Classroom Literacy Block Content for Lower-Performing First Graders: Are There Differential Instruction Effects on Gains for Language Minority Students?

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A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Education

University of Washington

2013

Committee:

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Program Authorized to Offer Degree:

College of Education

Abstract

The present study examines the relationships between classroom literacy instruction activities and lower-performing students' reading and language gains over their first-grade year. Data from $N = 94$ students (approximately half of whom are language minority learners) from 28 classrooms in 11 schools were used for analyses. Three-level model results showed that lower skilled language minority (LM) students generally exhibited more growth than their lower skilled non-LM peers, and that classroom instruction effects on student growth depended on LM status. In particular, lower performing LM children appeared to benefit from increased vocabulary and comprehension instruction time, whereas their non-LM peers yielded higher gains when their teachers provided increased oral language, word study, and text reading instruction time. Future research might investigate optimal differentiated instruction for these two groups of at-risk students.

Keywords: early reading instruction, language minority learners, English language learners, first grade

Acknowledgements

The author thanks her committee members and Dr. Patricia Vadasy for their helpful comments and suggestions, and to Dr. Vadasy in particular for use of the data. The research reported in this paper was supported in part by the Institute of Education Sciences, U.S. Department of Education (Grant #R305A070324).

Classroom Literacy Block Content for Lower-Performing First Graders: Are There Differential Instruction Effects on Gains for Language Minority Students?

Learning to read in the primary grades is unquestionably the most important skill for later academic success. However, children from low socioeconomic status (SES) and language minority (LM) backgrounds experience a disproportionately higher risk for reading difficulties (Kieffer, 2010; National Center for Education Statistics, 2010; Snow, Burns, & Griffin, 1998). In particular, language minority (LM) students in the U.S. (i.e., students whose home language is other than English) are faced with having to acquire English language proficiency while simultaneously learning the reading skills taught in the classroom. While LM students appear to develop decoding and word recognition skills similar to their native English speaking peers (Chiappe & Siegel, 1999; Verhoeven, 2000; Wade-Wooley & Siegel, 1997), LM students have lower English vocabulary knowledge (August, Carlo, Dressler, & Snow, 2005; Biemiller & Slonim, 2001; Hoff, 2003; National Early Literacy Panel, 2009; Snow et al., 1998) and are more likely to experience later difficulties in English reading comprehension in middle school (Kieffer, 2008; Lesaux & Kieffer, 2010; Nakamoto, Lindsey, & Manis, 2007).

Phonological Awareness

Phonological awareness is the ability to reflect on and manipulate phonemes, the smallest parts of speech (Blachmann, 2000). This skill develops along a continuum, beginning with preschool (such as learning the first sound in one's name, or discovering how certain words rhyme); by first grade, students are developing the phoneme blending and segmenting skills that are prerequisites for learning to decode and spell. For both LM and non-LM students, phonological awareness has been shown to be a strong predictor of word reading ability (Jongejan, Verhoeven, & Siegel, 2007).

One model of spoken word recognition suggests that children's rapidly growing vocabulary size influences the development of phonemic awareness (Metsala & Walley, 1998). The lexical restructuring model reflects a shift from a holistic view of words to sensitivity to the segments of words. This information causes the child to attend to the phonemes in words that differentiate, for example, *map* from *mat*.

Explicit phonics instruction (e.g., letter-sound correspondences) helps young students learn the phonological awareness skills that are the prerequisite for efficient word reading. Prior research (e.g., Jorm & Share, 1983; Tunmer & Rohl, 1991) has demonstrated that children who receive phonics-based reading instruction develop phonological awareness faster, and further, that there is a reciprocal relationship between phonics-based reading instruction and the development of phonological awareness skills.

Vocabulary Acquisition

Vocabulary knowledge has been consistently shown to predict later reading comprehension, with lower levels of vocabulary knowledge associated with increased reading comprehension difficulties (e.g., Clarke, Snowling, Truelove, & Hulme, 2010; Kieffer, 2010; Nakamoto et al., 2007). Vocabulary acquisition begins through oral language experiences in the home and preschool, and it is not surprising that students from low-SES and LM backgrounds often enter school with lower levels of vocabulary knowledge (August et al., 2005). Because children begin to develop vocabulary at a young age, children from home environments in which early language experiences are more limited, including children who are of language minority status and from low SES backgrounds, often enter school lagging in vocabulary knowledge (Biemiller & Slonim, 2001; Hoff, 2003; National Early Literacy Panel, 2009; Snow et al., 1998).

Vocabulary instruction approaches for younger children can take a variety of forms. In their recent meta-analysis, Marulis and Neuman (2010) examined the features of effective vocabulary interventions for children ages birth to nine years. In particular, they considered the effects of explicit, direct instruction in the word meanings, as well as the effects of implicit, incidental vocabulary instruction that occurs in the context of another activity, such as storybook reading. Their findings showed that the most effective vocabulary interventions were those that combined explicit, direct instruction in the meanings of words with implicit word learning (e.g., through book reading).

Many classroom literacy activities afford opportunities for explicit and implicit vocabulary learning, including oral and silent text reading, word study, and comprehension instruction. Encounters with new vocabulary words outside the literacy block can also help children learn to use and understand words they encounter in content-area contexts (Biemiller & Boote, 2006; Silverman & Crandall, 2010).

Role of Text Reading

During primary-grade classroom literacy instruction, students may practice reading aloud individually or chorally, and are often read to by the teacher. These activities help students develop reading fluency, vocabulary, and reading and listening comprehension, as well as oral language skills. During text reading activities, students may be taught contextualized word definitions and gain experience hearing and using new words in varied reading contexts and oral language interactions (Metsala, 1999; Silverman & Crandall, 2010). As Marulis and Neuman (2010) showed, brief doses of vocabulary instruction that may occur across the reading block may be quite effective.

Language Minority Students

As already mentioned, LM students disproportionately enter school with limited oral language and vocabulary skills (Kieffer & Vukovic, 2012; Proctor, Carlo, August, & Snow, 2005; Swanson, et al., 2006) which influence the development of later word reading and reading comprehension. In a recent study, Kieffer and Vukovic (2012) found that LM students with word reading deficits had weaker vocabulary, oral comprehension, and phonological awareness, and LM students with reading comprehension problems had weaker oral comprehension and vocabulary. Further, weaknesses in first-grade vocabulary were associated with lower fourth-grade word reading and reading comprehension skills. One clear implication from these findings is that first-grade LM students may require classroom reading instruction that differs from their non-LM peers in order to improve their future word reading and reading comprehension outcomes.

Current Study

The current study investigates whether the amounts of time spent on typical components of first-grade literacy block instruction have unique effects on lower-skilled first-grade students' literacy and language gains during the academic year, and further, whether students from language minority (LM) backgrounds differentially benefit from these instructional components. Importantly, the focus of the present study is on fall-spring academic year *gains* rather than end-of-grade outcomes, since it has been well established that LM students enter school with lower language and literacy skills than non-LM students. The research questions are:

1. Do lower performing first-grade LM students have different amounts of fall-spring gains in early reading outcomes compared with non-LM students, after accounting for time received in classroom literacy block content areas?

2. Does time received in typical classroom literacy block content areas (including word study, oral language, text reading, comprehension, and vocabulary) uniquely predict lower performing first graders' fall-spring gains?
3. Do effects of time received in classroom literacy block content areas depend on students' LM status? In other words, do lower performing LM students benefit from more or less time on instructional content compared with non-LM classmates?

Method

Participants

The present study utilizes a portion of data from an earlier study, specifically, data from $N = 94$ first graders (50 LM and 44 non-LM students) and their teachers ($N = 28$ classrooms) across 11 schools will be used for testing the research questions. These first graders were previously identified as performing in the bottom half of their peer groups (i.e., their LM or non-LM classmates) during the early fall of their first grade year, and then had been randomly assigned to a business-as-usual control condition (no-treatment). Data from the control condition specifically allow us to examine the relationships between typical classroom instruction (no intervention) and outcomes of students who are relatively low in their reading skills. The earlier study's sample selection and experimental assignment procedures are reviewed below; further details can be found in Vadasy and Sanders (2011).

Original Study. In the original study (Vadasy & Sanders, 2011), 903 first graders from 13 public schools (from one diverse, urban school district in the Pacific Northwest) were invited to participate in the study. The schools were purposefully selected because they had very high enrollments of LM students. A student whose parent reported speaking a language other than English in the home on the school record was classified as LM; non-LM otherwise. Parents

provided consent for 553 students (282 LMs). Consent and study information forms were provided in English for all students, and were also provided in translated languages for the top 10 languages in the school district. Two schools and 15 classrooms were excluded before student screening due to insufficient numbers of consented students for randomization procedures. Screening and other pretest assessments continued in the fall of that year for 399 students (214 LMs). Screening included a phonological awareness measure (the Sound Matching subtest of the Comprehensive Test of Phonological Awareness; Wagner, Torgesen, & Rashotte, 1999) and an alphabetic measure (correct number of letter names and sounds from 52 randomly ordered capitalized English letters; Fuchs et al., 2001).

After standardizing and computing the mean of the screening scores, students were stratified by LM status and classroom, and rank ordered by screening mean score to determine their relative risk level. In other words, students who scored in the lower half of their peers (LM or non-LM groups, within classroom) were considered eligible for study participation. Stratified random assignment by LM status and classroom was then employed to assign children to treatment or control conditions. After random assignment, there were 106 treatment (58 LMs) and 102 control (56 LMs) students participating in the study. By spring, 10% of the sample was lost to attrition. The final sample included 93 treatment and 94 control students from 28 classrooms and 11 schools (no classrooms or schools were lost to attrition).

Current Study. For the purpose of this study, only data from the control condition are examined; those data include 94 students (50% of the original sample of students) in 28 classrooms (100% of the original sample of classrooms) across 11 schools (100% of the original sample of schools). Of the 94 students, 50 (53% of the student sample) were LM students and averaged 6.68 years old (*SD*=0.35) at pretest (all were first graders). The sample comprised

approximately equal proportions of males (56%) and females (44%), and a high percentage of minority students (88%), with 20% identified as Asian, 24% Black, 39% Hispanic, and 4% Other.

Classroom Literacy Instruction Observations

Procedures. The instrument used to conduct observations is an adapted version of the *Instructional Content Emphasis-Revised* (ICE-R; Edmonds & Briggs, 2003). Seven trained observers went onsite to each participating first-grade classroom three times between fall and spring, on approximately equidistant occasions (after student pretesting in the fall, again in mid-winter, and again, just before posttesting in the spring). It is important to note that this instrument captures observed time spent on instructional content components (not, for example, overall teaching quality or teacher-student interactions). Specifically, time afforded to specific literacy content areas was measured for the entire duration of each teacher's literacy block for each observation. Each instance that a teacher switched content type, the observer recorded the content code and the clock time at which the content code started. To avoid potential drift, observers used timers so that they were reminded every five minutes to check whether the instructional code had changed.

Content Codes. The content codes measure instructional time spent on 12 mutually exclusive literacy activities, including: concepts of print, phonological awareness, alphabetic knowledge, word-study/phonics, spelling, oral language development, fluency building, text reading, comprehension, writing/language arts, vocabulary, and "other" (e.g., behavior management, evaluative feedback, transition time, and other types of non-literacy instruction). Appendix A provides the short form of the definitions of the content codes, as well as instructional grouping codes (the latter was not considered in the present study).

Observer Reliability. Seven certificated teachers served as classroom instruction observers. Prior to onsite observations, each observer studied the ICE-R manual and coding instructions, and participated in several training sessions with the principal investigator. To establish reliability, observers coded eight videotapes of literacy instruction in kindergarten and first grade classrooms. To calculate reliability, each videotape was treated as an observation (and each observer treated an item). For each observer, time spent on each content type per observation was computed. Instructional category reliabilities (using Cronbach's alpha) were as follows: print concepts (.90), phonological awareness (.74), alphabetics (.95), phonics/word study (.99), spelling (.96), oral language (.95), text reading (.94), comprehension (.96), writing/language arts (.91), and vocabulary, (.99). The only content that was not observed during reliability coding was fluency.

Calculation of Variables. Similar to the observer reliability procedures above, data from observations were entered into a database that automatically calculated time (in minutes) spent on each content code for each teacher, for each observation (recall three observations were conducted). Because preliminary data analyses showed no significant linear change in time spent on content areas, content area times across each of the three observations were averaged together for each teacher. As such, the classroom instruction variables used in the present study represent the mean daily minutes teachers spent on content areas.

Variables for Analysis. Across the 28 teachers in the present study, the mean daily literacy block time was 86.98 minutes (SD = 12.55). Among the content codes, teachers spent the highest proportion of their time on "Other" instruction, with M = 30.79 minutes (SD = 10.33), or 35% of their average literacy block time. *Text reading* was allocated an average of 20% of literacy block time (M = 17.12, SD = 8.56); *Word Study/Phonics* was given 15% of the time, and

Comprehension was afforded 11% of the literacy block time ($M = 9.98$, $SD = 6.11$). Although *Writing* was only observed a mean of 7% of the literacy block time ($M = 5.83$, $SD = 7.08$), it was not used in analyses as it was discovered that teachers had another entire period of writer's workshop at a separate time of the day. *Oral Language* was observed for 5% of the literacy block time ($M = 4.38$, $SD = 3.92$) and *Vocabulary* was observed for 3% of the time ($M = 2.70$, $SD = 2.62$). The remaining content codes were observed 2% or less of the literacy block time, and were not considered further.

Student Assessments

Student assessments were individually administered in English in October (pretest) and May (posttest) by trained testers who were unaware of students' experimental assignment. For the present study, we include two early reading measures (phonological awareness and word reading) and three language-related measures (listening comprehension, oral language, and language syntax knowledge). With the exception of language syntax, all measures were based on norm-referenced standard scores (the language syntax measure is a raw score). Gain scores were calculated for each outcome. Details for each of the measures are given below.

Phonological awareness was measured with a composite standard score consisting of three subtests from the *Comprehensive Test of Phonological Processing* (Wagner et al., 1999). This composite assesses the extent to which students are able to hear sounds in words. The Blending Words subtest asks students to blend together parts of words they hear into a complete word. The Elision subtest asks students to repeat words they hear aloud, but without one of the sounds, to make a new word (e.g., "Say *cat*. Now say *cat* without saying /c/".) Finally, the Sound Matching subtest asks students to identify the word with the same sound as that spoken by the tester (Part I), and then to choose which word ends with the same sound as the one spoken by the

tester. Sample internal consistencies (Cronbach's alpha) were .83, .85, and .90 for non-LMs at pretest for each of the subtests, respectively (.83, .85, and .86 for LMs). Reliabilities at posttest were .78, .88, and .91 for non-LMs at posttest for each of the subtests, respectively (.78, .87, and .90 for LMs).

Word reading skill was measured using a mean composite of the Word Identification and Word Attack subtests of the *Woodcock Reading Mastery Test-Revised/Normative Update* (Woodcock, 1987-1998). The Word identification subtest asks students to read real words in isolation that are increasingly difficult (106 items total). The Word Attack subject consists of 45 nonsense words read in isolation that are also increasingly difficult. Norm-referenced standard scores for the WRMT-R/NU are scaled with $M = 100$ and $SD = 15$. Sample internal consistencies were .96 and .89 for non-LMs at pretest for each of the two subtests, respectively (.95 and .88 for LMs). At posttest, reliabilities were .96 and .94 for non-LMs, respectively (same for LMs).

Listening Comprehension was measured using the Listening cluster (composite) from the norm-referenced *Woodcock-Muñoz Language Survey-Revised* (WMLS) (Woodcock et al., 2005). The Listening cluster score comprises two subtests: Verbal Analogies and Understanding Directions. The Verbal Analogies subtest measures the ability to reason using lexical knowledge. Items employ a cloze format and ask students to generate a word that fits a particular relationship with another provided word, with the relationships becoming increasingly difficult (35 items). The Understanding Directions subtest measures listening skills, lexical knowledge, and working memory. It requires students to listen to a sequence of audiotaped instructions and follow those instructions by pointing to various objects in a colored picture, with the directions becoming increasingly difficult (five pictures with of 12 items each). The WMLS norm-referenced standard scores are scaled with $M = 100$ and $SD = 15$. Sample internal consistencies were .73 and .88 for

non-LMs at pretest for each measure, respectively (.79 and .88 for LMs), and .70 and .87 for non-LMs at posttest, respectively (.83 and .88 for LMs).

Oral Language was measured using the norm-referenced WMLS Oral Language cluster (composite), which also comprised two subtests: Picture Vocabulary and Verbal Analogies. The Picture Vocabulary subtest measures language development and lexical knowledge, and asks students to name increasingly difficult pictured nouns (59 items). (Verbal Analogies subtest already described above). As previously mentioned, WMLS norm-referenced standard scores are scaled with $M = 100$ and $SD = 15$. Sample internal consistency for the Picture Vocabulary subtest was .80 at pretest for non-LMs (.87 for LMs) and .70 at posttest for non-LMs (.83 for LMs).

Language Syntax was measured using an adapted version of Siegel's oral cloze task (Siegel, 2008). Students are asked to complete a sentence with a word from a given set of choices. *Fertility*, *fertilize*, *fertilizer*, and *fertilization* might be choices for completing a sentence asking "The farmer put _____ on his crops." In this study, the items from the original cloze task with the best item-total correlations at pretest were utilized at posttest (12 items for the adapted measure). Note that the items were presented in random order with similar difficulty levels; as such, they represent a sampling of items. Raw scores with a maximum of 12 points possible were used for analyses in the present study. Sample internal consistency was .68 for non-LMs at pretest (.69 for LM students), and .69 at posttest for non-LMs (.72 for LM students). (One reason for the lower than typical reliability was due to the relatively high difficulty of the items: median item difficulty based on the entire first grade sample was .30 at pretest and .44 at posttest.)

Data Analysis Plan

Due to the nesting structures (non-independence of data) present in the research design, a multilevel (hierarchical) modeling approach was adopted for testing the research questions. For all outcomes, three-level models were conducted to account for nesting of students (Level 1, n = 94) within classrooms (Level 2, n = 28) within schools (Level 3, n = 11). Specifically, LM status (Level 1), classroom time spent on instructional content areas (Level 2), and two-way interactions between LM status and classroom instructional variables (cross-level) were used to explain variation in student pretest-posttest gains (Level 1). For all models, full maximum likelihood estimation was used. Finally, for ease of results interpretation, all classroom instructional variables were standardized (z-scores) and LM status was effect-coded (+1=LM, -1=non-LM). All multilevel analyses were conducted using *HLM7* software (Raudenbush, Byrk, & Congdon, 2004).

Results

Table 1 reports descriptive statistics for student assessments by Language Minority (LM) status. Although not reported in Table 1 (see Vadasy & Sanders, 2011), pretest means averaged in the 13th percentile on phonological awareness for LMs (27th percentile for non-LMs), 52nd percentile on word reading for LMs (61st percentile for non-LMs), 13th percentile on listening comprehension (48th percentile for non-LMs), and 4th percentile on oral language for LMs (48th percentile for non-LMs). Language syntax, which is a raw score measure with a maximum of 12 points, averaged 25% correct for LM students (M = 3.02, SD = 2.33) and 42% correct for non-LM students (M = 5.07, SD = 2.65).

Zero-order correlations (disaggregated at the student level) are given in Table 2, separated for LM and non-LM students. In general, the pattern of correlations shows that LM students' gains were most strongly associated with increased comprehension and vocabulary

instruction, but for non-LMs, word study and text reading instruction was most strongly associated with fall-spring gains. Text reading instruction time in particular shows differential relationships with student gains: for LM students, time afforded to text reading instruction had a positive relationship with students' gains in oral language and listening comprehension, but a negative relationship with student gains in phonological awareness. Comparatively, for non-LM students, text reading instruction time had a positive relationship with student gains in oral language, listening comprehension, and phonological awareness. Zero-order correlations among the instructional variables used in analyses (across the 28 teachers in the sample) are given in Table 3. These correlations show vocabulary instruction time was positively associated with oral language instruction time, but negatively correlated with text reading time. Importantly, all of these instructional times are somewhat correlated due to the constraints of a typical 90-minute literacy block –more time spent on one content area necessarily means less time on another content area(s).

Intercept-Only Models

An unconditional ("intercept-only") model was conducted for each of the outcomes prior to the full model analyses to obtain preliminary tests of student gains as well as variance component estimates. As shown in Table 4, all first-grade students (across LM and non-LM students) made significant gains from fall to spring on phonological awareness, oral language, and language syntax, but not on word reading or listening comprehension. Table 5 shows that the intraclass correlation coefficients (ICCs), calculated as the percent of variance that the nesting structure accounts for in the total variance, were generally non-zero (exception was for language syntax); hence a multilevel modeling approach to data analysis for these data was appropriate (O'Connell & McCoach, 2008). Specifically, classroom membership accounted for variance in

student gains on word reading, listening comprehension, and oral language, and school membership accounted for variance in student gains on phonological awareness, word reading, and listening comprehension.

Early Reading-Related Outcomes

Phonological Awareness. Results for phonological awareness and word reading gains are presented in Table 6. For phonological awareness (first set of columns in Table 6), only the interaction between LM status and classroom text reading time had unique effect on students' gains. In other words, although LMs did not differ from non-LMs on gains over the course of the academic year (Research Question 1), and although there were no significant main effects of instructional components (Research Question 2), there was a differential effect of classroom text reading time on gains for LMs compared to non-LMs (Research Question 3). To understand the nature of this interaction, predicted (model-implied) gain scores were computed for LM and non-LM students based on three levels of the text reading instruction time (one standard deviation below average to one standard deviation above average). As illustrated in Figure 1, LM students' gains were higher for lower amounts of classroom text reading time, whereas non-LMs had greater gains with greater amounts of classroom text reading time.

Word Reading. Similar to the phonological awareness results, the only unique predictor of students' word reading gains were two significant 2-way interactions: one between LM status and oral language instruction time, and one between LM status and vocabulary instruction time. For LM students, there was a decrease in word reading gains when greater amounts of classroom literacy instruction time were devoted to oral language instruction. In contrast, LM students made greater word reading gains with more vocabulary instruction time. (The pattern was opposite for non-LM students.)

Language-Related Outcomes

Listening Comprehension. Results for the three language-related student outcomes are presented in Table 7. For listening comprehension gains (first set of columns in Table 7), there were two main effects, but no interactions. First, LM students had significantly greater gains than non-LM students on listening comprehension from fall to spring, holding all other things constant (Research Question 1). Second, text reading instruction time had a unique, positive effect on all students' gains: for every one standard deviation increase in text reading instruction time, there was an expected 4.65-point increase in listening comprehension gains, holding all other predictors constant (Research Question 2). No other instructional content had unique effects, and no 2-way interactions were present (Research Question 3).

Oral Language. Similar to the listening comprehension findings, LM students made greater gains (2.36 points) than non-LM students on oral language, and text reading instruction had a unique positive effect on oral language gains across all students (for every standard deviation increase in text reading time, students were predicted to increase by 4.66 points). In addition, comprehension instruction time also had a positive effect on all students' oral language gains (for every standard deviation increase in time spent on comprehension, students were predicted to gain 2.75 points). No significant interactions were detected (see second set of columns in Table 7).

Language Syntax. For language syntax gains (see last set of columns in Table 7), there were no significant main effects (Research Questions 1-2); however, three of the 2-way interactions were significant (Research Question 3). Specifically, there were interactions between LM status and word study instruction, LM status and comprehension instruction, and LM status and vocabulary instruction. Again, to understand the nature of the interactions, model-implied

values were computed and plotted (see Figure 3 Panels A, B, and C for the word study, comprehension, and vocabulary instruction interactions respectively). For LM students, lower gains on language syntax were associated with increased word study instruction time, whereas gains were predicted to be higher for LMs if they received increased time on comprehension and vocabulary instruction. The pattern of effects was opposite for non-LM students.

Discussion

This study investigated the relationships between first-grade classroom literacy instruction content and lower performing students' gains from fall to spring, with a focus on Language Minority (LM) students' outcomes. Findings showed that LM students had greater growth in listening comprehension and oral language outcomes, but not word reading-related or language syntax outcomes. Second, findings showed that none of the literacy block variables uniquely predicted students' reading or language syntax outcomes; however, time spent on text reading instruction uniquely positively predicted gains in listening comprehension and oral language, and further, time on comprehension instruction uniquely predicted students' gains in oral language. More interestingly, the results showed significant interactions between LM status and instructional content on students' gains in phonological awareness, word reading, and language syntax.

As with all studies, the current study has limitations. First, the classroom observations of literacy block instruction did not capture student engagement or teacher quality, and therefore the time spent on literacy content activities may not necessarily reflect student learning during instruction. Nevertheless, the significant associations found in the results demonstrate some reliability that the observations were capturing aspects of student learning. Second, students were not randomly assigned to teachers and as such no causal inferences should be made about teacher

effects on student gains (e.g., teachers with higher performing students may have less room to make gains). However, the students sampled from these teachers represent lower performers within the class and as such, certainly did have some room to grow. Third, students were selected for participation in the original study using relative risk rather than a cut-score criterion that would make the findings perhaps easier to generalize to other lower performing populations. However, even within the relative risk groups, students performed within a range that included very poor performers from struggling schools. Fourth, similar to many prior studies, the current study defined students' LM status based on parent report of the student's home language. Future research could take into consideration the range of English language proficiency at school entry. Finally, though this sample included 28 teachers from 11 schools, it would be beneficial for further research to include a larger, more representative sample of teachers – especially given that the current sample is teachers from relatively high needs schools.

This study provides evidence that lower-skilled first-grade LM students may benefit differentially from typical features of classroom literacy instruction. In particular, these students seemed to benefit from relatively higher amounts of vocabulary and comprehension instruction, and relatively less time on word study or text reading activities. The vocabulary and comprehension instruction observed may have provided the type of student-teacher interactions that promote language development that LM students require to build other early reading skills. This said, lower-performing native English speaking children appear to benefit more from higher amounts of instructional time on text reading, oral language, and word study instruction. Future studies on differentiated classroom instruction might manipulate literacy block composition times to begin to understand optimal sequencing.

References

August, D., Carlo, M., Dressler, C., & Snow, C. (2005). The critical role of vocabulary development for English language learners. *Learning Disabilities Research and Practice, 20*, 50-57.

Biemiller, A., & Boote, C. (2006). An effective method for building meaning vocabulary in primary grades. *Journal of Educational Psychology, 98*, 44-62.

Biemiller, A. & Slonim, N. (2001). Estimating root word vocabulary growth in normative and advantaged populations: Evidence for a common sequence of vocabulary acquisition. *Journal of Educational Psychology, 3,* 498-520.

Blachmann, B. A. (2000). Phonological awareness. In M. L. Kamil, P. B. Mosenthal, P. D. Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test-IIIA* (3rd ed.). Circle Pines, MN: American Guidance Service.

Chiappe, P., & Siegel, L.S. (1999). Phonological awareness and reading acquisition in English- and Punjabi-speaking Canadian children. *Journal of Educational Psychology, 91*, 20-28.

Clarke, P. J., Snowling, M. J., Truelove, E., & Hulme, C. (2010). Ameliorating children's reading-comprehension difficulties: A randomized controlled trial. Psychological Science, published online 28 June, 2010 DOI: 10.1188/09956797610375449, http://pss.sagepub/com/content/early/2010/06/28/0956797610375449

Edmonds, M., & Briggs, K. L. (2003). The Instructional Content Emphasis Instrument:: Observations of reading instruction. In S. Vaughn & K. L. Briggs (Eds.), *Reading in the classroom: Systems for the observation of teaching and learning* (pp. 31-47). Baltimore, KM: Brookes.

Fuchs, D., Fuchs, L.S., Thompson, A., Al Otaiba, S., Yen, L., Yang, N. J.,…O'Connor, R. E. (2001). Is reading important in reading-readiness programs? A randomized field trial with teachers as program implementers. *Journal of Educational Psychology, 93*, 251-267.

Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development, 74,* 1368-1378.

Jongejan, W., Verhoeven, L., & Siegel, L.S. (2007). Predictors of reading and spelling abilities in first- and second-language learners. *Journal of Educational Psychology, 99*, 835-851.

Jorm, A., & Share, D. (1983). Phonological recoding and reading acquisition. *Applied Psycholinguistics, 4*, 103-147.

Kieffer, M. J. (2008). Catching up or falling behind? Initial English proficiency, concentrated poverty, and the reading growth of language minority learners in the United States. *Journal of Educational Psychology, 100*, 851-868.

Kieffer, M. J. (2010). Socioeconomic status, English language proficiency, and late-emerging reading difficulties. *Educational Researcher, 39*, 484-486.

Kieffer, M. J., Vukovic, R. K. (2012). Growth in reading-related skills of language minority learners and their classmates: more evidence for early identification and intervention. *Reading and Writing*, *(published online)*, 1-36. doi: 10.1007/s11145-012-9410-7

Lesaux, N. K., & Kieffer, M.J. (2010). Exploring sources of reading comprehension difficulties among language minority learners and their classmates in early adolescence. *American Educational Research Journal, 4*, 596-632.

Marulis, L. M., & Neuman, S. B. (2010). The effects of vocabulary intervention on young children's word learning: a meta-analysis. *Review of Educational Reasearch, 80,* 300-335.

Metsala, J. L. (1999). Young children's phonological awareness and nonword repetition as a function of vocabulary development. *Journal of Educational Psychology, 91,* 3-19.

Metsala, J., L., & Walley, A., C. (1998). Spoken vocabulary growth and the segmental restructuring of lexical representations: Precursors to phonemic awareness and early reading ability. In J.,L. Metsala and L.C. Ehri (Eds.), *Word recognition in beginning literacy* (pp. 89-120). Mahwah, NJ: Lawrence Erlbaum Associates.

Nakamoto, J., Lindsey, K. A., & Manis, F. R. (2007). A cross-linguistic analysis of Englishs language learners' word decoding and reading comprehension. *Scientific Studies of Reading, 12,* 351-371.

National Center for Education Statistics (2009). *Nation's Report Card: Reading, 2009.* Washington, DC: National Center for Education Statistics.

National Early Literacy Panel. (2009). *Developing early literacy: Report of the National Early Literacy Panel.* Washington, DC: National Institute for Literacy.

O'Connell, A. A., & McCoach, D. B. (2008). *Multilevel modeling of educational data.* Charlotte, NC: Information Age Publishing.

Raudenbush, S. W., Bryk, A. S., Congdon, R. T., (2004). *HLM for Windows 6.0.* Lincolnwood, IL: Scientific Software International, Inc.

Siegel, L. S. (2008). Morphological awareness skills of English language learners and children with dyslexia. *Topics in Language Disorders, 28*, 15-27.

Silverman, R., & Crandall, J. D. (2010). Vocabulary practices in prekindergarten and kindergarten classrooms. *Reading Research Quarterly, 45,* 318-340.

Snow, C. E., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children.* Washington, DC: National Academy Press.

Swanson, H. L., Saez, L., & Gerber, M. (2006). Growth in literacy and cognition in bilingual children at risk for reading disabilities. *Journal of Educational Psychology, 98*, 247-264.

Tunmer, W. E., & Rohl, M. (1991). Phonological awareness and reading acquisition. In Phonological Awareness in reading: The evolution of current perspectives (pp. 31-72). New York: Springer-Verlag.

Vadasy, P.F. & Sanders, E. A. (2011). Efficacy of supplemental phonics-based instructions for low-skilled first graders: How language minority status and pretest characteristics moderate treatment response. *Society for the Scientific Study of Reading, 0,* 1-27.

Verhoeven, L. (2000). Components in early second language reading and spelling. *Scientific Studies of Reading, 4*, 313-330.

Wade-Wooley, L., & Siegel, L.S. (1997). The spelling performance of ESL and native speakers of English as a function of reading skill. *Reading and Writing: An Interdisciplinary Journal, 9*, 387-406.

Wagner, R., Torgesen, J. K., & Rashotte, C. A. (1999). *Comprehensive Test of Phonological Processing*. Pro-Ed: Austin, TX.

Woodcock, R., (1987/1998). *Woodcock Reading Mastery Test-Revised/Normative Update*. Circle Pines, MN: American Guidance service.

Appendix

ICE-R Classroom Reading Instruction Content Codes (Short Form)

DIMENSION A →	1: Concepts of Print	2: Phonological Awareness	3: Alphabetic Knowledge	4: Word Study / Phonics	5: Spelling
	1. Concepts of print	1. Rhyming 2. Blending or segmenting sentences/syls 3. Onset/rime 4. Blending or segmenting phonemes 5. Isolation tasks 6. Other	1. Letter identification and/or recognition 2. Other	1. Letter/sound relationships 2. Provides opportunities for application of letter/sound knowledge to reading/ writing/ spelling 3. Irregular words 4. Word reading 5. Integration of word study 6. Other	1. Spelling

DIMENSION A →	6. Oral Language Development	7. Fluency	8. Text Reading	9. Comprehension	10. Writing or Language Arts
	1. Teacher initiated structured opportunities to talk with teachers/peers 2. Expansion of student initiated language (incidental language strategies) 3. Other	1. Letter or sound naming fluency 2. Word fluency 3. Repeated reading of text 4. Other	1. Supported oral reading 2. Choral reading 3. Independent silent reading 4. Independent oral reading 5. Teacher reads aloud 6. Teacher reads aloud while students read along 7. Other	1. Prior knowledge/ predicting 2. Reading comprehension monitoring 3. Listening comprehension monitoring 4. Comprehension strategy instruction/ use 5. Other	1. Shared writing 2. Writing composition 3. Independent writing/publishing 4. Grammar and punctuation 5. Handwriting instruction 6. Copying 7. Other

DIMENSION A →	11. Vocabulary Direct or Indirect	Non-Literacy Content Codes	DIMENSION B Instructional Grouping
	1. Teacher defines the word, direct instruction of meaning 1. Vocabulary instruction embedded 2. Teacher shows students how to figure out the meaning 3. Students categorize words 4. Teacher talks about word origins/relatives 2. Students use context to confirm meaning	T= transition, preparing and explaining reading activity and objectives, set up time, student movement between activities, students getting or putting back materials, moving into groups or other classrooms E= evaluative feedback in response to student, correcting and reviewing errors, providing feedback to student on performance B= behavior management, non instructional time O= other non-reading instruction (e.g., incidental math instruction)	1. Whole class 2. Small group 3. Pairing 4. Independent 5. Individualized

Table 1

Student Assessment Descriptive Statistics

	LM (n= 50)		*Non-LM (n = 44)*	
Measure	*M*	*SD*	*M*	*SD*
Phono Aware	3.84	9.77	3.93	8.70
Word Reading	3.14	8.14	0.56	5.65
Listening Comp	4.70	13.47	-1.18	9.75
Oral Lang	6.64	12.56	0.93	9.20
Language Syntax	1.64	2.25	2.32	2.79

Note. N = 94 first-grade students from 28 classrooms and 11 schools. All measures are gain scores from pretest (fall) to posttest (spring). Phonological Awareness = Comprehensive Test of Phonological Processing Phonological Awareness standard score; Word Reading = mean of Woodcock Reading Mastery Test Revised/Normative Update (WRMT-R/NU) Word Identification and Word Attack subtest standard scores; Listening Comp = Listening Comprehension subset of the Woodcock-Muñoz Language Survey-Revised standard score; Oral Lang = Oral Language subset of the Woodcock-Muñoz Language Survey-Revised standard score; Language Syntax = Siegel Oral Cloze Task raw score (12 points max).

Table 2

Zero-Order Correlations among Student Gains and Instruction Variables (Disaggregated at Student Level)

Measures	*LM (n=50)*					*Non-LM (n=44)*				
	6. Word Study	7. Oral Lang	8. Text Reading	9. Comp	10. Vocab	6. Word Study	7. Oral Lang	8. Text Reading	9. Comp	10. Vocab
Student Pre-Post Gains										
1. Phono Aware	.01	-.11	-.30*	.25	.23	.08	.02	.28	-.04	-.11
2. Word Reading	.23	.21	-.07	.16	.20	.20	.07	.01	.08	.09
3. Listening Comp	.05	-.13	.23	.17	.06	.33*	-.02	.21	.02	-.07
4. Oral Lang	-.04	-.14	.30*	.24	-.05	.23	-.14	.31*	.17	-.21
5. Language Syntax	-.13	-.14	-.03	.13	.25	.23	.07	.01	-.33*	.05
Instruction Time (minutes)										
6. Word Study	--	-.17	-.24	.14	.36*	--	-.09	-.17	.08	.22
7. Oral Language	--	--	-.10	-.26	.28*	--	--	.43**	-.25	.50**
8. Text Reading	--	--	--	-.24	-.55**	--	--	--	.01	-.57**
9. Comprehension	--	--	--	--	.04	--	--	--	--	-.22
10. Vocabulary	--	--	--	--	--	--	--	--	--	--

Note. $N = 94$ students from 28 classrooms and 11 schools. LM=Language Minority; Phono Aware = standard score of the Phonological Awareness subtest of the Comprehensive Test of Phonological Processing standard score; Word Reading = mean of Woodcock Reading Mastery Test Revised/Normative Update (WRMT-R/NU) Word Identification and Word Attack subtest standard scores; Oral Lang = standard score of the Oral Language subtest of the Woodcock-Muñoz Language Survey-Revised; Listening Comp= standard score of the Listening Comprehension subtest of the Woodcock-Muñoz Language Survey-Revised; and Language Syntax = raw score from the Siegel Oral Cloze Task (12 points max). Instruction times are minutes of instruction spent on the topic and are standardized. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3

Zero-Order Correlations among Classroom Instruction Variables (Teacher Level)

Instructional Variables	1.	2.	3.	4.	5.
1. Word Study	--				
2. Oral Lang	-.20	--			
3. Text Reading	-.17	-.24	--		
4. Comprehension	.08	-.19	-.11	--	
5. Vocab	.20	.38 *	-.54 **	-.04	--

Note. $N = 28$ classrooms. All variables are mean minutes of instruction spent on the content area.
*$p < .05$, ** $p < .01$.

Table 4

Intercept-Only Gain Models

Student Gains	*Coef f*	*SE*	*t*	*df*	*p*
Phono Aware	3.90	1.17	3.32	10	.009
Word Reading	1.65	1.14	1.45	10	.179
Listening Comp	1.76	1.77	0.99	10	.344
Oral Lang	4.35	1.48	2.93	10	.016
Language Syntax	1.96	0.26	7.55	10	.001

Note. N = 94 first-grade students from 28 classrooms and 11 schools. All measures are gain scores from pretest (fall) to posttest (spring). Phonological Awareness = Comprehensive Test of Phonological Processing Phonological Awareness standard score; Word Reading = mean of Woodcock Reading Mastery Test Revised/Normative Update (WRMT-R/NU) Word Identification and Word Attack subtest standard scores; Listening Comp = Listening Comprehension subset of the Woodcock-Muñoz Language Survey-Revised standard score; Oral Lang = Oral Language subset of the Woodcock-Muñoz Language Survey-Revised standard score; Language Syntax = Siegel Oral Cloze Task raw score (12 points max).

Table 5

Intraclass Correlations

Student Gains	Classrooms	Schools
Phono Aware	0.00	0.06
Word Reading	0.16	0.13
Listening Comp	0.24	0.04
Oral Lang	0.23	0.00
Language Syntax	0.00	0.00

Note. $N = 94$ first-grade students from 28 classrooms and 11 schools. All measures are gain scores from pretest (fall) to posttest (spring). Phonological Awareness = Comprehensive Test of Phonological Processing Phonological Awareness standard score; Word Reading = mean of Woodcock Reading Mastery Test Revised/Normative Update (WRMT-R/NU) Word Identification and Word Attack subtest standard scores; Listening Comp = Listening Comprehension subset of the Woodcock-Muñoz Language Survey-Revised standard score; Oral Lang = Oral Language subset of the Woodcock-Muñoz Language Survey-Revised standard score; Language Syntax = Siegel Oral Cloze Task raw score (12 points max). Intraclass correlations calculated as the percent of total variation accounted for by the classroom or school level (variance components estimated from the intercept-only models).

Table 6

Model Results for Reading-Related Student Gains

	Phono Aware Gain					Word Reading Gain				
Fixed Effects	*Coeff*	*SE*	*t*	*df*	*p*	*Coeff*	*SE*	*t*	*df*	*p*
Intercept (Mean)	4.01	1.09	3.70	10	.005	1.81	0.93	1.93	10	.082
LM Status	-0.28	0.88	-0.32	82	.751	0.98	0.62	1.57	82	.120
Word Study Inst T	-0.23	1.22	-0.19	22	.855	0.90	1.06	0.85	22	.405
Oral Lang Inst T	0.13	1.11	0.12	22	.906	-0.13	1.04	-0.12	22	.903
Text Read Inst T	0.77	1.10	0.70	22	.493	0.47	1.07	0.44	22	.666
Comp Inst T	0.71	1.05	0.68	22	.505	0.72	0.97	0.74	22	.469
Vocab Inst T	1.27	1.27	1.00	22	.327	0.72	1.19	0.61	22	.548
LM*Word Study Inst T	-1.86	1.09	-1.70	82	.093	-0.30	0.76	-0.39	82	.699
LM*Oral Lang Inst T	-1.66	0.98	-1.69	82	.094	-1.64	0.68	-2.40	82	.019
LM*Text Read Inst T	-2.48	1.07	-2.32	82	.023	0.23	0.75	0.32	82	.754
LM*Comp Inst T	0.74	1.00	0.74	82	.461	-0.13	0.74	-0.18	82	.859
LM*Vocab Inst T	1.32	1.20	1.10	82	.274	1.92	0.84	2.29	82	.024
Random Effects	*Var*		*chi*	*df*	*p*	*Var*		*chi*	*df*	*p*
Intercept										
Between Classrooms	0.05		13.77	12	.315	11.17		37.17	12	.000
Between Schools	4.06		15.97	10	.100	1.07		11.24	10	.338
Residual	67.54					30.55				
No. Param	15					15				
Deviance (-2LL)	667					612				

Note. N = 94 first-grade students from 28 classrooms and 11 schools. LM status effect coded (-1 = non-LM, +1 = LM) and all instructional variables standardized. Word Study Inst T = Word Study Instruction Time; Oral Lang Inst T = Oral Language Instruction Time, Text Read Inst T = Text Reading Instruction Time; Comp Inst T = Comprehension Instruction Time; Vocab Inst T = Vocabulary Instruction Time. All student outcome measures are gain scores from pretest (fall) to posttest (spring). Phonological Awareness = Comprehensive Test of Phonological Processing Phonological Awareness standard score; Word Reading = mean of Woodcock Reading Mastery Test Revised/Normative Update (WRMT-R/NU) Word Identification and Word Attack subtest standard scores.

Table 7

Model Results for Language-Related Student Gains

	Listening Comp Gain					*Oral Language Gain*					*Lang Syntax Gain*				
Fixed Effects	*Coeff*	*SE*	*t*	*df*	*p*	*Coeff*	*SE*	*t*	*df*	*p*	*Coeff*	*SE*	*t*	*df*	*p*
Intercept (Mean)	1.95	1.19	1.63	10	.134	4.08	1.02	3.99	10	.003	1.94	0.24	8.15	10	.000
LM Status	2.34	1.10	2.13	82	.036	2.36	1.02	2.31	82	.023	-0.34	0.24	-1.44	82	.153
Word Study Inst T	2.38	1.46	1.63	22	.118	1.41	1.28	1.11	22	.281	0.24	0.30	0.82	22	.423
Oral Lang Inst T	0.06	1.35	0.04	22	.965	0.09	1.15	0.08	22	.940	0.16	0.27	0.62	22	.543
Text Read Inst T	4.65	1.46	3.20	22	.005	4.66	1.25	3.73	22	.001	0.28	0.29	0.96	22	.349
Comp Inst T	1.62	1.33	1.22	22	.236	2.75	1.15	2.38	22	.026	-0.39	0.27	-1.47	22	.157
Vocab Inst T	2.22	1.62	1.37	22	.184	1.26	1.40	0.90	22	.379	0.39	0.33	1.19	22	.249
LM*Word Study Inst T	-2.57	1.37	-1.88	82	.063	-2.33	1.28	-1.82	82	.071	-0.82	0.30	-2.78	82	.007
LM*Oral Lang Inst T	-1.47	1.23	-1.20	82	.235	-1.08	1.14	-0.95	82	.346	-0.05	0.27	-0.19	82	.850
LM*Text Read Inst T	1.58	1.34	1.18	82	.241	1.45	1.25	1.16	82	.251	0.19	0.29	0.64	82	.525
LM*Comp Inst T	1.32	1.26	1.05	82	.297	1.09	1.15	0.95	82	.347	0.82	0.27	3.07	82	.003
LM*Vocab Inst T	2.89	1.50	1.93	82	.057	2.30	1.40	1.64	82	.105	0.69	0.33	2.12	82	.037
Random Effects		*Var*	*chi*	*df*	*p*		*Var*	*chi*	*df*	*p*		*Var*	*chi*	*df*	*p*
Intercept															
Between Classrooms		6.57	26.39	12	.010		0.01	21.36	12	.045		0.00	14.13	12	.292
Between Schools		0.05	7.30	10	>.500		0.02	6.01	10	>.500		0.00	5.33	10	>.500
Residual		104.53					93.49					5.04			
No. Param		15					15					15			
Deviance (-2LL)		709					693					419			

Note. N = 94 first-grade students from 28 classrooms and 11 schools. LM status effect coded (-1 = non-LM, +1 = LM) and all instructional variables standardized. Word Study Inst T = Word Study Instruction Time; Oral Lang Inst T = Oral Language Instruction Time, Text Read Inst T = Text Reading Instruction Time; Comp Inst T = Comprehension Instruction Time; Vocab Inst T = Vocabulary Instruction Time. All student outcome measures are gain scores from pretest (fall) to posttest (spring). Listening Comp = Listening Comprehension subset of the Woodcock-Muñoz Language Survey-Revised standard score; Oral Lang = Oral Language subset of the Woodcock-Muñoz Language Survey-Revised standard score; Language Syntax = Siegel Oral Cloze Task raw score (12 points max).

Figure 1. *Model-implied Phonological Awareness Gains for levels of Text Reading Instruction Time, separated for LM and non-LM students*

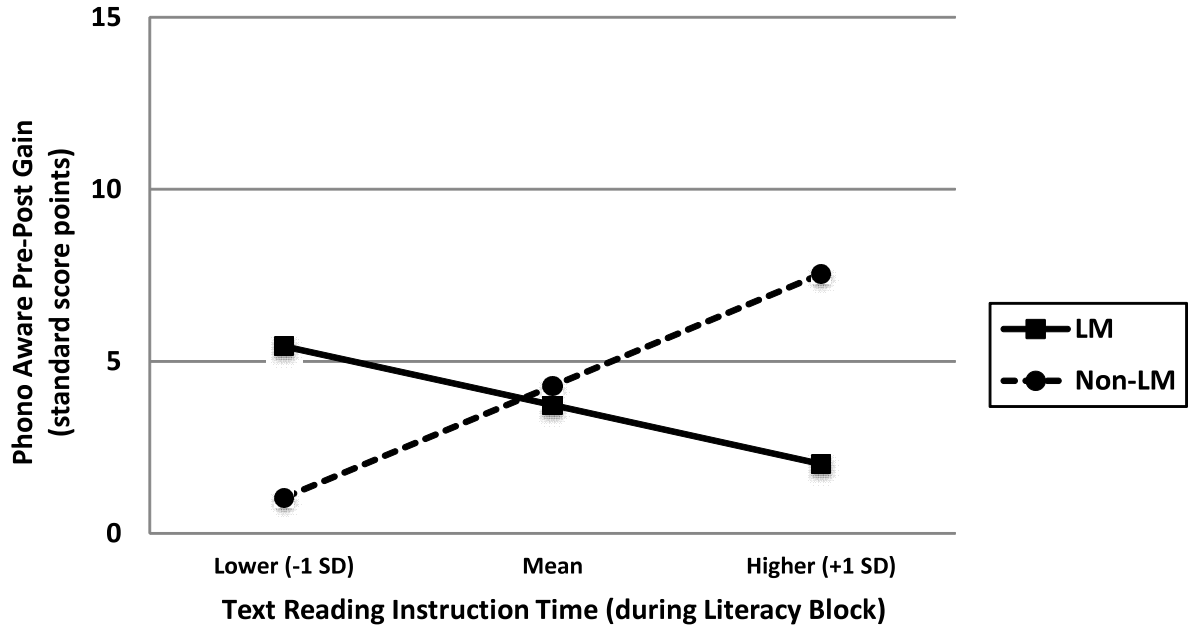

Figure 2. *Model-implied Word Reading Gains for levels of Oral Language (Panel A) and Vocabulary (Panel B) Instruction Time separated for LM and non-LM students*

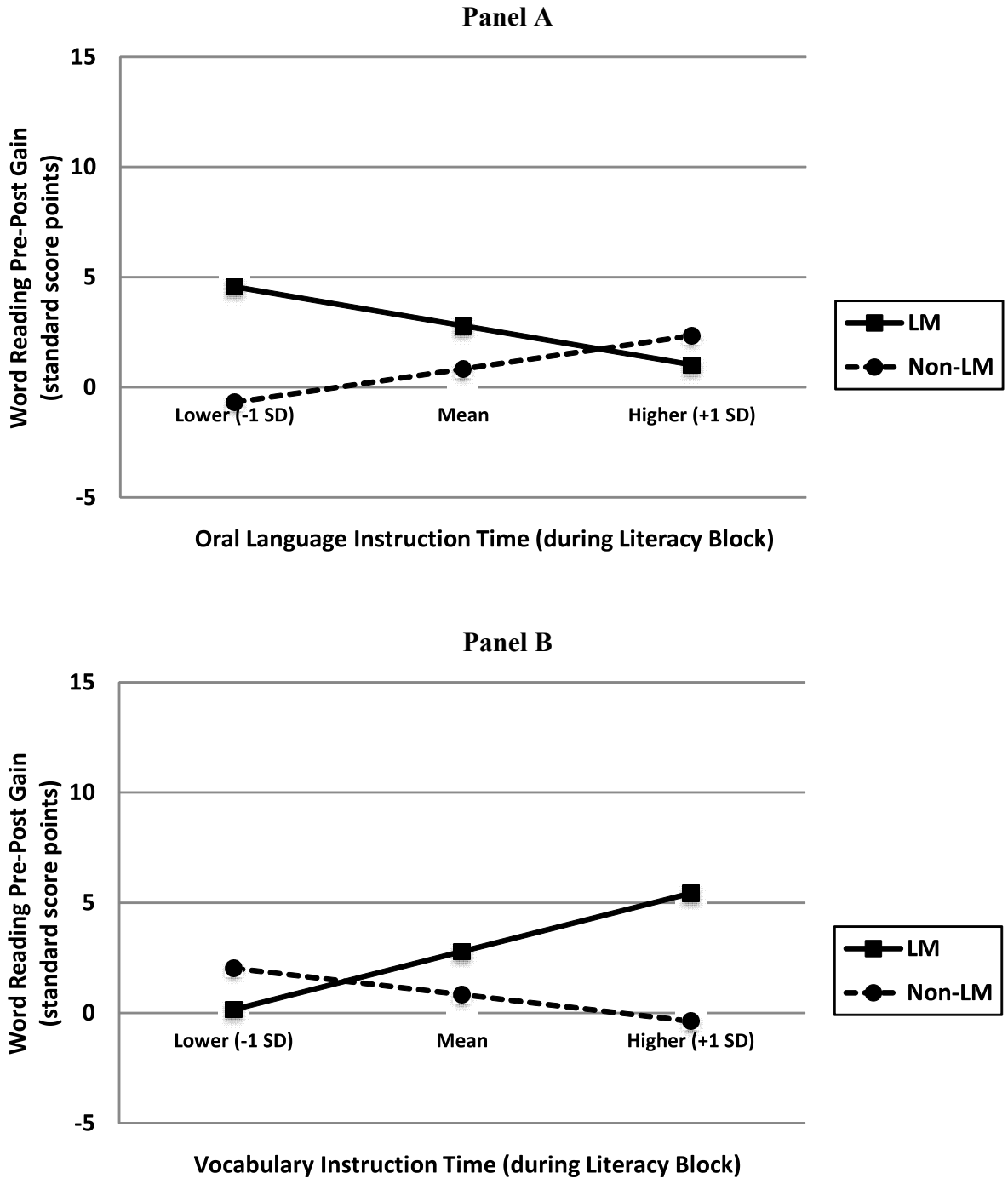

Figure 3. *Model-implied Language Syntax Gains for levels of Word Study (Panel A), Comprehension (Panel B), and Vocabulary (Panel C) Instruction Time separated for LM and non-LM students*