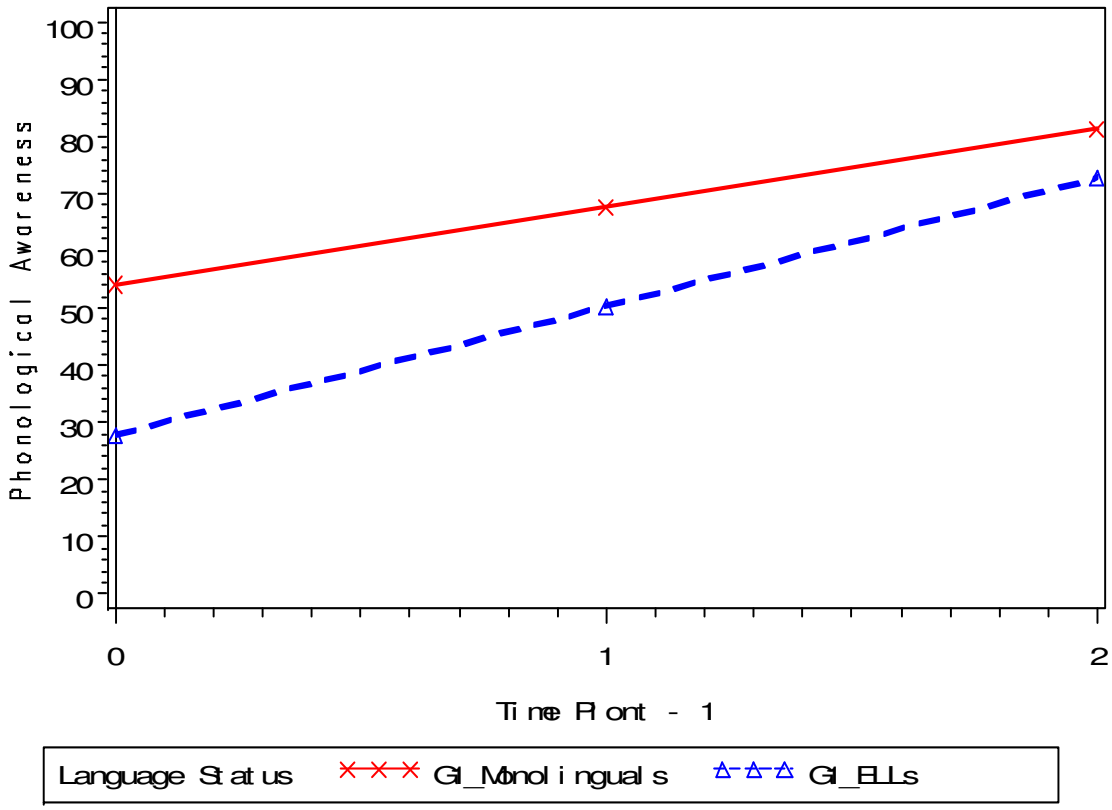
Note. An Instructional Reading Level score of "0" indicates that a student did not pass even the lowest reading passage; .25 indicates approximately a pre-primer level, which is, for typically developing students, achieved around the beginning of first grade; .50 indicates approximately a primer level, achieved by typically developing students around the middle of first grade; 1.00 indicates approximately first grade level; 2.00 indicates approximately second grade level; and so on. The model-implied mean intercept for the English language learners in the first-grade cohort is negative (-0.28), not interpretable. G1 = first-grade cohort. G2 = second-grade cohort. ELLs = English-language learners.

Figure 4.3. Growth trajectories of Instructional Reading Level by cohort regardless of language status (significant cohort by time interaction).



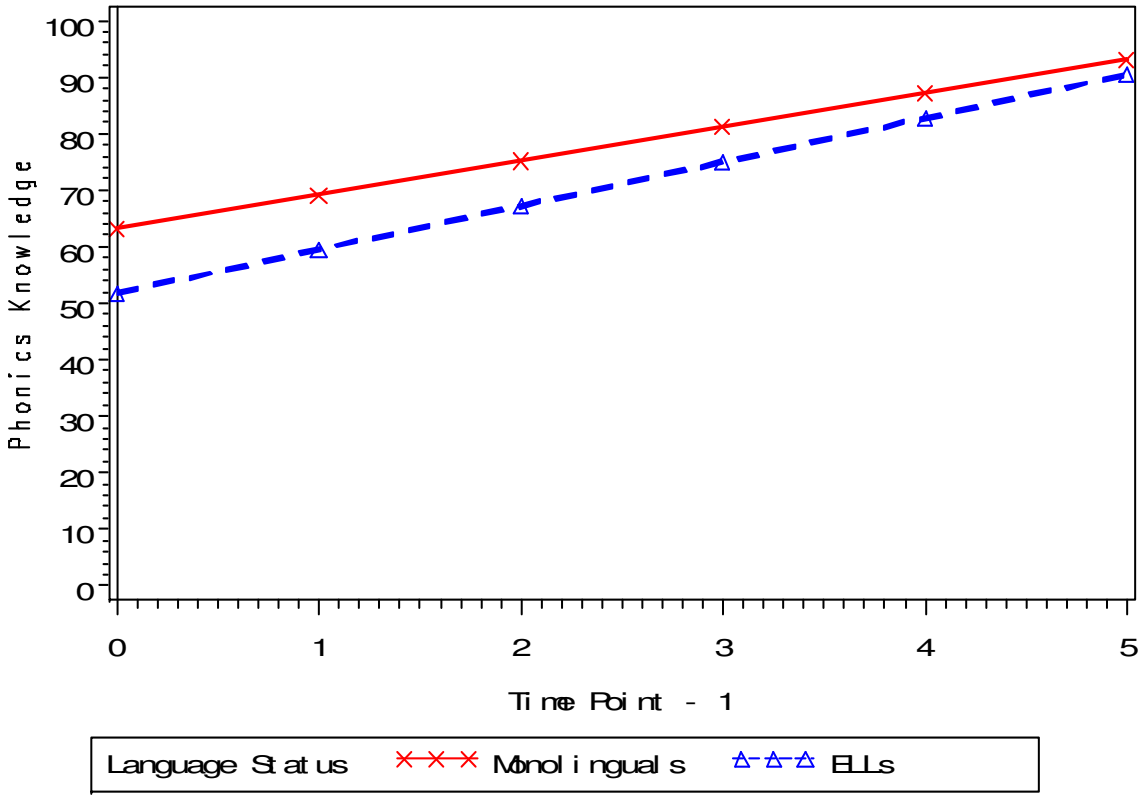
Note. An Instructional Reading Level score of "0" indicates that a student did not pass even the lowest reading passage; .25 indicates approximately a pre-primer level, which is, for typically developing students, achieved around the beginning of first grade; .50 indicates approximately a primer level, achieved by typically developing students around the middle of first grade; 1.00 indicates approximately first grade level; 2.00 indicates approximately second grade level; and so on. The model-implied mean intercept for the first-grade cohort is negative (-0.11), not interpretable. IRL = Instructional Reading Level. G1 = first-grade cohort. G2 = second-grade cohort.

Figure 4.4. Growth trajectories of Phonological Awareness by language status (significant language status by time interaction).



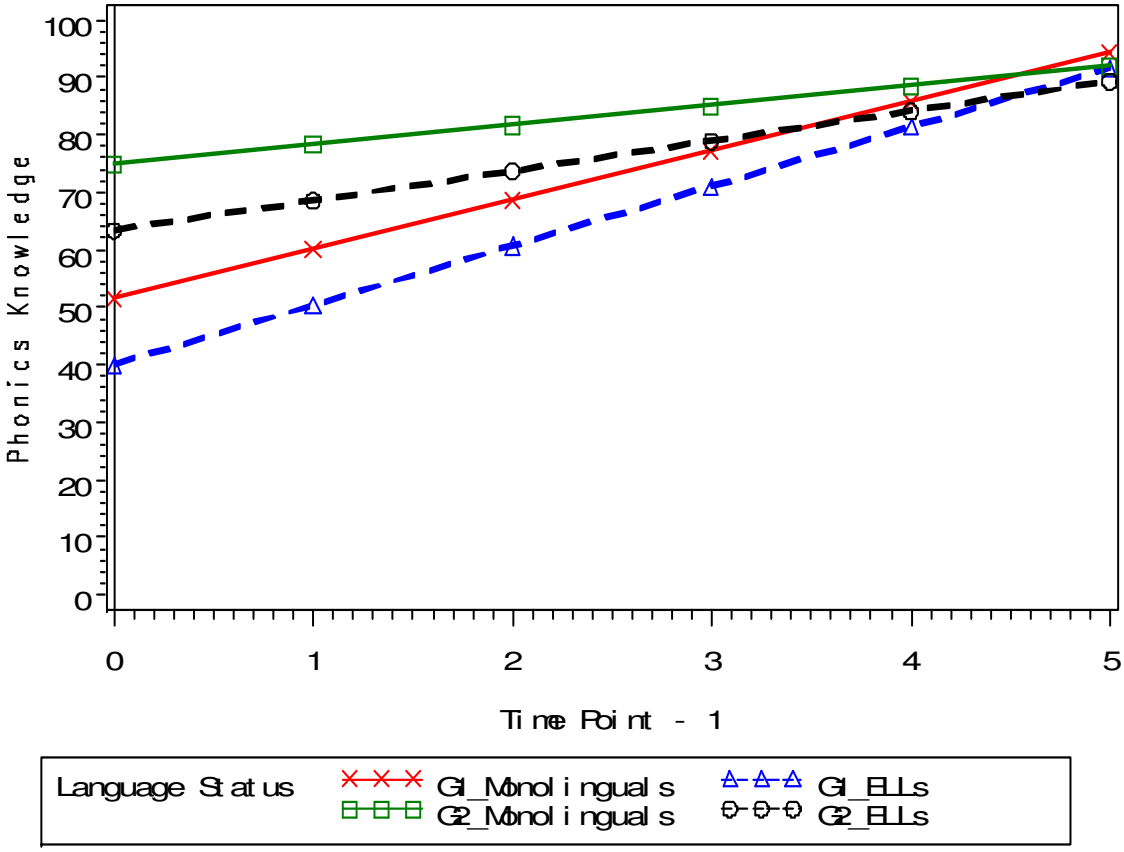
Note. The first-grade cohort was assessed across Year 1 only. The second-grade cohort was not assessed. The scores were reported as percentage points. ELLs = English-language learners.

Figure 4.5. Growth trajectories of Phonics Knowledge by language status regardless of cohort (significant language status by time interaction).



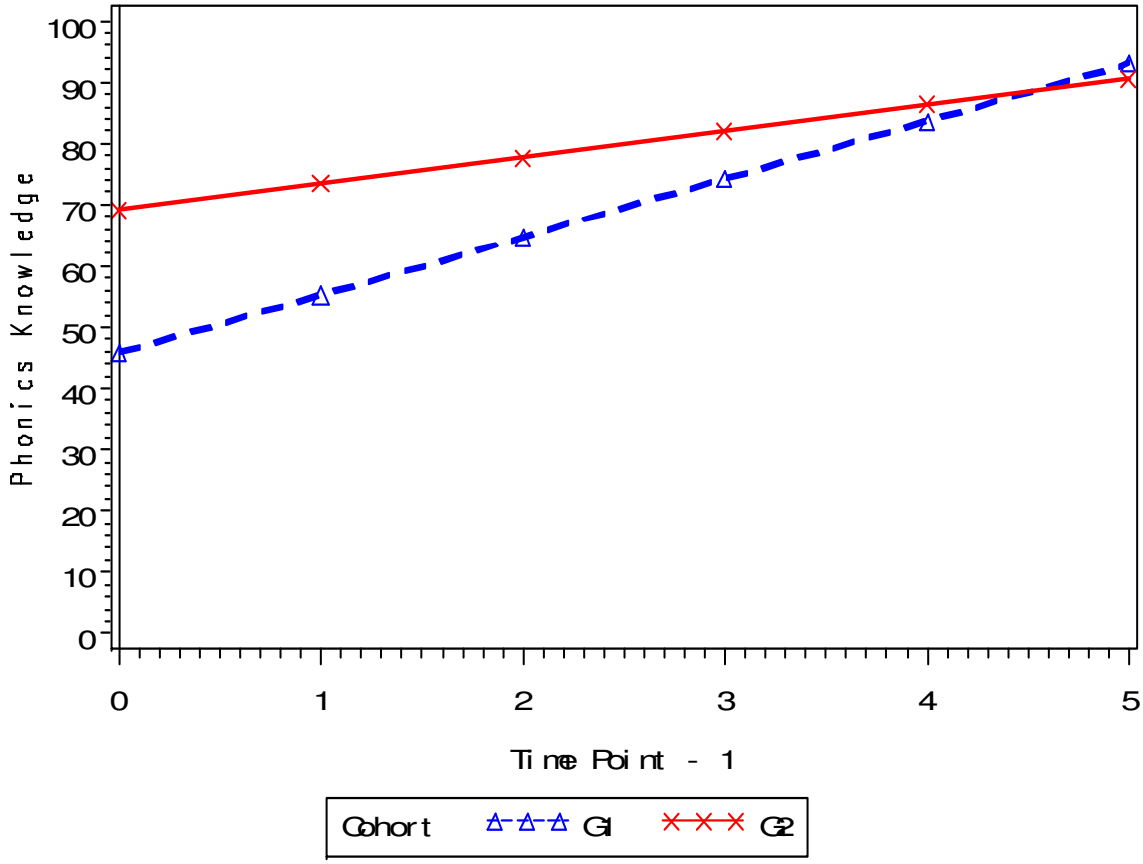
Note. The scores were reported as percentage points. ELLs = English-language learners.

Figure 4.6. Growth trajectories of Phonics Knowledge by language status and cohort.



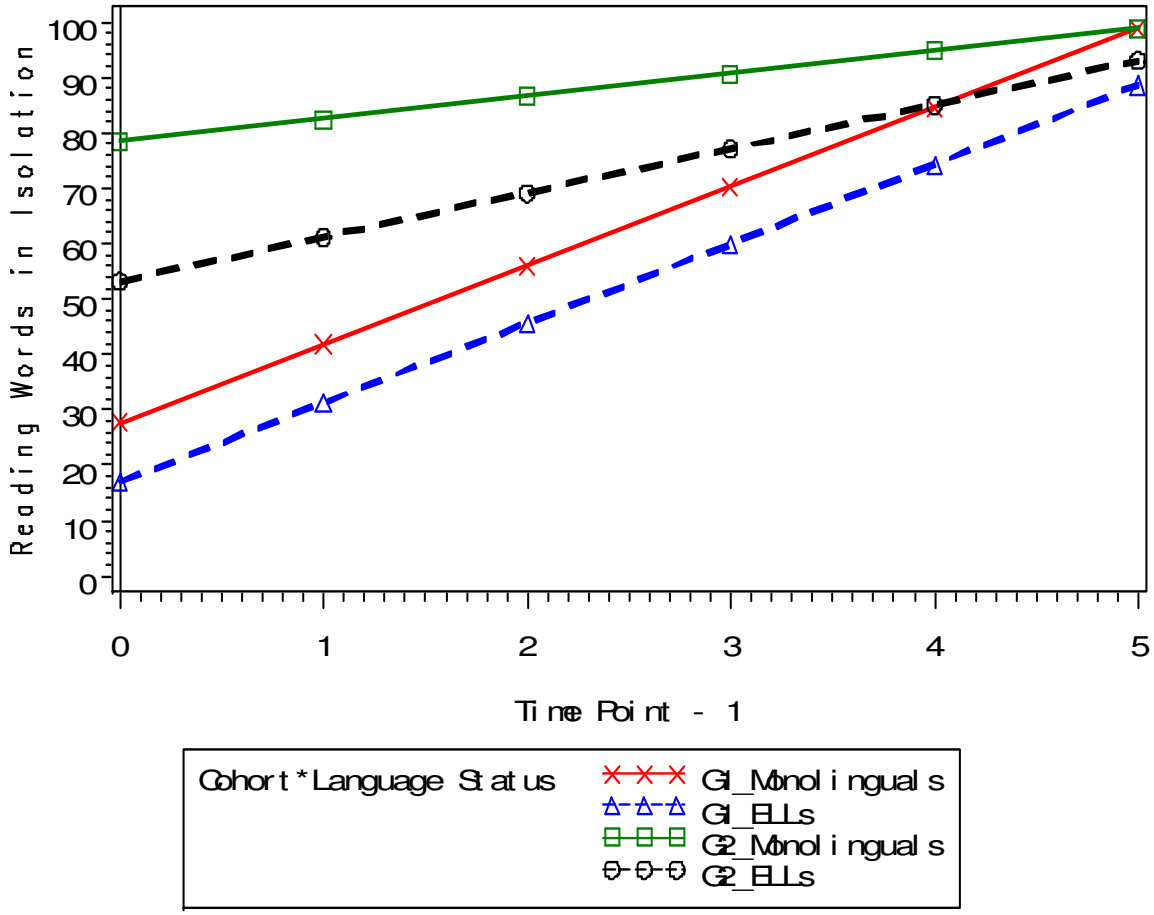
Note. The scores were reported as percentage points. G1 = first-grade cohort. G2 = second-grade cohort. ELLs = English-language learners.

Figure 4.7. Growth trajectories of Phonics Knowledge by cohort regardless of language status (significant cohort by time interaction).



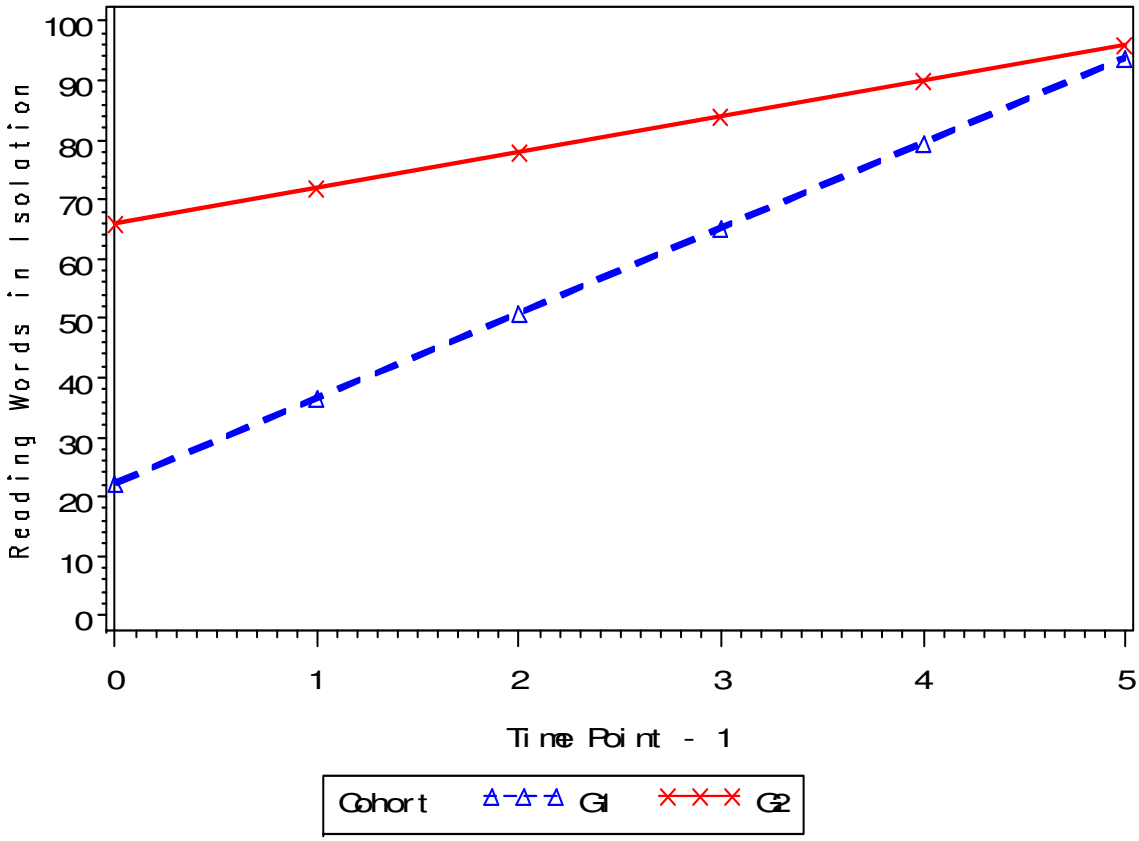
Note. The scores were reported as percentage points. G1 = first-grade cohort. G2 = second-grade cohort.

Figure 4.8. Growth trajectories of Reading Words in Isolation by language status and cohort.



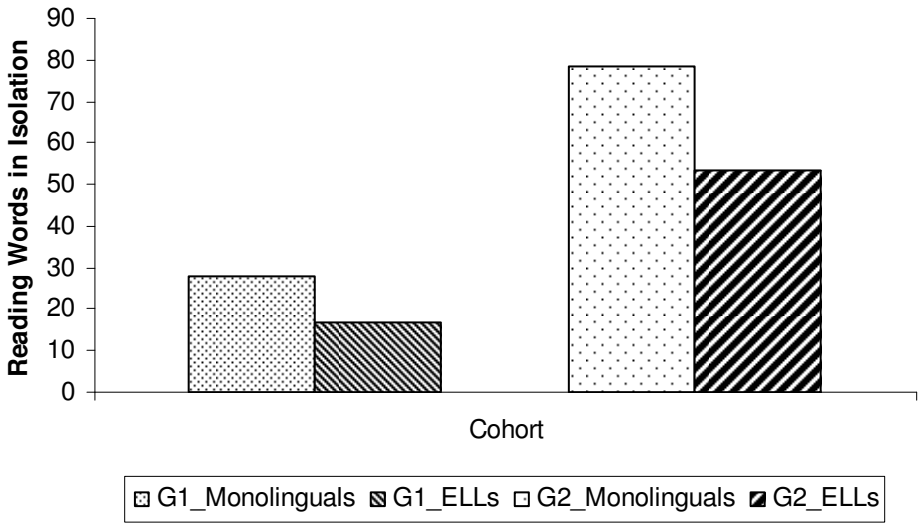
Note. The scores were reported as percentage points. G1 = first-grade cohort. G2 = second-grade cohort. ELLs = English-language learners.

Figure 4.9. Growth trajectories of Reading Words in Isolation by cohort regardless of language status (significant cohort by time interaction).



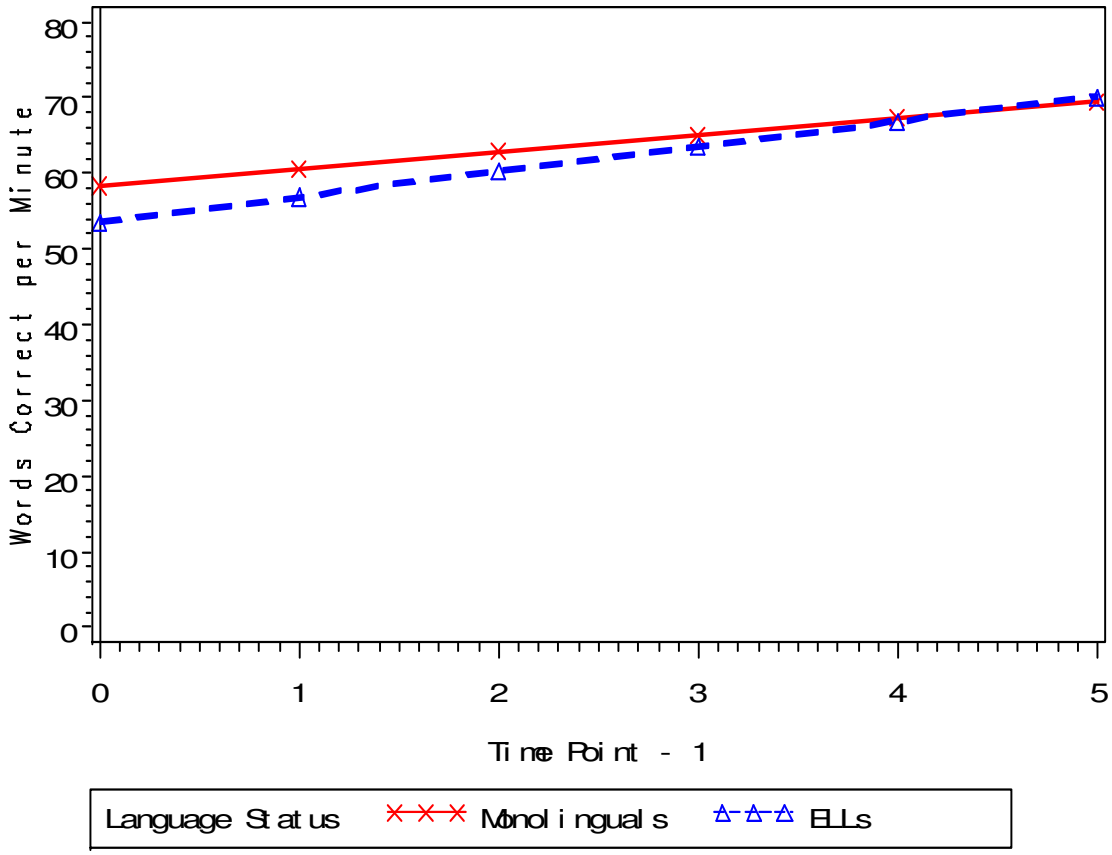
Note. The scores were reported as percentage points. G1 = first-grade cohort. G2 = second-grade cohort.

Figure 4.10. Reading words in isolation by language status and cohort regardless of time (significant language status by cohort interaction).



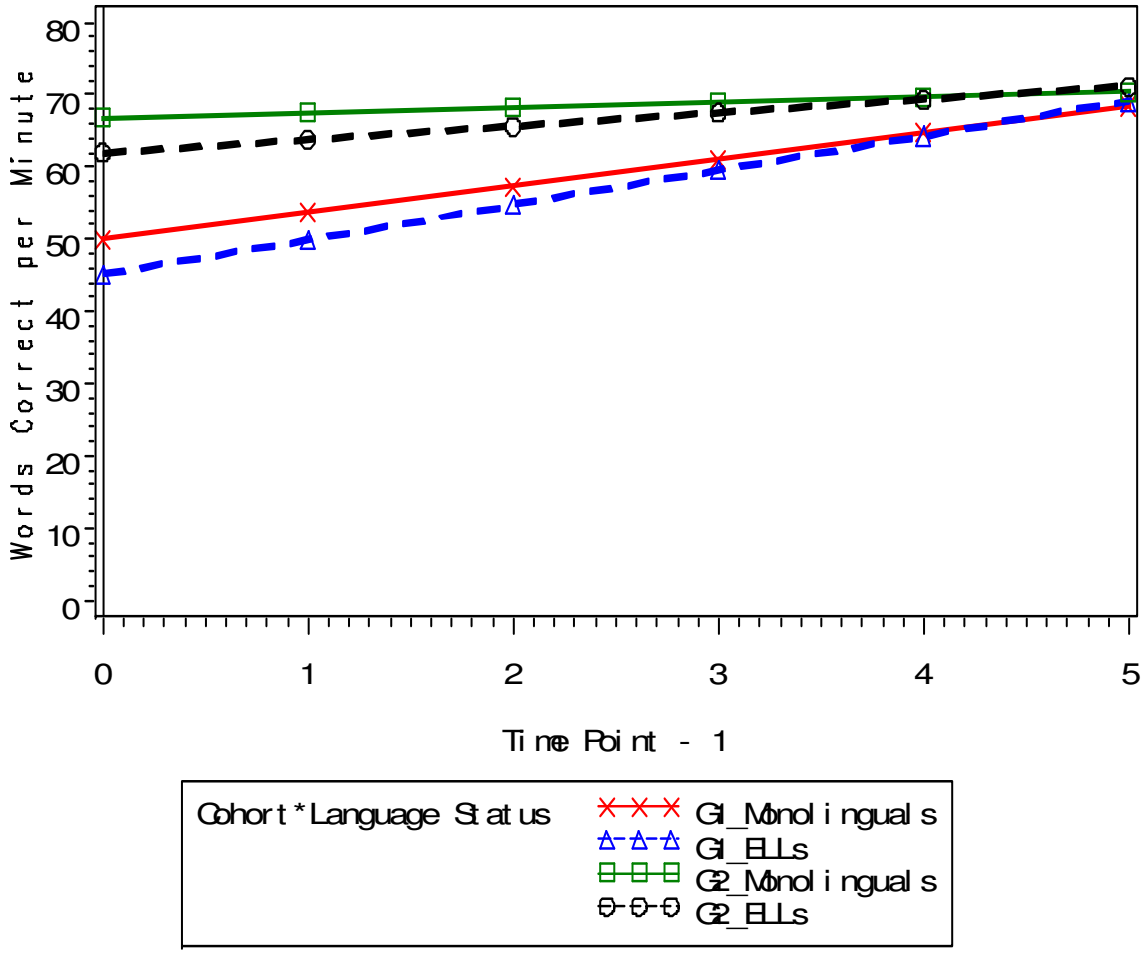
Note. Scores were reported as percentage points. G1 = first-grade cohort. G2 = second-grade cohort. ELLs = English-language learners.

Figure 4.11. Growth trajectories of Fluency by language status regardless of cohort (non-significant language status by time interaction).



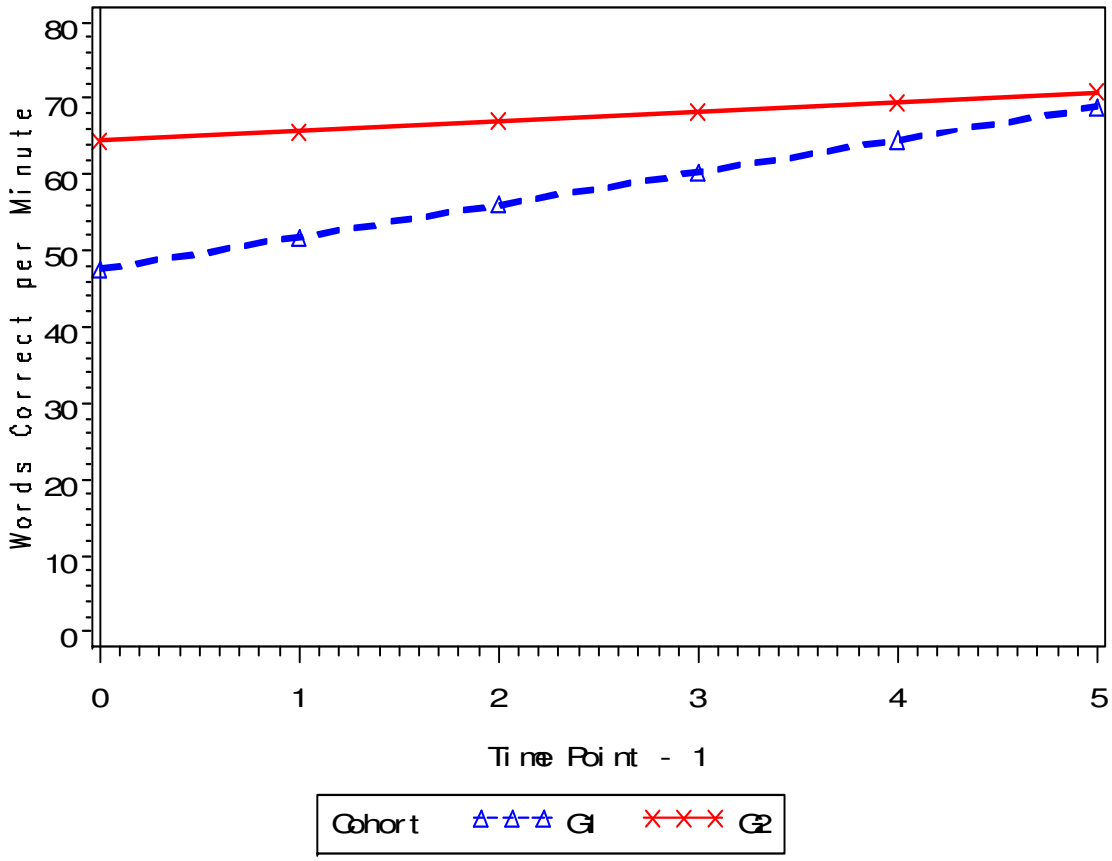
Note. Fluency means were adjusted. Scores were reported as words read correctly within one minute. ELLs = English-language learners.

Figure 4.12. Growth trajectories of Fluency by language status and cohort.



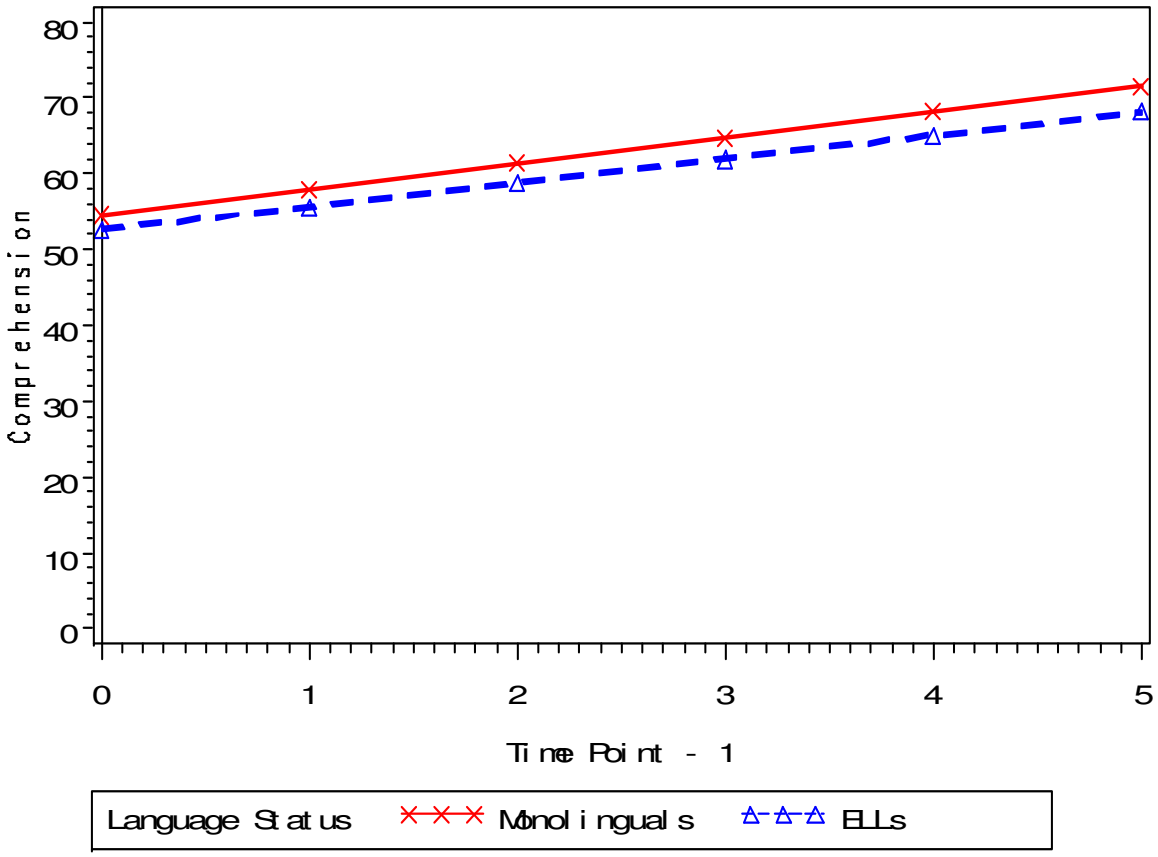
Note. Fluency means were adjusted. Scores were reported as words read correctly within one minute. ELLs = English-language learners. G1 = first-grade cohort. G2 = second-grade cohort.

Figure 4.13. Growth trajectories of Fluency by cohort regardless of language status (significant cohort by time interaction).



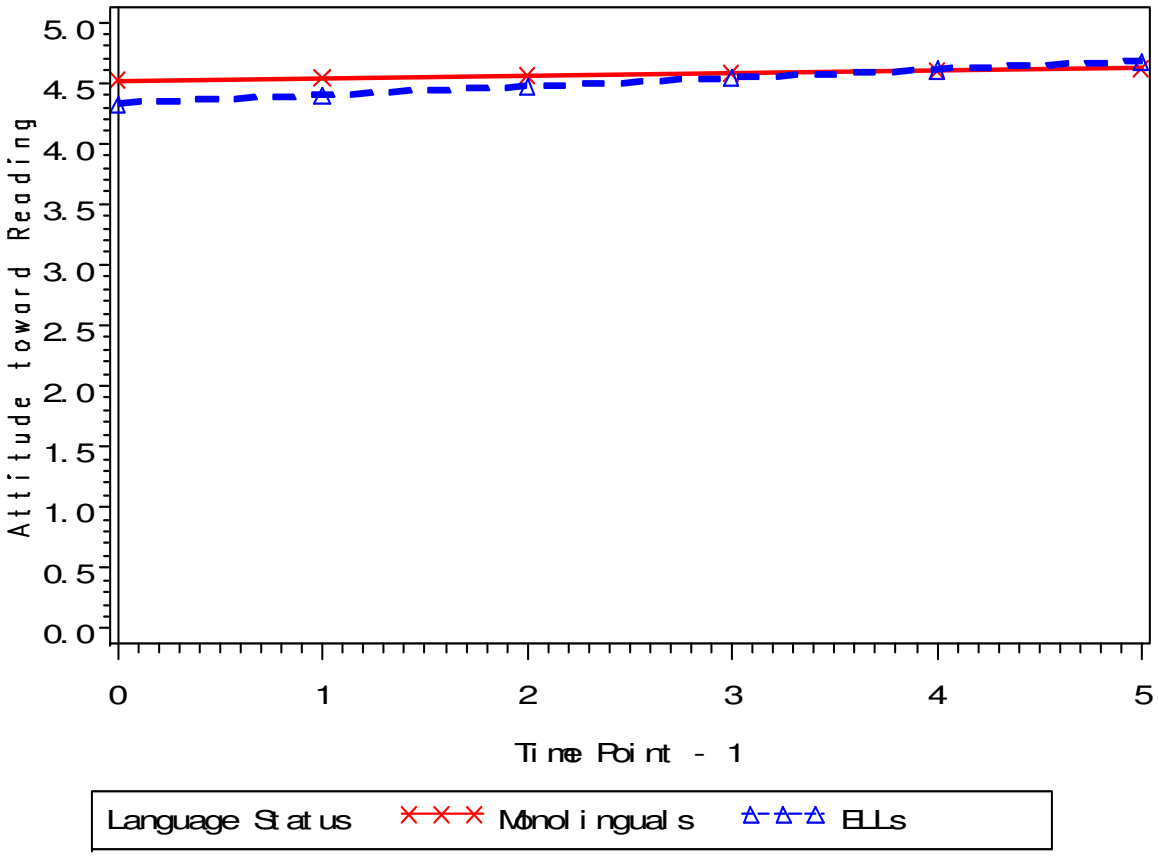
Note. Fluency means were adjusted. Scores were reported as words read correctly within one minute. G1 = first-grade cohort. G2 = second-grade cohort.

Figure 4.14. Growth trajectories for Comprehension by language status regardless of cohort (non-significant language status by time interaction).



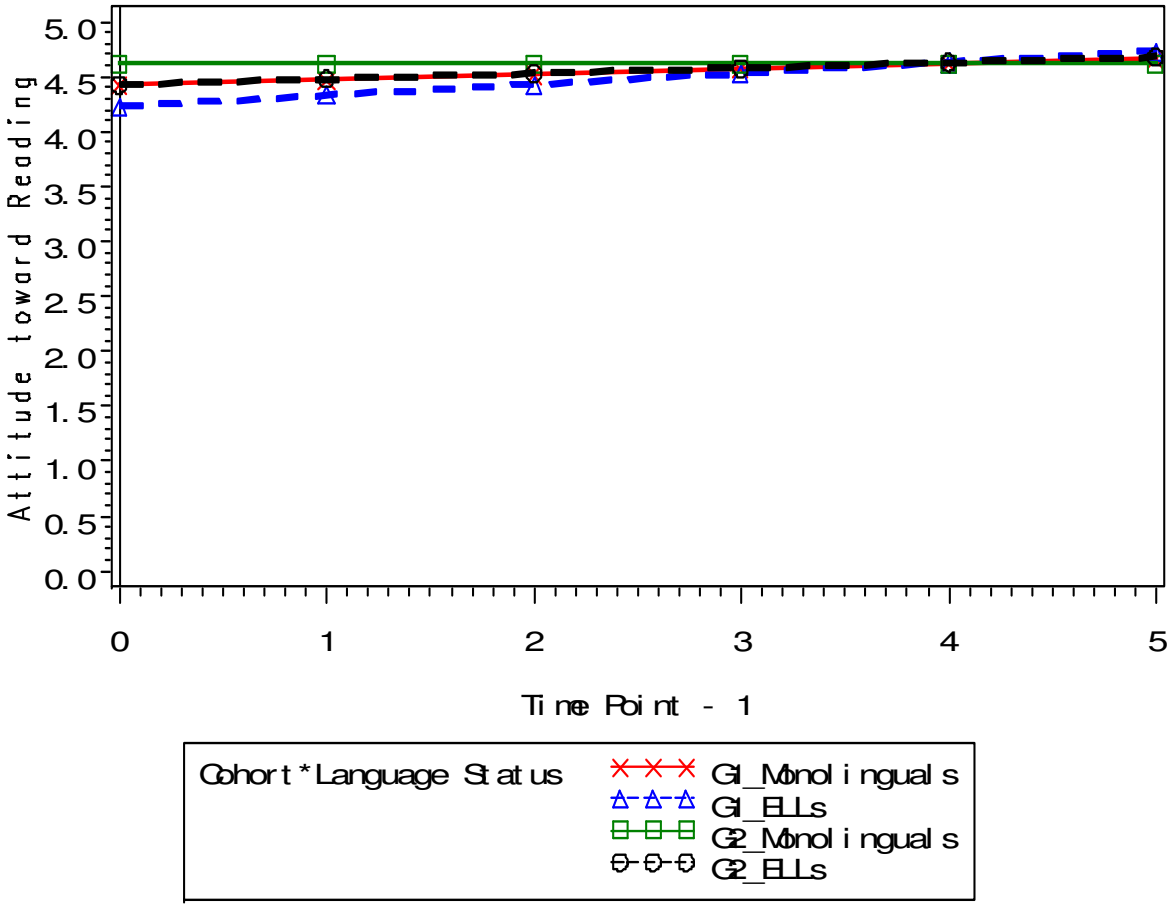
Note. Comprehension means were adjusted. Scores were reported as percent correct. ELLs = English-language learners.

Figure 4.15. Growth trajectories of attitude toward reading by language status regardless of cohort (significant language status by time interaction).



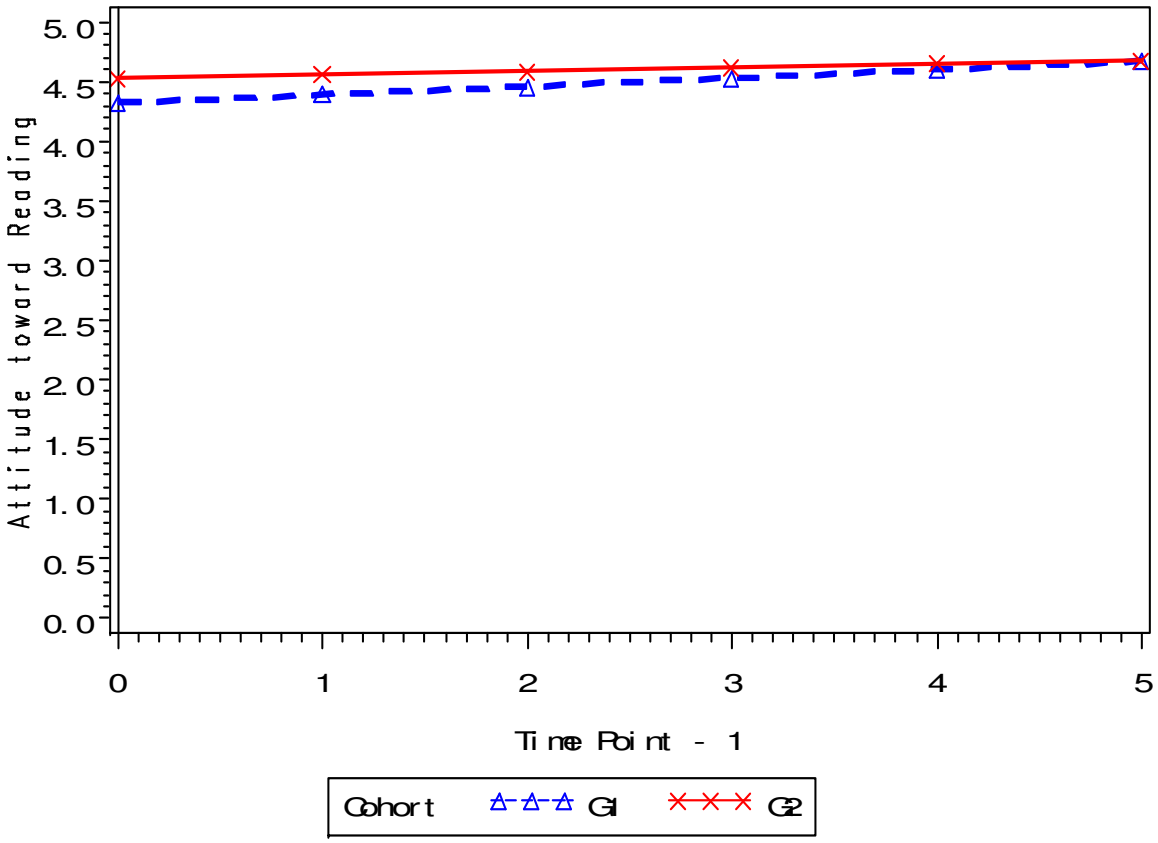
Note. Scores were the average scores across all the items on the questionnaire. ELLs = English-language learners.

Figure 4.16. Growth trajectories of attitude toward reading by cohort and language status.



Note. Scores were the average scores across all the items on the questionnaire. G1 = first-grade cohort. G2 = second-grade cohort. ELLs = English-language learners.

Figure 4.17. Growth trajectories of attitude toward reading by cohort regardless of language status (significant cohort by time interaction).



Note. Scores were the average scores across all the items on the questionnaire. G1 = first-grade cohort. G2 = second-grade cohort.

Appendix A

Attitude toward Reading Questionnaire

Directions and Scoring

Say: *"I'd like to know a little about how you feel about reading and writing. I'm going to ask you some questions. Please look at these faces. See how this one looks like a pretty bad feeling* (point to each face), *this one a little bit bad feeling, this one is not especially bad or good feeling, this one is a little bit good feeling, and this one shows a very good feeling? Can you draw a circle around the face that best shows: How do you feel about going to school?"*

Now continue through each of the questions on the sheet. Help the child as needed to understand what he/she is supposed to do.

Possible prompts:
. Sometimes it's hard to choose. Just choose the one that seems like the *best* one.
. Do you feel really really good about xxx? Not so good?
. Can you *tell* me how you feel about xxx?

SCORING:
TOTAL RAW SCORE (TRS): In each row, score "1" if the first face is circled, "2" for the next, and so on with "5" for the happiest face. Then add across the seven rows. The lowest possible total scores is "7," and the highest possible score is "35."
AVERAGE: TRS/7 = the average. The average can range from 1 to 5.

CHILD'S LAST NAME, FIRST NAME_____
*DATE of ASSESSMENT*_____

*EXAMINER*_____

SCHOOL_____

CHILD'S CLASSROOM TEACHER_____
_____Total Raw Score (7-35) Attitude toward Reading
_____Average (1-5) Attitude toward Reading

1. How do you feel about going to school?



2. How do you feel when someone reads you a story?



3. How do you feel when it's time for reading in school?



4. How do you feel when you are asked to read out loud?



5. How do you feel about how well you can read?



6. How do you think you'll feel about reading when you're older?



7. How would you feel if someone gave you a book for a present?



Note. From "Project report to the North Carolina Department of Public Instruction: North Carolina Reading Excellence Act external evaluation," by J. Fitzgerald, 2004. Used with permission.

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